

**Table of Contents**

<b>1. Abbreviations</b>	<b>Page 2</b>
<b>2. BuildLACCD Program Sustainability Requirements Overview</b>	<b>Page 5</b>
<b>3. Use of LEED Rating System</b>	<b>Page 7</b>
<b>4. Standard Operating Procedure for Achieving Sustainability For projects</b>	<b>Page 7</b>
<b>5. Mandatory Sustainability Features</b>	<b>Page 18</b>
<b>6. Campus Provided Credits</b>	<b>Page 36</b>
<b>7. Requirements of Renovation Projects not meeting the LEED Certification Threshold</b>	<b>Page 36</b>
<b>8. Appendix (Reference Documents/Attachments)</b>	<b>Page 36</b>

**1. Abbreviations**

ARB - Air Resources Board	ASTM - American Society for Testing and Materials
ATCM - Air Toxics Control Measure	ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
BAS – Building Automation System	BIFMA - Business and Institutional Furniture Manufacturers Association
BIM – Building Information Modeling	BMPs – Best Management Practices
BMS - Building Management System	BOD – Basis of Design
BOT – Board of Trustees	BUG – Building User Group
CBC – California Building Code	CEC – California Energy Code
CD- Construction Documents	CFCs - Chloroflourocarbons
CFD - Computational Fluid Dynamics	CMC – California Mechanical Code
CO2 - Carbon Dioxide	CPC – California Plumbing Code
CPT – College Project Team	CSL - Candidate Standard Level
CWA – Clean Water Act	Cx - Commissioning
DB – Design Build	DBB – Design Bid Build
DCV - Demand Control Ventilation	DD- Design Development
DDC - Direct Digital Control	ECM – Electronically Commutated Motor
EERs - Energy Efficiency Ratios	EMS - Energy Management System

EPM – Energy Project Manager	EPACT – Energy Policy ACT
EPA - Environmental Protection Agency	ETV - Environmental Verification
EUIs - Energy Use Indices	FF&E - Furniture, Fixtures and Equipment
FMP&OC - Facilities Master Planning & Oversight Committee	FSC - Forest Stewardship Council
GBCI – Green Building Certification Institute	HCFCs - Hydrochlorofluorocarbons
HVAC – Heating Ventilation & Air Conditioning	IAQ - Indoor Air Quality
IDM - Integrated Design Manual	ISO - International Organization for Standardization
LACCD – Los Angeles Community College District	LED - Light-Emitting Diodes
LEED – Leadership in Energy & Environmental Design	LLB – Lease Lease Back
MDF - Medium Density Fiberboard	M&DR – Metering & Demand Response
MEP – Mechanical, Electrical & Plumbing	MERV - Minimum Efficiency Reporting Value
NEMA - National Electrical Manufacturers Association	O&M – Operations & Maintenance
OPR – Owner Project Requirements	PM – Project Manager
PMO – Program Management Office (of Build LACCD)	PVC - Polyvinyl Chloride
RDL – Regional Design Liaison	REHVA - Federation of European Heating, Ventilation and Air Conditioning Associations
RoHS - Restriction of Hazardous Substances Directive	RPL – Regional Program Liaison

SCAQMD - South Coast Air Quality Management District	SMACNA - Sheet Metal and Air Conditioning Contractors National Association
SPL –Sustainability Manager	SRI - Solar Reflectance Index
SUSMP - Standard Urban Stormwater Mitigation Plan	TARP - Technology Acceptance Reciprocity Partnership
TMDLs - Total Maximum Daily Loads	TSS - Total Suspended Solids
USGBC – United States Green Building Council	VAV – Variable Air Volume
VFDs - Variable Frequency Drives	VOC - Volatile Organic Compounds
WBCxA – Whole Building Commissioning Agent (PMO CxA)	

## 2. Build LACCD Program Sustainability Requirements Overview

### Sustainable Building Principles and Standards

- A. Sustainability Policy:** In 2002, the LACCD Board of Trustees adopted the Leadership in Energy and Environmental Design (LEED™) rating system<sup>1</sup> to deliver new construction and major renovation projects. The policy requires that:
- i. All new buildings and major renovations over 7,500 sf and an occupied structure shall minimally be LEED 'Certified'. Individual projects may stipulate LEED goals that exceed the minimum.
  - ii. Minor renovations are exempt from LEED certification, but are required to exceed Title 24 by 10%. Individual projects are monitored using a 'sustainability checklist for renovation projects'.
  - iii. Exceed Title 24 by 20% for all new construction.
  - iv. 15% of the project's energy use to be supplemented by renewable energy, of which min 10% is to come from on-site sources (Photovoltaic panels). Compliance and approval is on a project by project basis.

**B. Applicable Documents Reflecting LACCD Sustainability Requirements:**

- i. **Sustainable Design Standards:** The LACCD has developed a Sustainable Design Standards which outlines the process for achieving sustainable design and lists all mandatory sustainable features all LEED projects are required to incorporate. Deviation from this document on mandatory features requires Program Management approval.
- ii. **Bulk Procurement of Flooring Products:**  
  
Design Build teams have the option of using master agreements available to LACCD for specifying flooring products. The list of master procurement contracts related to sustainability products is continually updated. Please contact the Contracts Department of the PMO to obtain these.
- iii. **Sustainable Design Specifications:**  
  
LACCD Division 1 General Conditions contain a section on Sustainable Design. These outline the sustainability threshold requirements for individual projects.

**C. Application of the Sustainable Building Principles and Standards to Projects**

**i. New Construction Projects**

New construction projects that incorporate the District's Sustainable Building Principles and Standards meet all of the following criteria:

- More than 50% of the funding is from Bond proceeds
- Building area is over 7,500 square feet
- Occupied structure

---

*1 The LEED™ Green Building Rating System, developed by the United States Green Building Council (USGBC), is a consensus based national standardized process for delivering green buildings, providing third party verification for sustainability metrics.*

If the above three criteria are satisfied then the building is targeted to achieve a minimum of LEED Certified in the latest rating system by United States Green Building Council (USGBC). Depending on the delivery method selected at project initiation, a higher certification goal may be targeted at the discretion of the College President and shared governance. The driver for certification level should always be the program intent and LEED certification updates should reflect intent of sustainable features and criteria for the project.

- a) **Design/Bid/Build and Lease/Leaseback-** The campus Shared Governance approves the level of certification established by the design team. The Facilities Master Planning & Oversight Committee (FMP&OC) recommends approval of the level of LEED certification to the board while recommending the project package for approval.
- b) **Design Build-** the DB selection committee approves the best value DB proposal. The FMP&OC approves sustainability features and level of LEED certification at 100% Design Development.

## ii. Major Renovation Projects

Major renovation projects that incorporate the District's Sustainable Building Principles and Standards include projects that meet the following criteria:

- More than 50% of the exterior envelope is renovated. (Exterior envelope is defined as exterior walls, windows, door systems, or roof systems.)
- Project scope includes upgrading major building systems, (mechanical, electrical and/or plumbing systems)
- Occupied Structure

These projects should follow LEED certification requirements, and all sustainability requirements similar to new construction projects.

## iii. Non LEED Buildings

If a building does not meet the District's criteria for new construction projects or major renovation projects, it is then considered a non-LEED™ project, i.e. these projects will continue to incorporate sustainable features that complement the program for the project, however, will not pursue official LEED certification through GBCI. Non LEED projects include projects that meet the following criteria:

- Less than 50% of exterior envelope renovated.
- Infrastructure projects
- Non-occupied structures

- a) Design/Bid/Build and Lease/Leaseback

The LACCD Sustainable Checklist for Renovation Projects shall be completed in Schematic Design phase and receive approval of sustainable features incorporated in Design Development Phase by the program manager.

- b) Design Build

The program criteria architect should complete the renovation checklist (Appendix Attachment 8A) and this should be included in the programming document included in the RFP.

All non-LEED™ projects are to be listed on the FMP&OC Meeting Agenda where approval of the sustainable checklist will be provided. The LACCD Sustainable Checklist for Renovation Projects shall be completed in design development phase and receive approval of sustainable features incorporated.

### 3. Use of LEED rating system

#### A. Green Building Certification Institute (GBCI) Coordination:

- i. The PMO will assign registration numbers for all LEED projects on LEED Online at project initiation when LEED certification requirement for the project is established.
- ii. GBCI certification process and LEED management will be provided by the design team. Throughout the design and construction process the Sustainability Consultant who is part of the design team, is responsible for managing the LEED certification process and submits all documentation to the GBCI/USGBC for evaluation. LACCD does not necessitate hiring of a LEED consultant. If the architect takes on this role, the architect is required to perform the duties of LEED management with GBCI. Refer to the Division 1 Specification for more on this topic.
- iii. The LEED consultant should obtain campus specific information for project setup from the Program Management SPL- Sustainability Program Manager.
- iv. Issuance of a Credit Interpretation Request (CIR) to GBCI must be approved by the SPL. SPL should be advised of situation and copied on all communication to the GBCI/USGBC as related to LACCD projects.
- v. The use of the 'sustainable education' innovation credit is at the discretion of the design team. This would give the user a summary of sustainable features of the project. Methods to display this information include a computer console at the entrance of the building with a looped PowerPoint presentation that would continuously display, cut away models of the building showing the sustainable features, signage describing the sustainable features, and/or commitment to tour the facility. The sustainability consultant on the project team should coordinate early in design with the owner to confirm how sustainable education will be incorporated into the project. Written approval is required of all owner items and on scorecard.
- vi. The Commissioning Agent (CxA) on the project, hired by LACCD, is responsible for submitting the prerequisite and enhanced Cx credit to GBCI/USGBC.
- vii. Selection of LEED version- the program requirements will specify this information. When it does not, it should be assumed that the latest version of LEED will apply.
- viii. LACCD projects fall under the realm of New Construction. However, if a Design Build/Design Team wants to pursue a different LEED certification model (Schools, Commercial Interiors, Core and Shell etc.), it has to be approved in writing during procurement, otherwise it will be assumed that New Construction will apply.

### 4. Standard Operating Procedure for Achieving Sustainability for Projects

#### A. Sustainable Design Process Summary

Sustainable building design will be achieved through execution of the following:

- Integrated design delivery, in coordination with Master planning, programming, BIM modeling with the goal of facility management, Energy efficiency and management best practices, Commissioning, Warranties and handover.
- Balancing of programming requirements to available resources and funds.
- During early stages of design, calibrating the cost model to choose sustainable design features in line with program requirements.

- Understanding operations and maintenance requirements and resources of the building systems considered.
- Complying with the LEED rating system requirements and process to deliver a LEED certified project.

**B. Critical Sustainable Design Coordination among various parties**

Integrated design through timely coordination between various disciplines will ensure a quality sustainable design delivery. Details of the coordination meetings required, who they are chaired by, goals and outcomes of the meeting and each party’s responsibility are listed below.

**During Programming**

Meeting # (can be touch base/email)	USGBC Registration
Chaired by	PMO SPL
Participants and responsibilities	CPT Programming Criteria Architect
Goals and Outcomes	Establish a project registration, rating system and number for the project on LEED Online from LACCD pre-registered projects.  Confirm timeline and registration info for team member to accurately complete LEED online registration (for DB teams on boarding).  Architect (DBB) or DB team to invite PMO and CPT to LEED Online with PM level access.

Meeting #	Programming Meeting
Chaired by	Programming Criteria Architect (PCA) and the MEP criteria engineers
Participants and responsibilities	CPT to coordinate meeting invitation list and logistics  Campus Facilities, Building User Group  SPL, RDL
Goals and Outcomes	During Programming, alternative heating, cooling and ventilation systems should be evaluated. The use of natural ventilation, radiant floors, passive and active chilled beams, underfloor air distribution, and displacement ventilation should be studied by the PCA and their MEP teams. The program should be reviewed in its DRAFT form with



	the BUG and CPT and alternative systems study should be presented. The MEP programming criteria team should list specific criteria for rooms where these systems are considered.
--	--

Each project should have its own Owner Project Requirements (OPR) tailored to the program of the project. The meeting should occur after program has been established. The Program and the OPR should be coordinated. Programming Criteria Architect, RDL and SPL is required to coordinate with the WBCxA and review the OPR for coordination.

Meeting #	OPR BUG Meeting  BUG - A group determined by shared governance to make up the campus approval committee, and usually consists of Dean of the college curriculum, building department chairs for college, Facilities Director and others as deemed appropriate.
Chaired by	WBCxA (or project CxA)
Participants and responsibilities	CPT to coordinate meeting invitation list and logistics  Campus Facilities  Building User Group  PMO WBCxA, SPL, RDL  CxA (or WBCxA) to develop an OPR based on this meeting with BUG
Goals and Outcomes	Define training requirements overview based on building needs.

**100% Schematic Design, 50% DD (Prior to FMP&OC Meetings), 100% DD, DSA Documents**

Meeting #	Energy & Asset Modelling Review
Chaired by	Design Team Energy Modeler
Participants and responsibilities	PMO- SPL, AE Energy Modeler, EPM, District Facilities Office or designee as assigned. Facilities PM for Central Plants (if applicable)
Goals and Outcomes	As needed, when compliance is not achieved, conduct a status meeting to confirm progress at the energy modeling milestones. Discuss central plant modeling and design criteria as applicable.

**100% Schematic Design, 50% DD, 50% & 95% CD, DSA Documents**

Meeting #	Sustainability Review at each phase of design
-----------	---

Chaired by	CPT
Participants and responsibilities	<p>AE</p> <p>Design Team members as appropriate</p> <p>Facilities Management- for O&amp;M and design input</p> <p>Construction Team as applicable to delivery process</p> <p>PMO-SPL, WBCxA, EPM, District Facilities Office or designee as assigned, Facilities PM for Central Plants (if applicable)</p> <p>Optional- BIM</p>
Goals and Outcomes	<p>-Validate design goals, status check; confirm sustainability requirements are incorporated into the design drawings.</p> <p>-Confirm facilities training needs</p> <p>-Confirm central plant and energy requirements and design options</p> <p>-Coordinate with Project WBCxA</p>

**Construction- Kick Off**

Meeting #	LEED Kick off, Cx Kick-off and Asset Modelling Mtg.
Chaired by	Design Team Sustainability Consultant
Participants and responsibilities	<p>CPT</p> <p>Cx Agent</p> <p>Construction Team including all MEP, BAS and renewable energy subcontractors</p> <p>PMO- SPL</p> <p>(Can be individual or combined meeting)</p>
Goals and Outcomes	<p>Convey contractor LEED credits roles and responsibilities</p> <p>Convey Commissioning Plan and coordination with Sub-contractors</p> <p>Review construction schedule with respect to Cx activities at pre-functional and functional testing</p> <p>Kick off asset modeling criteria, requirements and roles and responsibilities</p>

**Construction-Substantial Completion**

Meeting #	Building Flushout- This can be concurrent with a WBCxA coordination meeting
Chaired by	CPT
Participants and responsibilities	WBCxA Construction Team ME Consultant LEED consultant
Goals and Outcomes	Confirm the flushout duration, responsibilities, schedule and LEED deliverables and incorporation of flushout in the project completion schedule.

**Construction- Handover Process**

Meeting #	WBCxA Training
Chaired by	WBCxA
Participants and responsibilities	CPT Building Facilities, Facilities PM for Central Plants (if applicable), Construction Team representative Optional- PMO Warranty
Goals and Outcomes	Conduct training as specified in the specifications to fulfill LEED Cx and District Cx requirements.

**Construction- Post Occupancy 10 months**

Meeting #	WBCxA Review
Chaired by	WBCxA
Participants and responsibilities	Building Facilities Construction Team representative CPT Optional-PMO-RDL, RPL, SPL, Facilities PM for Central Plants (if applicable)
Goals and Outcomes	Building performance review and report

	Coordination with building performance model Coordination with energy model and asset tracking
--	---

**Construction-Post Occupancy Warranties**

Meeting #	11 month Post Occupancy Warranty walk
Chaired by	CPT
Participants and responsibilities	PMO- post construction group Facilities manager Construction Team
Goals and Outcomes	Create 11 month warrantee list Address outstanding warrantee issues Review training information and questions

**C. Sustainable Design Deliverables by Project Phase**

Below is an outline of documents related to sustainable design and construction deliverables. At various stages of programming, pre-planning, design, construction and post construction, the CPT is responsible to ensure that quality sustainable design deliverables are produced by the design team. Timely review and comment on the sustainable submittals will ensure a quality project.

Programming

Document Name:	Sustainable Design Criteria for project- included in project program
Prepared by:	Programming Architect
Reviewed by:	CPT PMO- SPL, EPM, District Facilities Office or designee as assigned, Facilities PM for Central Plants (if applicable)
Scope and Goal	Establishes final scope of sustainability and Energy efficiency and management best practices for the project

Document Name:	Owner Project Requirements
Prepared by:	Commissioning Agent for Building User Group (BUG)
Reviewed by:	CPT, BUG, PMO- SPL, EPM, District Facilities Office or designee as assigned, Facilities PM for Central Plants (if applicable)
Scope and Goal	Establishes system requirements for the project

**Design- Schematic**

Document Name	Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Schematic Energy Model, Sustainability Cover sheet & Energy Modeling cover sheet
Prepared by:	Design Team
Reviewed by:	CPT , SPL, project LEED consultant
Scope and Goal	Establishes the sustainability criteria for the project, Design response to the OPR and identifies the sustainability features for the project. Energy model review should establish preliminary targeted energy compliance for the project.

Items to confirm with SPL in schematic design phase regarding a LEED project:

- i. LEED boundary of project
- ii. Occupied space in the program
- iii. Occupancy of project to be used for LEED submission
- iv. Owner provided sustainability attributes (pull exhibits from the sustainability standards at back of the document that show bicycles and metro paths etc.)
- v. M&DR program interface
- vi. Central Plant Coordination
- vii. Project appropriate certification level (LEED certified is the program minimum)
- viii. LEED scorecard approval from owner at 100% SD and 100% CD

Sustainability Cover Sheet- See Appendix Attachment 8B

See Energy model requirements- See Appendix Attachments 8C/8D

**Design- 50% Design Development**

Document Name:	Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Schematic Energy Model, Sustainability Cover sheet & Energy Modeling cover sheet
Prepared by:	Design Team
Reviewed by:	CPT, SPL, BIM, project LEED consultant
Scope and Goal	Tracks status of sustainability. Show incorporation of sustainability features and LEED requirements in documents

**Design- 100% Design Development**

Document Name:	Energy modeling cover sheet + Model + asset tracking
Prepared by:	Design Team
Reviewed by:	CPT , SPL, BIM, project LEED consultant
Scope and Goal	Energy model in line with design progress and incorporating sustainable design goals

**Design- Construction Documents**

Document Name:	Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist with action items from various design members, renewable energy allocation from campus bank and/or project renewable energy
Prepared by:	Design Team
Reviewed by:	CPT, SPL, BIM, project LEED consultant
Scope and Goal	Tracks status of sustainability. Show incorporation of sustainability features and LEED requirements in documents  Confirms WBCxA and Training requirements

**GBCI Design Submission**

Document Name:	LEED Online
Prepared by:	Design Team

Reviewed by:	CPT, project LEED consultant
Scope and Goal	Completes GBCI submission

**Construction- Kick Off**

Document Name:	Contractor Project Plans MRc2, MRc4, MRc5, MRc7, EQc4.1-4.4 (as applicable)
Prepared by:	Contractor
Reviewed by:	CPT, project LEED consultant
Scope and Goal	Establishes projection plan for targeted credits on construction LEED scorecard

**Construction-Progress**

Document Name:	Contractor credit status for all construction related sustainability items
Prepared by:	Contractor
Reviewed by:	CPT, project LEED consultant
Scope and Goal	Establishes construction LEED scorecard status

**Construction-Progress**

Document Name:	BIM asset deliverable
Prepared by:	Construction team
Reviewed by:	CPT, PMO -BIM
Scope and Goal	Tracking energy model and asset management document

Document Name:	M&DR Review
Prepared by:	PMO-EPM, District Facilities Office or designee as assigned

Reviewed by:	CPT, Facilities Director, project LEED consultant
Scope and Goal	Confirms compliance with District M&DR and requests additional documentation or information related to metering and demand response for the project as required by project program

**Construction-Substantial Completion**

Document Name:	WBCxA Training Manuals and Schedule
Prepared by	Construction Team
Reviewed by:	CPT, PMO-SPL and PMO- WBCxA
Scope and Goal	Confirm training is in accordance with OPR and Specification requirements

**GBCI Construction Submission**

Document Name:	LEED Online
Prepared by:	Design and Construction Team
Reviewed by:	CPT, Project LEED consultant
Scope and Goal	Completes GBCI submission

**Construction- DSA Closeout**

Document Name:	Final OPR, Basis of Design, Construction Manual, Training Manuals, LEED Online documentation , Energy model
Prepared by:	Design and Construction Team
Reviewed by:	CPT Facilities Director PMO- SPL, PMO- WBCxA, Post Constr., EPM, District Facilities Office or designee as assigned, WBCxA
Scope and Goal	Establishes final documentation from Design and Construction Team



**Construction- Post Occupancy 10 months**

Document Name:	WBCxA report
Prepared by:	Cx Agent
Reviewed by:	CPT, Construction Team, Facilities Director PMO- WBCxA
Scope and Goal	Review report on post occupancy information on the building, possible corrections in system

**D. Facilities Master Planning & Oversight Committee (FMP&OC) Approval of LEED Projects**

All LEED™ and Non-LEED™ projects in excess of five million dollars are reviewed and approved in concept by the Facilities Master Planning & Oversight Committee (FMP&OC) for their sustainable elements and design features. The FMP&OC is a subcommittee of the LACCD Board of Trustees (BOT). The committee convenes monthly to give recommendations on approval on buildings that incorporate sustainable design features, among other recommendations. Once sustainable features of LEED projects are approved by the FMP&OC, the project teams can continue on to the next phase of design.

The FMP&OC approval of LEED projects is similar to FMP&OC approval of all projects.

The FMP&OC Presentation will occur at the end of the Design Development Phase and approval must be obtained prior to proceeding to the Construction Documents Phase.

**E. Energy Modeling for New Construction and Major Renovation LEED Projects**

The Energy model plays an integral part in confirming the project design is achieving sustainability and energy requirements at each phase of design. Confirmation of sustainability goals through an energy model at each phase of design is required. Refer to energy modeling requirements below-

Criteria on LEED project energy modeling requirements and process:

The design team should complete the Title 24 energy model and cover sheet and submit to CPT for review at each milestone deliverable. The energy model files are also required at certain phases of design completion. The CPT shall confirm compliance with sustainable design requirements. In addition to Title 24 modeling, whole building energy modeling is required for LACCD projects.

Energy Modeling Cover Sheet- See Appendix Attachment 8C

Energy modeling Requirements and Climate Zone information- See Appendix Attachments 8C/8D

**F. Commissioning**

All LEED™ projects have a third party Commissioning Authority (WBCxA) firm, hired by LACCD, to oversee the commissioning process. Commissioning is a systematic process of ensuring that all equipment or systems have been properly installed and function in tested modes according to contract documents. Commissioning also verifies that building systems perform interactively according to Basis of Design and Owner project Requirements (OPR) i.e. Building User Group’s operational needs.

The Commissioning process encompasses and coordinates traditionally separate functions of system documentation, equipment Startup, Control System Calibration, testing and balancing, and performance testing and training.

The Commissioning Authority performs the following at a minimum:

- Ensures the Owner Project Requirements are complete and reviews the Basis of Design prepared by the design team (BOD) against the Owner Project Requirements (OPR).
- Performs all LEED related Commissioning.
- Completes LEED related documentation on LEED Online and attests to successful commissioning efforts for the project.
- Continues commissioning activities approximately 10 months after beneficial occupancy. The contractor is required to be available for warranty issues and the design consultant is required to be available for clarifications on design issues.

Commissioning is coordinated through the CPT and the Design Consultant. PMO has a Whole building commissioning authority (WBCxA) on staff that manages all WBCxA contracts. Any disputes, etc. are to be brought to the attention of the WBCxA. The PM/SPL/RDL/RPL should be kept informed.

See LACCD General Requirements Technical Specification on Commissioning

The Owner Project Requirements (OPR) is required to be generated (in addition to the programming criteria documents) for all new and renovation building projects. The Commissioning Agent for the project shall prepare the OPR. The OPR shall be developed during the programming phase.

The OPR document is critical to the Cx process and must be prepared in programming because:

- 1) the CxA reviews all Basis of Design Narratives generated by the design/design build teams against the OPR.
- 2) The CxA reviews design drawings for compliance against the OPR.
- 3) The OPR is required to contain sufficient critical technical data that will maximize this process. Without a good OPR, or OPR not included at the correct time of procurement, this process becomes invalid.

## 5. Mandatory Sustainability Features

Below is a list of mandatory sustainability features that all LACCD projects that pursue LEED Certification are required to follow in entirety. Deviations from this list are only allowed in writing and shall be approved by the Building User Group and PMO. Refer to the LEED reference guide for strategies and sustainable features to incorporate in to the building projects in addition to the ones listed below.

- 1) Stormwater Design - 95% Capture of Stormwater on the Project Site
- 2) Stormwater Design - Quality Control
- 3) Heat Island Reduction - Non-Roof
- 4) Heat Island Reduction - Roof
- 5) Light Pollution Reduction
- 6) Water Efficiency Landscaping
- 7) Building Water Use Reduction – Water Efficient Plumbing Fixtures
- 8) Building Water Use Reduction - Water Efficient Appliances for Process Loads
- 9) Commissioning Fundamental & Enhanced
- 10) Optimize Energy Performance – EUI
- 11) Optimize Building Energy Performance – Whole Building Energy Performance Modeling
- 12) Optimize Energy Performance Strategies – HVAC Equipment Efficiency
- 13) Optimize Energy Performance Strategies – Air-side Economizers
- 14) Optimize Energy Performance Strategies – Demand Control Ventilation
- 15) Optimize Energy Performance Strategies – Fan & Pump Energy Use

- 16) Optimize Energy Performance Strategies - Motors and Variable Frequency Drives
- 17) Optimize Energy Performance Strategies – Condensing Boilers
- 18) Optimize Energy Performance Strategies – Outside Air Intake Locations
- 19) Optimize Energy Performance Strategies – Building Management System (BMS)
- 20) Optimize Energy Performance Strategies – Daylighting and Daylight-Responsive Controls
- 21) Optimize Energy Performance Strategies – Occupancy Sensors
- 22) Optimize Energy Performance Strategies – Efficient Lighting Systems
- 23) Optimize Energy Performance Strategies – Efficient Electrical Distribution
- 24) Optimize Energy Performance Strategies – Plug Load Management
- 25) Optimize Energy Performance Strategies – Low Pressure Filters
- 26) Optimize Energy Performance Strategies – Energy Efficient Appliances
- 27) Materials and Resources – Storage & Collection of Recyclables
- 28) Materials and Resources – Construction Waste Management: 75%
- 29) Materials and Resources – Recycled Content: 10%
- 30) Materials and Resources – Regional Materials: 10%
- 31) Materials and Resources – Certified Wood: Over 50%
- 32) Materials & Resources Strategies – Red List Building Materials
- 33) Materials & Resources Strategies – Furniture, Fixtures & Equipment (FF&E)
- 34) Indoor & Environmental Quality – Construction IAQ Management Plan - During Construction
- 35) Indoor & Environmental Quality – Construction IAQ Management Plan – Before Occupancy
- 36) Indoor & Environmental Quality – Low Emitting Materials – Adhesives and Sealants, Paints & Coatings, Carpet Systems, Composite Wood and Agrifiber Products
- 37) Indoor & Environmental Quality – Indoor Chemical & Pollutant Source Control
- 38) Indoor & Environmental Quality – Controllability of Systems – Lighting System Controllability
- 39) Indoor & Environmental Quality – Daylight & Views – Daylight: 75% of Spaces
- 40) Indoor & Environmental Quality – Daylight & Views – Views: Critical Spaces Requiring Views

\*\*\*If the project cannot comply with any of the mandatory measures as provided in this section please submit a Sustainability Standard Deviation Request Form to CPT. PMO and District approval is required. (Refer to Appendix 9F Attachment).

**1) Stormwater Design- Quantity Control- 95% Capture of Stormwater on the Project Site**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Stormwater Management Design Guide Best Practice</li> <li>• Div 1 Storm water management spec</li> </ul>	<p>The project must obtain the LEED Credit for storm water management and the requirements below:</p> <ul style="list-style-type: none"> <li>• The LACCD has mandated that no stormwater shall leave the project site boundary.</li> <li>• Stormwater must be collected and infiltrated on-site or stored for re-use if the program calls for water reuse.</li> <li>• For zero lot line projects only- reduce run-off by 85%.</li> <li>• Reduce impervious area during design. By reducing impervious area, stormwater infrastructure can be minimized from the project.</li> <li>• Strategies to minimize or mitigate impervious surfaces include:                         <ul style="list-style-type: none"> <li>○ Pervious paving materials and/or open grid paving</li> <li>○ Stormwater harvesting for reuse in irrigation and/or buildings</li> <li>○ Bioswales/vegetated filter strips</li> <li>○ Retention Ponds.</li> <li>○ Bio-retention and bio-infiltration ponds</li> <li>○ Green roofs</li> </ul> </li> </ul>

2) Stormwater Design- Quality Control

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• LA County Department of Public Works Standard Urban Stormwater Mitigation Plan: <a href="http://ladpw.org/wmd/npdes/SUSMP_MANUAL.pdf">http://ladpw.org/wmd/npdes/SUSMP_MANUAL.pdf</a></li>   <li>• Stormwater Best Management Practice Design Guide</li>   <li>• Maryland Stormwater Design Manual: <a href="http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/MarylandStormwaterDesignManual/Pages/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.aspx">http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/MarylandStormwaterDesignManual/Pages/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.aspx</a></li>   <li>• Technology Acceptance and Reciprocity Partnership <a href="http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/swprotoc.pdf">http://www.mass.gov/eea/docs/dep/water/laws/i-thru-z/swprotoc.pdf</a></li> </ul>	<p>Project must obtain the LEED credit for storm water treatment and the requirements below:</p> <p>Implement a stormwater management plan that reduces impervious cover, promotes infiltration, and captures and treats the stormwater runoff from 90% of the average annual rainfall using acceptable best management practices (BMPs). BMPs used to treat runoff must be capable of removing 80% of the average annual post development total suspended solids (TSS) load based on existing monitoring reports. Total Suspended Solids (TSS) are particles or flocs that are too small or light to be removed from stormwater via gravity settling. Suspended solid concentrations are typically removed via filtration.</p> <p>Use either non-structural stormwater management measures, structural stormwater management measures, or a combination of the two. BMPs are considered to meet these criteria if (1) they are designed in accordance with standards and specifications from a state or local program that has adopted these performance standards, or (2) there exists in-field performance monitoring data demonstrating compliance with the criteria.</p> <p>Data must conform to accepted protocol (e.g., Technology Acceptance Reciprocity Partnership [TARP], Washington State Department of Ecology) for BMP monitoring.</p> <ul style="list-style-type: none"> <li>• A stormwater management plan must adhere to requirements of the LA County Department of Public Works Standard Urban Stormwater Mitigation Plan (SUSMP) and employ strategies outlined in the LA County Department of Public Works Standard Urban Stormwater Mitigation Plan (SUSMP).</li>   <li>• In addition, all stormwater elements of a project may have to adhere to additional regulation including Total Maximum Daily Loads (TMDLs), Endangered Species Act, CWA Section 404 Dredge and Fill Permits, and Section 401 Water Quality Certifications</li> </ul> <p>The following BMPs are considered preferable for the campus context:</p> <ul style="list-style-type: none"> <li>• Promote infiltration and limit stormwater generation</li> <li>• Pervious pavement and open grid pavers</li> <li>• Construct hardscape to drain towards planters</li> <li>• Vegetated swales</li> <li>• Bio-retention and Bio-infiltration Ponds</li> <li>• Vegetated roofs</li> <li>• Rain gardens to infiltrate roof runoff</li> <li>• Rainwater treatment and recycling</li> </ul> <p>These strategies reduce imperviousness and promote filtration, thereby reducing pollutant loadings.</p>

3) Heat Island Reduction - Non-Roof

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• ASTM E 1980</li> <li>• ASTM E 903</li> <li>• ASTM E 1918</li> <li>• ASTM C 1549</li> <li>• ASTM E 408</li> <li>• ASTM C 1371</li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit and meet the requirements below:</li> <li>• Provide any combination of the following strategies for 50% of the <u>site hardscape</u> (including roads, sidewalks, courtyards and parking lots):                             <ul style="list-style-type: none"> <li>○ Shade (within 5 years of occupancy)</li> <li>○ Paving materials with a three year aged Solar Reflectance Index (SRI) of at least 28 (or initial SRI of at least 33)</li> <li>○ Open grid pavement system (50% unbound)</li> </ul>                             OR                         </li> <li>• Any roof used to shade or cover parking must have a three year aged SRI of at least 32 (or initial SRI of 39 at installation) or be a vegetated roof or be 100% covered by energy generation systems.</li> </ul>

4) Heat Island Reduction – Roof

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Cool Roof Rating Council: <a href="http://www.coolroofs.org">www.coolroofs.org</a></li> <li>• ASTM E 1980</li> <li>• ASTM E 903</li> <li>• ASTM E 1918</li> <li>• ASTM C 1549</li> <li>• ASTM E 408</li> <li>• ASTM C 1371</li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit and the requirement below:</li> <li>• Use roofing materials having a three year aged Solar Reflectance Index (SRI) equal to or greater than 64 for low sloped roofs, 32 for steep sloped roofs for 100% of the roof surface.</li> <li>• Low sloped roofs and steep sloped roofs as defined by LEED criteria reference guide</li> </ul>

5) Light Pollution Reduction

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• LEED Reference Guide</li> <li>• Darksky.org</li> </ul>	<ul style="list-style-type: none"> <li>• Projects shall install LED luminaires for all campus lighting applications and shall follow the District Facilities standards</li> <li>• Meet the criteria of the International Dark-Sky Association.                             <ul style="list-style-type: none"> <li>• <b>Include adaptive controls</b> - timers and motion sensors</li> <li>• <b>Only light the exact space and in the amount required for particular tasks</b></li> </ul> </li> <li>• Select fixtures with the International Dark Sky Associations Fixture Seal of Approval (The Fixture Seal of Approval provides objective, third-party certification for luminaires that minimize glare, reduce light trespass, and don't pollute the night sky.)</li> <li>• Do not specify exterior lighting fixtures and applications where light output spills directly into the sky. Do not use uplight FIXTURES in exterior applications.</li> <li>• Do not locate indoor luminaires wherever their main light output exits the building through a window.</li> </ul>

6) Water Efficient Landscaping

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California The Landscape Coefficient Method and WUCOLS III</li> <li>• <a href="http://ucanr.edu/sites/WUCOLS/">http://ucanr.edu/sites/WUCOLS/</a></li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit and meet the following requirements:</li> <li>• Reduce potable water demand used for landscape by a minimum of 50% for the site’s peak watering month.</li> <li>• Incorporate drought-tolerant and native or adaptive plants into the landscape.</li> <li>• Specify drought tolerant plant species only.</li> <li>• Use drip irrigation.</li> <li>• Use harvested greywater or rainwater for irrigation purposes when available. Infrastructure inclusion will be specified on a case by case basis in the program documents.</li> <li>• When installing new landscaping, irrigation controllers are required for all landscaped areas.</li> <li>• Metering of Landscape Water Use-Landscaping over a total of 5000 sf (incongruous) is required to have landscaping water use metered. Meter should be network capable and capable of reporting the data to a web based application.</li> </ul> <p>In order to determine potable water reduction through water efficient landscaping the Landscape Coefficient methodology must be used. This method compares the calculated July irrigation water requirement for the project design with that of a standard design of that same project without the use of water efficient irrigation equipment and the use of native and drought tolerant plants.</p>

7) Building Water Use Reduction – Water Efficient Plumbing Fixtures

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• ASME Standard A112.19.19-2006</li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit for 30% above base water fixtures and the requirement below:</li> <li>• Utilize low-consumption water closets to reduce the potable water usage for sewage conveyance. Flush fixtures shall not exceed the following criteria:             <ul style="list-style-type: none"> <li>○ Water Closets 1.28 gpf, maximum. Urinals: Pint flush</li> </ul> </li> <li>• Utilize low-consumption flow fixtures (lavatories, sinks and showers) in order to reduce potable water consumption. Flow fixtures shall not exceed the following criteria:             <ul style="list-style-type: none"> <li>○ Lavatories: Motion-sensor operated. 0.5 gpm, maximum</li> <li>○ Showers: 1.5 gpm, maximum</li> <li>○ Kitchen/Break Room Sinks: 1.0 gpm, maximum</li> </ul> </li> <li>• Meter water use at the building level for all new construction projects over 3000 sf. For renovation projects, refer to the renovation checklist included in the program for mandatory requirements.</li> </ul>

**8) Building Water Use Reduction - Water Efficient Appliances for Process Loads**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• <a href="http://www.energystar.gov">www.energystar.gov</a></li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• For all water consuming process loads, use LEED required allowances and requirements per the LEED reference guide. (version project is pursuing)</li> <li>• The following process loads have to be included at a minimum:</li> <li>• Heat rejection and cooling- no once through cooling with potable water for any equipment or appliances that reject heat</li> <li>• Cooling towers and evaporative condensers- equip with makeup water meter, conductivity controllers and overflow alarms, efficient drift eliminators that reduce drift to maximum of 0.0002% of re-circulating water volume for counter flow towers and 0.0005% of re-circulated water flow for cross-flow towers.                         <ul style="list-style-type: none"> <li>• Clothes washers</li> <li>• Dishwashers</li> <li>• Pre-rinse spray valves</li> <li>• Ice machines</li> <li>• Food Steamers</li> <li>• Combination Ovens</li> </ul> </li> </ul>

**9) Commissioning, Fundamental & Enhanced**

LACCD requires fundamental and enhanced commissioning (as defined by the LEED rating system) be conducted for all new construction projects.

- CxA shall report directly to the owner
- CxA will at a minimum:
  - Assist with development of the OPR or develop the OPR.
  - Provide at least one commissioning design review of the OPR, BOD, and design documents, prior to mid-construction documents phase.
  - Perform a back check of all subsequent design submissions, to ensure that peer review comments and commissioning comments have been included in the final design.
  - Include commissioning requirements into the construction documents (Division 1 and other specifications)
  - Develop and utilize commissioning plan.
  - Conduct a review of building’s energy-related systems contractor submittal.
  - Verify the installation and performance of energy consuming systems meet the OPR and BOD, including:
    - Develop and conduct startup checkouts/pre-functional checklists to ensure equipment has been installed and hooked up properly
    - Develop and conduct functional acceptance test procedures to verify that all equipment runs through the controls sequences of operations properly
    - Keep a log of any issues that are observed during the commissioning process, including methods and dates of resolution, to serve as a chronological report of the commissioning process
  - Develop a single systems manual containing information required for re-commissioning, including:
    - All equipment O&M manuals
    - Functional acceptance test forms
    - Recommended schedule for recommissioning
  - Verify that the requirements for training facilities and operating personnel is completed
  - Complete a final commissioning report

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>○ The project must obtain the LEED prerequisite and credit and follow all the requirements of the contract related to commissioning.</li> <li>○ All commissioning requirements and activities will be managed through the Whole building Commissioning Group. (WBCxA)</li> <li>○ The programming criteria Architect shall review the OPR during programming (before RFP) to ensure all program requirements listed in the OPR are included in the proposed project. Programming criteria architects cost estimate shall include the OPR requirements.</li> <li>○ Compliance with OPR during design and construction and at contract completion will be monitored by the CxA for the project.</li> </ul>

**10) Optimize Building Energy Performance - EUI**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>○ All projects shall meet or exceed the following energy use indices (EUIs) by building type. Buildings that contain more than one type of space shall calculate the EUI target as a weighted average EUI based on the various uses of the building.</li> <li>○ The project team shall confirm all energy model assumptions with LACCD, through the Energy model cover sheet (in Appendix) at various stages of design. Items to verify include building plug loads and schedules for building occupancy, lighting, and equipment loads. The appendices of these Standards contain many of the energy model criteria to be used.</li> </ul>

**ENERGY USE INDEX (EUI) TARGETS**

Building Type	Energy Use Index (kBtu/sq.ft./yr)
Offices	30
Parking – Above Ground	3
Physical Ed. – Fitness Rooms	50
Physical Ed. – Sports Courts	40
Classroom / Auditorium	30
Food Service	120
Lab / Science	150
Library	30
Performance / Theater	40
Maintenance Shop / Warehouse	10



11) Optimize Building Energy Performance - Whole building Energy Performance Modeling

REFERENCES	REQUIREMENTS
<p>Codes</p> <ul style="list-style-type: none"> <li>• CEC</li> <li>• “Assessment of the Technical Potential for Achieving Net Zero-Energy Buildings in the Commercial Sector”, NREL/TP-550-41957, December 2007</li> </ul>	<ul style="list-style-type: none"> <li>• Design the building to maximize energy savings as compared to Title 24 standards as listed in the LACCD policy.</li> <li>• Confirm all energy model assumptions in the energy modeling cover sheet at SD phase and each subsequent phase if changes occur.</li> <li>• Perform a Whole Building Energy Simulation using EnergyPro, eQuest, or VisualDOE software. Calculate the percentage improvement in proposed building performance compared to baseline building performance per Title 24.</li> <li>• Provide the energy model in native format at milestone deliverable listed below                         <ul style="list-style-type: none"> <li>-100% Design Development</li> <li>-50% Construction documents</li> <li>-100% Construction Documents (after LEED submission when all LEED required edits have been made to the model)</li> <li>-100% Construction Completion.</li> </ul> </li> <li>• Building level metering is required. Refer to the Metering and Demand Response requirements in the contract.</li> <li>• At 11-month warranty walk, the Energy Modeling team is required to compare the buildings actual energy usage against the modeling data provided during design and forward a recommendation to bridge any potential gaps between the model and building performance.</li> </ul>

12) Optimize Energy Performance Strategies - HVAC Equipment Efficiency

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• <u>ANSI/ASHRAE/IES Standard 90.1-2013</u></li> </ul>	<ul style="list-style-type: none"> <li>• For unitary equipment, the following Integrated Energy Efficiency Ratios (IEER's) must be met:</li> </ul> <p><u>Unitary Air Conditioners, Air-Cooled:</u></p> <p>A.</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥ 65,000 Btu/h :12.9 IEER</li> <li>▪ Split System and Single Package &lt; 135,000 Btu/h: 12.7 IEER</li> </ul> <p>B:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥135,00 Btu/h: 12.4 IEER</li> <li>▪ Split System and Single Package &lt; 240,000 Btu/h: 12.2 IEER</li> </ul> <p>C:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥ 240,000 Btu/h: 11.6 IEER</li> <li>▪ Split System and Single Package ≤ 760,000 Btu/h: 11.4 IEER</li> </ul> <p>D.</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥ 760,000 Btu/h 11.2 IEER</li> </ul> <p><u>Unitary Air Conditioners, Water-Cooled</u></p> <p>A.</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥ 65,000 Btu/h :13.9 IEER</li> <li>▪ Split System and Single Package &lt; 135,000 Btu/h: 13.7 IEER</li> </ul> <p>B:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package ≥135,00 Btu/h: 13.9 IEER</li> <li>▪ Split System and Single Package &lt; 240,000 Btu/h: 13.7 IEER</li> </ul>

	<p>C:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package <math>\geq</math> 240,000 Btu/h: 13.6 IERR</li> <li>▪ Split System and Single Package <math>\leq</math> 760,000 Btu/h: 13.4 IERR</li> </ul> <p>D.</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package <math>\geq</math> 760,000 Btu/h: 13.5 IEER</li> </ul> <p><u>Unitary Heat Pumps:</u></p> <p><u>A.</u></p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package <math>\geq</math> 65,000 Btu/h :12.2 IERR</li> <li>▪ Split System and Single Package <math>&lt;</math> 135,000 Btu/h: 12.0 IERR</li> </ul> <p>B:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package <math>\geq</math>135,00 Btu/h: 11.6 IEER</li> <li>▪ Split System and Single Package <math>&lt;</math> 240,000 Btu/h: 11.4 IERR</li> </ul> <p>C:</p> <ul style="list-style-type: none"> <li>▪ Split System and Single Package <math>\geq</math> 240,000 Btu/h: 10.6 IERR</li> </ul> <p>All other HVAC equipment must meet the minimum efficiency standards outlined in the ASHRAE Standard 90.1-2013. Please reference tables 6.8 for Minimum Equipment Efficiencies.</p>
--	--

**13) Optimize Energy Performance Strategies - Air-side Economizers**

Often small server rooms and other equipment rooms require 24/7 cooling, but they are located in the interior of buildings, where outside air ductwork is difficult to route. With an integrated design approach, the architects and engineers work together to provide the necessary room locations or provisions for duct routing that allow economizers.

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• 2013 CEC-400-2012-004-CMF-REV2</li> </ul>	<ul style="list-style-type: none"> <li>• Provide enthalpy economizers for all cooling systems, including but not limited to the following.                             <ul style="list-style-type: none"> <li>○ Central air handling units</li> <li>○ Packaged rooftop units</li> <li>○ Dedicated cooling units serving electrical rooms, server rooms, and elevator machine rooms with cooling loads greater than 4.5 tons.</li> </ul> </li> <li>• Provide adequate filtration for sensitive equipment such as computer rooms, server rooms and laboratories.</li> </ul>

**14) Optimize Energy Performance Strategies - Demand Control Ventilation**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• 2013 CEC-400-2012-004-CMF-REV2</li> </ul>	<ul style="list-style-type: none"> <li>• Demand Control Ventilation systems shall meet the requirements of the latest California Energy Code with the following additional requirements.                             <ul style="list-style-type: none"> <li>○ DCV is required in classrooms.</li> <li>○ DCV is required for spaces larger than 500 ft<sup>2</sup> and with a design occupancy for ventilation of <math>\geq</math> 25 people per 1,000 ft<sup>2</sup> of floor area and served by systems with one or more of the following:</li> </ul> </li> </ul>

	<p>Economizers, Automatic modulating control of outdoor air dampers, and design outdoor airflow greater than 3,000 cfm.</p> <ul style="list-style-type: none"> <li>• CO monitoring systems shall be provided for all mechanically-ventilated enclosed parking garages. The ventilation rate shall be at least 0.15 cfm/ft<sup>2</sup> when the garage is scheduled to be occupied.</li> <li>• Exhaust rates shall not be reduced below 0.05 cfm/ft<sup>2</sup> during occupied hours.</li> </ul>
--	--

**15) Optimize Energy Performance Strategies - Fan and Pump Energy Use**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Carrier Design Manual</li> </ul>	<ul style="list-style-type: none"> <li>• Ductwork shall be sized for pressure drops no greater than 0.08 in.wg. per 100 ft.</li> <li>• Pipework shall be sized for pressure drops no greater than 4 ft.wg. per 100 ft.</li> <li>• Coils and filters shall be sized for face velocities no greater than 400 fpm.</li> <li>• Single-duct terminal units, including the reheat coil, shall be sized for pressure drops no greater than 0.5 in.wg.                         <ul style="list-style-type: none"> <li>○ Exception: laboratories or other similar spaces that are served by Venturi-type air valves for precise air flow control.</li> </ul> </li> </ul>

**16) Optimize Energy Performance Strategies - Motors and Variable Frequency Drives**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• 2013 CEC-400-2012-004-CMF-REV2</li> </ul>	<ul style="list-style-type: none"> <li>• Motors shall be NEMA Premium Efficiency.</li> <li>• Small motors in fan-powered boxes and similar units shall be ECM type.</li> <li>• VSDs/VFDs shall have a minimum efficiency of 97% and a minimum fundamental power factor of 0.98 at all speeds.                         <ul style="list-style-type: none"> <li>• Provide VSDs/VFDs for all hydronic systems as described in 2013 CEC Building Energy Efficiency Standards.</li> </ul> </li> <li>• Balancing valves are not permitted on hydronic system pumps with VFDs.</li> </ul>

**17) Optimize Energy Performance Strategies - Condensing Boilers**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• All heating water boilers shall be condensing type with an AFUE rating of 95%.                         <ul style="list-style-type: none"> <li>○ Exception: renovation projects where existing heating coils do not have adequate capacity at lower water temperatures.</li> </ul> </li> <li>• All heating coils shall be sized to provide a return water temperature no greater than 110°F.</li> <li>• Neutralization kits shall be provided to neutralize the condensate from the boiler.</li> </ul>

**18) Optimize Energy Performance Strategies - Outside Air Intake Locations**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• Locate outside air intakes on the north side of the building or in another shaded location.</li> <li>• Outside air intakes should be located 20 feet from exhausts and other air polluting factors. Wind direction should be considered when designing these.</li> </ul>

**19) Optimize Energy Performance Strategies - Building Management System (BMS)**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• “VAV System Static Pressure Setpoint Reset”, ASHRAE Journal, June 2007</li> </ul>	<p>All new buildings and major renovations shall implement a direct digital control (DDC) building management system (BMS) that is consistent with the campus standards for system protocol (BACnet, LONworks, etc.) and manufacturers.</p> <ul style="list-style-type: none"> <li>• Provide a BMS that meets the performance requirements of Standards for “Measurement &amp; Verification”.</li> <li>• Provide a BMS that meets the requirements of Standards for “Education in Building Energy Use”.</li> <li>• Provide controls devices and BMS sequencing that provides the following HVAC controls functionality.                             <ul style="list-style-type: none"> <li>○ Static pressure reset using trim &amp; respond algorithms for VAV air distribution systems.</li> <li>○ Supply air temperature reset</li> <li>○ Night purge ventilation for central air handling units and packaged rooftop units.</li> <li>○ Capability to implement load shedding and load management.</li> </ul> </li> </ul>

**20) Energy Performance Strategies - Daylighting and Daylight-Responsive Controls**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• All multi-occupant spaces such as conference rooms, classrooms, and common areas within the building shall incorporate daylight controls.</li> <li>• Commission daylighting controls after furniture is in place.</li> </ul>

**21) Optimize Energy Performance Strategies - Occupancy Sensors**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>○ Refer to Title 24 requirements for Wall or Ceiling Mounted Lighting Sensors</li> <li>○ Commission occupancy sensors after furniture is in place.</li> </ul>

**22) Optimize Energy Performance Strategies - Efficient Lighting Systems**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• Use Illuminating Engineering Society of North America recommendations for minimum illuminance levels required for task lighting.</li> <li>• Provide separately controlled ambient and task lighting for all office spaces.</li> <li>• Lamp Efficacy:                             <ul style="list-style-type: none"> <li>○ Only Use lamps or luminaires of higher efficacy (&gt;100 lumen/watt).</li> </ul> </li> <li>• Projects shall install LED luminaires for all campus lighting applications and shall follow the District Facilities standards.</li> <li>• All exit signs shall be LED-type.</li> </ul>

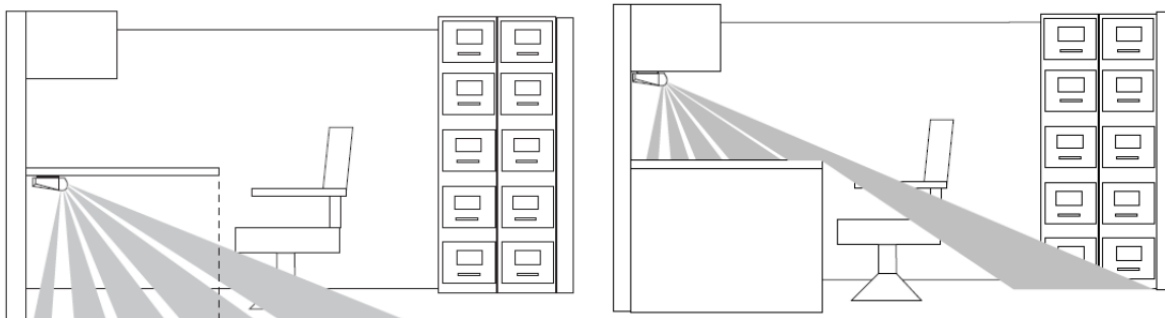
**23) Optimize Energy Performance Strategies - Efficient Electrical Distribution**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• Provide electrical transformers that are 30% more efficient than the TP-1 standard.</li> </ul>

**24) Optimize Energy Performance Strategies - Plug Load Management**

The design team is to coordinate the following items for effective plug load management for all projects.

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• <a href="http://www.advancedbuildings.net/plug-load-best-practices-guide-offices">http://www.advancedbuildings.net/plug-load-best-practices-guide-offices</a></li> </ul>	<ul style="list-style-type: none"> <li>• The location and mounting method of the occupancy sensor shall be coordinated with the architect, furniture vendor and client for proper functioning of the device.</li> <li>• For open office areas, the occupancy sensor shall be furniture mounted. It is preferable to mount it in a location that detects hand motion. The occupancy sensor can also be located below the work surface to avoid unnecessary motion detection.</li> <li>• The occupancy sensor shall be located to avoid coverage of open doors or entrances.</li> <li>• Each user shall be provided with instructions as to how to use and adjust the device to suit the needs of the individual workspace.</li> <li>• Commission occupancy sensors after all furniture is in place.</li> <li>• Refer to the illustrations below for examples of how to mount the occupancy sensor for proper detection.</li> <li>• Plug load management of vending machine -Vendingmizers shall be installed in all vending machines</li> </ul>



**25) Optimize Energy Performance Strategies - Low Pressure Filters**

REFERENCES	DESIGN STANDARDS
	<ul style="list-style-type: none"> <li>• Provide deep-pleated filters with initial pressure drops for a 24"x24" module at 500 fpm, no greater than             <ul style="list-style-type: none"> <li>○ MERV 10: 0.25 in. wg.</li> <li>○ MERV 11: 0.31 in. wg.</li> <li>○ MERV 13: 0.34 in. wg.</li> <li>○ MERV 14: 0.37 in. wg.</li> <li>○ MERV 15: 0.40 in. wg.</li> <li>○ MERV 16: 0.61 in. wg.</li> </ul> </li> <li>• Provide electrically-charged filters connected to a permanent electrical power source.             <ul style="list-style-type: none"> <li>○ Electronic filters shall not produce ozone and shall not ionize particles.</li> </ul> </li> </ul>

**26) Optimize Energy Performance Strategies - Energy Efficient Appliances**

REFERENCES	DESIGN STANDARDS
<ul style="list-style-type: none"> <li>• <a href="http://www.energystar.gov">www.energystar.gov</a></li> </ul>	<ul style="list-style-type: none"> <li>• Specify energy-efficient appliances that have earned the EnergyStar rating for the following equipment.                             <ul style="list-style-type: none"> <li>○ Computers, monitors, and computer accessories</li> <li>○ Copiers</li> <li>○ Printers</li> <li>○ Televisions</li> <li>○ Refrigerators</li> <li>○ Freezers</li> <li>○ Ice Makers</li> <li>○ Commercial Kitchen Equipment</li> <li>○ Vending Machines</li> </ul> </li> </ul>

**27) Material and Resources - Storage and Collection of Recyclables**

REFERENCES	DESIGN STANDARDS
	<ul style="list-style-type: none"> <li>• Recycling areas should be designed on each floor of the building and should have collection services for the following (at a minimum):                             <ul style="list-style-type: none"> <li>○ Glass</li> <li>○ Plastic</li> <li>○ Mixed paper</li> <li>○ Metals</li> <li>○ Cardboard</li> <li>○ Organic waste</li> <li>○ Include a signage plan that specifies what materials should go into which containers.</li> </ul> </li> <li>• Each project should have a building level (maintenance accessible only) trash collection area that is dedicated to the separation and collection of materials for recycling.</li> </ul>

**28) Material and Resources - Construction Waste Management: 75%**

REFERENCES	REQUIREMENTS
	<ul style="list-style-type: none"> <li>• LACCD has a goal of recycling 100% of demolition and construction waste. Project teams shall strive to maximize percentage of waste diverted.</li> <li>• The project must obtain the LEED credit for 75% construction waste recycling. Recycle or salvage at least 75% of construction, demolition and land clearing waste by weight or volume.</li> <li>• Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site OR comingled, hauled off-site and then sorted at the off-site facility.</li> </ul>

**29) Material and Resources - Recycled Content: 10%**

Items to consider for recycled content due to their high recycled content and relative high material cost include:

- Aluminum curtain wall systems
- Aluminum and steel products
- Metal studs
- Carpet
- Ceiling tiles
- Gypsum board
- Insulation
- Asphalt paving
- Reclaimed lumber, timbers and wood finish

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Green Building Pages <a href="http://www.greenbuildingpages.com">http://www.greenbuildingpages.com</a> Appendix A ISO 14021</li> <li>• <a href="https://www.buildinggreen.com/">https://www.buildinggreen.com/</a></li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit for 10% recycled content at a minimum.</li> <li>• Steel construction projects must obtain a minimum of 20% recycled content.</li> <li>• Projects should reference LEED for calculation methodology for this requirement.</li> </ul>

**30) Material and Resources - Regional Materials: 10%**

Due to our proximity to the Pacific Ocean, In Los Angeles, a smaller portion of the building materials can be sourced within a 500 mile radius – these include:

- Masonry
- Concrete
- Reinforcing Steel
- Structural Steel
- Glazing
- Casework

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Green Building Pages: <a href="http://www.greenbuildingpages.com/">http://www.greenbuildingpages.com/</a></li> <li>• Geobytes: <a href="http://geobytes.com/CityDistanceTool">http://geobytes.com/CityDistanceTool</a></li> <li>• <a href="https://www.buildinggreen.com/">https://www.buildinggreen.com/</a></li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit for 10% regional content at a minimum.</li> <li>• Projects with a high level of concrete construction must obtain a minimum of 20% regional content.</li> <li>• Projects should reference LEED for calculation methodology for this requirement</li> </ul>

**31) Material and Resources - Certified Wood: More than 50% FSC certified wood**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>Green Building Pages: <a href="http://www.greenbuildingpages.com/">http://www.greenbuildingpages.com/</a></li> </ul>	<ul style="list-style-type: none"> <li>Use wood-based materials and products, which are certified in accordance with the Forest Stewardship Council’s (FSC) Principles and Criteria, for wood building components. The target to achieve is more than 50% FSC Certified Wood</li> <li>These components include, but are not limited to:                             <ul style="list-style-type: none"> <li>Structural framing</li> <li>General dimensional framing</li> <li>Flooring</li> <li>Sub-flooring</li> <li>Wood doors</li> <li>Wood finishes</li> <li>Casework</li> </ul> </li> <li>Only include materials permanently installed in the project.</li> <li>Furniture excluded from the calculations.</li> </ul>

**32) Materials & Resources Strategies - Red List Building Materials**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>LEED v4 reference guide</li> <li>International Living Future Institute</li> </ul>	<ul style="list-style-type: none"> <li>This requirement is for new construction projects only- The responsible project team will be required to <u>submit in writing</u> that the project complies with the requirements below at 100% Construction documents and at project completion.</li> <li>For Design/Bid/Build and Lease-leaseback projects, Design team should submit written declaration at the end of design and DBE/Contractor to submit at the end of construction.</li> <li>For Design Build projects, the DBE to submit written declaration at the end of design and at the end of construction.</li> <li>Identify and specify lead and cadmium free products- Solder, flux, pipe, pipe fittings and fixtures must meet the California AB1953 standard for lead content by looking for ANSI approved third party certification. Compliance with the lead- and cadmium-free standard</li> <li>Identify electrical wiring and cabling with lead content less than 300 parts per million. (ppm)</li> <li>Roofing and flashing must not contain any lead.</li> <li>Lead and cadmium free paints must be specified using Green Seal certification for metal-free paints or equivalent source of lead and cadmium free documentation.</li> <li>Design plumbing systems to prevent copper corrosion using the following strategies at a minimum:                             <ul style="list-style-type: none"> <li>Specify the AST M B828 standard for making capillary joints by soldering of copper and copper alloy tube and fittings for solder joints.</li> <li>Specify correct use of AST M B813 fluxes or use O-ring gaskets and crimping tools for jointing.</li> <li>Use compatible materials (e.g., copper straps for copper pipes) to reduce galvanic corrosion and similar problems.</li> </ul> </li> <li>Specify PBT source reduction goals for sub-contractors.</li> <li>Ensure that return lines in a circulating hot water system have the same diameter as the supply lines.</li> <li>Avoid stagnant sections by minimizing direction and size changes.</li> </ul>



	<ul style="list-style-type: none"> <li>• Prevent electrical currents by grounding directly to a copper rod driven into the ground. Do not attach a grounding wire to water pipes.</li> <li>• Do not allow galvanized nails to touch copper piping.</li> <li>• Avoid induced stresses, provide enough pipe support, and allow for thermal expansion.</li> <li>• Carefully ream cut ends to reduce turbulence. Unreamed tubing corrodes and fails at a higher rate.</li> <li>• Use stainless-steel piping and components for industrial process water supplies, heat exchangers, chillers, and condensers when operation temperatures exceed 140 degrees F (60 degrees C).</li>   <li>• Track specified and purchased materials during construction with a material checklist or PBT tracking form. Check the products’ material safety data sheets (MSDS) and manufacturers’ documentation before installation to ensure that only qualifying materials are used. At a minimum, review the following:             <ul style="list-style-type: none"> <li>• Roofing and flashing</li> <li>• Electrical wiring and cabling</li> <li>• Indoor and outdoor paints</li> <li>• Flux and solder</li> <li>• Pipes, pipe fittings, and fixtures</li> <li>• The following information about each product or material is recommended for inclusion in a tracking tool:                 <ul style="list-style-type: none"> <li>• Product type</li> <li>• Manufacturer</li> <li>• Product name</li> <li>• Allowable lead, cadmium, and copper content</li> <li>• Actual lead, cadmium, and copper content, with source of data</li> <li>• Materials containing the following products may not be used in building construction:                     <ul style="list-style-type: none"> <li>• Chlorinated Polyethylene and Chlorosulfonated Polyethylene</li> <li>• Chloroflourocarbons (CFCs)</li> <li>• Chloroprene (Neoprene) – WITH THE EXCEPTION OF MEP EQUIPMENT</li> <li>• Formaldehyde (Added)</li> <li>• Halogenated Flame Retardants</li> <li>• Hydrochlorofluorocarbons (HCFCs)</li> <li>• Mercury</li> <li>• Petrochemical Fertilizers and Pesticides</li> <li>• Phthalates</li> <li>• Polyvinyl Chloride (PVC) – WITH THE EXCEPTION OF ROOFING AND PIPING</li> <li>• Wood treatments containing Creosote, Arsenic or Pentachlorophenol or added urea formaldehyde</li> <li>• Endangered Wood Species</li> </ul> </li> </ul> </li> </ul> </li> </ul>
--	---

**33) Materials & Resources Strategies – Furniture, Fixtures & Equipment**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Green Building Pages: <a href="http://www.greenbuildingpages.com">http://www.greenbuildingpages.com</a></li> <li>• Energy Star:</li> </ul>	<ul style="list-style-type: none"> <li>• All systems furniture/seating introduced into the project space that has been manufactured or refurbished within one year prior to occupancy shall be:             <ul style="list-style-type: none"> <li>○ GreenGUARD certified (or)</li> <li>○ Meet EPA's Environmental verification (ETV) standards for volatile organic</li> </ul> </li> </ul>

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• <a href="http://www.energystar.gov">http://www.energystar.gov</a></li> <li>• Greenguard: <a href="http://www.greenguard.org">http://www.greenguard.org</a></li> <li>• RoHS: <a href="http://www.gov.uk/guidance/rohs-compliance-and-guidance">http://www.gov.uk/guidance/rohs-compliance-and-guidance</a></li> <li>• BIFMA International: <a href="http://www.bifma.org/">http://www.bifma.org/</a></li> </ul>	<p>compounds (VOC) and formaldehyde emissions (or)</p> <ul style="list-style-type: none"> <li>○ Meet Business and Institutional Furniture Manufacturers Association (BIFMA) emissions standards.</li> <li>• Domestic appliances and office equipment shall be Energy Star compliant.</li> <li>• Printers and copiers shall be Energy Star compliant in addition to meeting the Restriction of Hazardous Substances Directive (RoHS).</li> </ul>

**34) Construction IAQ Management Plan - During Construction**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA) <a href="http://www.smacna.org">www.smacna.org</a></li> <li>• Controlling Pollutants and Sources, IAQ Design for Schools; U.S. Environmental Protection Agency: <a href="http://www.epa.gov/iaq/schooldesign/controlling.html">www.epa.gov/iaq/schooldesign/controlling.html</a></li> <li>• ASHRAE 52.2- Method of Testing General Ventilation air- cleaning devices for removal efficiency by particle size.</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit for construction IAQ management plan during Construction.</li> <li>• Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building per LEED requirements (applicable version)</li> </ul>

**35) Construction IAQ Management Plan - Before Occupancy**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• SMACNA <a href="http://www.smacna.org">www.smacna.org</a></li> <li>• Controlling Pollutants and Sources, IAQ Design for Schools; U.S. Environmental Protection Agency <a href="http://www.epa.gov/iaq/schooldesign/controlling.html">www.epa.gov/iaq/schooldesign/controlling.html</a></li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit during Occupancy.</li> <li>• Please reference LEED-NC for detailed instructions on flush out procedures and/or IAQ testing protocol.</li> </ul>

**36) Low Emitting Materials - Adhesives and Sealants, Paints & Coatings, Carpet Systems and flooring systems, Composite Wood and Agrifiber Products**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• Green Seal GS-11 <a href="http://www.greenseal.org/standards/paints.htm">www.greenseal.org/standards/paints.htm</a></li> <li>• Green Seal GS-03 <a href="http://www.greenseal.org/standards/anti-corrosivepaints.htm">www.greenseal.org/standards/anti-corrosivepaints.htm</a></li> <li>• SCAQMD Rule 1113, Appendix A2</li> <li>• Carpet and Rug Institute Green Label Plus Testing Program</li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit for adhesives and sealants, paints and coatings, carpet and flooring system, composite wood and agrifiber products.</li> <li>• The General contractor to address this requirement for low emitting materials at 5 sub-contractor meetings at a minimum for each year the project is in construction.</li> </ul>

**37) Indoor Chemical & Pollutant Source Control**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• 2015 Addenda Supplement to ASHRAE Standard 52.2-2012</li> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit.</li> <li>• Only Permanent entryway systems should be installed. Temporary entry mats are not acceptable.</li> </ul>

**38) Controllability of Systems – Lighting System Controllability**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• LEED reference guide</li> </ul>	<ul style="list-style-type: none"> <li>• The project must obtain the LEED credit.</li> <li>• At workstations within a building project, provide task lighting with workstation-level occupancy sensors in all office spaces.</li> <li>• For conference rooms and other multi-occupant spaces, provide dimming or multi-level lighting control for all multi-occupant spaces</li> </ul>

**39) Daylight & Views - Daylight: 75% of Spaces**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• LEED Reference Guide</li> <li>• The Art of Daylighting</li> <li>• <a href="http://www.wbdg.org/resources/daylighting.php">http://www.wbdg.org/resources/daylighting.php</a></li> </ul>	<p>The project must obtain the LEED credit for daylighting.</p> <ul style="list-style-type: none"> <li>• The project shall achieve a minimum glazing factor of 2% in a minimum of 75% of all regularly occupied areas.</li> <li>• Regularly occupied spaces include but are not limited to: office spaces, meeting areas, classrooms, laboratories and cafeterias. Areas that should not be considered</li> </ul>

REFERENCES	REQUIREMENTS
	<p>include support areas for copying, storage, mechanical equipment, laundry and restrooms.</p> <ul style="list-style-type: none"> <li>• Daylighting should be provided in the following spaces: Classrooms, offices, laboratories, conference rooms, libraries.</li> <li>• Daylighting should be provided in all corridors via clearstory windows or skylights for new construction projects.</li> </ul>

**40) Views: Views in all Critical work spaces**

REFERENCES	REQUIREMENTS
<ul style="list-style-type: none"> <li>• LEED Reference Guide</li> <li>• The Whole Building Design Guide, Daylighting: <a href="http://www.wbdg.org/resources/daylighting.php">http://www.wbdg.org/resources/daylighting.php</a></li> </ul>	<p>The project must provide access to views (as defined by the LEED reference guide) in all the following regularly occupied spaces in the project at a minimum:</p> <ol style="list-style-type: none"> <li>1) All Classrooms</li> <li>2) All Offices</li> <li>3) All Conference rooms</li> <li>4) All Cafeterias</li> <li>5) All libraries</li> </ol>

**6. Campus Provided Credits**

See Appendix Attachment 8E for Campus Maps that identifies LEED credit documentation completed at each campus.

**7. Requirements of renovation projects not meeting the LEED certification threshold**

See Appendix Attachment 8A

For renovation projects, look for RFP to include mandatory requirements within this checklist.

**8. Appendix (Reference Documents/Attachments)**

- a. Renovation Project Checklist
- b. Sustainability Cover Sheet
- c. Energy Modeling Cover Sheet
- d. Energy Modeling Climate Zone Information
- e. Provided by Campus Credits (Maps)
- f. Sustainability Standards Deviation Request