

LACCD Bond Program	Design Procedure	Procedure Number:	DP 3.0
	<i>Sustainable Design Standards</i>	Effective Date:	October 15, 2013
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1.0 Purpose

This section describes the roles and responsibilities of the parties involved in the program in relation to sustainable design for the LACCD Bond Program (hereafter referred to as Bond Program).

2.0 Scope

This LACCD Sustainable design principles and standards applies to the nine LACCD colleges, satellite campuses and any design program documents prepared or revised in relation to:

2.1 Sustainability (Building and site)

2.2. Energy (Building and site as it relates to the board of Trustees mandate, including renewable energy)

2.3 Green House Gas Emissions Inventory/Reduction (as related to the Bond Program)

3.0 Responsibilities

3.1 College Project Managers (CPMs)

The LACCD Campus Project Managers (CPMs) are responsible to confirm the project LEED goal with the College President.

- Monitor and confirm sustainability goals are incorporated into the project scope, during project initiation.
- Monitor and confirm sustainability and energy goals and processes of the program have been incorporated into the design and construction documents.
- Optimize sustainable strategies by ensuring policy and procedures outlined in this section have been followed by design and construction teams.
- Track sustainability goals and status of LEED projects at the campus- Coordinate with Sustainability Program Liaison (SPL) for issues related to LEED project procedures

- Monitors design reviews with the appropriate stakeholders and documents stakeholder feedback, issue resolution and attendance at review meetings. All deviations from the requirements and OPR are required to be tracked and reported by the AE and MEP consultant. SPL should be copied on these deviation notices.
- Oversee the design team in the data gathering related to Life Cycle Cost Analysis (LCCA) and Total Cost of Ownership (TCO) data to inform decisions to be presented to Building User Groups (BUG) on sustainability initiatives including system selection, material selection, M&O related issues.
- Provide technical review of LCCA and TCO reports for new projects and technologies as required. Ensure safety and facilities input during various phases of sustainability review.
- Gather submittal data for Facilities Master Planning and Oversight Committee (FMP&OC) reviews of LEED projects. Refer Chapter 13 on FMP&OC involvement.
- Escalate the sustainability related issues to SPL/RDL for issue resolution.
- Gather data to inform sustainability key performance indicators (KPI's) dashboard tracking updates for college KPIs.
- Monitor the Green Building Certification Institute (GBCI) design and construction submittal process for progress and status for LEED projects. Report status to PMP SPL on Monthly basis.
- For Lease/Leaseback and Design bid Build projects, coordinate between design and construction teams for LEED projects.

3.2 Sustainability Program Liaison (SPL)

The LACCD Sustainability Program Liaison (SPL) is responsible to:

- Monitor the execution of district sustainability policies
- Update and track performance of sustainability/energy standards and procedures to incorporate
 - a) Changes in LEED rating system, as applicable
 - b) Energy Optimization Program (EOP) goals and initiatives into bond program contract documents.
 - c) District and Campus KPI's on sustainability
- Monitor the CPM review of LCCA and TCO reports for new projects and technologies as required.

- Evaluate proposed new technologies or initiatives related to sustainable design when requested by CPM.
- Conduct sustainability charrettes for LEED projects in design development.
- Assign registration numbers for all LEED projects on LEED Online.
- Participate in sustainability charrette and review program criteria during design development and beyond.
- Provide tracking reports to District via sustainability KPI dashboard (to be developed).
- Review and augment safety and facilities input during various phases of sustainability review. Facilitate ongoing changes in relation to sustainable maintenance and operations.
- Coordinate with RPL and RDL for project-specific approvals and changes as required.

3.3 LACCD

The LACCD is responsible to:

- Approve/ authorize all new policies and changes to existing policy
- Authorize Green House Gas inventory and Climate Action Plan updates for the Bond program

3.4 College President/ Shared Governance

- Approve sustainable design thresholds for projects at the campus.

4.0 Procedure

4.1 Sustainable Building Principles and Standards

4.1.1 Sustainability Policy: In 2002, the Board of Trustees adopted the Leadership in Energy and Environmental Design (LEED™) rating system to deliver new construction and major renovation projects. The policy requires that:

- a) 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.

- i) Design/Bid/Build and Lease/Leaseback- The campus Shared Governance approves the level of certification established by design team. The Facilities Master Planning & Oversight Committee (FMP&OC) approves sustainability features and level of LEED certification at 100% DD.
- ii) Design Build- the DB selection committee approves the LEED certification targeted by the best value DB proposal. The FMP&OC approves sustainability features and level of LEED certification at 100% DD.
- b) 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' and energy performance through the Title 24 report. Review of documentation at various stages of design by CPM.
- c) Exceed Title 24 by 20% for all new construction. Energy performance is monitored through Title 24 reports.
- d) 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). Remaining may be supplemented by utility provided "green power" Compliance and approval on a project by project basis.

4.1.2 Sustainable Design Standards: The LACCD has developed a Sustainable Design Standards to provide direction to planning and design teams pursuing certification. This standard includes credit feasibility at the campus level. For all campus level credits, the design teams are urged to reach out to the campus project manager for direction and information on interpreting the document.

4.1.3 Energy Optimization Program: Several energy efficiency projects are developed and managed directly through the Program Management Office (PMO) and are funded through the 40J Energy Fund. These will be coordinated with the Campus Project Manager for cost and schedule management in conjunction with other projects at the campus.

These projects are:

- Renewable Energy Projects
- Measurement and Demand Response
- Demand Side Management

Refer to the Energy Optimization Program sub-section for more information on this.

4.1.4 Climate Action Plan and Inventory: The District and the nine colleges are signatories of the American College & University Presidents Climate Commitment (ACUPCC). The District also reports carbon emissions to The Climate Registry. Each Campus has a baseline carbon inventory and Climate

Action Plan (CAP) aimed at reducing the carbon footprint. These are managed by the Program Management Office.

Green House Gas reductions are achieved through execution of the sustainable building program of the LACCD. Through efficient design, district central plants, renewable energy offsets, the LACCD colleges are on their way to achieve significant GHG reductions.

The carbon inventory is performed in close cooperation of the all the Facility Directors of the Colleges.

4.1.5 Bulk Procurement of Sustainable Technologies:

LACCD Board actions 'resolve' use of master procurement agreements. Selection of these pre-negotiated vendors and products ensure sustainability criteria. Build-LACCD has written bulletins instructing use of the vendor/products, part of the RFP package that is given to all Design/ Design Build Teams. The list of bulk procurement contracts related to sustainability products is as follows:

- Flyash use
- Photoluminescent Exit Signs
- Carpet and carpet tiles
- Bulk procurement of Concrete

4.1.6 Sustainable Design Specifications:

LACCD Division 1 General Conditions require the use of the Sustainable Design Specifications. PMO and CPM may change the Division 1 General Conditions through addition of a Supplemental Design Conditions document. These should be reviewed by the PMO for approval prior to including in a bid package.

4.2 Application of the Sustainable Building Principles and Standards to Projects

4.2.1 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

If the above three criterion 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 of the delivery method selected at project initiation, a higher certification goal may be targeted at the discretion of the College President and shared governance.

- i) Design/Bid/Build and Lease/Leaseback- The campus Shared Governance approves the level of certification established by design team. The Facilities Master Planning & Oversight Committee (FMP&OC) approves sustainability features and level of LEED certification.
- ii) Design Build- the DB selection committee approves the LEED certification targeted by the best value DB proposal. The FMP&OC approves sustainability features and level of LEED certification at 100% DD.

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 developed for new construction.

4.2.1.1 Design Build

During design, the architect and LEED consultant on the design build team are responsible to confirm all the sustainable design deliverables and, coordination is incorporated into the design documents. Once a design checklist is developed and as the design progresses, the LEED™ check list must be refined by the Design Consultant to ensure the LEED™ points pursued are achieved, at LEED Certified level at a minimum.

Prior to commencement of construction, the LEED consultant on the design-build team provides the information that the design-build team will track for LEED certification. The construction team tracks the certification goals and credits and reports on the metrics related to LEED certification. The design- build team provides all the documents related to a sustainable building handover.

The CPM is responsible to confirm that the design process is executed in compliance with the program procedures. The PMO SPL is responsible to assist with any clarifications on sustainable design criteria as related to each project and provide guidance as applicable.

Please refer to the Design Build project flowchart for sustainability process and approvals.

4.2.1.2. Lease/ Lease Back

During design, the architect and LEED consultant selected during design are responsible to confirm all the sustainable design deliverables and, coordination is incorporated into the design documents. Once a design checklist is developed and as the design progresses, the LEED™ check list must be refined by the Design Consultant to ensure the LEED™ points pursued are achieved, at LEED Certified level at a minimum. 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.

Prior to construction, the CPM will schedule a meeting with the contractor where LEED consultant on the design team provides the information that the construction team will track for LEED certification. The construction team tracks the certification goals and credits and reports on the metrics related to LEED certification. The design and construction team provides all the documents related to a sustainable building handover.

Please refer to the Lease/ Lease back project flowchart for sustainability process and approvals.

4.2.2 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.

4.2.3 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 compliment the program for the

project, however, will not pursue official LEED certification through GBCI nor be required to meet principles and standards policy criteria. Non LEED projects include projects that meet the following criteria:

- Less than 50% of exterior envelop renovated.
- Minor renovation of the building interior throughout the building.

The LACCD Sustainable Checklist for Renovation Projects shall be completed in design development phase and receive approval of sustainable features incorporated.

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.

The CPM is to be at the FMP&OC meeting in the audience and available for questions for non-LEED™ projects on the FMP&OC Agenda; and attendance of the Design Consultant is also required. In addition, the CPM submits the LACCD Sustainable Checklist and the Environmental Protection Agency (EPA) Renovation and Repairs Checklists for the Campus.

4.2.4. Interior Renovation Projects- Non LEED

Interior renovation projects include projects that meet the following criteria:

- Less than 50% of exterior envelop renovated.
- Renovations, improvements in a portion of the building, department specific.

These projects will continue to incorporate sustainable features that compliment the program for the project, however, will not pursue official LEED certification through GBCI nor be required to meet sustainable principles and standards policy criteria.

The LACCD Sustainable Checklist for Renovation Projects shall be completed in design development phase and receive approval of sustainable features incorporated.

4.3 Sustainable Design Process

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, Integrated Design Manual (IDM), Energy optimization program, 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 of the building systems considered
- Complying with the LEED rating system requirements and process to deliver a LEED certified project

Refer to the SOP design process workflow for sustainable design deliverables and coordination requirements for all delivery methods. These are outlined in this section in further detail. Compliance with this work flow is integral to delivery of a quality sustainable project.

4.3.1 Critical Sustainable Design Coordination among various parties

Timely coordination between various groups of the integrated design process will ensure a sustainable design delivery. Please refer to the Project life cycle work flow for a summary timeline of required meetings. Detailed below are details of the coordination meetings required, who they are chaired by, goals and outcomes of the meeting and each party's responsibility.

Procurement

It is understood that a large part of the building 3D modeling can be completed by the design-build team during the RFP process. Outline of the BIM/Energy model requirements prior to this exercise will provide the competing teams with critical information that will enable them to set up their modeling requirements correctly from the beginning and substantially reduce their labor costs of remodeling the design if they were the winning design build team for any inaccuracy.

Meeting #1-Energy Modeling IDM Overview

This meeting is chaired by the PMO IDM and BIM Manager

The participants should ideally include the 3D modeling specialist of the shortlisted teams for the design build proposal.

Goals of the meeting are to provide a preview of the energy modeling and BIM requirements for asset tracking.

Pre-Planning/ Planning

Meeting #2- Project Initiation

This meeting is chaired by the CPM Project manager.

Participants include: PMO RDL, SPL and EOP, Building user groups, campus facilities and the AE.

As part of a larger meeting there are several goals of project initiation. This meeting shall confirm the sustainability and EOP scope of the project, central plant and metering requirements and concepts for achieving those goals.

Programming

Meeting #3

USGBC Registration

This meeting is chaired by the PMO SPL.

The participants should include the CPM and the design team members involved in project programming

The goal of the meeting would be to 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. Invite PMO and CPM to LEED Online with PM level access.

Meeting #4

OPR-BUG Meeting

The Owner Project Requirements (OPR) –Building User Group (BUG) meeting is mandatory. This meeting establishes the system requirements for the project. Each project shall have its own OPR tailored to the program of the project. The meeting shall occur after program has been established but prior to RFQ/RFP for design services so the requirements developed in this meeting may be included in the RFP.

This meeting is chaired by the CPM and CxA (or the party preparing the OPR document for the project). Note that the OPR cannot be prepared by the design team.

This meeting shall include the AE involved in project programming, campus facilities director, key members of the building user group, the PMO Whole Building Commissioning Agent (WCxA). The SPL may attend this meeting as required.

The goal of this meeting is to develop key parameters and feedback that will inform the making of the OPR. A key element of this meeting is to define training

requirements based on the complexity of the systems required to meet the needs of the programs.

Design Build RFQ-RFP-NTP

Lease-Leaseback RFQ-RFP-NTP

-SPL and EOP will attend meetings at this stage as requested to provide feedback on sustainability policy requirements and EOP procedures.

Design Phase:

At Project Design Milestones:

100% Schematic Design,

50% DD (Prior to FMP&OC Meetings),

100% DD,

DSA Documents

Meeting #5- Energy & Asset Modeling Review

This meeting is chaired by the CPM.

Participants attending this meeting include the PMO-SPL, VDC and BIM Manager, the AE energy modeler and the E7 studio representative.

Goal of this meeting is to review the energy modeling cover sheet, associated assumptions and obtain clarifications on asset modeling requirements moving forward. (each applicable milestone)

At Project Design Milestones:

100% Schematic Design,

50% DD,

50% & 95% CD,

Meeting #6- Sustainability Review

This meeting is chaired by the CPM.

The participants include the architect and engineering team including MEP, civil, landscape and sustainability consultant (if applicable), Facilities management for O&M review and input of technologies being discussed, the PMO SPL, EOP, CxA, BIM/VDC Manager as applicable to meeting and stage.

Goal of this meeting, depending on various stages of design shall be to:

- a) Validate design goals
- b) Perform milestone status check
- c) Confirm sustainability requirements are incorporated into the drawings
- d) Coordinate O&M and safety issues and requirements with facilities management
- e) Coordinate CxA review comments and issues with owner and facility management (if applicable)-Enhanced Cx
- f) Coordinate and confirm central plant connections and metering specification with EOP and facility management
- g) Confirm facilities training needs for proposed technologies and solutions

Construction-

Meeting #7- LEED Kick Off, Cx Kick-off and Asset Modeling Meeting:

This meeting is chaired by the CPM.

The participants include the project sustainability consultant or architect representative, project's CxA, construction team, including all MEP, BAS and renewable energy sub-contractors, PMO SPL and VDC.

Goal of this meeting is to:

- a) Convey contractor LEED credits roles, responsibilities and requirements with critical milestones
- b) Convey Commissioning Plan and coordination with Sub-contractors
- c) Confirm systems to be commissioned with sub-contractors
- d) Review Cx activities at pre-functional and functional testing, including air testing or flushout procedure and incorporate it into the construction schedule
- e) Kick off asset modeling criteria, requirements and roles and responsibilities

Construction-Milestone Meetings

Meeting #8- Construction Asset Tracking Milestone Meeting.

This meeting is chaired by the CPM.

The participants include the VDC manager, construction team, facilities management, Cx Agent, ME consultant and energy modeler, sustainability consultant on the design team (as needed).

Goal of this meeting is to review status of the energy model and asset tracking and resolve coordination issues.

Construction-Substantial Completion

Meeting #9- Building Flush-out meeting. This can be concurrent with a CxA coordination meeting

This meeting is chaired by the CPM.

The participants include the CxA, the construction team members responsible for building flushout, the ME consultant, the sustainability consultant.

Goal of this meeting is to confirm flushout duration, responsibilities, schedule and LEED deliverables.

Construction- Handover Process

Meeting #10- CxA Training Review

This meeting is chaired by the CPM.

The participants include the CxA, all the building facilities manager and staff involved in maintenance and operation of the building, the construction team representative, and the PMO-Warranty

Goal of this meeting is to conduct training as specified in the specifications to fulfill LEED Cx and District Cx requirements.

Construction- Post Occupancy 10 months

Meeting #11- CxA post occupancy review

This meeting is chaired by the CPM.

The participants should ideally include the CxA, building facilities director and building manager, construction team representative, and PMO-CxA (optional)

Goal of this meeting should be conduct a building performance review and report, coordination with building performance model, coordination with energy model and asset tracking.

Construction-Post Occupancy Warranties

Meeting #12- 11 month Post Occupancy Warranty walk

This meeting is chaired by the CPM.

The participants include PMO - post construction group, facilities manager and construction team.

Goal of this meeting is to create the 11 month warrantee list, address outstanding warrantee issues, confirm all training material has been provided in formats requested and ask questions on training material provided as applicable.

4.3.2 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 approval on buildings that incorporate sustainable design features, among other project approvals. 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.

4.3.3 Green Building Certification Institute Coordination:

- 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.
- GBCI certification process will be managed by the design team. The design team will provide access to the CPM and PMO SPL to the LEED online project as the project is setup in the GBCI database.

- The LEED consultant should obtain campus specific information for project setup from CPM.
- 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.
- The use of the 'sustainable education' innovation credit is at the discretion of the design team. This would give the user, visitor, 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 and signage describing the sustainable features.
- Throughout the design and construction process the Design Sustainability Consultant is responsible for managing the LEED certification process and submits all documentation to the GBCI/USGBC for evaluation.
- The CxA on the project is responsible for submitting the prerequisite and enhanced Cx credit (if applicable) to GBCI/USGBC.

4.3.4. 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 at each phase is required. Refer to the sustainability and energy model review sub-process flow chart for milestones and deliverables related to the energy model at each phase of the design deliverables. Please also refer to the IDM for energy modeling, and Section 5 for more information on energy modeling requirements. Review the 4D energy modeling and asset tracking requirements.

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 CPM for review at each milestone deliverable. Confirm compliance with sustainable design requirements.

Refer to the following Design Management Sub-Process:

Energy Modeling Sub-process

BIM and Energy Modeling Sub-Process

1. Energy Modeling Approvals
2. Energy Modeling IDM (Reference IDM)
3. Energy Modeling Cover Sheet

4.3.5. Commissioning

All LEED™ projects have a third party Commissioning Authority (CxA) firm, hired by the CPM, 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:

- Ensures the Owner Project Requirements are complete and reviews the OPR and BOD.
- 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.
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Additional commissioning is coordinated through the CPM and the Design Consultant. Any disputes, etc. are to be brought to the attention of the SPL/RDL/RPL, through the CPM for resolution.

See LACCD General Requirements Technical Specification on Commissioning and the Commissioning process Flowchart for further clarifications.

The Owner Project Requirements (OPR) is generated for all LEED Projects with the assistance of the CxA. This document is used by the CxA for review of all Basis of Design Narratives generated by the design/design build teams. The OPR should be developed early in the project.

The CxA is also integral to review design drawings for compliance with BOD and OPR. The CxA also monitors the submittals during construction if enhanced Cx is pursued for the project. This is recommended to provide a quality review of the submittals during construction.

4.4 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 CPM 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

1. Document Name: Sustainable Design Criteria for project- included as part of Project Program

This document establishes the scope of sustainability and EOP coordination for the project.

This document is prepared by the Programming Architect, reviewed by the CPM and PMO-SPL, RDL and EOP. The PMO provides input to the Programming architect as requested.

2. Document Name: Owner Project Requirements

This document establishes the system design criteria and requirements

This document is prepared by the commissioning agent or other responsible party for the building user group (BUG). It is reviewed by the CPM, BUG, and the PMO SPL and EOP.

Design- Schematic

4. Document Name: Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Schematic Energy Model cover sheet

This document 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. This will be accomplished by delivering the energy model cover sheet applicable to the project. (see more in the energy modeling section)

This document is prepared by the design team and reviewed by the CPM. (See design management sub-process)

Design- 50% and 100% Design Development

1. Document Name: Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Design Development Energy Model cover sheet

This document tracks status of sustainability. Show incorporation of sustainability features, how sustainability objectives are accomplished. Provide an updated LEED scorecard that reflects the status of sustainability objectives of the project. Provide updated energy modeling cover sheet + title 24 documentation to show energy modeling compliance with LACCD board policy requirements.

This document is prepared by the design team and reviewed by the CPM. PMO SPL to assist as applicable.

2. Document Name: Energy modeling cover sheet + Model + asset tracking

This document confirms the energy model is in line with the design progress and has incorporated the sustainable design goals of the project. It will establish the baseline and proposed case modeling parameters.

This document is prepared by the design team energy modeler and reviewed by the CPM and the PMO-VDC

Design- Construction Documents

1. Document Name: Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Progress Energy Model, renewable energy allocation from campus bank and/or project renewable energy

This document tracks the status of sustainability. Show incorporation of sustainability features and LEED requirements in documents. This document confirms the energy model is in line with the design progress and has incorporated the sustainable design goals of the project in this phase. Provide the energy modeling cover sheet and Title 24 documentation showing compliance of energy requirements. Confirm CxA and Training requirements. Coordinate central plant and metering requirements with EOP. Coordinate campuswide LEED credits, including renewable energy bank as applicable with SPL.

This document is prepared by the design team and reviewed by the CPM and SPL as requested.

GBCI Design Submission

1. Document Name: Green Building Certification Institute (GBCI) LEED Online Design Submission

Completes the design phase GBCI LEED submission.

CPM and PMO SPL to provide any input requested by design team.

Construction- Kick Off

1. Document Name: Contractor Project Plans for credits: MRc2, MRc4, MRc5, MRc7, EQc4.3

This document establishes projection plans for targeted construction credits on the LEED scorecard.

These should be prepared by the contractor and submitted to the CPM and design professional for review and conformance of LEED overall scorecard goals.

Construction-Progress

1. Document Name: Contractor credit status for all construction related sustainability items

Ongoing contractor progress updates provides status on contractor tracked credits such as MRc2, MRc4, MRc5, MRc7, EQc4.1-4.4 (as applicable)

The updates are provided through an updated LEED template and back-up documentation showing percentage compliance of LEED goals.

This document prepared by the contractor is reviewed by the CPM and design team professionals tracking the performance of the overall LEED scorecard.

2. Document Name: 4D Milestone deliverable
3. This document tracks the energy model and asset management deliverable during construction. It is prepared by the construction team and reviewed by the CPM and PMO-VDC.

EOP M&DR

1. Document Name: EOP M&DR Review

This document reviews the construction drawings for compliance with District M&DR and requests additional documentation or information related to metering and demand response for the project. Coordinate all requirements with the facilities director and contractor.

This document is a review prepared by PMO-EOP for coordination with CPM and Director of Facilities.

Construction-Substantial Completion

1. Document Name: CxA Training Manuals and Schedule

This document confirms training is in accordance with OPR and Specification requirements. This document is prepared by the construction team and reviewed by the CPM and PMO.

GBCI Construction Submission

1. Document Name: Green Building Certification Institute (GBCI) LEED Online Construction Submission

Completes the construction phase GBCI LEED submission.

CPM and PMO SPL to provide any input requested by design and construction team.

Construction- DSA Closeout

Document Names: Final OPR, Basis of Design, Construction Manual, Training Manuals, LEED Online documentation , Energy model cover sheet, energy native model + Title 24 documents

This is the final sustainable design documentation to be prepared and submitted by design and construction team and reviewed by the CPM, CxA, Facilities Director, PMO-SPL, CxA, Post Construction and EOP.

Construction- Post Occupancy 10 months

1. Document Name: CxA report

This document provides a review report on post occupancy information on the building, possible corrections in system and action items. It is prepared by the CxA and reviewed by the CPM, construction team, facilities director, and PMO warranties and PMO WCxA

4.5 Energy Optimization Program (EOP)

The EPO is responsible for planning and execution of all districtwide energy related projects, utility coordination and management for Renewable Energy projects, Demand

Side management (ESCO contracts, energy review and audit, retrofits), Monitoring and Demand Response (in RFP currently) and Retro Cx (future planned). This program is primarily funded through the 40J Energy Fund.

The EOP is managed by PMO. Refer to the Energy Optimization Program subsection for more information on this.

4.6 Campus Renewable Energy

Each campus has a certain amount of renewable energy constructed as part of the bond program. This is referred to as the existing renewable energy bank in this document.

For new LEED projects, decision on incorporating a new renewable energy project will be made at project initiation by the Shared Governance and College President. The CPM and design team shall consult with PMO on existing renewable energy bank and its availability to meet policy requirements at a campuswide level. A portion of the renewable energy bank will be allocated to the new project and pertinent documentation to aid the LEED submission process will have to be generated by responsible parties.

Availability of Renewable energy at the campus and its allocation to the project will help achieve LEED credits/points for certification.

Also reference EOP section 13.

5.0 Terms and Definitions

6.0 Approvals

Prepared By: Functional Lead – Daynard Tullis	Date:
Reviewed By: Quality Manager – Kathleen Copus	Date:
Approved By: Program Director – Terri Mestas	Date:

7.0 Revision History

This page is a record of all revisions to this implementing procedure. Each time the procedure is changed, the nature of this change is noted under the description and/or by revision lines in the procedure.

Comments to the SOPs and associated forms and documents are welcome, and should be emailed to procedures-comments@build-laccd.org. You must include the following in the body of your email:

- Your Name/Firm/Contact Telephone Number
- SOP Volume
- Section Name and Number
- Sub-section
- Description of Concern/Comment
- Reason/Suggested Resolution

Procedure revision requests will be reviewed and responded to on an ongoing basis.

Revision	Effective Date	Pages Revised	Description	Type of Revision (Editorial/ Technical)	Update Required Reading?
0	10-15-2013	All	Original Issue	Initial Issue	Yes

8.0 Records

- None

9.0 Attachments

Attachment Number	Title	Attachment Identifier
	Sustainable Design Policies -LEED Certification -Energy and Renewable Energy	
	Sustainable Design Standards- May 2009	
	LACCD Sustainable Checklist for Renovation Projects- Non LEED Projects	
	Building Process work flow -Design Build -Lease Lease Back	
	Design Management Sub-Process: a) Sustainable Design Review b) OPR and BOD Review	
	Critical Coordination for sustainable design process by phases- reference chart	
	Sustainable Design Deliverables by project phase- reference chart	
	Design Management Sub-Process: BIM and Energy Modeling Sub-process Energy Modeling Cover Sheet 1. Energy Modeling Approvals 2. Energy Modeling IDM (Reference IDM)	
	Sustainability KPIs -CPM -PMO	
	College Climate Action Plan Summaries (CAP)	

Critical Coordination for sustainable design process by phases- reference chart

Procurement

It is understood that a large part of the building 3D modelling can be completed by the design-build team during the RFP process. Outline of the BIM/Energy model requirements prior to this exercise will provide the competing teams with critical information that will enable them to set up their modeling requirements correctly from the beginning and substantially reduce their labor costs of remodeling the design if they were the winning design build team for any inaccuracy.

Meeting #1	Energy Modeling IDM Overview
Chaired by	PMO-IDM/BIM team
Participants and responsibilities	Shortlisted teams for design build proposal
Goals and Outcomes	Preview of energy model and BIM project requirements

Pre-Planning/ Planning

Meeting #1	Project Initiation
Chaired by	CPM
Participants and responsibilities	AE involved in project initiation Building User Group Facility Manager PMO- RDL SPL and EOP
Goals and Outcomes	Confirm sustainability and EOP scope, central plant connectivity and metering requirements for Project Initiation

Programming

Meeting #1	USGBC Registration
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Chaired by	PMO SPL
Participants and responsibilities	CPM AE involved in project programming
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 Invite PMO and CPM to LEED Online with PM level access.

The Owner Project Requirements (OPR) meeting is mandatory. This meeting should establish the system requirements for the project. Each project should have its own OPR tailored to the program of the project. The meeting should occur after program has been established.

Meeting #2	OPR BUG Meeting
Chaired by	CPM/CxA
Participants and responsibilities	CPM to coordinate meeting invitation list and logistics CxA AE involved in project programming Campus Facilities Building User Group PMO WCxA Optional-SPL

Goals and Outcomes	CxA to develop an OPR based on this meeting with BUG Define training requirements overview based on building needs.
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Design Build RFQ-RFP-NTP

Lease Lease Back RFQ-RFP-NTP

-SPL and EOP can attend meeting at this stage as requested

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

Meeting #	Energy & Asset Modelling Review
Chaired by	CPM
Participants and responsibilities	PMO- SPL ,BIM, VDC E7 AE Energy Modeler
Goals and Outcomes	As needed , when compliance is not achieved, conduct a status meeting to confirm progress at the energy modeling milestones

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

Meeting #	Sustainability Review
Chaired by	CPM
Participants and responsibilities	AE Design Team members as appropriate Facilities Management- for O&M and design input

	<p>Construction Team as applicable to delivery process</p> <p>Optional- PMO-SPL, EOP, CxA, BIM/VDC</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>-Coordinate with Project CxA</p>

Construction- Kick Off

Meeting #	LEED Kick off, Cx Kick-off and Asset Modelling Mtg
Chaired by	CPM
Participants and responsibilities	<p>Design Team sustainability consultant</p> <p>Cx Agent</p> <p>Construction Team, including all MEP, BAS and renewable energy subcontractors</p> <p>PMO- SPL, VDC</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 wrt to Cx activities at pre-functional and functional testing</p>
Goals and Outcomes	Convey contractor LEED credits roles

	<p>and responsibilities and requirements</p> <p>Convey Commissioning Plan and coordination with Sub-contractors</p> <p>Review construction schedule wrt to Cx activities at pre-functional and functional testing</p> <p>Kick off asset modeling criteria, requirements and roles and responsibilities</p>
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Construction-Milestone Meetings

Meeting #	4D Milestone Meeting
Chaired by	VDC
Participants and responsibilities	<p>Construction Team</p> <p>Facilities Management</p> <p>CxA</p> <p>ME Consultant energy modeler</p> <p>LEED consultant (As needed)</p>
Goals and Outcomes	Status review of the energy model and asset tracking

Construction-Substantial Completion

Meeting #	Building Flushout- This can be concurrent with a CxA coordination meeting
Chaired by	CPM

Participants and responsibilities	CxA Construction Team ME Consultant LEED consultant
Goals and Outcomes	Confirm the flushout duration, responsibilities, schedule and LEED deliverables.

Construction- Handover Process

Meeting #	CxA Training
Chaired by	CxA
Participants and responsibilities	CPM Building Facilities 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 #	CxA Review LEED
Chaired by	CxA
Participants and responsibilities	Building Facilities

	Construction Team representative CPM Optional-PMO-CxA
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	CPM
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

Sustainable Design Deliverables by project phase- reference chart

Programming

Document Name:	Sustainable Design Criteria for project- included in project program
Prepared by:	Programming Architect
Reviewed by:	CPM PMO- SPL, EOP
Scope and Goal	Establishes final scope of sustainability and EOP for the project

Document Name:	Owner Project Requirements
Prepared by:	Commissioning Agent for Building User Group (BUG)
Reviewed by:	CPM BUG PMO- SPL, EOP
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
Prepared by:	Design Team
Reviewed by:	CPM (See Design Management Sub- Flow)

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.
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Design- 50% Design Development

Document Name:	Sustainability Narratives, Systems Narratives and Basis of Design, LEED Checklist, Schematic Energy Model
Prepared by:	Design Team
Reviewed by:	CPM (See Design Management Sub-Flow)
Scope and Goal	Tracks status of sustainability. Show incorporation of sustainability features and LEED requirements in documents

Design- 50% Design Development

Document Name:	Energy modeling cover sheet + Model + asset tracking
Prepared by:	Design Team
Reviewed by:	CPM (See Design Management Sub-Flow) VDC
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, Progress Energy Model, renewable energy allocation from campus bank and/or project renewable energy
Prepared by:	Design Team
Reviewed by:	CPM (See Design Management Sub-Flow)
Scope and Goal	Tracks status of sustainability. Show incorporation of sustainability features and LEED requirements in documents Confirms CxA and Training requirements

GBCI Design Submission

Document Name:	LEED Online
Prepared by:	Design Team
Reviewed by:	CPM
Scope and Goal	Completes GBCI submission

Construction- Kick Off

Document Name:	Contractor Project Plans MRc2, MRc4, MRc5, MRc7, EQc4.3
Prepared by:	Contractor
Reviewed by:	CPM

Scope and Goal	Establishes projection plan for targeted credits on construction LEED scorecard
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Construction-Progress

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

Construction-Progress

Document Name:	4D Milestone deliverable
Prepared by:	Construction team
Reviewed by:	CPM VDC
Scope and Goal	Tracking energy model and asset management document

EOP M&DR

Document Name:	EOP M&DR Review
Prepared by:	PMO-EOP
Reviewed by:	CPM Facilities Director
Scope and Goal	Confirms compliance with District M&DR and requests additional

	documentation or information related to metering and demand response for the project
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Construction-Substantial Completion

Document Name:	CxA Training Manuals and Schedule
Prepared by	Construction Team
Reviewed by:	CPM, PMO
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:	CPM
Scope and Goal	Completes GBCI submission

Construction- DSA Closeout

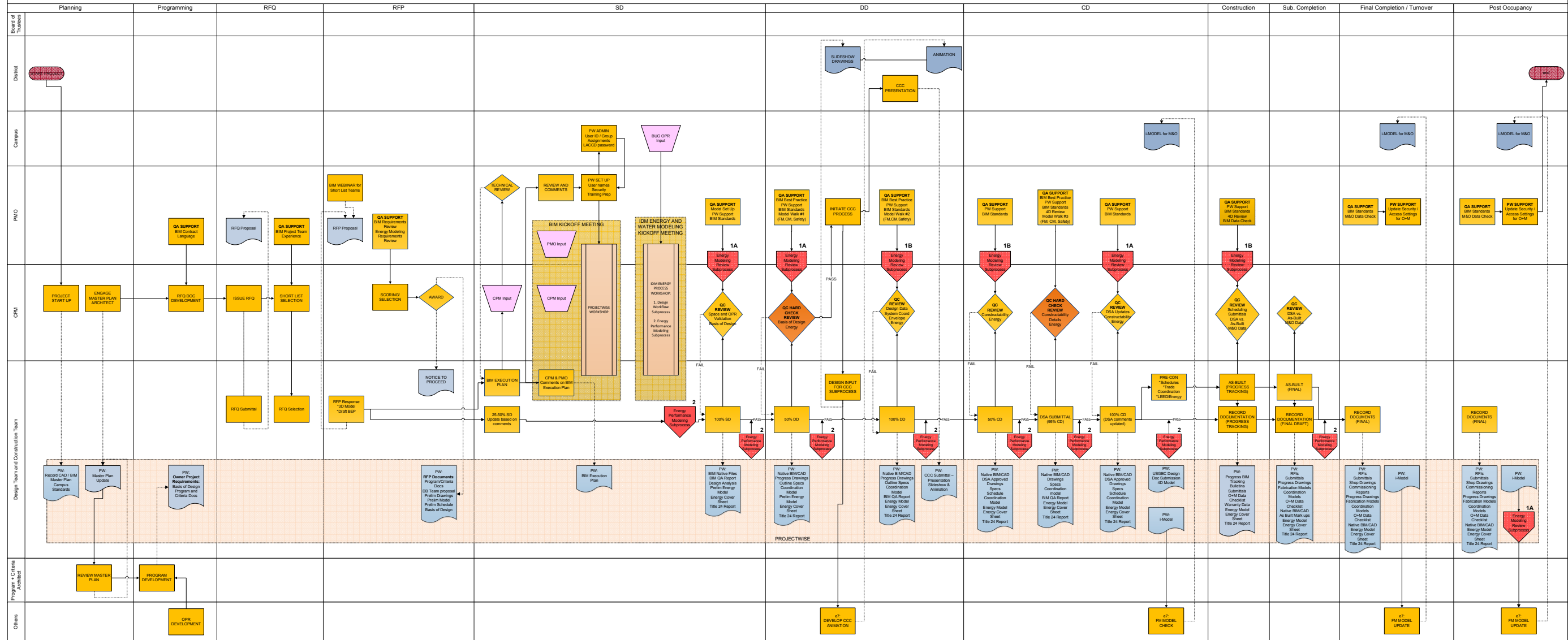
Document Name:	Final OPR, Basis of Design, Construction Manual, Training Manuals, LEED Online documentation , Energy model, imodel,
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Prepared by:	Design and Construction Team
Reviewed by:	CPM Facilities Director PMO- SPL, CxA, Post Constr., EOP E7 CxA
Scope and Goal	Establishes final documentation from Design and Construction Team

Construction- Post Occupancy 10 months

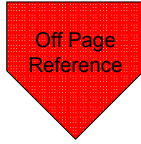
Document Name:	CxA report
Prepared by:	Cx Agent
Reviewed by:	CPM Construction Team Facilities Director PMO- WCxA
Scope and Goal	Review report on post occupancy information on the building, possible corrections in system

Building Information Modeling and Energy Modeling SUB-Process: Quality Assurance, Design Review and Digital Document Deliverable workflow for projects requiring the use of Building Information Modeling



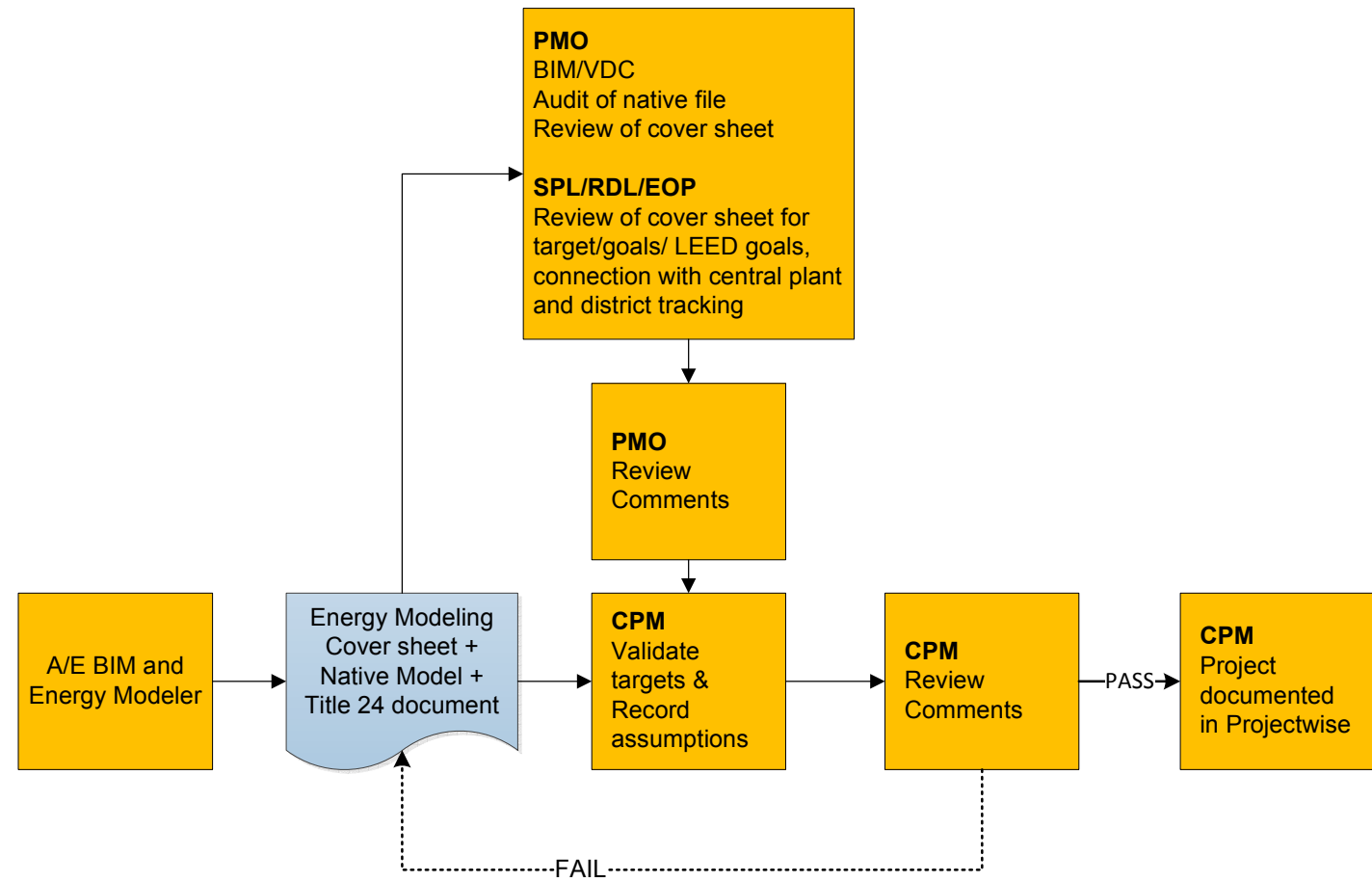
1A & 1B Energy Modeling Review Flow Subprocess

2 Energy Performance Modeling IDM Subprocess



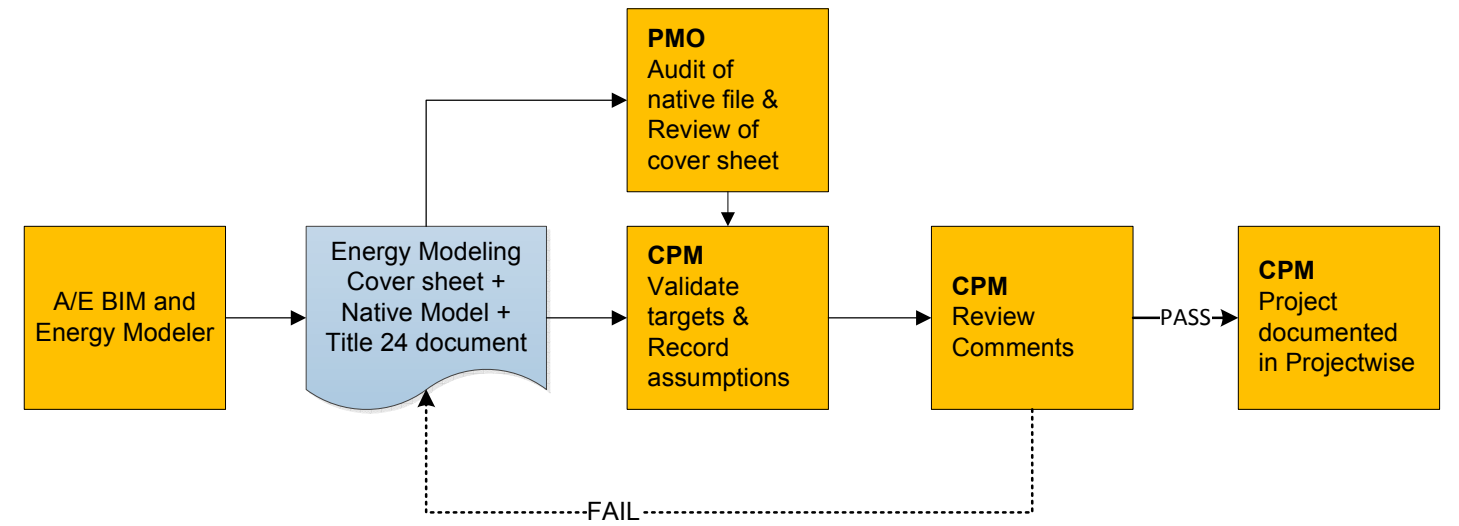
1A. Energy Modeling Review/Approval Flow (Sub-Process)

For Phases:
100% SD
50% DD
DSA Approved Drawings-Design
10 months Post Occupancy



1B. Energy Modeling Review/Approval Flow (Sub-Process)

For Phases:
100% SD
50% DD
DSA Approved Drawings-Construction



ENERGY MODELING COVER SHEET

Standard Operation Procedure (SOP) Vol II Sec 3.0

GENERAL ENERGY MODELING

Project Name:

Point of Contact:

Name:

Phone:

Project Phase:

Total SF of project:

List and Attach the below related documents:

Energy Modeling Simulation Program:

 (drop down)

If other, list energy modeling program:

LEED Certification

LEED Project? (Y/N):

LEED version (e.g. NCv2.2)

Certification Level Targeted

Energy performance targeted (energy cost)

Occupancy Schedule:

Schedule Profile:

Exceptional Calculations:

Renewable Energy:

(provide renewable energy design specification)

Is building connected to Campus Central Plant?

List systems supplemented by central plant:

List backup building systems

Project Code:

Email:

Company:

ENERGY MODELING COVER SHEET

Standard Operation Procedure (SOP) Vol II Sec 3.0

IDM: ENERGY **Project:** **Project Code:**
Point of Contact: **Name:** **Phone:** **Email:** **Company:**

Project Management data contact:
 Title 24 data contact:
 DOE-2 Analysis contact:

Project Code:	08V000	Bldg Type:	higher education	Energy Use Intensity (EUI) Proposed :	EUI Baseline:	
Location Zip Code:	91401	Project Phase:	50% DD	Electricity EUI	10 kWh/sf/yr	10 kWh/sf/yr
Weather Station:	7780	Construction Type:		Fuel EUI	50 kBtu/sf/yr	50 kBtu/sf/yr
Gross Sq Ft:	77000	Primary Structure:		Total EUI	85 kBtu/sf/yr	85 kBtu/sf/yr
Assignable Sq Ft:	40000	Primary Exterior Skin:				
Average Lighting Power:	1.20 W/sqft	Construction	Percent	Life Cycle Energy Use/Cost:	Life Cycle Baseline:	
Exterior Window Ratio:	40%	New Construction:	25	Energy Use (kWh)	200000000	
Electricity Cost (kWh):	.12 / kWh	Renovating:	25	Fuel Use (Therms)	1000000	
Fuel Cost (Therm):	.80 / Therm	Existing to Remain:	50	Energy Cost	\$1,000,000	

Title 24 Summary Data:	Standard Design	Previous Design	Proposed Design	Percent Savings	Compliance Margin	Project Data: Area or Volume	Proposed EUI	Baseline EUI	Source File Name & Type	Regulated/Unregulated
PERF-1 Energy Component										
Space Heating (kBtu/sqft-yr)	3		1		2				0 08V000M/E	
Space Cooling (kBtu/sqft-yr)E	300		150		150				0 08V000M/E	
Indoor Fans (kBtu/sqft-yr)	100		95		5				0 08V000M	
Heat Rejection (kBtu/sqft-yr)	0		0		0				0 08V000M	
Pumps & Misc (kBtu/sqft-yr)	0		0		0				0 08V000P	
Domestic Hot Water (kBtu/sqft-yr)	20		20		0				0 08V000P	
Outdoor Lighting (kBtu/sqft-yr)			50		-50				0 08V000A/L/I	
Indoor Lighting (kBtu/sqft-yr)			65		-65				0 08V000A/L/I	
Lighting (kBtu/sqft-yr) Subtotal:	0									
Receptacle (kBtu/sqft-yr)	65		65		0				0 08V000A/L/I	
Elevators (kBtu/sqft-yr)										
Service Water Heating (kBtu/sqft-yr)										
Auxiliary 1 (kBtu/sqft-yr)										
Auxiliary 2 (kBtu/sqft-yr)	65		65		0				0 08V000A/L/I	
Process (kBtu/sqft-yr)	150		150		0				0	
Totals:	703		661		42				0	
% > Standard					5.97%					
% > exclude Process					7.59%					

DOE-2 Project Data	Estimated	Schematic	Proposed	Percent	Compliance	Calculated	Specific	Identified	Source File	Source File
Electricity to Fuel Energy Use	Cost	Massing	Design	Savings	Margin	Area or Volume	Source	Zones	Name	Type
Electricity (kBtu/sqft-yr)	\$85,000		210						08V000M/E	rvt
Fuel (Therms-yr)	\$13,000		13000						08V000M/P	rvt
Totals:	\$98,000		13210							

Fuel Energy Use	Estimated	Schematic	Proposed	Percent	Compliance	Calculated	Specific	Identified	Source File	Source File
	Cost	Massing	Design	Savings	Margin	Area or Volume	Source	Zones	Name	Type
HVAC (Therms-yr)	\$6,000		210						08V000M/P	rvt
Domestic Hot Water (Therms-yr)	\$4,000		6000						08V000P	rvt
Totals:	\$10,000		6210							

Electricity Energy Distribution	Estimated	Schematic	Proposed	Percent	Compliance	Calculated	Specific	Identified	Source File	Source File
	Cost	Massing	Design	Savings	Margin	Area or Volume	Source	Zones	Name	Type
HVAC (kBtu/sqft-yr)	\$37,000		315						08V000M/P	rvt
Lighting (kBtu/sqft-yr)	\$24,000		210						08V000E/L	rvt
Receptacle (kBtu/sqft-yr)	\$22,000		190						08V000A/LV/L	rvt
Totals:	\$83,000		715							

System Breakdown by Zone & Code	Zone Description	Code	Energy Source	Fans	Project Data: Area or Volume	Cooling	Heating	Source File Name	Source File Type
Space Heating (kBtu/sqft-yr)	1,2 W	PTAC	Gas	CV		DX	Boiler		rvt
Space Heating (kBtu/sqft-yr)	1,2 W	PTHP	Electric	CV		DX	HP		rvt
Space Cooling (kBtu/sqft-yr)E	1,2,3 SE	PVAV-RH	Gas	VAV		CW	Boiler		rvt
Space Cooling (kBtu/sqft-yr)E	1,2,3 SE	VAV-RH	Electric	VAV		CW	Electric Resist		rvt

Building System: (Component Family- UNI-2)			Energy - Building Services
Mass Exterior Wall - UG - B2010	Lightweight Construction - Typical Mild Climate Insulation		HVAC D3010 12 SEER/0.9 AFUE Split/Packaged Gas, 5-11 Ton
Mass Interior Wall - C1010	Lightweight Construction - No Insulation		References
Mass Exterior Wall - UG - B2020	High Mass Construction - Typical Mild Climate Insulation		Lighting Spec:
Mass Roof - B3010	No Insulation - Cool Roof		Envelope Spec:
Mass Slab - B1010	High Mass Construction - No Insulation		Operations Req:
Mass Glazing - B2020	Single Pane Clear - No Coating		Energy Code:
Mass Skylight - B3020	Single Pane - Tinted		Additional Code: