

Chapter 9 – Design Guides

9.5 ENERGY EFFICIENCY (EXECUTIVE ORDER 88) and SUSTAINABLE DESIGN

This chapter provides instructions to Designers, Project Managers and Consultants to determine the extent of compliance required by EO88 on their project, as well as instructions, tools and other resources. It also provides instructions for buildings undergoing LEED certification and for the use of Best Green Practices in non-LEED buildings.

Note that Executive Order 88 and LEED certification are two distinctly different topics and that EO 88 does not mandate the use of LEED. However since they each deal with sustainable design they are both included in this chapter.

9.5.1 ENERGY EFFICIENCY (EXECUTIVE ORDER 88)

Governor Cuomo signed Executive Order No. 88 “Directing State Agencies and Authorities to Improve the Energy Efficiency of State Buildings” on December 28, 2012. This new Order repealed Executive Order No. 111 “Green and Clean Buildings and Vehicles” and included the following provisions:

1. Key Provisions:
 - a. The New York Power Authority (NYPA) has created a Central Management and Implementation Team (CMIT) to administer the Order. OGS and the New York State Energy Research and Development Authority (NYSERDA) are to provide technical assistance to state agencies. Virtually all state agencies must comply with the Order.
 - b. The CMIT issued **Guidelines Version 1.0** in September 2013 that set forth the requirements in detail. The Guidelines are to be found at: <http://www.nypa.gov/BuildSmartNY/Guidelines.pdf>
 - c. For more background go to:
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2. Existing Buildings (*refer to [Existing Buildings and Campuses chart](#)*):
 - a. General: By April 1, 2020, a collective 20% reduction in energy use intensity (EUI) relative to Fiscal Year 2010/2011 of state-owned or operated buildings is to be achieved.
 - b. Benchmarking: Annual energy use measurement and reporting is required for all stand-alone state buildings > 20,000 square feet and all multi-building campuses. Measurement of energy use on multi-building campuses includes all energy-consuming buildings regardless of size. NYPA has benchmarked and ranked this existing building stock into quartiles according to performance. The results of the benchmarking may be found in an August 2013 report: <http://nypa.gov/BuildSmartNY/BaselineEnergyReport08-2013.pdf>
 - c. Audits:

- Low-performing buildings that received low benchmark scores (the lowest or 1st quartile) must undergo an ASHRAE Level II energy audit. Audits must identify opportunities for energy efficiency measures and cost-effective on-site renewable energy generation and high-efficiency combined heat and power. A retro-commissioning study is to be part of the audit. All audits must be completed by December 31, 2015.
 - Required Capital Projects:
 - i. Implementation of the most cost-effective measures for the lowest quartile must occur within two years (December 31, 2017 deadline). The level of implementation is dependent on the cost and funding source:
 - Retrofits or equipment replacement as part of State-Financed Capital Program must be added to capital plan (1.1.2.1)
 - Significant retrofits or equipment replacements financed through other than State (third party such as NYPA, NYSEERDA) must be in the design phase (1.1.2.2)
 - Minor retrofits, and low/no-cost operations related upgrades must be completed.
 - ii. Cost-effectiveness may be determined utilizing life cycle cost analysis software such as the Federal Management Program's Building Life-Cycle Cost (BLCC) software.
 - d. Retro-commissioning: The remaining three quartiles of the buildings (which do not require audits) shall be retro-commissioned according to the following schedule:
 - 2nd quartile – by June 30, 2015
 - 3rd quartile – by June 30, 2017
 - 4th quartile – by June 30, 2019
 - e. Sub-metering: All buildings of 100,000 square feet or larger on master-metered campuses must be sub-metered for all fuels and energy sources by December 31, 2016.
 - f. D&C Term consultants may be used to perform the tasks required for existing buildings under this Order.
3. New Construction (*refer to [New Construction Chart](#)*):
- a. The term “new construction” refers to new buildings, additions and substantial renovations. (Note: The guidelines do not refer to “additions” but it may be inferred that they are included.)
 - b. Green building standards such as LEED are “supported” as a means of increasing energy efficiency but not mandated.
 - c. New construction must meet the current State Energy code or better.
 - d. New Buildings and Additions:
 - Perform an energy efficiency analysis early in the design phase.
 - i. ***D&C's interpretation of “energy efficiency analysis”***: The analysis may be performed with energy simulation software for analyzing baseline versus proposed building models. The baseline may be considered to be the minimum requirement for energy-

- efficient design as formulated in ASHRAE 90.1 which is referenced in the New York State Energy Code.
- ii. The program is to consider alternative HVAC and building energy efficiency measures to increase energy performance, analyze operating costs, and develop payback scenarios. Examples of appropriate software are Hap (Carrier) and Trace (Trane).
- Assign a Commissioning Authority CxA to commence document review by 60% design phase.)
 - Commissioning shall occur at two points in time:
 - i. Immediately after construction
 - ii. Twelve months after occupancy
- e. Substantial Renovations:
- Defined as:
 - i. A capital project affecting at least two primary building systems
 - ii. The building area is unoccupiable during construction for 30 days or more.
 - Primary systems are defined as HVAC, Electrical and/or Lighting, Exterior Walls and/or Windows, Roofing and/or Ceiling, Plumbing.
 - Requirements are the same as for a new building or addition.
- f. D&C Term consultants may be used to perform the tasks required for existing buildings under this Order.

9.5.2 SUSTAINABLE DESIGN

Although Executive Order 111, which prescribed the use of green design principles for all state buildings, has been repealed, designers should strive to incorporate these principles when possible. The measures incorporated to use these principles may be based on LEED credits, even if certification is not pursued. Reduction of heat island effect, using low emitting materials, water use reduction, using recycled content and/or regional products and recycling construction waste are all basic examples of green attributes that a designer may choose to incorporate. More expensive and involved measures such as sophisticated wastewater technologies, increased ventilation and daylighting should be requested by the client or approved by the team leader.

A. LEED RATING SYSTEM

LEED, which stands for Leadership in Energy and Environmental Design, is an internationally recognized green building certification system for designating, constructing and certifying green buildings. The voluntary rating system was designed by the U.S. Green Building Council, a non-profit trade organization of leaders from across the building industry working to promote buildings that are environmentally responsible, profitable and healthy places to live and work.

The LEED Reference Guide, which describes the rating system in greater detail, is available to OGS D&C designers through the D&C Green Quality Improvement Team.

LEED buildings are designed and built using strategies aimed at improving performance in the following five categories:

- sustainable site planning,
- safeguarding water and water efficiency,
- energy efficiency, renewable energy and CO2 emission reduction,
- conservation of materials and resources, and
- indoor environmental quality.

A whole-building approach is emphasized so that ideally no system works in a vacuum; the building design and construction process is integrated and collaborative.

LEED version 3 for New Construction is based on a 40 to 110 point scale. A project must satisfy specific prerequisites and earn a minimum number of points to be certified. Different levels of certification are granted based on the total number of earned credits. The four progressive levels of certification are: Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110.

Credits are weighted to reflect their potential environmental and human health impacts. Credits with the greatest number of points address climate change, energy performance, and water usage.

LEED version 4 has been released but both 3.0 and 4.0 versions will continue to co-exist.

The steps involved in getting a building certified are:

- register the project with USGBC (done by the client agency, Project Manager or consultant)
- prepare the project certification documentation,
- submit the application with the project certification documentation using the web-based LEED Online system.,
- await application review and resubmit application if necessary, and
- achieve certification.

Other non-LEED organizations such as the Green Building Initiative, which administers the Green Globes system and are accepted by code standard societies, federal agencies and other states, could also form the basis for incorporating green building principles into design projects. These systems will have their own ratings, measurement, and verification protocols that create their own certification standards. Please verify with the Team Leader for use of any non-LEED system.

B. SUBMISSION REQUIREMENTS FOR LEED PROJECTS

1. Program:

- a. Discuss with client and Team leader if project will be formally registered and certified with the USGBC.
- b. For new buildings, additions or major reconstruction, conduct a charette to identify potential LEED credits with input from client and consultants.

- c. Complete the [LEED Project Checklist](#). OGS Project Manager shall save the form to the electronic project file under the EO88-LEED folder.
 - d. Identify special consultants required (i.e., commissioning, sustainable design or energy modeling consultant).
 2. **Schematic Design Phase:**
 - a. Update the [LEED Project Checklist](#) and save in folder.
 - b. Seek recommendations from commissioning authority.
 - c. Submit computer-based energy modeling preliminary report.
 3. **100% Submission Phase:**
 - a. Update the [LEED Project Checklist](#) and save in folder.
 - b. If submitting to USGBC for certification, submit design phase LEED templates to the USGBC.
 - c. If not submitting for certification, save completed LEED templates to the project file.
 - d. Update modeling report.
 - e. Insure that specifications for Commissioning, IAQ Construction Management Plan and IAQ Testing are included in the Project Manual.
 4. **Final Submission Phase:**
 - a. Finalize the [LEED Project Checklist](#) of applicable credits and save in folder.
 - b. Update design phase LEED templates and resubmit to USGBC if building is to be certified.
 5. **Construction Phase:**
 - a. At substantial completion, update the [LEED Project Checklist](#).
 - b. If building is to be certified, submit construction phase LEED templates to USGBC.

C. LEED CERTIFICATION FEE PROCEDURES

1. Discuss with the Client Agency and Consultant, if you have one, on which method works best:
 - a. If OGS is to pay the LEED registration and certification fees, the Project Manager provides D&C Finance with the Project Number and dollar amount. They will bill the Client Agency for reimbursement and add the LEED certification fee costs to DCNet under [Related Fees](#) for that Project Number.
 - b. If the Consultant pays the certification fees, the Project Manager needs to include in the BDC 41 - Request for Term Assignment, the following deliverables: Obtaining LEED registration and certification, as required. The Consultant will add these in his fee request when first hired. If added after the initial work order is in place, the Project Manager provides a BDC 41.1, Modification to a Term Contract. Reimbursement to the Consultant will be made using the Client's cost center which would be already encumbered.

- c. The Client registers the building and pays for the LEED certification fees.

D. SUBMISSION REQUIREMENTS FOR NON-LEED PROJECTS (optional):

The vast majority of D&C projects are not suitable for LEED certification because of their size and/or scope. A single or double trade project such as a window replacement, for example, would not be eligible for LEED certification because it would not impact all five areas of the LEED rating system. However, it ideally would include green building design attributes (or best green practices) such as proper sorting and recycling of construction waste and energy efficiency (well insulated glass with low emissivity).

To incorporate significant attributes of green design:

1. Program Phase:
 - a. Fill out [Green Design Table for Small Projects](#) and save table in electronic project file under the EO88-LEED folder.
2. 100% Submission Phase:
 - a. Update [Green Design Table for Small Projects](#) and save table in project file.
 - b. Use the [LEED Project Checklist](#) as a guide during the design process.
3. Final Submission Phase:
 - a. Update [Green Design Table for Small Projects](#). Save table in electronic project file.

Revision History:

| <i>Rev</i> | <i>Date</i> | <i>Description</i> | <i>Reviewed by:</i> | <i>Approved by:</i> |
|------------|-------------|---|---------------------|---------------------|
| 0 | 04/29/13 | Last revised date | | |
| 1 | 01/03/14 | Revisions include guidelines and benchmark links. Retro-commissioning, etc. | A. Campas | C. Parnett |
| 2 | 5/12/14 | Expanded 9.5.1 items 1 c & 2 c | A. Campas | C. Parnett |