



The Canadian Green Building Council (CaGBC) introduces the new rating system: LEED v4. The CaGBC has recently made available the new LEED v4 reference guide and compliance path documents. The following is summary of the changes for EAp1 & EAc3.

LEED 2009 vs LEED v4

Summary of Changes from LEED 2009 – for Pre-Requisite EAp1 & Credit EAc3

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Presently most North American based LEED projects are being certified to the 2009 standard. This article will attempt to describe in general the changes from LEED 2009 to LEED v4, which although available since last fall in the USA, will be mandated into all new continental projects starting in the second half of 2015.

Canadian projects can meet the v4 requirements by utilizing 'Alternative Compliance Path (ACP)' documentation, which was introduced to the Canadian marketplace at the national CaGBC meeting in June. In this way, separate LEED Canada reference guides will not be required to be followed to achieve LEED v4 certification on projects going forward.

In addition, this article will briefly describe the fundamental changes to be expected for v4 from 2009, with respect to the following credits earned through participating in a commissioning program – *Building Design & Construction – Energy and Atmosphere Prerequisite EAp1: Fundamental Commissioning and Verification and Credit EAc3: Enhanced Commissioning.*

General Overview

A concise summary of changes for LEED v4 from LEED 2009 can be found at the USGBC and CaGBC websites for the three major and distinct disciplines: *Building Design & Construction, Interior Design & Construction and Building Operations & Maintenance.*

LEED v4 for Building Design & Construction (BD+C) covers the previous and familiar categories for new projects, i.e. New Construction and Core and Shell, but now includes for new categories for schools, retail areas, data centres, warehouse and distribution centres, hospitality and healthcare.

The driving prerequisite for BD+C is integrative project planning and design. LEED credit disciplines include for:



- a) Location and Transportation (LT),
- b) Sustainable Sites (SS),
- c) Water Efficiency (WE),
- d) Energy and Atmosphere (*the basis of this article*),
- e) Materials and Resources (MR),
- f) Indoor Environmental Quality (EQ),
- g) Innovation (IN), and
- h) Regional Priority (RP).

As well, LEED v4 for Interior Design & Construction (ID+C) covers the previous category for new projects, i.e. Commercial Interiors, but now includes for new categories for retail and hospitality. Finally, LEED v4 for Buildings Operations & Maintenance (O+M) covers the previous 'existing buildings' category but now also includes for new categories to cover schools, retail, data centres, hospitality and warehouse and distribution centres.

Energy and Atmosphere – EA Prerequisite: Fundamental Commissioning and Verification

The EA prerequisite covers fundamental commissioning and verification (renamed from fundamental commissioning of building energy systems) and is a requirement for all project types described under BD+C. Changes for LEED v4 include for the following:

- Modified intent to ensure project meets the Owner's project requirements (OPR);
- Added requirement for preparing an operations and maintenance (O&M) plan;
- Added requirement to engage a Commissioning Authority (CxA) by end of design development stage;
- Clarification as to who can be the CxA on a project;
- Included requirement for design review of building enclosure/envelope.

Energy and Atmosphere – EA Credit: Enhanced Commissioning

This EA credit covers enhanced commissioning and is a requirement for all project types described under BD+C. Changes for LEED v4 include for the following:

- Added options for monitoring base building and building envelope commissioning;
- Added requirements to prepare building operators for intended operation of building systems;
- Clarification as to who can be the CxA on a project.

Changes to EA Prerequisite and Enhanced Commissioning Credit

The EA prerequisite requires the completion of Cx activities for mechanical, electrical, plumbing and renewable energy systems in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC&R Systems.

The design team, for projects past and present, are responsible to develop the OPR and BOD (Basis of Design), but for v4 projects the requirements for exterior enclosures must be included. Furthermore, the review of the OPR, BOD and project design must also include for the exterior envelope. However, its review may be performed by a qualified member of the design or construction team who is not directly responsible for the building envelope design, and not necessarily the CxA.



In essence, the CxA is still required for the EA prerequisite to perform the following:

- Review the OPR, BOD and project design;
- Develop and implement a Cx plan;
- Confirm Cx requirements have been incorporated into construction documents;
- Develop system pre-functional test procedures (PFTs) for the Contractors;
- Develop and execute system functional test procedures (FTPs);
- Maintain an issues log throughout the Cx process;
- Prepare a final Cx process report;
- Document and report findings and recommendations directly to the Owner.

Furthermore, for v4 projects a CxA must be engaged by the end of the design development stage and have experience in at least two building projects with a similar scope of work. The CxA may be a qualified employee of the Owner, an employee of the design or construction team who has no part on the project, or an independent Consultant. Note that for projects smaller than 20,000 sq ft (1,800 sq m), the CxA may be a qualified member of the design or construction team, but in all cases must report their findings directly to the Owner.

Lastly, a major change for the v4 EA prerequisite is for the preparation of an operations and maintenance plan that contains the information necessary to operate the building efficiently. The plan must include for the following as a minimum:

- Sequences of operation for the building;
- Building occupancy schedules;
- Equipment run-time schedules;
- HVAC equipment and system set points;
- Set lighting levels throughout the building;
- Minimum outside air requirements;
- Changes in schedules or set points for different seasons, days of the week and times of the day;
- Narratives describing the mechanical and electrical equipment and systems;
- Preventative maintenance plan for building equipment and systems described in the narratives;
- Cx program that includes for periodic Cx requirements, ongoing Cx tasks, and continuous tasks for critical facilities.

The EA Credit: Enhanced Commissioning requires the implementation (or contract in place to implement) of Cx activities in addition to those required under the EA Prerequisite discussed previously. Furthermore, the CxA cannot be an employee of the design or construction team.

Up to 2-6 points are achievable by selecting a) Option 1 with Path 1(3 points) or Path 2 (4 points) and/or b) Option 2, Envelope Commissioning worth 2 points.

In essence, selecting Option 1 with Path 1 requires the CxA to perform basically the same commissioning activities previously required for LEED 2009 as following:

- Review Contractor submittals;
- Verify inclusion of requirements for system O&M manuals in construction documents;



- Verify inclusion of requirements for equipment and system training in construction documents;
- Verify system O&M manuals have been delivered and are complete;
- Verify operator and occupant training delivery and effectiveness;
- Perform seasonal testing of mechanical systems;
- Review building operations 10 months after substantial completion;
- Development ongoing Cx plan.

However, the requirement for developing a re-commissioning manual has basically fallen back to the EA Prerequisite (noted as an 'Operations & Maintenance Plan' above). Furthermore, the previous requirement for verification review of the design documents at the different stages of document development now only applies to Data Centres.

Selecting Path 2 (Enhanced & Monitoring Based Commissioning) entitles achieving Path 1 and developing monitor-based procedures to evaluate and assess the performance of energy and water consuming systems. Items to address can be found in the LEED literature.

Finally, selecting Option 2 (Envelope Commissioning) entitles completing commissioning activities for the building's thermal envelope in accordance with ASHRAE Guideline 0-2005 and the NIBS Guideline 3-2012, Exterior Enclosure Technical Requirements for the Commissioning Process.

Conclusion

From the discussion above, note that important changes have been implemented for LEED v4 projects over 2009, for the EA Prerequisite and EA Credit: Enhanced Commissioning. It is important to keep abreast of these and subsequent changes going forward and into the future to achieve a successful completion to any project, and to ensure LEED certification for the Owner. We recommend an experienced commissioning consultant be hired to ensure that these credits are secured, and that you dialogue with your project's LEED manager to be clear of the CxA prerequisite and credit option responsibilities. We hope that this article has helped clarify some of these changes.

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