LEEDv4: What’s New?
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CLAYTON BARTCZAK, LEED-AP BD+C
Sustainable Design Team Leader

TRACEY WHALEY, PE, FPE, CxAP
Commissioning Team Leader
THE SAME

110 Point System
Pre-Requisites
Optional Credits
Regional Priority
Pilot Credits
LEED AP Credential

YET DIFFERENT

Location & Transportation
Integrative Process
21 Market Sectors
International Criteria
Increased Performance
Increased Rigor

ambient energy
# LEED v4 RATING SYSTEMS

## BD&C
- BUILDING DESIGN & CONSTRUCTION RATING SYSTEMS
  - New Construction
  - Core & Shell
  - Schools
  - Retail
  - Hospitality
  - Data Centers
  - Warehouses & Distribution Centers
  - Healthcare

## ID&C
- INTERIOR DESIGN & CONSTRUCTION RATING SYSTEMS
  - Commercial Interiors
    - Retail
    - Hospitality

## EB:O&M
- EXISTING BUILDINGS: OPERATIONS & MAINTENANCE RATING SYSTEMS
  - Existing Buildings: Operations & Maintenance
    - Schools
    - Retail
    - Hospitality
    - Data Centers
    - Warehouses & Distribution Centers

## ND
- NEIGHBORHOOD DEVELOPMENT RATING SYSTEMS
  - Neighborhood Development Plan
  - Neighborhood Development

## HOMES
- HOMES RATING SYSTEMS
  - Homes
  - Mid-Rise
ALLOCATION BY CATEGORY

LEED v2009

LEED v4
WHO IS AFFECTED BY THE CHANGES?

- Project Owners
- Designers
- Green Building Professionals
- Product Manufacturers
- Contractors
- Cx Providers
CHANGES: SS CATEGORY

• **Location and Transportation** *(NEW category)*
  - Moved Alternative Transportation credits from “SS” category
  - Added/modified credits that relate to site selection

• **Sustainable Sites**
  - **NEW** Site Assessment prerequisite for LEED-S and LEED-HC
  - Heat-island credits merged into one credit with **NEW** requirements
  - Stormwater Design credit merged into one credit with **NEW** options
  - **NEW** standards for Light Pollution Reduction and Construction Activity Pollution Prevention
  - **NEW** option for off-site preservation
  - **NEW** requirement for open space to be physically accessible and beneficial to community or occupants
BUG Rating

- Backlight
- Uplight
- Glare
CHANGES: WE CATEGORY

• Water Efficiency
  o NEW prerequisite for Outdoor Water Use Reduction
  o NEW prerequisite for Building-level Water Metering
  o NEW credits for cooling tower water use and submetering
  o WaterSense label required for certain fixtures
  o Innovative wastewater credit removed
  o Appliance and process water requirements included in Indoor Water Use calculations
NEW: IP CATEGORY

- **Integrative Process**
  - NEW All stakeholders involved
  - NEW OPR and BOD
  - NEW Performance target set at SD
  - NEW Simple box energy model at SD
  - NEW Min 2 design options
  - NEW Water Budget analysis
NEW: IP CATEGORY

INTEGRATED PROJECT TEAM

Assemble an integrated project team and include as many of the following professionals as feasible (minimum of four), in addition to the owner or owner’s representative.

- Owner’s capital budget manager
- Architect or building designer
- Mechanical engineer
- Structural engineer
- Energy modeler
- Equipment planner
- Acoustical consultant
- Telecommunications designer
- Controls designer
- Food Service Consultant
- Infection Control Staff
- Building science or performance testing agents
- Green building or sustainable design consultant
- Facility green teams
- Physician and nursing teams
- Facility managers
- Environmental services staff
- Functional and space programmers
- Commissioning agent
- Community representatives
- Civil engineer
- Landscape architect
- Ecologist
- Land planner
- Construction manager or general contractor
- Lifecycle cost analyst; construction cost estimator
- Lighting Designer
- Other disciplines appropriate to the specific project type
CHANGES: EA CATEGORY

• Energy and Atmosphere
  o NEW Prerequisite Building-Level Metering
  o NEW Advanced Metering
  o NEW Demand Response
  o NEW Renewables requirements
  o NEW Green Power requirements
  o ASHRAE 90.1-2010 vs 2007
DEMAND RESPONSE

• Energy load reduction during times of peak demand
  o Min 1yr program or infrastructure
  o Fully-Automated
  o Min 10% of peak load or 20 kW
  o DR program to be commissioned by CxA

Photo credit: www.metrics.net
CHANGES: MR CATEGORY

- Material and Resources
  - NEW Prerequisite for construction waste management planning
  - NEW credits for environmental product declarations, sourcing of raw materials and material ingredient reporting
  - UPDATED Regional materials requirements
CHANGES: IEQ CATEGORY

- **Indoor Environmental Quality**
  - NEW requirements for Flushout/IAQ test
  - NEW requirements for Lighting Controls
  - NEW Enhanced Indoor Air Quality Strategies credit
  - NEW requirements for Daylight and Views
  - NEW credit for Acoustic Performance
Fundamental Cx

- **NEW** Requires the CxA to be engaged prior to the DD phase of the project is complete.
- **NEW** Electrical and Plumbing scope expanded.
- **NEW** Elements of BECx are incorporated into the OPR and BOD.
- **NEW** One design review, CFR, & O&M Plan is required in Fundamental Cx
Fundamental Cx

- **NEW** Guidance in the LEED v4 Reference Guide has a step by step process for Commissioning.
- **Note:**
  - Step 1: Develop OPR, by the owner
  - Step 2: Develop BOD, by design team
  - Step 3: Engage the CxA....
  - Thru Step 15
  - Additional guidance on things like OPR & BOD.
Fundamental Cx

- Systems to be Cx include:
  - Mechanical, including HVAC&R equipment and controls
  - **NEW Plumbing**, including domestic hot water systems, **pumps**, and **controls**
  - **NEW Electrical**, including **service, distribution**, lighting, and controls, including daylighting controls
  - **NEW Building Envelope Review**
  - Renewable energy
Fundamental Cx

• NEW Who can be CxA?

• General requirements are similar
  o If doing ECx, then CxA must have experience doing ECx.

• NEW Data Centers:
  o Under 2,000 MBH peak cooling load
  o Total or peak computer room peak cooling load less than 600 MBH
  o CxA can be qualified member of design team or construction team.
Fundamental Cx

- **NEW** Current Facilities Requirements (CFR) and Operations and Maintenance (O&M) Plan.
  - SOQ for building
  - Occupancy Schedule
  - Equipment Runtime schedules
  - HVAC equipment setpoints, min OA requirements
  - Lighting levels in the building
  - Seasonal, weekly, TOD schedules
  - Systems narrative for mech & elec
  - Preventative Maintenance Plan
  - Cx Program:
    - Periodic Cx requirements
    - Ongoing Cx tasks
    - Continuous tasks
Fundamental Cx

• **NEW** Functional Performance Test Procedures is now called **Test Scripts**
• Pre-functional checklists also called **construction checklists**
Fundamental Cx

LEED-Online Credit Form
Related Credits

- **(New Category) Integrative Process Credit**
  - Energy & water analysis can affect site and system selections
- **EA Credit** Advanced Energy Metering
- **EA Credit** Renewable Energy Production
  - Onsite renewable energy systems must be commissioned
- **EA Credit** Enhanced Cx (3-6 points possible)
Enhanced Cx (3 points)

- **NEW** Guidance in the LEED v4 Reference Guide has a step by step process for Commissioning.
- **Option 1, Path 1**
- **Required Tasks:**
  - Review contractor submittals.
  - Verify inclusion of systems manual requirements in construction documents.
  - Verify inclusion of operator and occupant training requirements in construction documents.
  - Verify systems manual updates and delivery.
  - Verify operator and occupant training delivery and effectiveness.
  - Verify seasonal testing.
  - Review building operations 10 months after substantial completion.
  - **NEW** Develop an On-going Commissioning Plan.
Enhanced Cx

• System Manual: ASHRAE Guideline 0-2005
  o Executive Summary
  o OPR
  o BOD
  o System Single Line Diagram
  o Record Documents and Specs
  o Approved Submittals
  o As-built Drawings
  o A-built SOO
  o Original Setpoints
  o Schedule for Recommissioning
  o Schedule for recalibration
  o O&M Manuals
  o Preventative Maintenance Plan
  o Confirm training is completed
  o Ongoing system optimization procedures
  o Final Cx Report
MBCx (1 point)

- **NEW Option 1 Path 2**
  - Includes Enhanced Cx
  - Develop MBCx Plan into Cx Plan
    - Identify points, frequency & duration of trend
    - Action Plan for correcting deficiencies
    - Analysis must be quarterly for warranty period of 12 months post occupancy
    - Update Systems Manual with modifications made during warranty
MBCx (1 point)

- Silent on use of software such as SkySpark and others.
- Encourages use of BAS trend data and metering of systems.
BECx (2 points)

• **NEW Option** under EAc1 Enhanced Cx
  - Cx Include requirements in OPR, BOD
  - Example Tests
    - Air infiltration
    - Water infiltration
    - Exhaust re-entrainment
    - Thermal performance
    - Envelope pressure
    - Envelope air leakage
    - Daylighting glare control
Enhanced Cx Summary

• Enhanced Cx – 3 points
• **NEW** Monitoring Based Cx – 1 point
• **NEW** Building Envelope Cx – 2 points
• **Total of 6 points possible!**
• LEED v2009 could only achieve 2 points for Enhanced Cx
• BECx was ID credit – 1 point
• M&V credit – up to 3 points
Enhanced Cx

LEED-Online Credit Form
THANK YOU!

Tracey, tracey@ambient-e.com  x214
303-278-1532
Clayton, clayton@ambient-e.com  x213
303-278-1532

San Francisco • Denver
www.ambient-e.com

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