LEED AP O+M TRAINING

May 21, 2009
Session 2 of 5

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Today's Agenda

- Alteration and Renovations Update
- Sustainable Sites (SS)
- Break
- Cost of Green Revisited
- Innovations in Operations (IO)
- LEED AP Exam Requirements and Sign Up Process

UPDATED INFORMATION ON FACILITY ALTERATIONS AND ADDITIONS

To Be In LEED O+M Program

- The facility may not:
  - increase its size by more than 50%
  - have alterations on more than 50% of sq ft

Facilities exceeding these limits need to pursue LEED for New Construction

To Apply Construction Related Credits in LEED O+M Program

- Facility Alterations or Additions affecting more than 5% of the square footage
- Eligible for consideration in:
  - MRc3 – Sustainable Purchasing – Facility Alt & Add
  - MRc9 – Solid Waste Mgmt – Facility Alt & Add
  - IEQc1.5 – IAQ Mgmt for Facility Alt & Add

Less than 5% sq ft affected would be considered everyday maintenance and repair – project may not earn points

Site Selection

LEED O+M Training

Site Selection

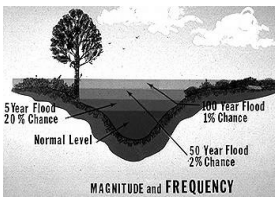
Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

Site Selection

- NOT : Prime agricultural land as defined by the Farmland Trust

Site Selection

- NOT :Land whose elevation is lower than 5 feet above the elevation of 100 year flood plan



Site Selection

- NOT : Land that provides habitat for threatened or endangered species

Site Selection

- NOT :Within 100 feet of wetland OR local code

Site Selection

- NOT : Land within 50 ft of body of water which could support fish, recreation or industrial use - Clean Water Act

Site Selection

- NOT : Land which prior to the acquisition for the project was public parkland

New Construction Site Selection

- Give preference to sites that do not include sensitive elements
- Design the building with the minimal footprint
- Minimize site disruption
- Developing on an inappropriate site can result in the loss of prime farmland or key habitat

New Construction Site Selection

- Consider a smaller footprint
- Channel development into previously and densely developed areas to prevent sprawl and habitat loss
- Set aside large contiguous areas for natural space on the project site
- Choosing the site prudently can make good economic sense

Development Density

- Channel development to urban areas with existing infrastructure, protect greenfields, and preserve habitat and natural resources
- Construct and renovate buildings on previously developed sites
- Construct and renovate buildings in communities with a minimum development density of 60,000 sq. ft. per acre net

Development Density

- Redeveloping sites reduces or eliminates new infrastructure, including roads, utility services and other amenities that are already in place
- Can rehabilitate existing buildings, eliminating costs for new materials and new construction
- Mass transit may already be in place and help reduce transportation

Development Density & Community Connectivity

- Previously developed land

1984

2006

Community Connectivity

- ½ mile of at least 10 basic services with pedestrian access:
  - Banks
  - Places of worship
  - Convenience grocery
  - Day care
  - Cleaners
  - Fire Station
  - Beauty
  - Hardware
  - Laundry
  - Library
  - Medical/Dental
  - Senior Care Facility
  - Park
  - Pharmacy
  - Post Office
  - Restaurant
  - School
  - Supermarket
  - Theater
  - Community Center
  - Fitness Center
  - Museum

Development Density & Community Connectivity Terms

- Greenfields: sites that have not been previously developed or build on, and which could support open space, habitat, or agriculture
- Pedestrian Access: pedestrians can walk to the services without being blocked by walls, freeways, or other barriers
- Building Density: floor area of the building divided by the total area of the site (square feet per acre)

Brownfield Redevelopment

- Brownfield site: "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence of potential presence of a hazardous substance, pollutant or contaminant"
- Remediation efforts remove hazardous materials from soil and groundwater, providing a benefit to the humans and wildlife surrounding the site
- Intent: Rehabilitate damaged sites where development is complicated by environmental contamination, reducing pressure on undeveloped land

Brownfield Redevelopment

Before

Jordan Valley Park
Springfield, Missouri

After

Brownfield Redevelopment Terms

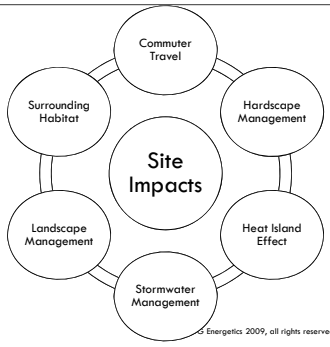
- Remediation: the process of cleaning up a contaminated site by physical chemical, or biological means (typically refers to soil and groundwater)
- Ex-Situ Remediation: removing contaminated soil and groundwater and treating it off-site
- In-Situ Remediation: treating contaminants in place using technologies such as injection wells or reactive trenches
- Risk Assessment: methodology used to analyze potential health effects caused by contaminants in the environment

Questions

SUSTAINABLE SITES

LEED O+M OVERVIEW

Introduction



Site Impact: Landscape Management

- Minimization of irrigation, fertilizers, and pesticides use
- Prevent erosion
- Sedimentation increases the risk for flooding and adversely affects aquatic habitats
- Sustainable landscaping uses **native** and **adapted** plants-
  - **Less** irrigation
  - **Less** maintenance
  - Fewer/no chemical fertilizers and pesticides

Site Impact: Hardscape & Exterior Management

- Exterior building and window cleaning solutions
- Pavement and sidewalk cleaning & pressure washing
- Maintenance equipment – emissions and noise
- Paint and sealants
- Snow removal

Site Impact: Commuter Travel

- In 2006- commuters in America:
  - 76% of drove to work alone
  - 11% carpooled
  - 5% used public transport
- Impact of commuter travel
  - GHG Emissions
  - Congestion - parking, roadways, etc
- Promote mass transit
  - **Strategic effort**
  - **Mass benefits**

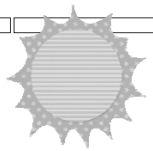
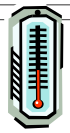
Site Impact: Surrounding Habitats

- Encroachment on agricultural lands and/or wildlife habitat
- Ecologically appropriate sites reduce habitat destruction & displaced animals
- Threats to individual and overall biodiversity

Site Impact: Storm-water Runoff

- Reduced surface permeability
- Runoff from impervious surfaces
- Contaminants: oil, fuel, lubricants, deicing salts, material from tire wear
- Accelerated flow rate of waterways
- Increased erosion, altered aquatic habitat, downstream erosion

Site Impact: Heat Island effect


- Heat island effect - absorbing and retaining solar radiation
- Raises building temperature
- Requires more energy for HVAC to cool
- Nation could save $4 billion per year

Site Impact: Light Pollution


- Nighttime light pollution:
  - Interferes with nocturnal ecology
  - Hinders enjoyment of night sky by occupants and neighbors
  - Can disturb migratory bird patterns
  - Creates roadway glare
  - Reduced light pollution encourages nocturnal life on site, can cut costs

SSc1 – LEED Certified Design and Construction

Intent

- Reward environmentally sensitive building design and construction
- High-performance building operations to be achieved more easily

Approach

- Option 1: LEED for New Construction and Major Renovations
- Option 2: LEED for Schools
- Option 3: LEED for Core& Shell AND 75% of floor area certified LEED Commercial Interiors

Documentation Guidance:

- Official USGBC Scorecards; LEED Commercial Interiors documentation if applicable

Referenced Standard-U.S.G.B.C.

Points- 4

SSc2– Building Exterior and Hardscape

- **Intent**
  - + Encourage environmentally sensitive building exterior and hardscape management practices that provide a clean, well-maintained and safe building exterior while supporting high-performance building operations
- **Reference Standard**-None
- **Other**: incremental improvement credit available
  (20% use of environmentally preferred products)

SSc2– Building Exterior and Hardscape

- **Approach**
  - Significantly reduce harmful chemical use, energy waste, water waste, air pollutions, solid waste, and/or chemical runoff (e.g. gasoline, oil, antifreeze, salts) addressing:
    - Maintenance equipment
    - Snow and ice removal
    - Building exterior, sidewalks, pavement, and other hardscape
    - Paints and sealants used on building exterior

SSc2– Building Exterior and Hardscape

- **Points**-1

- **Documentation Guidance:**
  - Retain a copy of the Building exterior and Hardscape management plan and record the dates of its implementation
  - Describe how and to what extent best management practices used reduce environmental impacts

SSc3–Pest Management, Erosion Control, and Landscape Management

- **Intent**
  - Preserve ecological integrity, enhance natural diversity, and protect wildlife, while supporting high-performance building operation and integration into the surrounding landscape

- **Approach and Implementation**
  - Outdoor Integrated Pest Management (IPM)
  - Erosion and Sedimentation Control
  - Diversion of Landscape Waste
  - Chemical Fertilizer use

SSc3–Pest Management, Erosion Control, and Landscape Management

- **Referenced Standard**-None
- **Points**-1

- **Documentation Guidance:**
  - Retain a copy of the Environmentally Sensitive Management Plan and the dates of implementation
  - Keep implementation records (e.g. logs of pesticide application)
  - Describe how and to what extent best management practices used reduce environmental impacts

SSc4 – Alternative Commuting Transportation

- **Intent**
  - Reduce pollution and land development impacts from automobile use for commuting
- **Referenced Standards-**
  - California Air Resources Board (CARB) standard for Zero-Emission Vehicle (ZEV)
  - American Council for an Energy Efficient Economy (ACEEE)
  - South Coast Air Quality Management (SCAQMD) Rule 2202

- **Points**- 3 to 15 (% reduction)
  - Exemplary Performance Eligible

SSc4 – Alternative Commuting Transportation

- **Approach and Implementation**
  - Infrastructure
    - Bike Commuters
    - Offer preferred parking
    - Provide charging stations
    - Provide shuttles to public transportation hubs
    - Promote compressed workweeks/telecommuting
  - Incentive programs
    - Provide financial incentives or recognition rewards for using alternative transportation
    - Provide management-subsidized transport passes
    - Incentivize purchasing bicycles, hybrids, etc.

  - Programs
    - Ensure that unexpectedly working late or leaving early doesn't strand employees
    - Facilitate carpooling
    - Provide information on public transportation, carpools, etc.
    - Participate in local transportation planning

SSc4 – Alternative Commuting Transportation

- **Documentation Guidance:**
  - Options 1&2: retain program participation documents verifying compliance with program requirements, commuter data from the building, and information about the metrics
  - + Option 3- prepare a summary of the employee commuting data collected via the survey methodology outlined by SCAQMD Rule 2202 Program, and a description of the data collection methodology

SSc4 – Alternative Commuting Transportation

- **Calculations:**
  - Options 1 & 2: Participation in local or regional commute reduction program-comprehensively describe program and data collection/analysis methodologies

- Option 3- LEED for existing Buildings: O&M Occupant Commute Survey. Must use survey methodology and data collection procedures in SCAQMD Rule 2202

Transportation Survey Option 2 and 3

Alternative Transportation

On average, do you arrive to work between the hours of 6AM and 10AM? ___Y ___N

On average, do you leave work between 3PM and 7PM? ___Y ___N

How many miles is your commute to work? _____

Last week, how did you commute to work? Please place the number of times a week that each commuting option was used in the box next to each method. The sum of the numbers should equal 5.

A. Drive Alone	
B. Motorcycle	
C. Carpool (2+ persons in vehicle)	
D. Vanpool (5+persons in vehicle)	
E. Bus	
F. Rail/Light Rail	
G. Walk	
H. Bicycle	
I. Zero Emission Vehicle (No Hybrids)	
J. Telecommute (reduction of more than 50% of trip)	
K. Noncommuting	

SSc5 – Reduced Site Disturbance Protect or Restore Open Space

- **Intent**
  - Conserve existing natural site areas and restore damaged site areas-provide habitat and promote biodiversity

- **Approach and Implementation**
  - Preserve and enhance natural site elements
  - Increase native/adapted vegetation
  - Install vegetated roofs
  - Restore or maintain an off-site natural area

SSc5 – Reduced Site Disturbance
Protect or Restore Open Space

- **Requirements**
  - + 25% of site area covered native or adapted plants (excludes building footprint) AND/OR
  - + Improving or maintaining off-site areas with native or adapted plants in a 2:1 ratio of square feet

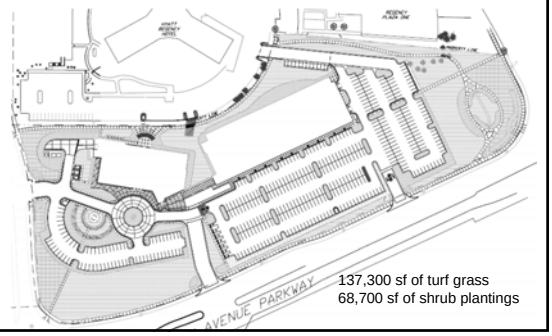
Referenced Standards - none

SSc5 – Reduced Site Disturbance
Protect or Restore Open Space

SSc5 – Reduced Site Disturbance
Protect or Restore Open Space

- **Calculation**- Natural area (and/or 50% of qualifying off-site area) must be at least 25% of total project site area, less building footprint, OR 5% of the total site area (whichever is greater)
- **Points**-1; Exemplary Performance Eligible

Area of Plant Types



137,300 sf of turf grass
68,700 sf of shrub plantings

SSc5 – Reduced Site Disturbance Protect or Restore Open Space

Documentation Guidance:

- List the natural areas used to achieve the credit, including: size, plant species, and other descriptions of ecological features
- If an off-site natural area is being protected or restored, retain a copy of the contract that details the support provided by the LEED project

SSc6 – Stormwater Management

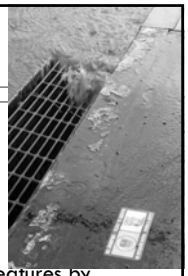
Intent - Limit disruption of natural hydrology by the building and grounds

Requirements

- Stormwater management plan
- Annual inspection program
- Maintain documentation of inspection
- Perform all required maintenance, repairs, and stabilization

Referenced Standards- none

SSc6 – Stormwater Management



Documentation Guidance:

+ List the stormwater management strategies in place
+ Assess the stormwater mitigated by site features by evaluating the project site's surface areas or assembling stormwater assessment reports
+ Retain copies of stormwater inspection logs that show any needed maintenance or repairs were performed within 60 days of the inspection

SSc6 – Stormwater Management

Approach and Implementation

Controlling stormwater runoff
- × Limit impervious surface area
- × Install green roofs
- × Design infiltration swales, vegetated filter strips, or retention ponds

Harvesting stormwater runoff
- × Substitute for potable water in toilets, fire suppression, landscaping, etc.
- × Various concerns: water budget, drawdown, drainage area, conveyance system, pretreatment, and pressurization

SSc6 – Stormwater Management

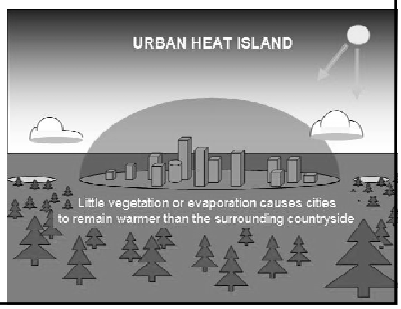
- **Calculations**
  - Equation 1: Volume of captured runoff
  - Equation 2: Minimum drawdown rate
  - Equation 3: Determining Rainwater Runoff

Points-1; Exemplary Performance Eligible

SSc7.1 – Heat Island Reduction: NonRoof

Intent

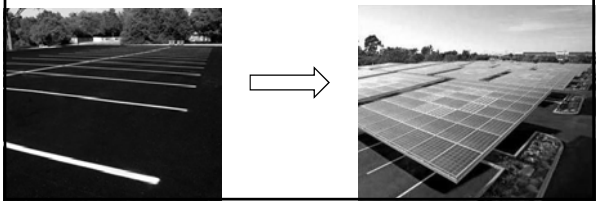
Reduce heat islands to minimize impact on microclimates and human/wildlife habitat



SSc7.1 – Heat Island Reduction: NonRoof

Requirements

- Option 1: Provide shade, reflect sunlight radiation, or use solar panels on 50% of site hardscape
- Option 2: Minimum of 50% of parking spaces underground, under deck, under roof, or under a building



SSc7.1 – Heat Island Reduction: NonRoof

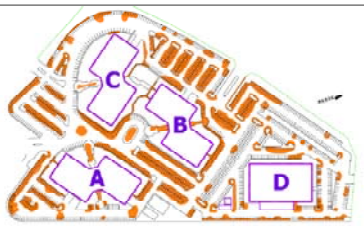
Approach and Implementation

- Higher solar reflectance
- Shading
- Less hardscape

Referenced Standards- none

Points-1; Exemplary Performance Eligible

SSc7.1 – Heat Island Reduction: NonRoof



Calculations

- Option 1: Equation 4- Sum of all areas qualifying for heat island reduction
- Option 2: Covered parking spaces must be at least 50% of total parking spaces

SSc7.1 – Heat Island Reduction: NonRoof

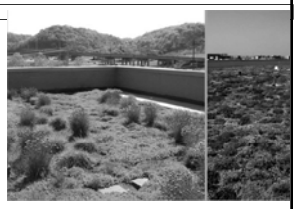
Documentation Guidance:

- Option 1: Prepare a site plan that highlights all nonroof hardscape areas, clearly label and list information about the compliant surfaces
- Option 2: Determine the total number of parking spaces and the portion located under cover
- If applicable, prepare written maintenance procedures for maintaining surfaces

SSc7.2 – Heat Island Reduction: Roof

Intent

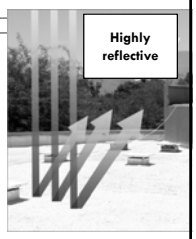
- Reduce heat islands to minimize impact on microclimates and human/wildlife habitat



Requirements

+ Option A: Use high SRI value roofing materials for 75% of roof area
+ Option B: Install and maintain a vegetated roof for 50% of roof area
+ Option C: Install high-albedo and vegetated roof surfaces that meet criteria

SSc7.2 – Heat Island Reduction: Roof



Approach and Implementation

- High-reflectance materials-apply to roof to meet SRI threshold
- Vegetated roof

Referenced Standards- none

Calculations

+ Determine total roof surface area
+ Determine and deduct area of roof covered by equipment, solar energy panels, etc
+ Use **equation 1** to determine if reflective and vegetated roofing are adequate to meet credit requirements

SSc7.2 – Heat Island Reduction: Roof

Points-1; Exemplary Performance Eligible

Documentation Guidance:

- Reflective roofing materials: assemble information about the area covered by each material type, slope of the surface, SRI values, cleaning procedures, etc.
- Vegetated roof systems: assemble plans and/or photographs showing the vegetated roof features

SSc8–Light Pollution Reduction

Intent

- Eliminate light trespass from the building and site; improve night sky access; improve nighttime visibility through glare reduction and reduce impact on nocturnal environments

Pasadena and Los Angeles, CA - 2001

SSc8–Light Pollution Reduction

Approach and Implementation

Interior lighting

- Automatic controls
- No direct lines of sight

SSc8–Light Pollution Reduction

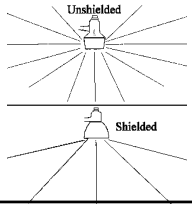
- **Approach and Implementation**

  Exterior and site lighting

  - Option A- Previous certification
  - Option B- Shielded fixtures
  - Option C- Measured night illumination levels

SSc8–Light Pollution Reduction

- **Requirements**
  - Option 1: Show that SSc8 was earned in LEED New Construction
  - Option 2: Partially or fully shield all fixtures 50 watts and over
  - Option 3: Measure night illumination levels to show that level with lights on is not more than 20% above lights off level



SSc8–Light Pollution Reduction

Calculations

Duration of programmed after-hours periods

Referenced Standards - none

Points -1

SSc8–Light Pollution Reduction

Documentation Guidance:

- For automatic controls, assess the lighting schedule for each zone to determine after-hours periods
- For shielded exterior fixtures, assemble information for each fixture type greater than 50 watts demonstrating shielding
- If measuring exterior lighting levels, prepare scaled drawings showing the project boundary and the location of all measurement points

BREAK

INNOVATION IN OPERATIONS

LEED AP O+M training

Introduction

Innovation in Operations credits:

- Recognize excellence
- Provide input

Implementing new technologies

Involving LEED AP expertise

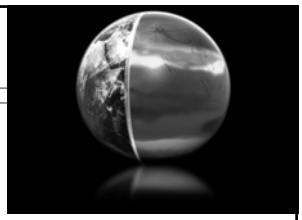
Documenting cost impacts

IOc1.1-1.4 – Innovation in Operations

Intent: provide building operations, maintenance, and upgrade teams with the opportunity to achieve additional environmental benefits achieved beyond those already addressed by the LEED for EB: O&M rating system

- Referenced standards: see each associated credit
- Calculations:
  - Path 1: use the same calculation as the associated credit. For expanded approach, explain the rationale for calculations performed
  - Path 2: develop and justify calculation methodologies

IOc1.1-1.4



Points: 1-4, exemplary performance eligible

Requirements:

- Option 1: achieve exemplary performance in a LEED EB: O&M prerequisite or credit that allows it
- Option 2: achieve significant, measureable environmental performance using an operations, maintenance, or system upgrade strategy not addressed in the LEED EB: O&M rating system

Up to 4 points available (IOc1.1, 1.2, 1.3, 1.4) for identifying the intent, additional benefits, requirements, performance metrics, and strategies for the proposed IO credit

IOc1.1-1.4

- Approach and Implementation
  - Option 1: Exemplary Performance strategy:
    - Greatly exceed the level or scope required by a LEED EB: O&M prerequisite or credit
    - With mathematical metrics, meet the performance level defined by the next step in the threshold progression
    - If the next step would require 100%, only 95% is required, if greater than 100%, no credit can be earned
    - Only 1 point per credit can be earned for exemplary performance

Exemplary performance points possible

Sustainable Sites

SS Credit 4	Alternative Commuting Transportation
SS Credit 5	Site Development—Protect or Restore Open Space
SS Credit 6	Stormwater Quantity Control
SS Credit 7.1	Heat Island Reduction—Nonroof
SS Credit 7.2	Heat Island Reduction—Roof

Water Efficiency

WE Credit 1	Option 2 Water Performance Measurement — Submetering
WE Credit 2	Additional Indoor Plumbing Fixture and Fitting Efficiency
WE Credit 4,	Option 2 Cooling Tower Water Mgmt — Nonpotable Water Source Use

Energy and Atmosphere

EA Credit 1	Optimize Energy Efficiency Performance
EA Credit 4	On-site and Off-site Renewable Energy

Exemplary performance points possible (cont'd)

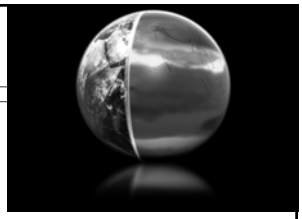
Materials and Resources

MR Credit 1 Sustainable Purchasing—Ongoing Consumables
MR Credit 2 Sustainable Purchasing—Durable Goods
MR Credit 3 Sustainable Purchasing—Facility Alterations and Additions
MR Credit 4 Sustainable Purchasing—Reduced Mercury in Lamps
MR Credit 5 Sustainable Purchasing—Food
MR Credit 7 Solid Waste Management—Ongoing Consumables
MR Credit 9 Solid Waste Management—Facility Alterations and Additions

Indoor Environmental Quality

IEQ Credit 2.2 Controllability of Systems—Lighting
IEQ Credit 2.4 Daylight and Views
IEQ Credit 3.2 Green Cleaning—Custodial Effectiveness Assessment
IEQ Credit 3.3 Green Cleaning—Purchase of Sustainable Cleaning Products and Materials

IOc1.1-1.4

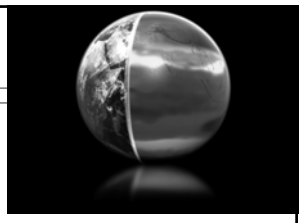


- Approach and implementation
  - Option 2: Additional Strategies: Broaden the scope of the effort
    - Possible way: expand strategy to include off-site participation
    - Example: bring recycling from home
    - Strategies must be comprehensive, thorough, and effective
    - Strategy must be applicable to other buildings, and may have been employed in other buildings

IOc1.1-1.4

- Documentation Guidance
  - Document the process by which the project team has worked to develop and/or implement additional environmental benefits beyond those already addressed by LEED EB: O&M
  - Track development and implementation process to illustrate the specific exceptional and innovative strategies used

IOc1.1-1.4



- Suggested IO credits
  - Facilitate occupants' access to sustainable food sources
  - Participate in a peak energy demand reduction program
  - Create a comprehensive wellness program for occupants
  - Quantify the environmental benefits that result from a purchasing program targeting source reduction
  - Use an environmental management system

IOc1.1-1.4

- More suggested IO credits
  - Provide an educational program on the benefits of green building projects
  - Evaluate a substantial quantity of materials being used
  - Record greenhouse gas emissions associated with energy uses not addressed in EAc6
  - Provide a superior acoustic environment
  - Enhance thermal integrity- perform an infrared scan

IOc2 – LEED Accredited Professional

- Intent: support and encourage the operations, maintenance, upgrade, and project team integration required for LEED for Existing Buildings O&M implementation and to streamline the application and certification process
- Requirements: at least one principal participant of the project team must be a LEED Accredited Professional
  - Points: 1

IOc2 – LEED Accredited Professional

- Referenced Standard: LEED Accredited Professional
- Documentation Guidance
  - Obtain confirmation from team members who are LEED APs or planning on becoming LEEED Aps
  - Track the LEED AP's role and participation in the project design and development process
- Approach and Implementation:
  - Engage an accredited individual already within the organization
  - Have a member of the organization study for and receive LEED AP accreditation
  - Hire a LEED AP to support the project

IOc3 – Documenting Sustainable Building Cost Impacts

- Intent: document sustainable building cost impacts
  - Requirements:
    - Document overall building operating costs for the previous five years
    - Track changes in overall building operating costs over the performance period
    - Document building operating costs and financial impacts of all aspects of LEED EB: O&M

IOc3 – Documenting Sustainable Building Cost Impacts

- Approach and Implementation:
  - Track the costs and savings generated by sustainability measures
  - Record and analyze costs and savings
  - Begin tracking early in the LEED process
  - Put in place an ongoing tracking program
  - Identify building staff to oversee tracking and financial staff to analyze
- Points: 2

IOc3 – Documenting Sustainable Building Cost Impacts

- Documentation Guidance:
  - Track all annual building operational costs
  - Maintain records of low- or no-cost improvements made during the performance period, including their associated paybacks
  - Document any capital improvements made, including their associated paybacks
  - Record the staff hours and consultant costs associated with the building's sustainability efforts

IOc3 – Documenting Sustainable Building Cost Impacts

Calculations: Complete all worksheets

- Table 1: record historical building operating expenses
- Table 2: Operating cost tracking during performance period
- Table 3: compares historical annual operating costs for the major expense categories with performance period costs
- Table 4: provides a rough estimate of the increased value of the project building due to savings from sustainability
- Table 5: list all significant sustainability measures, programs, or investments
- Table 6: brief summary of costs related directly to the process of certifying the project in LEED
- Table 7: summarizes costs, benefits, and payback period for the LEED EB project

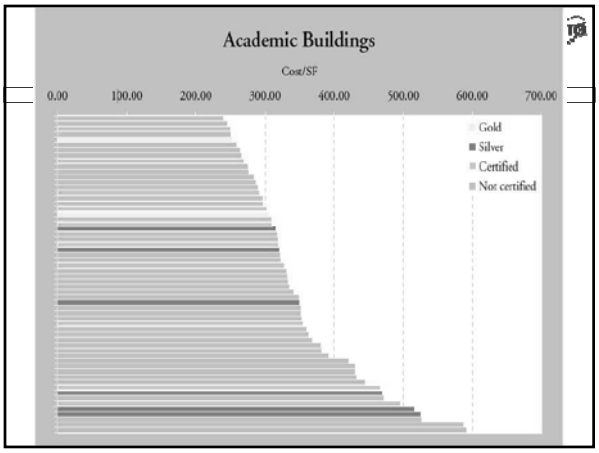
COST OF GREEN REVISITED

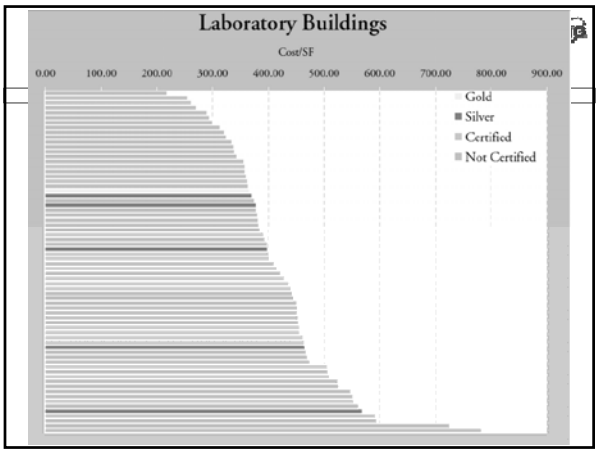
Article Overview

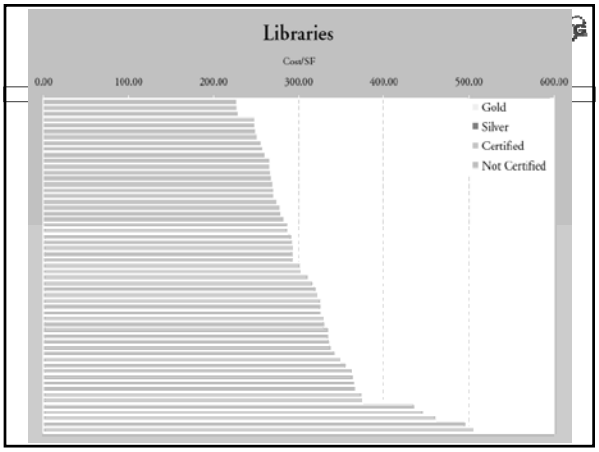
- No significant cost difference in building green
- Less challenges when thinking green
- Projects following code and not superseded
- Documentation still a concern
- Sustainable design perceived as an added feature
- Construction cost rising – LEED still part of industry

Study of Similar Buildings

- 221 Facilities
  - 83 going for LEED certification
  - 138 not attempting LEED
- Costs were normalized for time and location
- Cost per sq ft based on all projects




Laboratory Buildings
Cost/SF
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
Gold
Silver
Certified
Not Certified


Libraries
Cost/SF
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500.00
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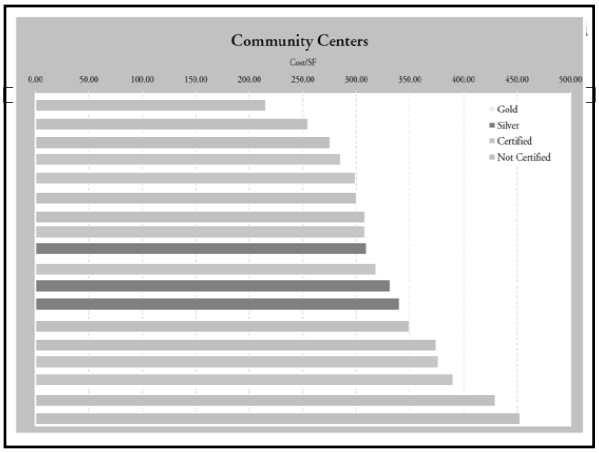
Community Centers
Cost/SF
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50.00
100.00
150.00
200.00
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350.00
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Gold
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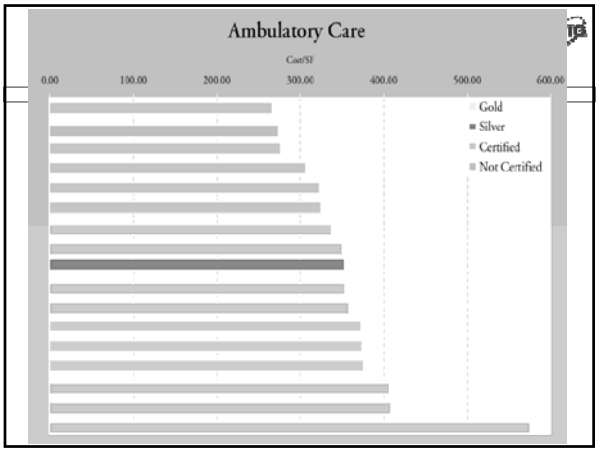


Feasibility and Costs (SS)

- Minimal cost impacts when selecting site
- Design costs minimal to make sustainable
- Implementing features with potential costs
  - Stormwater management
  - Roofing material
  - Remediating brownfield

Feasibility and Costs (WE)

- Advance planning
- Rebate programs
- Flush and Flow fixtures - vary
- Direct first costs -More costly the more efficient
  - Enhance irrigation systems
  - Wastewater treatment onsite

Feasibility and Costs (EA)

- Upfront Cost vs. Long Term Payback
- Easy to Calculate
- MANY synergies with other areas
- Renewable Energy on or off - slow payback
- Commissioning - long term and short term
  - $1-3/ sq ft

Feasibility and Costs (MR)

- Advance planning and contracts
- Minimal cost impacts
- Documentation is key – timely
- Possible credits dictated from start
- Potential higher costs
  - Rapidly Renewable Resources
  - Forest Certified Wood

Feasibility and Costs (EQ)

- Many synergies (EA and MR)
- Timing is an issue which may reflect in cost
- Significant costs could come in lighting controls
- Planning and good design - minimal material cost but possible labor increase

Feasibility and Costs Conclusion

- Each point for project
- Cost and tradeoffs
- Sustainably looking at entire project - not individual areas
- Some design premiums will occur and cost analysis reviewed

Methodology

- Establish entire team
- Set goals
- Align budget with program
- Stay on track

- Document and record
- Decide and continue to move forward

Conclusion

- Set teams up for success
- Good design from the start
- Do not look at it as added feature to project

LEED AP OPERATIONS + MAINTENANCE CANDIDATE HANDBOOK

Exam Application & Registration

Agenda

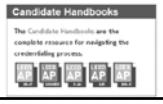
- Who is the Green Building Certification Institute – www.gbci.org?
- Overview of the content of the LEED AP Operations + Maintenance Handbook
- Who pays for your exam fee?
- How to apply and register for the exam…
- Project experience discussion
  - Does your experience qualify?
  - Project experience options…

Who is the Green Building Certification Institute?

- GBCI was established with the support of USGBC
  - Objective, balanced management of the credentialing program
- The LEED AP program is administered by GBCI
- Professional credentials
  - Recognizing excellence in green building performance and practice

Professional Credentials

- Green Building Associate
- LEED AP O+M – Operations & Maintenance
- LEED AP BD+C – Building Design & Construction
- LEED AP ID+C – Interior Design & Construction
- LEED AP HOMES – Homes
- LEED AP ND – Neighborhood Development
- LEED AP Fellow, program development in process



Candidate Handbook

- Exam Process & Credential Reference

LEED AP O+M
LEED AP Operations + Maintenance Candidate Handbook

Valid for April 2009

Table of Contents

- Critical name and test security information
- List of recommended study materials
- Sample questions
- Passing score information

GBCI Candidate Handbook 2

Table of Contents

Table of Contents

- Information regarding scheduling exam
- Exam fee is <u>your</u> responsibility
  - $300 USGBC Member pricing

Table of Contents

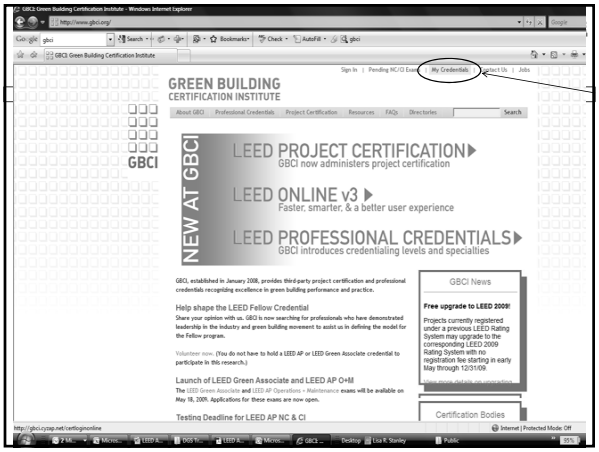
- Important exam day information
- Post exam information, certificates & maintenance program

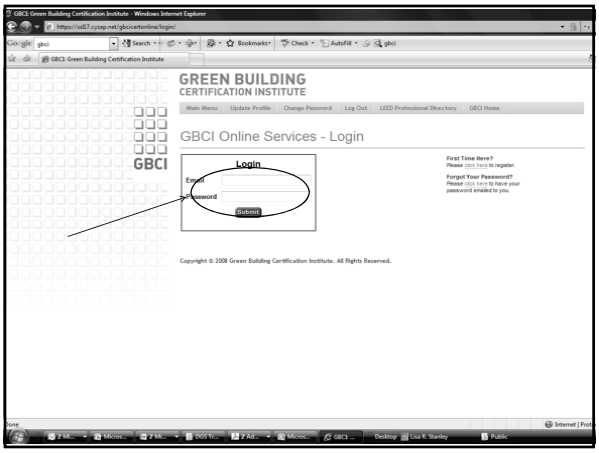
Exam Format

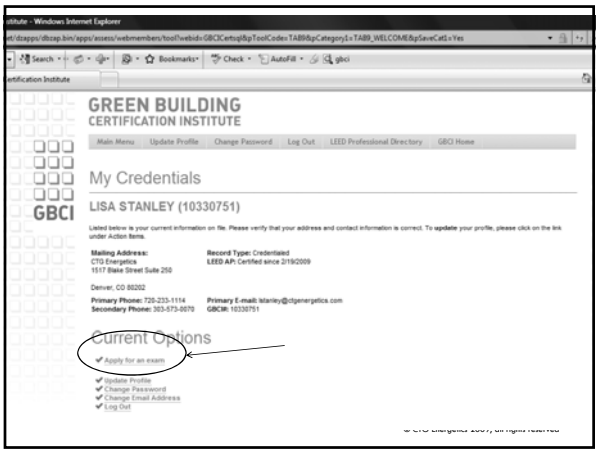
- Prometrics testing center – multiple locations
- Two parts – 200 total questions
- Multiple choice questions
- 4 hour exam
- Passing score is 170 on each section of the exam
- Results available upon completion
- Must pass both sections of the exam

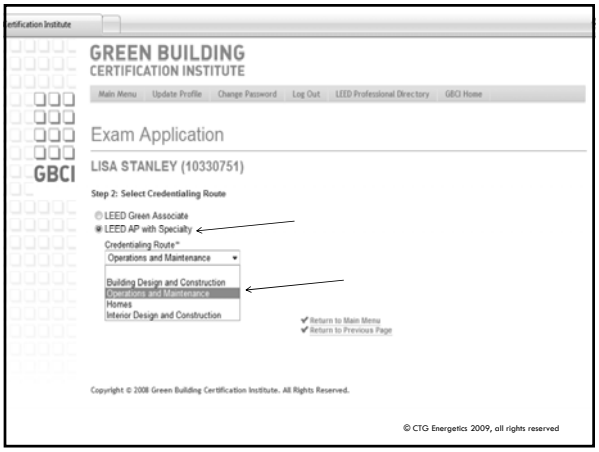
Applying for the Exam

- Apply for exam www.gbci.org
- Click on My Credentials
- Create an account profile for your self…
- $100 Application Fee (final $200 due when registering for the exam)
- Within 7 days – notice of approval
- Application reference number provided for you to use when you register
- If approved proceed to registration for the exam






GREEN BUILDING
CERTIFICATION INSTITUTE
Main Menu
Update Profile
Change Password
Log Out
LEED Professional Directory
GBCI Home
My Credentials
LISA STANLEY (10330751)
GBCI
Current Options
Apply for an exam
Update Profile
Change Password
Change Email Address
Log Out


GREEN BUILDING
CERTIFICATION INSTITUTE
Main Menu
Update Profile
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LEED Professional Directory
GBCI Home
Exam Application
LISA STANLEY (10330751)
GBCI
Step 2: Select Credentialing Route
LEED Green Associate
LEED AP with Specialty
Credentialing Route*
Operations and Maintenance
Building Design and Construction
Operations and Maintenance
Homes
Interior Design and Construction
Return to Main Menu
Return to Previous Page
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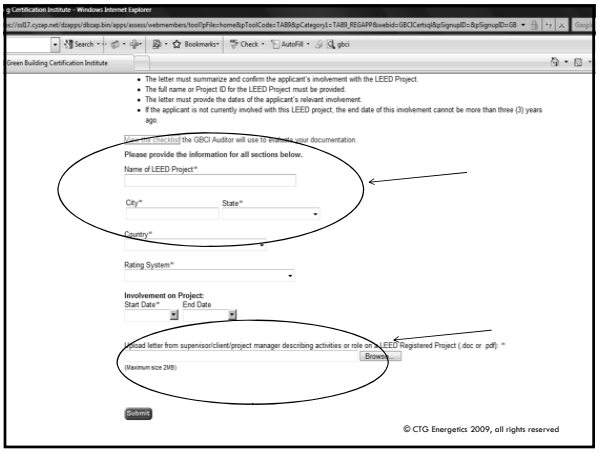
The letter must summarize and confirm the applicant's involvement with the LEED Project.
The full name or Project ID for the LEED Project must be provided.
The letter must provide the dates of the applicant's relevant involvement.
If the applicant is not currently involved with this LEED project, the end date of this involvement cannot be more than three (3) years ago.
the GBCI Auditor will use to evaluate your documentation.
Please provide the information for all sections below.
Name of LEED Project*
City*
State*
Country*
Rating System*
Involvement on Project:
Start Date*
End Date
Browse...
(Maximum size 2MB)
Submit
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Project Experience

- You must have LEED project level experience
- Within three years of your application submittal date
- Requires a letter of attestation from:
  - Supervisor
  - Client
  - Project Manager

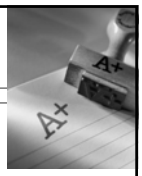
Letter of Attestation

- Describe your involvement in the project as a
  - Consultant
  - Contracted worker
  - Member of the LEED project team
- On authentic letter head & dated
- Include author's title & relationship
- Summarize and confirm involvement
- Include project ID
- Involvement cannot be more than three years ago

Application Acceptance

- With in seven days of submitting your application you will find out if it was approved or denied
- If denied, they may request more information
- If denied or expired you must wait 90 days to reapply
  - If your application is approved, you may proceed to registration
  - Approved application is valid for one year from the approval date

Exam Registration



- Approved applicants receive -
  - Application reference number
- The exams are hosted by Prometric
- As you finish the final steps of the exam
  - Select the date you will take the exam
  - Our last class is July 7
  - If you successfully complete the full class AND associated reading we recommend taking the test the week of July 13
  - Select the most convenient location

What is a LEED AP?

- "A LEED AP is an individual who has passed the exam and possesses the knowledge and skills necessary to participate in the design process, to support and encourage integrated design, and to streamline the application and certification process."

GCBI Candidate Handbook

Why?

- Professional development
- Personal development
- Excellent networking opportunity
- One of the first few LEED AP's "with specialty"
- Rigorous program – you will not pass the exam if you do not READ the material

Wrap up

- Homework for next week:
  - LEED EB O&M Reference Guide
    - Section Five
    - Section Six
  - Supplemental materials provided in advance.