

LEED-EB: How to achieve certification and reduce operating costs

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ABSTRACT

LEED-EB is a performance based green building rating system for existing buildings. The rating system encourages high performance building operations through continuous maintenance and system performance documentation. The LEED-EB process is designed to be an on-going procedure that continually improves the performance of the building. The cost to implement the LEED-EB process is a fraction of a dollar per square foot and the return on investment can be as short as six months to as long as several years. A LEED-EB certified building has lower operating costs and a higher quality indoor environment compared with similar buildings that do not practice sustainable building operating practices.

Implementation of sustainable building operation and maintenance practices reduces the negative impact on the environment, minimizes operating costs, and enhances the indoor environment. This is also known as the triple bottom line benefits. Recycling of building debris diverts materials from the landfills and minimizing waste water lessens the strain on water treatment plants; thereby reducing negative environmental impacts. Operating and maintaining energy consuming equipment at optimal levels reduces operating costs and extends the life of the equipment. Improving the indoor environment can result in productivity gains of up to 16% and reductions in absenteeism. Sustainable building operation and maintenance practices benefit the building owner, building occupants, and the community where the building resides.

LEED-NC

In 1993 the U. S. Green Building Council (USGBC) was formed to develop a system for defining and measuring the parameters of green buildings. In August of 1998, the USGBC launched the pilot program of a green building rating system that would promote the construction of

buildings that are environmentally responsible, profitable, and healthy places to live and work; Leadership in Energy & Environmental Design for New Construction & Major Renovations (LEED-NC).

As of Spring 2005, more than 2000 buildings world-wide have registered to be certified and 275 buildings have been certified green (LEED-NC versions 1 & 2). Almost 94% of the certified buildings are in the United States. Table 1 indicates the quantity of buildings certified at the various levels according to the LEED website¹.

Certified Projects (LEED-NC)				
World Wide				
Certified	Silver	Gold	Platinum	Total
116	80	69	10	275
United States				
Certified	Silver	Gold	Platinum	Total
112	74	64	8	258
Note: LEED-NC version 1 included a bronze rating category. Any building that certified at the bronze level has been included in the certified category.				

Table 1

LEED-NC is a prescriptive measurement system designed for rating new commercial green buildings; with a focus on office buildings. The measurement system provides a definitive green building standard while evaluating the building's environmental performance from a whole-building perspective.

¹ www.usgbc.org/DisplayPage.aspx?CategoryID=19

The rating system focuses on the design and construction of the building. Points are achieved by designing and constructing environmentally sensitive strategies into the building. Employing environmentally sensitive strategies from a whole-building perspective reduces negative environmental impacts, increases the buildings asset value, and improves the occupant comfort level; a triple bottom line savings.

The LEED-NC rating system includes six categories with seven prerequisites and sixty-nine possible points. Table 2 indicates the quantity of prerequisites and possible points for each category.

LEED-NC		
Category	Pre-requisite	Possible Points
Sustainable Sites	1	14
Water Efficiency	0	5
Energy & Atmosphere	3	17
Materials & Resources	1	13
Indoor Environmental Quality	2	15
Innovation & Design Process	0	5
Total	7	69

Table 2

LEED-EB

In October 2004, the USGBC launched a new green building rating system specifically for existing buildings; Leadership in Energy & Environmental Design for Existing Buildings (LEED-EB). LEED-EB is a voluntary standard that improves building performance while reducing overall operating costs.

As of Spring 2005, there were 67 buildings in the United States that registered to be certified and 20 buildings have been certified green (LEED-EB versions 1 & 2). Table 3 indicates the quantity of buildings certified at the various levels according to the LEED website².

Certified Projects				
Certified	Silver	Gold	Platinum	Total
5	4	10	1	20

Table 3

The LEED-EB & LEED-NC rating systems include similar categories, point names, and certification levels; but that is where the similarities end. LEED-EB includes six categories with thirteen prerequisites and eighty-five

² www.usgbc.org/DisplayPage.aspx?CategoryID=19

possible points. Table 4 indicates the quantity of prerequisites and possible points for each category. Even though the categories are similar, the levels of certification require different quantities of points (see Table 5 for a certification level comparison of NC & EB).

LEED-EB		
Category	Pre-requisite	Possible Points
Sustainable Sites	2	14
Water Efficiency	2	5
Energy & Atmosphere	3	23
Materials & Resources	2	16
Indoor Environmental Quality	4	22
Innovation in Upgrades, Operations & Maintenance	0	5
Total	13	85

Table 4

LEED Certification				
Level	EB		NC	
	Points	% of Total	Points	% of Total
Certified	32 - 39	38 - 46	26 - 32	38 - 46
Silver	40 - 47	47 - 55	33 - 38	48 - 55
Gold	48 - 63	56 - 74	39 - 51	57 - 74
Platinum	64 - 85	75 - 100	52 - 69	75 - 100

Table 5

LEED-EB focuses on building operations to be implemented over the useful life of the building; it is an ongoing process. LEED-NC focuses on the design and construction of the building and is a one time event; certification completes the process. “LEED-EB specifically addresses exterior building site maintenance programs, water and energy use, environmentally preferred products for cleaning and alterations, waste stream management, and ongoing indoor environmental quality.”³

LEED-EB is a performance based rating system designed for existing green buildings where performance must be monitored and documented. LEED-NC is a design based measurement system that focuses on anticipated results based on sound design and installation principles.

LEED-EB focuses on operating, maintaining, and enhancing the building systems by implementing proven technology that minimizes negative environmental consequences, reduces operating costs, and enhances the

³ LEED-EB for Existing Buildings Reference Guide, version 2.0, first edition, June 2005.

indoor environment of the building. Because the focus of LEED-EB is different than LEED-NC, the team members required to develop and implement the process are not the same. The LEED-EB team members include professionals that specialize in the operation, maintenance, and up-grading of building systems; Facility Managers, Property Managers, Plant Engineers, Operations and Maintenance Personnel, Commissioning Authorities, Engineers, Contractors, and Vendors.

LEED-EB OBJECTIVES

As with all green buildings, the objectives of LEED-EB are to achieve the triple bottom line benefits. It is not only wise to minimize the consumption of natural resources such as timber, fossil fuels, and minerals but a good steward of the environment also minimizes the use of potable water, energy, waste water, and landfills when alternative choices are available. Existing commercial, industrial, and institutional buildings represent 39% of the United States' primary energy use, 40% of raw material consumption, and 12% of potable water use. Reducing the consumption of finite natural resources and minimizing the disposal of waste water and debris reduces the negative environmental impact of operating a building.

Building systems include many diverse systems that require routine maintenance to operate at optimal performance levels. The adage of "pay me now or pay me later" applies to every building. Devoting the time to inspect and replace simple components such as a fan belt is much less expensive than operating the motor in a poor performance range for months (consuming more energy than is necessary) before the motor burns out and has to be replaced. An emergency equipment replacement is not only more expensive than a planned replacement but it is also disruptive to the production level of the occupants. Developing and implementing a preventive maintenance program not only optimizes the life cycle cost of the equipment it also reduces the amount of energy consumed.

Operating building systems at optimal performance levels not only extends the life of the equipment, it also improves the quality of the indoor environment thereby increasing occupant comfort. When the building occupants are comfortable they are more productive and tenant retention is higher. A safer more comfortable indoor environment may also reduce insurance premiums and minimize or eliminate litigation.

In regards to LEED-EB and the triple bottom line benefits Craig Sheehy, CPM said, "through significant reductions in operating expenses, I have determined that green

building operation is not only good for the environment, it is good for the bottom line."⁴

IMPLEMENTING LEED-EB

The first step to implementing LEED-EB is to select the primary team members required to execute the LEED-EB process successfully. Regardless of the size or complexity of the building, the Owner or his representative should select a person that is familiar with the building and how it is operated. This could be the Building Manager, Maintenance Manager, or any other individual that has knowledge of the building operations and is capable of developing and managing the LEED-EB process.

The other primary member of the team should be a person familiar with the LEED-EB rating system. This could be the Building Manager, Maintenance Manager, Commissioning Authority, or a LEED Accredited Professional. The responsibilities of the primary team members could be performed by one person or several people but only one person should be the team leader or champion. "It is helpful to identify an individual who will champion LEED goals, facilitate communication, track progress and compile the components of the final LEED submittal for certification."⁵

The remainder of the LEED-EB team should be selected specifically for the building's needs and to supplement the skills of the primary team members. Knowledge of building systems and maintenance is as important as the ability to collect and document data. The documentation that is required to achieve certification includes narrative descriptions of systems and how they comply with the requirements, calculations estimating energy usage, calculations verifying compliance with the requirements, and actual meter data or other documented energy usage.

Building Analysis

Since all thirteen prerequisites must be accomplished in order to certify the building, each prerequisite should be evaluated to determine whether the building already meets the requirements or whether additional work is required. After the prerequisites have been evaluated each of the eighty-five points should be evaluated. A determination should be made as to whether the requirements of each point are already being met, whether the point can be attained with little or no expense, or whether a point can only be attained through significant expenditure.

Register the Project

⁴ Craig Sheehy is the Director of Property Management for Thomas Property Group, LLC. He was responsible for achieving a LEED-EB Platinum certification for the California EPA Headquarters.

⁵ LEED-EB for Existing Buildings Reference Guide, version 2.0, first edition, June 2005.

LEED is a registered trademark of USGBC. Only buildings certified by USGBC under the LEED Green Building Rating System may refer to themselves as LEED buildings. Register the project through the LEED website to initiate a relationship with USGBC and receive orientation materials. Registration during the planning phase is highly recommended.

Technical support is provided through the *Reference Guide* (version 2.0, first edition, June 2005), Credit Interpretation Rulings (CIR), and LEED templates. The LEED-EB process is not a race but an ongoing process to improve the performance of your building. Plan the process, implement the plan, and finally apply for certification. The application review can take from six weeks to several months.

The registration and certification fees vary by building square footage. The registration fee for a 74,999 square foot building is \$750 and a building larger than 300,000 square feet is \$3,000. The certification fee for a 74,999 square foot building is \$1,500 and a building larger than 300,000 square feet is \$7,500.

LEED-EB Plan Development

Identify all the “low cost and no cost” improvements and develop a plan to accomplish the improvements. Some examples of “no cost” improvements are: sealing window and door frames, regularly changing filters, increasing the outside-air quantity, replace washers or cartridges in leaking faucets, replace inefficient light bulbs with high efficiency bulbs, and review the current building operating procedures.

Some examples of “low cost” improvements are: equipment tune-ups, review the sequence of operation, calibrate controls, and perform minor equipment upgrades such as variable frequency drives for motors and installing occupancy sensors.

Implement the “low cost and no cost” improvements. Completing the improvements generally results in attaining between fifteen and twenty points. Most buildings are at least half way to certification with little or no expense. Track the savings from the “low cost and no cost” improvements. The savings can be used to fund equipment or system upgrades without budgeting for additional capital. All “low cost and no cost” improvements must be completed within the first two years of registration.

Using the information found in the building analysis, determine the level of green certification for your building. LEED-EB is an ongoing process that can take as long as five years. When determining the level of certification, decide on the length of the plan as well as the availability or need for capital.

Every building has its own unique characteristics. Even two identical buildings will operate differently because

the occupants and maintenance staff are different individuals. The LEED-EB plan should be developed to meet your specific building needs. Determine which points are best suited to your building and develop the plan.

Tracking System

Because LEED-EB is a performance based rating system, the actual performance levels must be regularly monitored and recorded during the performance period. For first time applicants “the performance period can be as short as three months. This allows first time LEED-EB participants to get all their policies, programs and tracking systems in place and reviewed quickly, to assure that these are set up to meet the requirements for ongoing LEED-EB recertification.”⁶

Special care should be taken when developing the tracking system or modifying the existing tracking system to avoid duplication of data. The Commissioning Authority can be an invaluable resource when developing the tracking system. Gathering, managing, and documenting data is part of every commissioning process.

Equipment and System Upgrades

Policies or guidelines should be developed to address future equipment and system upgrades. Minimum efficiency levels should be identified to ensure that budgets are accurately prepared. The policy should address how the upgrades will effect the achievement of additional or future points and continually strive to improve building performance.

CASE STUDY BUILDINGS

Several case studies have been prepared to demonstrate that implementation of the LEED-EB process does in fact make economic sense. Four of the five case studies had a return on investment of less than two years and the average return on investment was less than one and a half years. Table 6 summarizes the initial cost, annual savings, and the return on investment for four of the five case studies.

Case Study Buildings - Return On Investment			
Building	Project Cost/ft ²	Annual Net Savings/ft ²	ROI (months)
CA EPA	\$1.25	\$0.64	23
Johnson/Diversey	\$0.27	\$0.49	6
Brengel Center	\$0.21	\$0.21	12
Goizueta School	\$0.79	\$1.26	8

Table 6

The fifth case study was not included in the table because “in a state-funded building, it is complicated to arrange

⁶ LEED-EB for Existing Buildings Reference Guide, version 2.0, first edition, June 2005.

for any return on investment to be returned to the savers pockets. With so many of the purchase orders being paid directly by state accountants, any generated savings, either by changes in operations or by outright equipment upgrades, cannot be funded through a savings program.”⁷

California EPA Headquarters

The California EPA Headquarters, located in Sacramento, is a multi-story office building. The building floor area is 950,000 square feet. The building has more than 700 photovoltaic panels generating electricity that is delivered to the utility grid. All cleaning products used in the building have received the Golden Seal Charter Team certification from the State of California. The California EPA Headquarters was certified LEED-EB Platinum in 2004.

Johnson/Diversey Global Headquarters

Johnson/Diversey's global headquarters, located in Sturtevant, Wisconsin, is a three-story mixed-use facility constructed in 1997. The building floor area is 277,440 square feet, of which 70% is office space and 30% is research laboratories. The building was designed based on green-building principles, including high-energy efficiency, extensive use of natural lighting, and individual control of workspace environments. Because it was built with sustainability in mind, applying LEED-EB to the building was primarily a matter of fine-tuning the building's operations practices and improving the documentation of existing sustainable practices. The Johnson/Diversey's global headquarters was certified LEED-EB Gold in March 2004.

According to Stu Carron, “achieving LEED-EB certification not only publicly illustrated our commitment to reducing environmental impacts and to ensuring the health of our workplace, it affirms our corporate interests in pursuing sustainable business practices for the future. LEED-EB certification has helped us identify significant cost savings as well as opportunities to reduce the environmental impacts of our building operations.”⁸

Johnson Controls Brengel Technology Center

The Johnson Controls Brengel Technology Center was built in 2000 in the heart of downtown Milwaukee. The seven-story, 130,000 square-foot facility provides office and meeting space for about 400 controls business employees, while serving as a working showcase for Johnson Controls technologies. The Brengel Technology Center was first certified under LEED-NC at the Silver level, and in May 2004, it became the first building to be recertified under LEED-EB at the Gold level. Because energy efficiency and environmental quality are ingrained

in the building plan, seeking LEED-EB certification for the Brengel Technology Center was a sound decision and rather uncomplicated to actualize.

According to Paul von Paumgarten, “LEED-EB shows building owners and operators how to provide sustainable operations and reduce the environmental impact of a building over its entire life cycle. By going from silver certification to gold with a minimal investment, Johnson Controls has an even healthier and productive environment for our employees.”⁹

Moss Landing Marine Laboratories

The Moss Landing Marine Laboratories main building is situated on a twenty-one acre hillside in Moss Landing, CA, a fishing port located halfway between Santa Cruz and the Monterey Peninsula. The 60,000 square-foot facility includes scientific laboratories, classrooms, a research aquarium, a museum, and a library. While not designed as a green building, the LEED-EB process has shown that Moss Landing Marine Laboratories is a high-quality passive building well able to lead the way. Moss Landing Marine Laboratories received LEED-EB certification at the Gold level in June 2004.

Goizueta Business School

The Goizueta Business School was built in 1997 on the Emory University campus in Atlanta, Georgia. The Goizueta Business School is a 120,000 square-foot general purpose classroom building. Emory is an acknowledged leader in the LEED movement for new construction and they plan to implement the commercial interiors (LEED-CI) product in the future. The Goizueta Business School was certified at the Gold level this year.

PREREQUISITES

Building owners with a portfolio of buildings will want to consider the buildings that were constructed after 1992 as prime candidates for LEED-EB. Many of the following prerequisites require that the building performance level meets or exceeds post 1992 code requirements. Buildings constructed after 1992 met the code requirements when initially occupied, therefore it may be easier for these buildings to satisfy the prerequisite requirements.

Sustainable Sites

Prerequisite #1 requires the development and implementation of a site *erosion and sediment control* plan. The plan must address site maintenance that prevents erosion and sediment transfer for current site operations. In addition the plan must address erosion and sediment control for future site expansions, repairs, or other construction activities. The site expansion, repair, or other construction activity plan must comply with US

⁷ Moss Landing Marine Laboratories Case Study, USGBC March 2005.

⁸ Stu Carron is the Director of Global Facilities and Real Estate for Johnson/Diversey. Johnson/Diversey Global Headquarters Case Study, USGBC January 2005.

⁹ Paul von Paumgarten is the Director of Energy and Environmental Affairs for Johnson Controls. Johnson Controls Brengel Technology Center Case Study, USGBC January 2005.

EPA Storm Water Management for Construction Activities, Chapter 3 (EPA 832/R-92-005).

Implementing the plan will help preserve the site from storm water run-off and protect the quality of under ground water, nearby streams or rivers, and nearby standing water. Documentation that the plan is being implemented is part of the paperwork that must be submitted to the USGBC.

Prerequisite #2 addresses the *age of the buildings* that can participate in LEED-EB. Any existing building can register for LEED-EB but it must be two years old before certification will be awarded unless the building was previously certified under LEED-NC. If the building was certified under LEED-NC, it is eligible for LEED-EB certification as soon as the documentation is ready for submission.

Early registration is recommended even for buildings less than two years old that have not been previously certified. Once the project is registered the team can utilize the LEED reporting and documentation tools and begin implementing the LEED-EB plan. Some buildings take as few as six months to certify while others can take as long as five years. Generally speaking, it is never too early to register the building.

Water Efficiency

Prerequisite #1 addresses the *minimum water efficiency* for fixture potable water use. The potable water supply to fixtures can not exceed 120% of the calculated amount of water used if all the fixtures in the building comply with the Energy Policy Act of 1992.

Quarterly and annual water meter data is required to be submitted to the USGBC. If the fixture potable water supply is not separately metered, the calculated water usage must be provided to demonstrate compliance.

Buildings constructed prior to 1992 may have 2.5 GPM lavatory faucets and showers. The installation of aerators is an inexpensive way to reduce the flow rates to 0.5 GPM. On the other hand, some of the toilets and urinals may require replacement to comply with the Energy Policy Act of 1992.

Prerequisite #2 addresses building *discharge water compliance* if the building is regulated by the EPA National Pollution Discharge Elimination System (NPDES) Clean Water Act.

Documentation must be provided that demonstrates NPDES permit compliance and on-going reporting of discharge water monitoring. If the building is not regulated by the NPDES, a letter indicating that the building is not regulated is all that is required to achieve the prerequisite.

Energy & Atmosphere

Prerequisite #1 addresses *existing building commissioning* of the building systems; specifically the HVAC, building automation control, lighting, and life safety systems. Commissioning of the building systems includes the preparation of a building operation plan, a testing plan to verify performance, repairs and/or upgrades to correct the deficiencies found, and a re-testing plan to verify the performance of the repairs and/or upgrades. The building commissioning plan can take as long as five years to execute although all “low cost and no cost” improvements must be made in the first two years. Documentation must be submitted to the USGBC that includes a narrative summary of the building operating plan and verification that all the commissioning activities have been completed.

The commissioning plan is an important part of the LEED-EB plan. Both plans follow a similar format; identify the building operational parameters, evaluate and test the performance of the building systems, resolve the deficiencies found, retest the upgraded building systems, and document the results. The Commissioning Authority creates and manages processes on a regular basis. The Commissioning Authority’s participation as a primary team member or even as the team leader or champion can be invaluable when implementing the LEED-EB process.

A recent major study of 224 new and existing commercial buildings was conducted by the Lawrence Berkeley National Laboratory, Portland Energy Conservation Inc., and Texas A&M University to determine the cost effectiveness of commissioning. The study found the median cost to commission an existing building is 27¢/ft² and the median payback is less than nine months. The study also concluded that, “commissioning is one of the most cost-effective means of improving energy efficiency in commercial buildings. While not a panacea, it can play a major and strategically important role in achieving national energy-savings goals. If the results observed across the sample in this study are representative of the practice and potential of commissioning more broadly, significant energy savings could be achieved nationally.”¹⁰

Prerequisite #2 addresses the *minimum energy performance* of the building. The requirements of this credit are to achieve an Energy Star rating of 60. Energy Star is an EPA Energy Performance Rating System that can be found at www.energystar.gov. The rating system can be used for various types of commercial buildings to determine how a specific building ranks against the same type of building throughout the nation. In order to receive an Energy Star plaque a building must score a 75. Which means it is ranked in the top 25 percentile in the nation. If a building achieves an Energy Star Rating of 75 in the LEED-EB process, it would not only meet the

¹⁰ The cost-effectiveness of commercial buildings commissioning study is available at <http://eetd.lbl.gov/emills/PUBS/CX-Costs-Benefits.html>

prerequisite requirement but it would also earn four additional points under Energy & Atmosphere Credit #1 *Optimize Energy Performance*.

The documentation submitted to the USGBC includes the Energy Star performance rating, a summary of the annual energy bills (including costs, and usage) and copies of the most recent twelve months of utility bills. Not all building types are addressed by Energy Star. If a building is not addressed by Energy Star, provide calculations as described in the LEED-EB Reference Guide.

Buildings that were built in compliance with ASHRAE Standard 90.1-1999, Energy Standard for Buildings Except Low-Rise Residential Buildings should be able to score at least a 60 on the Energy Star system. The Brengel Technology Center (see case study buildings above) received an Energy Star score of 85. Buildings that were not constructed in compliance to ASHRAE 90.1-1999 could have some difficulty attaining the 60 score.

Prerequisite #3 addresses *ozone protection* by not allowing the use of CFC based refrigerants unless a third party audit shows that replacement or conversion is not economically feasible. If the building contains no CFC, HCFC, or Halons the building will qualify for an additional point under Energy & Atmosphere Credit #3 *Additional Ozone Protection*.

Materials & Resources

Prerequisite #1 addresses a building *waste stream audit* to establish the current building waste baseline. At a minimum the audit should include the amounts of paper, glass, plastics, cardboard, and metals in the waste stream. Another requirement is the development and implementation of a waste reduction plan for the building. Documentation to be submitted includes the waste stream audit and the waste reduction plan.

Recycling is one way to reduce the building waste stream. Not only is recycling beneficial to the environment by reducing the quantity of waste going to landfills but many recycling programs generate enough profit to pay for the recycling containers and trucking charges.

Prerequisite #2 addresses the *reduction of mercury in light bulbs*. Establish and maintain a toxic material source reduction program by purchasing mercury-containing light bulbs below 100 picograms per lumen hour for the building and associated grounds.

Documentation to be submitted includes the toxic material source reduction plan, copies of all purchases of mercury-containing light bulbs, and the manufacturer material safety data sheets.

Depending upon the size of the building and the inventory of light bulbs, the most difficult part of this prerequisite may be identifying and counting the inventoried and installed bulbs.

Indoor Environmental Quality

Prerequisite #1 addresses *outside air introduction and exhaust systems* for the building. The building ventilation system must meet the requirements of ASHRAE 62.1-2004, the requirements of EPA indoor air quality (IAQ) or SMACNA IAQ guidelines for HVAC system maintenance, and testing of the exhaust systems. If the outside air distribution system is not physically capable of complying with ASHRAE 62.1, the requirement can be met by introducing at least 10 CFM of outside air per person.

Meeting the requirements of this prerequisite will require an analysis of the ventilation system, calculations verifying compliance to ASHRAE 62.1, a maintenance plan complying with EPA or SMACNA IAQ guidelines, regular monitoring of the ventilation systems, and documentation of the performance level.

Prerequisite #2 addresses building occupant exposure to *environmental tobacco smoke*. Commercial buildings have two options when meeting the requirements of this prerequisite; either prohibit smoking inside the building and within 25 feet of entries and outside air intakes or create designated smoking areas. If the smoking area is inside the building, the smoking room must have a negative pressure ventilation system that directly exhausts the room air outside of the building. If the smoking area is outside of the building, it must be located at least 25 feet from entries and outside air intakes.

Prerequisite #3 addresses *asbestos removal or encapsulation* to prevent occupant exposure. If the building does not contain asbestos, a letter must be provided by an asbestos accredited inspector stating that asbestos containing materials are not present in the building, on the building exterior, or on the site.

If the building does contain asbestos, a description of the asbestos management program must be submitted. The plan must include as a minimum the history of asbestos removed, a current survey, and how the remaining asbestos is being addressed.

Prerequisite #4 addresses *polychlorinated biphenyl (PCB) removal* to prevent occupant exposure. If the building does not contain PCBs, a letter must be provided stating that PCB containing materials are not present in the building or on the site.

If the building does contain PCBs, a description of the PCB management program must be submitted. The plan must include as a minimum the history of PCBs removed, a current survey, and how the remaining PCBs are being addressed.

Methodology

The LEED-EB prerequisites include various types of building systems but the methodology used to meet the

requirements is similar. The basic methodology is to evaluate the building system performance level, develop a plan to raise the performance level, implement the plan, verify that the performance level meets or exceeds the requirements, continuously monitor the performance level, and document the performance level.

Many different skills are required to successfully implement the LEED-EB process. The primary team members should be selected for their ability to manage both processes and people. A strong team that works well together greatly improves the probability of certification.

CREDITS

The procedure for meeting the requirements of the credits is similar to the procedures used in achieving the prerequisites. Begin by evaluating the building system performance level and identifying the credits that have been met, the credits that can be easily met, and the credits that will require a capital investment to be met. Determine the level of certification desired, develop a plan to achieve that certification level, implement the plan, verify the credits achieved, continuously monitor the building systems, and prepare the documentation.

SUMMARY

The concepts presented in LEED-EB are based on proven facility management techniques and sound engineering principles that minimize the negative impact on the environment, reduce building operating costs, and provides a high-quality indoor environment. LEED-EB is an on-going process of modernizing or upgrading poorly performing building systems, maintaining the building systems to operate at optimal levels, and documenting the performance of the systems. Documentation of performance is not just a paper generating process. The data collected should be used to identify poorly performing systems.

Successful implementation of the LEED-EB process results in benefits for everyone associated with the building. The Owner recognizes an increased value in their asset, a possible reduction in insurance costs, and an increase of leasing fees. The Occupants work in a healthier workspace resulting in increased productivity and reduced absenteeism. The Community benefits from a reduced use of local landfills, water treatment facilities, and energy generating plants.

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BIOGRAPHY

Mr. Iczkowski has twenty-one years of experience in the HVAC construction industry as a Commissioning Authority and Project Engineer. For the past ten years he has specialized in the commissioning and retro-commissioning of mechanical, electrical, and plumbing systems. He is a member of the Building Commissioning Association, USGBC, ASHRAE, and a past USGBC-NJ Board of Director and Education Chair. Ed is the Founder and Managing Member of EFI Commissioning Services, LLC and can be reached at eiczkowski@eficx.com.