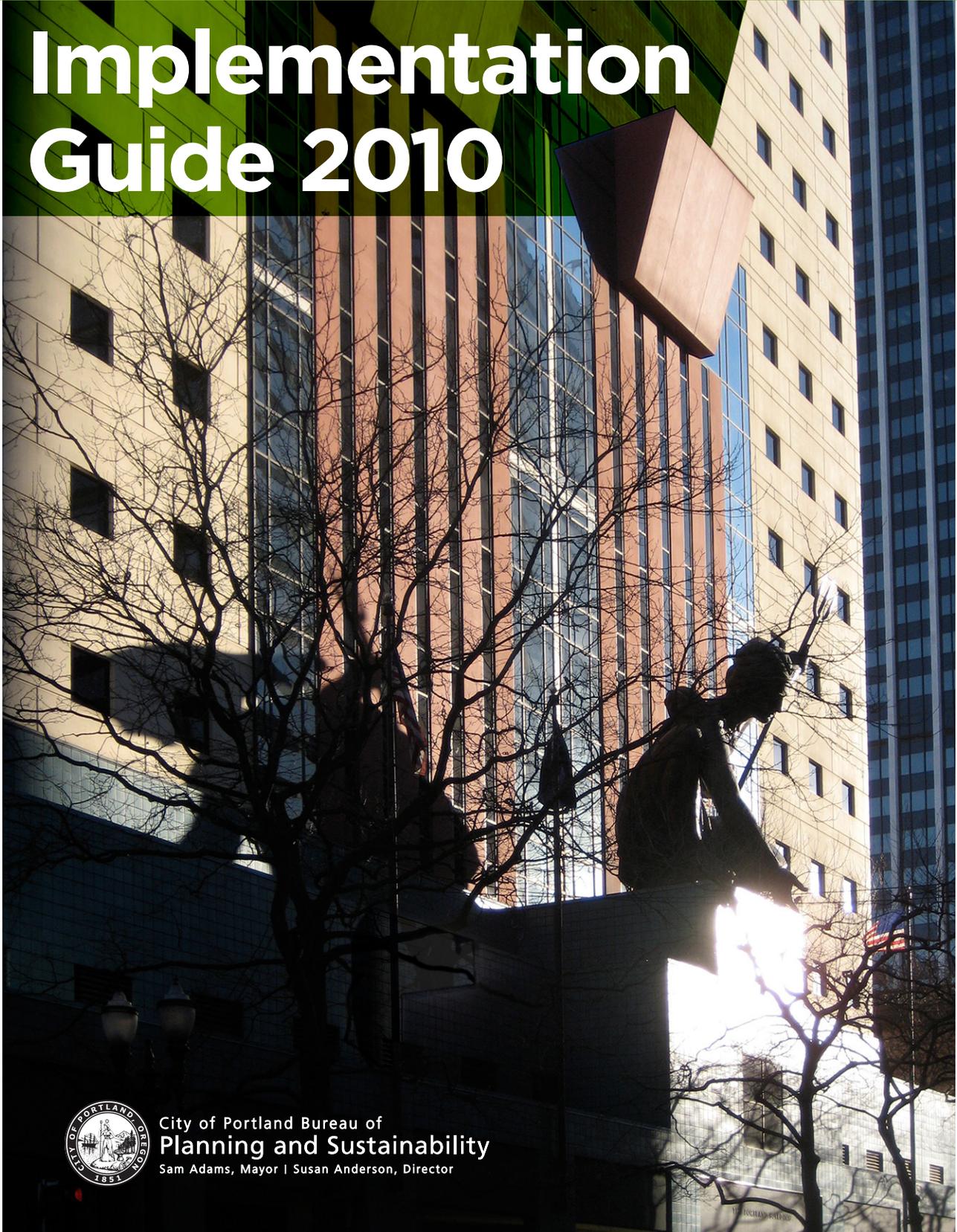




Implementation Guide 2010



City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director

GREEN BUILDING POLICY FOR CITY-OWNED FACILITIES IMPLEMENTATION GUIDE 2010

INTRODUCTION

In January 2001, the City of Portland was one of the first cities in the nation to adopt a Green Building Policy (Policy) that requires resource-efficient design, construction and operational practices for City-owned facilities and development funded by the Portland Development Commission. The Policy was updated in 2005, increasing performance thresholds and adding expectations around energy use, stormwater management, water conservation and construction waste recycling. The 2005 Policy also outlined bureau responsibilities and created requirements for interior alterations, operations and maintenance practices, ecoroof coverage and infrastructure projects.

In 2009, the City updated the Policy to clarify its intent and enhance performance requirements, including provisions for historic property renovations and construction waste prevention. In addition, the update directed the Bureau of Planning and Sustainability (BPS) to collaborate with other bureaus to create an implementation guide for the Policy. This guide does not create or revise the policy directives. **It is intended to be a useful tool to help City staff apply the policy to a range of construction projects, from office remodels to the design and construction of new buildings.**

POLICY INTENT

The City owns and manages its buildings for extended periods of time. The decisions we make about where and how we build our facilities affects the community physically, financially and socially. The City's Policy for its own facilities is intended to improve the environmental performance of its buildings and to protect the health and safety of its workers. Incorporating green building strategies can also save the City money over time and reduce operation and maintenance costs.

For many building types, the Policy references the US Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system, a design and evaluation tool that is widely used in the marketplace. While not all projects are good candidates for LEED certification, there are still many green building strategies you can use to improve the environmental performance of your project. If the Policy explicitly states that you achieve a certain level of certification or performance, you are required to meet that directive. If the Policy does not specifically cover your type of project, you should incorporate as many conservation strategies as possible, especially in the areas of energy, water, stormwater management, construction waste and indoor air quality. As a project manager, you are responsible for producing the most efficient, healthy and durable building you possibly can. Compliance with the Policy is the responsibility of the project manager, your bureau director and the Commissioner-in-Charge of your bureau. The Policy is a Council-adopted resolution that binds the City and its staff to take the actions outlined in the latest version of the document.

HOW TO USE THIS GUIDE

This guide is divided into sections arranged by key Policy components. Sections are also cross-referenced when affected by another area of the Policy. Due to the variations in project scope, size and programming, this guide will not provide definitive answers for every project type. Please do your best to follow the Policy as it is written. If you need assistance interpreting the Policy or want to discuss options, please contact Alisa Kane, Green Building Manager, at BPS.

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NEW CONSTRUCTION AND MAJOR RENOVATIONS

The policy says:

“All new, occupied City-owned facilities will register and certify for the US Green Building Council’s Leadership in Energy and Environmental Design (LEED) for New Construction (NC) at the Gold level including the following performance levels:

- *Recycle at least 85% of all construction, remodeling, and demolition waste.*
- *Improve water savings 30% beyond the Energy Policy Act of 1992 baseline code requirements.*
- *Use no potable water for building-related landscape irrigation, except for the first two years to establish plantings.*
- *Achieve 30% energy cost savings beyond applicable LEED baseline requirements.*
- *Employ building commissioning strategies as required by the state of Oregon Department of Energy to be eligible for the Sustainable Building Business Energy Tax Credit.*

“All new City-owned facilities will have an ecoroof covering at least 70% of the roof and high reflectance Energy Star-rated roof material on remaining roof areas, where practical. When an integrated eco-roof/ Energy Star-rated roof is impractical, a high reflectance, Energy Star-rated roof material will be installed.” (Note: The reference to “occupied” is purposefully not used in the above paragraph to indicate that it is intended for all roofs on new facilities. See the Ecoroofs section for more details.)

“On-site renewable energy systems will be incorporated into the design and construction of all new City-owned facilities, as practical or required by the state.”

Also see Ecoroof, Construction Waste and Historic Structures and Materials sections.

BACKGROUND

Every year, the City of Portland works on the design and construction of new buildings. Many of these projects are bonded or financed with rate-payer money or public financing. It is imperative that these buildings are built to save energy and water, address stormwater management and protect the health of City staff and facility users.

The LEED green building rating system for New Construction is defined by a set of performance

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standards aimed at promoting high-performance, healthy, and environmentally sound practices in existing buildings. The system addresses siting, water and energy use, stormwater management, solid waste prevention and indoor environmental quality. Credits are divided into seven categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation in Design and Regional Priority. In order to receive certification, all prerequisites in each category and a series of credits must be met. As the City of Portland has defined a goal of LEED Gold certification, 60-79 credits must be achieved. The Policy requires the City to **register** and **certify** its LEED projects. Bureaus should budget for this appropriately.

The City of Portland's required performance standards do not represent all of the possible measures that may be taken to achieve LEED Gold certification. City-owned projects may be designed to exceed the requirements of the Policy.

PROCESS FOR IMPLEMENTING THE POLICY

All new and major renovation projects must register and certify with the USGBC (now handled through the Green Building Certification Institute) to earn LEED NC Gold designation. The cost for members to register is \$450. The cost of certification depends on square footage. For example, projects over 50,000 square feet, but less than 500,000 square feet, will pay \$.035/square foot to certify. This does not include the additional cost of commissioning, consultants and investment in building performance.

A major renovation involves significant HVAC upgrades, envelope modifications, change in the building footprint and major interior rehabilitations. LEED for Existing Buildings Operation and Maintenance is better suited for projects that do not involve significant construction or system and envelope upgrades. Two examples of how LEED NC was used for City projects include the Water Bureau's Meter Shop renovation and Parks and Recreation's new addition to the East Portland Community Center. Those projects earned LEED NC Gold and Platinum respectively. See the Resources section for more details on these projects.

While the Policy requires all new buildings and major renovations to register and certify, LEED NC is not right for every project. For example, this section of the Policy applies to "occupied" spaces, meaning:

- The majority of space is used for permanent offices, workspaces, or recreation; and
- Space is conditioned (heated or cooled) for occupant comfort; and
- Occupants typically spend a minimum of 10 hours per week in the structure.

The following building types are not required to register and certify for LEED, but are obligated to comply with the Ecoroof/Energy Star requirements (see Ecoroofs section):

- Warehouses.
- Garages.
- Storage areas.
- Maintenance areas.
- Pump stations.

NEW CONSTRUCTION AND MAJOR RENOVATIONS

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- Freestanding restrooms.
- Unheated structures.
- Temporary modular buildings, like job shacks that will be used for several years or less.
- Residential projects. (The Policy did not anticipate the City building or remodeling residential projects. In this case, using LEED NC is not an option. Instead, use a rating system such as LEED for Homes or Earth Advantage.)
- Infrastructure projects. (These projects use sustainable best management practices and the specifications that are required by each bureau.)

In addition to the exclusions outlined above, when determining whether or not your project is a good fit for LEED NC certification, confirm that it can meet the Minimum Program Requirements identified by the United States Green Building Council. Please consult the LEED NC section in this document for more information about these requirements and how to register and certify a LEED building.

Additional performance requirements

The information in italics below will help you meet the Policy's additional performance requirements.

- **Recycle at least 85% of all construction, remodeling, and demolition waste.**

See Construction Waste section.

- **Improve water savings 30% beyond the Energy Policy Act of 1992 baseline code requirements.**

The primary goal of this requirement is to reduce the overall consumption of water necessary for the building operation, thereby reducing the demand on municipal water supplies and wastewater systems. This may be achieved by using a combination of low flow fixtures and Energy Star appliances. Find the EPACT requirements at: http://www.p2ad.org/toolkit/modules_4_1.html.

- **Use no potable water for building-related landscape irrigation, except for the first two years to establish plantings.**
- **Achieve 30% energy cost savings beyond applicable LEED baseline requirements.**

Energy cost savings indicates the amount of annual energy cost saved between a baseline building and the proposed design. The savings are determined through an energy simulation model that compares the annual energy costs between the baseline and proposed design. Modelers use ASHRAE 90.1-2007, Informative Appendix G to determine the cost savings.

- **Employ building commissioning strategies as required by the state of Oregon Department of Energy to be eligible for the Sustainable Building Business Energy Tax Credit.**

Building commissioning is the systematic process of ensuring and documenting that all building systems perform interactively according to the design intent and the owner's operational needs. Find more

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information about the business energy tax credit (BETC) requirements at the Oregon Department of Energy's website: www.oregon.gov/odoel/betc. Note that to meet this performance requirement, projects will need to pursue LEED's enhanced commissioning credit and calculate the building's annual solar income in BTUs.

- **All new City-owned facilities will have an ecoroof covering at least 70% of the roof and high reflectance Energy Star-rated roof material on remaining roof areas, where practical. When an integrated eco-roof/Energy Star-rated roof is impractical, a high reflectance, Energy Star-rated roof material will be installed.**

Note: There is no reference to occupied here, which was intended to include facilities such as park shelters, pump houses, etc. See the Ecoroof section for more details.

- **On-site renewable energy systems will be incorporated into the design and construction of all new City-owned facilities, as practical or required by the state.**

The State of Oregon's House Bill 2620 requires that public entities, including local governments, spend 1.5 percent of the total contract price of a public improvement contract for new construction or major renovation of a public building on solar energy technology. Eligible public building projects are new capital construction projects for which the total contract price is \$1,000,000 or more and major renovations that exceed \$1,000,000 and 50% of the insured value of the building. Rules can be found at the Oregon Department of Energy's website. See Resources for direct link.

Project managers should also incorporate specifications that meet requirements from other related City policies; see Additional Requirements: City Code and Policies Related to Green Building section.

OTHER RELATED INFORMATION

The Bureau of Purchases has a PTE template that project managers can use to solicit architect and engineering services for LEED projects. See the Resources section for a link to the template and the LEED section for more information on certification. Most of the City's LEED NC projects use a third-party consultant to assist with LEED documentation and certification. In addition, it's beneficial for the project manager to become a LEED Accredited Professional (AP) so they can better manage the overall process. This accreditation requires you to study for and pass an exam that demonstrates knowledge of the LEED rating system and its process. As of December 2009, there are at least 12 City staff that are LEED APs.



ECOROOF

For New Construction, Major Renovations and Existing Buildings

The policy says:

FOR NEW CONSTRUCTION AND MAJOR RENOVATIONS:

“All new City-owned facilities will have an ecoroof covering at least 70% of the roof and high reflectance Energy Star-rated roof material on remaining roof areas, where practical. When an integrated ecoroof/Energy Star-rated roof is impractical, a high reflectance, Energy Star-rated roof material will be installed.”

FOR EXISTING BUILDINGS:

“Any roof replaced on a City-owned facility will have an ecoroof covering at least 70% of the roof and high-reflectance Energy Star-rated roof material on remaining roof areas, where practical. When an integrated ecoroof/Energy Star-rated roof is impractical, a high reflectance, Energy Star-rated roof material will be installed.”

BACKGROUND

Ecoroofs are living, breathing, vegetated roof systems that provide a sustainable alternative to conventional roofing. They are part of a growing worldwide effort to promote sustainable development and reduce the negative impacts from buildings on air, water, energy and the earth. Even though they are used extensively in other countries, especially in Europe, they are a relatively new approach to roofing in the U.S. This guide will help you evaluate how an ecoroof can fit with your project.

Ecoroofs were included in the 2005 update of the Green Building Policy. The 2009 update clarified the language of the Policy and did not substantially change the requirements for ecoroofs.

Portland’s ecoroof program started in 1996. As of February 2010, there are more than 200 ecoroofs in Portland and a total of 23.47 acres that includes both ecoroofs and roof gardens. There are 10.12 acres of ecoroofs, 13.35 acres of roof garden and another 4.5 acres of ecoroof in design.

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BENEFITS

Ecoroofs provide a variety of environmental and human health benefits including:

- Precipitation retention and evapotranspiration.
- Stormwater peak flow reduction.
- Runoff temperature and pollutant reduction.
- Reduced impact on aging/undersized infrastructure.
- Helping to cool urban areas and insulate buildings.
- Air quality, oxygen release and carbon sequestration.
- Wildlife habitat for insects and birds.
- Greenspaces, agriculture and therapeutic gardens.
- Extension of roof life to 40 years versus 20 years.
- Incorporating aesthetic features, art and nature.
- Creates new jobs and supports local industry.
- Qualifies for LEED credits.
- Qualifies for stormwater fee discount.
- Qualifies for Portland Floor Area Ratio bonus.

COST

Ecoroofs can cost more initially, but they can save money over the life of the roof. Although estimates of the added cost of an ecoroof range from \$5 to \$20 per square foot, the Portland Building ecoroof was only \$8 per square foot for the “green” portion. When comparing the cost of an ecoroof to the cost of a conventional roof or an Energy Star roof, you must determine the cost of the “green” portion of the roof. The “green” portion includes a drainage layer, growing media and vegetation.

Sometimes a building will require structural upgrades to be able to hold the added weight of an ecoroof. The structural upgrade may not be prohibitively expensive. For example, a new, five-story wood frame apartment building in the Pearl District was redesigned to have an ecoroof. The added structural cost for the ecoroof was \$1.60 per square foot of roof area.

STRUCTURAL CAPACITY

For re-roofing existing facilities, the range of costs for structural improvements have varied widely. For example, no added structural cost was required for the Portland Building ecoroof. In contrast, the added structural cost for the police station on MLK and Killingsworth would have been three times the cost of the ecoroof and was determined “not practical.”

The Office of Management and Finance (OMF) prepared a report on several buildings evaluated for ecoroofs. View the document here: <http://www.portlandonline.com/bes/index.cfm?&c=52008&a=287490>. (Note that you will need a POL account to access the report.) You most likely will have to hire a qualified professional to get structural information about a building. This expertise is usually required for seismic and other permit-related issues.

ECOROofs

DESIGN

It is best to design a new building at the outset to hold the additional weight of an ecoroof. Even if an alternate roofing material is used initially, design and construct the building to hold an ecoroof. In the future the building can easily be retrofitted with an ecoroof.

If the facility has formal historic designation, then it is likely that Landmarks Commission and/or design review will be required. Working on a designated historic building does not preclude using an ecoroof. If it is not desirable to see the ecoroof on an historic building, then it can be designed with low-growing vegetation that will not be visible from ground level.

In addition, some buildings, whether existing or new, are of particular interest to the public. Community outreach may be needed to determine if the public has an interest in your building.

MAINTENANCE

All roofs require maintenance. For an ecoroof, maintenance need not be extensive. Typically, ecoroofs need to be checked for trees and excess weeds in early summer. Most ecoroofs also require irrigation for the first few years as the vegetation gets established. Proper design and operation of an ecoroof can minimize or eliminate weed issues. A maintenance plan will describe the routine maintenance that is needed to keep the ecoroof in excellent condition. Maintenance for a basic ecoroof of 40,000 square feet should not exceed \$1,000 per year.



TECHNICAL ASSISTANCE

For more technical information about ecoroofs, staff are encouraged to review the Ecoroof Handbook found at www.portlandonline.com/bes/ecoroof. Bureau of Environmental Services (BES) staff are producing an ecoroof workbook which will provide more technical, how-to information. When complete, the workbook will be posted on the web page listed above.

As a project manager, you may consider getting consultant assistance before making conclusions about practicality. BES staff are available to help you with your project. In addition, Portland has numerous ecoroofs, and there are many local professionals who can help with design and construction. Visit the BES Ecoroof website at www.portlandonline.com/ecoroof for extensive resources, including links to local and national research programs, websites, educational tools and events.

PROCESS FOR IMPLEMENTING THE POLICY

It is anticipated that most City bureaus will use consultants to design the ecoroof and have it installed. Bureaus such as OMF and BES have done several ecoroofs on buildings using consultants. As ecoroof designs become more established, the specifications will be more standardized and easier to apply.

Since the Policy states that an ecoroof will be installed when “practical,” determining practicality is an important first step in complying with the Policy. The following check sheet includes a series of questions to help staff decide whether or not an ecoroof is practical for a facility. This list is intended to help staff anticipate the impacts an ecoroof will have on the project budget, maintenance requirements and other aspects that should be considered before a decision is made.

Attempt to answer all the questions on the following worksheet before making a decision if an ecoroof is practical for your project. BES has staff with ecoroof design and construction experience who are available to assist you with your project, or you can use your own consultant.



Green Building Policy Ecoroof Practicality Check Sheet

Project manager: _____

I have read and understand the ecoroof Green Building Policy:

Project Manager Signature: _____ Date: _____

Facility type (e.g. pump station, park shelter, garage, office, community center, house):

Project address or location: _____

1. Structural Capacity

For existing construction

- What is the weight-bearing capacity of the facility? _____ lbs/sf
- If the building cannot hold an ecoroof, what upgrades are needed? _____

- What is the cost of the upgrades? \$ _____

For new construction

- Is your facility designed to hold the weight of an ecoroof? (check one) Yes No

2. Costs and Benefits

For New and Existing Construction

- What is the cost of the "green" portion of the ecoroof (drainage layer, root barrier, growing media, vegetation, and irrigation)? \$ _____
- Are you considering an alternative roofing material (e.g. high reflectance Energy-Star rated roofing material, glass, tile)?

- What is the cost of the alternative roofing material? \$ _____ /sf
- Table 1 in the 2008 *Cost Benefit Evaluation of Ecoroofs* provides a list of benefits (see Resources section). If an ecoroof is not used, how will these benefits be provided? _____

3. Maintenance

For New and Existing Construction

- Is there a maintenance plan for the ecoroof? (check one) Yes No
- If using high reflectance roofing material, is there a maintenance plan for this portion of the roof? Yes No
- Who will maintain the roof? (check all that apply)
 City staff Private company Other _____
- What is the estimated cost to maintain the ecoroof? \$ _____ per year
- What is the estimated cost to maintain alternative roofing material? \$ _____ per year

- How will maintenance be funded? (check all that apply)
 - Operating dollars Other _____
- How does the cost of maintaining an ecoroof compare with your selected alternative material (e.g. high reflectance roofing, glass, tile?) (check one)
 - More Less Same

4. Design

For New and Existing Construction

- Does the facility have formal historic designation? Yes No
- Do changes to the facility's roof require approval from the Landmarks Commission and/or design review?
 - Yes No
- What is the zoning for the site ? _____
- Does the zoning affect the type of roof that can be used? Yes No

If yes, describe the zoning restriction(s) _____
- Is there community input that needs to be considered? Yes No

If yes, describe community concerns or wishes _____

5. Technical Assistance

For New and Existing Construction

- Who have you contacted for information and technical assistance about ecoroofs? _____
- Have all your questions been answered? Yes No
- Have you consulted with BES staff or resources on ecoroofs? Yes No

6. Final decision

- Will you use an Ecoroof? Yes ____% of roof covered No

If no, explain why: _____
- Will you use a high reflectance roofing material? Yes ____% of roof covered No

If no, explain why: _____
- If using another roofing material, what is it? _____

Why: _____

If you do not specify an ecoroof or Energy-Star roof, submit this form to your bureau director and Commissioner in Charge.

Bureau Director Signature: _____ Date: _____



TENANT IMPROVEMENTS AND LEASED SPACES

What the policy says:

“All interior improvement projects to occupied, City-owned or City-leased spaces will use the Bureau of Planning and Sustainability’s Green Tenant Improvement Guide and/or register and certify for LEED for Commercial Interiors (CI) at the Silver level.”

Also see **Construction Waste and Historic Preservation** sections.

BACKGROUND

The City performs both small and large tenant improvement projects. Small projects are those less costly office remodels that involve minor actions such as replacing carpet, repainting, and minor office upgrades. Larger projects involve activities such as upgrading building systems and replacing windows.

WHAT IS THE PROCESS FOR IMPLEMENTING THE POLICY?

Determine which guidelines to use.

The *Green Tenant Improvement Guide* was updated and renamed to *Creating a High Performance Workplace: Portland’s Green Tenant Improvement Guide* in April 2010 and includes changes to some of the categories and associated Action Strategies. The new guide no longer includes a certification component. Project managers should reference the new guide to establish updated resources and changes to Action Strategies. However, you can still use the old guide to meet the Policy’s directives. The new guide can be downloaded at: www.portlandonline.com/bps/tiguide.

No matter what the size or scope of the project, the City’s *Creating a High Performance Workplace* should be used as a guiding document. Larger tenant improvement projects that include building system and feature upgrades should consider pursuing LEED CI certification. If this is a major renovation, you are required to register and certify for LEED NC at the Gold level. (See the New Construction and Major Renovations section.) Each type of project presents different opportunities and should be treated appropriately.

While LEED CI is similar to the City’s *Creating a High Performance Workplace*, it provides a much

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more thorough third-party analysis of sustainable tenant improvement practices. LEED CI also requires more documentation and an in-depth submittal process. LEED CI has a more comprehensive overview of building system efficiency upgrades and more specific credit requirements and direction. Credits are divided into seven categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation in Design and Regional Priority. In order to receive certification, all prerequisites in each category and a series of credits must be met. As the City of Portland has defined a goal of LEED Silver certification, 50-59 credit points must be achieved.

See **LEED** section for more details on how to certify.

OTHER RELEVANT INFORMATION

Compliance with LEED for Existing Building Operations & Maintenance (EBOM)

Some tenant improvement projects and facility renovations will be conducted in buildings concurrently pursuing LEED EBOM. A few of the LEED EBOM credits explicitly govern sustainable tenant improvements and facility renovations, including green practices associated with purchases, solid waste management and indoor air quality. For this reason, it is important to be aware of other events occurring in the building and be knowledgeable of LEED EBOM facility alteration credits when performing a tenant improvement based on the City's *Creating a High Performance Workplace*.

Project managers should also incorporate specifications that meet requirements from other related City policies – See Additional Requirements: City Code and Policies Related to Green Building section.





EXISTING BUILDINGS

What the policy says:

“All occupied, City-owned existing buildings will pursue LEED for Existing Buildings Operation and Maintenance (EBOM) certification at the Silver level.”

“Any roof replaced on a City-owned facility will have an ecoroof covering at least 70% of the roof and high-reflectance Energy Star-rated roof material on remaining roof areas, where practical. When an integrated ecoroof/Energy Star-rated roof is impractical, a high reflectance, Energy Star-rated roof material will be installed.”

(Note: The reference to “occupied” is purposefully not used in the paragraph above to indicate that it is intended for all roof replacements. See the Ecoroofs section for more details.)

Also see Ecoroof, Construction Waste and Historic Resources sections.

BACKGROUND

The LEED green building rating system for Existing Buildings Operations & Maintenance is defined by a set of performance standards aimed at promoting high-performance, healthy and environmentally sound practices in existing buildings. It addresses exterior building site maintenance, water and energy use, purchasing, green cleaning, alterations and tenant improvements, solid waste management and indoor environmental quality.

Credits are divided into seven categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation in Design and Regional Priority. In order to receive certification, all prerequisites in each category and a series of credits must be met. As the City of Portland has defined a goal of LEED Silver certification, 50-59 credit points must be achieved. Note that the Policy requires the City to register and certify its LEED projects. Bureaus should budget for this appropriately.

PROCESS FOR IMPLEMENTING THE POLICY

Although the Policy requires all buildings to pursue LEED EBOM certification, not all projects can qualify to use this rating system. USGBC designed LEED EBOM with the intent of evaluating the operations and maintenance of commercial, institutional and high-rise residential buildings. As bureaus review their real estate portfolio for certification potential, focus should begin with

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buildings that are most likely able to achieve LEED EBOM certification. Ideal candidates should be able to meet all the prerequisites and at least some credits in each of the seven categories. Priority should be given to those buildings that are:

- Primarily occupied by City employees.
- Located in urban environments where alternative modes of transportation are utilized.
- Where stormwater management can occur.
- Locations where purchases are made.
- Where building systems are controlled and maintained by the City.

While the general characteristics outlined above provide a good rule of thumb for identifying LEED EBOM candidates, not all buildings will meet these characteristics and should not be automatically excluded from potential certification. Additionally, buildings should also be vetted against USGBC's Minimum Program Requirements, which can be read in detail at: <http://www.usgbc.org/leed/eb>.

The City has also identified questions that project managers should take into consideration when determining LEED EBOM project potential:

1. Is the building regularly occupied by employees throughout the entire year? Buildings that are not occupied on a regular basis, do not operate at building capacity and may not provide enough energy efficiency upgrades to make the cost of LEED certification effective. The City's definition for "occupied" is:

- a. *The majority of space is used for permanent offices, workspaces, or recreation; and*
- b. *Space is conditioned (heated or cooled) for occupant comfort; and*
- c. *Occupants typically spend a minimum of 10 hours a week in the structure.*

2. Is the building Energy Star certifiable at or above 69? If the building cannot meet an Energy Star Rating of at least 69, even with system upgrades, the building cannot achieve certification.

3. How many tenants sublease the building? Is the building a multi-tenant building in which it will be hard to garner full cooperation from sublessors? In order to achieve LEED EBOM, 90 percent of building square footage must be included in and held accountable for credit achievements. The inclusion or exclusion of the private tenants must be consistent, except for IEQ Prerequisite 2 – Environmental Tobacco Smoke Control, which requires the inclusion of the entire building.

If a building is not a good candidate for LEED EBOM, certain steps can be taken to prepare for certification or increase the performance of the building.

These include:

- Education on sustainable purchasing, alternative transportation, waste reduction, and energy conservation.
- Expanding recycling programs.

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- Implementing composting.
- Performing Water Audits (contact the Water Bureau).
- Tracking purchases identified under LEED.
- Performing night audits to reduce building energy base load.
- Identifying contracts affected by LEED EBOM and incorporating LEED language.
- Discussions with contractors of your intent to eventually pursue LEED EBOM.
- Drafting and implementing plans and policies required by LEED EBOM.

OTHER RELATED INFORMATION

LEED EBOM Credits

L EED EBOM includes credit requirements associated with facility alterations and additions. Credit compliance includes green practices associated with purchases, solid waste management, and indoor air quality. LEED EBOM certification is measured through a series of implemented policies and programs whose performance is tracked. Several of the prerequisites and credits require the development of policies outlining steps to be taken to comply with LEED EBOM requirements. If policies are currently in place, LEED does not require project teams to develop new policies. However, the existing policies must contain specific components, which must be highlighted and called out during the submittal process. These components include identifying scope/goals, performance metrics, procedures and strategies, responsible parties and time period.

Site Boundary

U SGBC allows LEED EBOM project teams to define a “reasonable” site boundary for each LEED project site. In an urban area, the site boundary will be fairly small and consist primarily of the building footprint. However, the LEED project team will need to decide whether or not to include the street trees and sidewalk in the site boundary. It should be noted that street trees normally help with stormwater calculations, but the sidewalks do not. In either case, the LEED team will need to provide an explanation for including or excluding the sidewalk and trees. If the building maintenance technicians sweep and maintain the sidewalk, it would be reasonable to include the trees and sidewalk. Please refer to USGBC’s project requirements to confirm compliance with the site boundary requirements.

Performance Period

A nother key component of LEED EBOM is the performance period. Performance tracking and data gathering occurs after policies have been implemented and training has occurred. The timeframe during which this tracking takes place is called the “Performance period.” Performance periods for each credit must end within one week of each other and LEED certification submittal must be within 60 days of the end of the performance period. A minimum performance period of three months is required for all prerequisites and credits, except EA Prereq 2 and EAcl1, which have a minimum performance period of 12-months or one year. Performance periods can be as long as 24-months or 2-years. Ideally, the performance period for all credits would be consistent, with similar start and end dates.

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Once the performance period begins, LEED compliance is tracked and documented. In order to ensure a smooth process, it is necessary to create and implement tracking devices prior to the performance period. Every LEED project and credit requirement will require unique tracking. Some may be simple tracking in an Excel spreadsheet; others may require more significant efforts and collaboration with contractors.

[See Resources and LEED sections for more information on LEED EBOM and how to certify.](#)

Ongoing Operations and Maintenance

For all goods and services coming into a building, project managers should reference LEED EBOM for any applicable credit requirements. In addition, project managers should ensure specifications reflect the requirements of other related City policies – see Additional Requirements: City Code and Policies Related to Green Building section. Not only are these requirements City policy, but they complement achieving LEED credits as well.



HISTORIC STRUCTURES AND MATERIALS

What the policy says:

“All projects that contemplate removal, demolition or significant alteration to interior or exterior historic materials on City-owned buildings or structures that are designated historic landmarks, listed in the National Register of Historic Places, contributing resources in historic and conservation districts, or listed in Portland’s Historic Resource Inventory will consult with the City of Portland Historic Landmarks Commission for advice on preservation, reuse and salvage of historic building materials and advice on the alterations or improvements.”

BACKGROUND

The term historic resource describes more than just a physical structure that is considered valuable due to its particular architecture or age. Historic resources in Portland include structures, sites, trees, landscape elements and other objects that are of historic or cultural significance.

There are many ways that historic resources can be classified or designated. They range from being listed in a local inventory of potentially significant properties to being designated as a National Historic Landmark by the U.S. Department of the Interior. Resources may have more than one designation or classification and be listed as Contributing Resources in Historic or Conservation Districts.

HISTORIC STRUCTURES AND MATERIALS

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Portland's current regulations related to historic resources are primarily found in Zoning Code Chapter 33.445 (Historic Resource Protection Overlay Zone) and Chapter 33.846 (Historic Reviews).

Historic resources are classified into the following categories by the Portland Zoning Code:

HISTORIC LANDMARK. A Historic Landmark designation may include buildings, a portion of a building, sites, trees, statues, signs, or other objects or spaces that the City or the Keeper of the National Register of Historic Places has designated or listed for their special historic, cultural, archaeological, or architectural merit. Historic Landmarks can be designated at the local level, on the National Register, or both. Alterations to structures or objects designated as Historic Landmarks must be approved through a building permit approval at the local level. Historic landmarks are indicated on city zoning maps by a dot and a reference number.

CONSERVATION LANDMARK. A Conservation Landmark is an individual structure or other object that is of historic or cultural interest at the local or neighborhood level. Conservation Landmarks are examples of development that have helped create the character of the region's districts and neighborhoods. Conservation Landmarks are designated at the local level only. Conservation Landmarks are indicated on city zoning maps by a triangle.

HISTORIC DISTRICT. A Historic District is a collection of thematically related individual resources that is of historical or cultural significance at the local, state or national level. The boundaries of Historic Districts are identified on city zoning maps, with the name of the district noted inside the boundary line. Historic Districts may be designated at the local level, on the National Register, or both.

CONSERVATION DISTRICT. A Conservation District is a collection of individual resources that are of historic or cultural interest at the local or neighborhood level. The boundaries of Conservation Districts are identified on city zoning maps with the name of the district noted inside the boundary line. Conservation Districts are designated at the local level only.

HISTORIC RESOURCES INVENTORY. The Historic Resources Inventory (HRI) is a citywide catalogue of historic resources that may be eligible for landmark and district designation, and it is used for preservation planning purposes. It is not a true designation.

Process for implementing this section of the policy

1. Determine if the building or structure is historic.

The City of Portland owns many buildings and structures that have historic designations or classifications. A first step will always be determining the historic status of the property. If your project includes a structure that is over 50 years old, the State of Oregon's ORS 358. 653 may affect what type of updates that you can make. The Resources section of this document includes information on reference sources that are available for this purpose.

2. Check the zoning code requirements.

The City performs both small and large projects involving historic properties. Depending on the size of the project and the historic status of the property, design review or historic design review may

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be required. Portland's current regulations related to historic resources are primarily found in the Zoning Code Chapter 33.445 (Historic Resource Protection Overlay Zone) and Chapter 33.846 (Historic Reviews). The Bureau of Development Services (BDS) can provide information about any permitting requirements that apply. No matter the size or scope of the project, where removal, demolition or significant alteration is contemplated, the Historic Landmarks Commission should be consulted in addition to compliance with permitting requirements.

3. If property is historic, consult with Portland Historic Landmarks Commission.

The Landmarks Commission provides leadership and expertise on maintaining and enhancing Portland's historic and architectural heritage. Among other duties, the Commission provides advice on historic preservation matters. Consultation with the Portland Historic Landmarks Commission is required where projects involve City-owned buildings and structures that meet the definitions outlined in the Policy statement. Depending on the project size and scope, consultation may occur as part of design review, where a design review process is required or more informally for small projects. The first step will be to contact BDS Design Review staff to determine what type of consultation is appropriate. If design review is not required, the consultation process may be initiated with an informal check-in with Design Review Staff (contacts are listed below). They will determine if further steps are needed, such as a briefing to Landmarks Commission.

4. Additional considerations for meeting LEED certification requirements.

If your project has a historic designation, there may be special challenges with meeting LEED certification requirements. In general, interior changes and basic repair and maintenance do not compromise the character of historic buildings and do not require design review. Exterior changes to character-defining historic features, such as windows and doors, are discouraged and may not comply with applicable design guidelines. However, several projects in Portland have successfully balanced LEED certification with historic preservation, including the Ecotrust, White Stag and Armory buildings. Many retrofitting measures such as energy and seismic upgrades, for example, are appropriate for historic buildings.

OTHER RELATED INFORMATION

See Resources for website and maps to help you determine historic status.



CONSTRUCTION WASTE RECYCLING

What the policy says:

“New construction and major renovation projects will recycle at least 85% of all construction, remodeling and demolition waste.”

“All projects will practice waste management strategies that minimize waste generation through prevention, preservation, restoration, salvage, reuse and recycling.”

BACKGROUND

In April of 2008, City Council adopted the Portland Recycles! Plan, approving a package of strategies aimed at increasing the citywide recycling rate to 75 percent by 2015. The plan also established a new recycling rate goal of 85 percent for all City operations. This goal was reiterated in the 2009 City Green Building Policy, applying to the recycling of construction and demolition (C&D) waste. Meeting these construction waste recycling goals can assist projects in achieving LEED certification levels, since both LEED for New Construction (NC) and LEED for Commercial Interiors (CI) award credit points for reaching high levels of construction waste recycling.

Construction waste management describes a variety of strategies employed during construction and demolition to reduce the amount of disposed waste.

These strategies include (in hierarchical order):

WASTE PREVENTION: An upstream activity that involves reducing waste through changes in the design, purchasing, packaging, and use of materials. This means not making waste in the first place, by changing what we use and how we use it.

REUSE: The return of a material to active use in the same or related capacity.

RECYCLING: Transforming or remanufacturing waste materials into marketable materials for other uses.

Since the Green Building Policy requires all projects to employ strategies to minimize waste generation, options like waste prevention and salvage/reuse of materials should be considered before recycling.

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A large portion of construction waste comes from the removal of existing buildings.

There are several ways to remove a structure that can affect how much of the materials used to construct the structure can be reused or recycled, including:

DEMOLITION: The traditional way of removing a building using mechanical equipment to break the building up into pieces which are removed from the site. Demolition results in very little of the waste being recyclable, and offers no opportunity for salvaging usable materials.

DECONSTRUCTION: A method of dismantling a building piece by piece, typically by hand, in the reverse order of how it was constructed. Deconstruction allows for maximum material recovery since the majority of the building materials are removed intact and either sold, donated or reused.

SELECTIVE SALVAGE: A hybrid of demolition and deconstruction, where the building materials that are the easiest to remove or are the most valuable are salvaged from the building before the structure is demolished. Though selective salvage is a better option than simply demolishing the building, the material recovery rates are much lower than if the building is deconstructed.

When working with demolition contractors, project managers should be very clear about how much of the building materials they anticipate being salvaged from the removal of the structure, since contractors have a tendency to use the word “deconstruction” when they actually intend to only practice “selective salvage.”

PROCESS FOR IMPLEMENTING THIS SECTION OF THE POLICY

The key to reducing construction waste and achieving high recycling rates is to plan ahead. The following actions are key steps to creating and implementing a successful construction waste management plan.

1. Anticipate the waste streams.
 - *What waste materials are expected?*
 - *What will the largest waste streams be?*
 - *Will the materials be cut and assembled on-site or arrive ready to install?*
 - *During what phase of the construction will various waste materials be encountered?*
2. Determine which materials are recyclable.
 - *The most commonly recycled materials include wood, metal, cardboard, land clearing debris and rubble (asphalt and concrete), but a wide range of other materials can also be recycled. See the Resources section for information on finding recycling facilities.*
 - *Most local deconstruction services offer free evaluations to determine the deconstruction potential of a structure.*
3. Reduce packaging.
 - *What packaging will materials arrive in?*
 - *Will the packaging be recyclable?*
 - *Are there opportunities reduce the amount of packaging either through purchasing decisions or working with vendors?*
 - *What will happen to any excess materials that get over-ordered?*

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4. Work with your contractor to create a Waste Management Plan.
 - *Evaluate the construction site to determine how many drop-boxes can be placed on the site or in the adjacent right-of-way.*
 - *Is there adequate room to provide drop boxes for separating out some materials into a single box (“source separated”), or will all of waste need to go into a single box (“co-mingled”)?*
 - *Will phasing the arrival of the drop boxes to coincide with the phase of construction when the waste is anticipated help?*
 - *Where will trash and job shack waste go?*

5. Determine what facilities the waste will be taken to, based on how the materials will be separated, the proximity of facilities to the construction site and disposal/tipping fees.
 - *Contact recycling facilities to see if there are any specific guidelines for accepting materials. Note: In the Portland region there are several Material Recovery Facilities (MRFs) that accept construction waste as a co-mingled load and do sorting to recover some recyclables. However, for a new construction project to meet the City’s recycling goal (85 percent), the sorting rates at the MRFs are generally inadequate. Therefore, when possible it is recommended that the large waste streams be separated into a single drop box on site. Sorted loads can either be taken to a MRF or to a facility that specializes in recycling each particular material. Contact Metro’s recycling hotline for a facility near your project at 503-234-3000.*
 - *Will there be any hazardous waste materials (lead paint or asbestos) that need to be removed from the site?*
 - *How will hazardous materials be handled?*

6. Create a Waste Management Plan.
 - *At a minimum, the plan should identify the materials to be recycled or salvaged, how much material is anticipated (weight or volume), where it will be taken and handling procedures.*

7. Communicate the Waste Management Plan.
 - *Determine how the project’s waste reduction goals will be communicated to all of the construction staff, including any sub-contractors.*
 - *Designate a recycling coordinator responsible for implementing the plan. This should be the point person for educating the construction staff, answering questions and collecting waste receipts from haulers. The role of the recycling coordinator should be communicated to staff.*
 - *Determine how the bins on-site will be labeled to ensure that waste materials will be placed in the correct bin. Will the signs need to be written in different languages?*

8. Monitor the program.
 - *To earn LEED credits related to reducing construction waste, it is critical to be able to document where all of the waste from the project goes. The MRFs and recycling facilities in the region will provide receipts for any waste deposited at their facility. Before the construction phase begins, establish who will be collecting the waste receipts from the hauler and how they will be accounted for.*
 - *For non-LEED projects, determine if waste receipts should be accounted for and who will be in charge of collecting and entering the data.*
 - *Monitor the program at periodic intervals throughout the construction project to determine if goals are being met and the waste management plan is being followed.*
 - *Discuss and resolve any potential issues that are preventing the goals from being met.*
 - *Continue to communicate the goals and achievement levels to the construction staff.*

LEED projects should follow the sorting and documentation guidelines outlined in the appropriate LEED reference guide. Also make sure this requirement is reflected in the project specifications.



RESOURCES

2009 GREEN BUILDING POLICY

The City of Portland's Green Building Policy for its own facilities:
<http://www.portlandonline.com/bps/index.cfm?c=41701>

General information about green building

The Bureau of Planning and Sustainability provides a green building hotline for anyone in the Portland metro region. Call 503-823-5431 with questions about green building strategies, incentives and resources. Website also includes a comprehensive green building glossary of terms.
www.buildgreen411.com

General information about LEED

More detailed information about the LEED rating system can be accessed using the City's membership number. Please contact Alisa Kane to retrieve this information.

USGBC's website: <http://www.usgbc.org/>

LEEDuser: <http://www.leeduser.com/>

USGBC Roadmap to Sustainable Government Buildings:
<http://www.portlandonline.com/bps/index.cfm?c=50449&a=247376>

Searchable case studies:
<http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx>

LEED E-books available for purchase: <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1970#2>

LEED 2009 educational web casts:
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1986>

LEED NC

Public LEED NC Reference Guide:
<http://www.usgbc.org/ShowFile.aspx?DocumentID=5543>

RESOURCES

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LEED EBOM

Public LEED EBOM Reference Guide:

<https://www.usgbc.org/ShowFile.aspx?DocumentID=3617>

LEED CI

Public LEED CI Reference Guide:

<http://www.usgbc.org/ShowFile.aspx?DocumentID=5543>

OREGON DEPARTMENT OF ENERGY BUSINESS ENERGY TAX CREDIT

<http://www.oregon.gov/ENERGY/CONS/BUS/BETC.shtml>

TENANT IMPROVEMENTS

Bureau of Planning and Sustainability's *Creating a High Performance Workspace: Portland's Green Tenant Improvement Guide* (updated in 2010 from former G/Rated *Tenant Improvement Guide*):
www.portlandonline.com/bps/tiguide

ECOROofs

Numerous ecoroof publications and links to other web sites that address ecoroofs are available on the BES ecoroof web site: www.portlandonline.com/bes/ecoroof

ECOROOF HANDBOOK: provides a technical look at ecoroofs and describes issues to consider when planning an ecoroof, such as the building's slope and aspect and what the purpose of the ecoroof is such as stormwater management and energy conservation.

ECOROOF COST/BENEFIT REPORT: An evaluation of ecoroofs in Portland was conducted by a consultant to determine the costs and benefits associated with ecoroofs. Cost and benefits to both public and private buildings are described.

ECOROOF PLANT REPORT: An evaluation of 16 ecoroofs was conducted. The report describes technical aspects of the roofs such as soil type and depth, and it describes the vegetation on the roof and provides an evaluation of the vegetation.

STORMWATER MONITORING REPORT: Stormwater, both flow and quality, have been monitored on five ecoroofs for the past several years. The report describes the performance of these roofs. The report also provides the results of other stormwater monitoring.

RESOURCE LIST: Companies that have experience with ecoroofs in Portland are listed according to their area of expertise.

ECOROOF SEMINARS: CDs of the fall 2009 ecoroof seminars are available. The seminars describe the technical details of ecoroofs. Presentations from the two seminars are also available on the web site listed above.

BES maintains an e-mail list of interested parties. Notices of events such as seminars and recently completed reports are sent to the list. Contact Matt Burlin to be added to the list. You can reach him by phone at 3-7863, or by e-mail at: matt.burlin@portlandoregon.gov.

RESOURCES

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CONSTRUCTION WASTE MANAGEMENT RESOURCES

The following on-line publications, and City/Metro contacts, are helpful in implementing a successful waste management plan.

On-line publications and resources

Metro Toolkit – A directory for finding construction waste recycling facilities:
http://library.oregonmetro.gov/files/Metro_Find_a_Recycler_directory.pdf

Metro's Start Smart Guide – A local how-to guide for construction salvage and recycling:
http://library.oregonmetro.gov/files/Metro_Construction_salvage_and_recycling_guide.pdf

Boneyard Northwest – An online marketplace for used commercial building materials to buy or sell:
<http://www.boneyardnw.com/>

Succeed with LEED – Guide and tracking form for maximizing LEED recycling credits:
http://library.oregonmetro.gov/files/leed_recycling_credits_form.pdf

BPS webpage for deconstruction:
<http://www.portlandonline.com/bps/index.cfm?c=42114&a=114732>

BPS webpage for for salvage and reuse:
<http://www.portlandonline.com/bps/index.cfm?&a=114730&c=42114>

King County, Washington – C&D resources and planning tools:
<http://your.kingcounty.gov/solidwaste/greenbuilding/construction-recycling/index.asp>

Resource Venture – a clearing house of useful C&D publications:
<http://www.resourceventure.org/>

Contacts

BPS – Green Building Hotline: 503-823-5431

Metro – Construction Recycling Project Coordinator: Bryce Jacobson 503-797-1663

Metro – Recycling Hotline: 503-234-3000

HISTORIC STRUCTURES AND PROPERTIES

BPS Historic Resources website:
<http://www.portlandonline.com/bps/index.cfm?c=39750>

Portland Historic Landmarks Commission:
<http://www.portlandonline.com/bps/index.cfm?c=39750&a=133694>

Historic Resources Zoning Regulations:
<http://www.portlandonline.com/bps/index.cfm?c=39764&>

BDS website:
<http://www.portlandonline.com/bds/>

RESOURCES

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State Historic Preservation Office (SHPO):
<http://egov.oregon.gov/OPRD/HCD/SHPO/index.shtml>
(Consult with this office for any structure over 50 years old.)

State of Oregon – Historic Preservation Laws, Rules and Regulations:
http://egov.oregon.gov/OPRD/HCD/SHPO/programs_laws.shtml

National Park Service (NPS):
“Secretary of the Interior’s Standards for the Treatment of Historic Properties” (provides the philosophical and practical basis for preservation retrofitting measures):
http://www.nps.gov/history/local-law/arch_stnds_8_2.htm

National Park Service (NPS):
Technical Preservation Services (provides treatments and retrofitting measures by subject):
<http://www.nps.gov/history/hps/tps/index.htm>

MAPS AND INVENTORIES/LISTS

- *PortlandMaps*: <http://www.portlandmaps.com/>
- *Official Zoning Maps*: <http://www.portlandonline.com/bps/index.cfm?c=30420>
- *Citywide Historic Resources Map*: <http://www.portlandonline.com/bps/index.cfm?c=39764>
- *Portland Historic Landmarks*:
<http://www.portlandonline.com/bps/index.cfm?c=39764&a=146276>
- *Historic District Maps and Properties*:
http://www.portlandonline.com/bps/index.cfm?c=39750&a=133983#hist_dist
- *Conservation District Maps and Properties*:
http://www.portlandonline.com/bps/index.cfm?c=39750&a=133983#cons_dist
- *Historic Resource Inventory (HRI)*:
Note: Paper copies of the 27-volume HRI created in 1984 may be viewed at the Multnomah County Library and the Oregon Historical Society. An Excel table exported from the obsolete database in which most of the HRI data was stored may be downloaded via the following link. This table and information are provided “as is.”
<http://www.portlandonline.com/bps/index.cfm?c=44013&a=146278>

PURCHASING

Bureau of Purchases Sustainable Procurement guidelines:
<http://www.portlandonline.com/omf/index.cfm?c=47576>

Bureau of Purchase PTE Template for LEED projects:
<http://www.portlandonline.com/omf/index.cfm?c=27573&>

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GENERAL GREEN BUILDING EDUCATION

Bureau of Purchases provides scheduled project manager training and on an as needed basis:
<http://www.portlandonline.com/omf/index.cfm?c=27576&>

Bureau of Planning and Sustainability provides trainings by request through the Green Building Program: <http://www.portlandonline.com/bps/index.cfm?c=45837>.

Portland American Institute of Architects – Continuing Education:
http://www.aiaportland.org/continuing_ed.asp#1026

USGBC online courses:
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1760#CCSON>

City of Portland Sustainability Calendar:
<http://www.portlandonline.com/bps/index.cfm?c=42228>

Cascadia Region Green Building Council:
<http://www.cascadiagbc.org/search?SearchableText=trainings>



ADDITIONAL REQUIREMENTS: CITY CODE AND POLICIES RELATED TO GREEN BUILDING

City Code 5.33.080

- The City shall procure products that meet or exceed Energy Star criteria for energy efficiency. This applies to: (a) any equipment that uses electricity, natural gas, or fuel oil; and (b) products that indirectly impact energy use, such as, but not limited to, windows, doors and skylights.
- All paint must be low-VOC by complying with the current standards set forth by the California South Coast Air Quality Management District Rule 1113 for Architectural Coatings, or the VOC and chemical component limits of Green Seal's Standard GS-11, section 4.1.
- Recycled or rebled latex paint with low-VOC properties, as demonstrated by periodic tests conducted by the manufacturer, shall be given preference and used whenever feasible to the

ADDITIONAL REQUIREMENTS: CITY CODE AND POLICIES

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extent that the price differential between the recycled or rebled and virgin latex paint does not exceed the five percent price preference set forth in PCC Section 5.33.080 C.

- To reduce waste and support the recycled latex paint market, all surplus latex paint shall be recycled using a local latex paint recycling program. Surplus paint includes all latex paint in excess of quantities stored for touch-up purposes. Latex paint stored for touch-up purposes may not exceed 5 percent or 5 gallons, whichever is smaller, by volume, to the nearest gallon.

Climate Action Plan

- Reduce carbon emissions from City operations 50 percent from 1990 levels by 2030.
- Require all new City buildings to achieve Architecture 2030 performance targets.
- Adopt and implement green building policies that include third-party certification of energy, water, and waste conservation strategies.
- Purchase or generate 100 percent of all electricity required for City operations from renewable resources, with at least 15 percent from on-site or district renewable energy sources such as biogas and solar.
- Establish video and/or web conferencing capability in all major City facilities.

Green Streets Policy

- Infrastructure Projects in the Right of Way: Incorporate green street facilities into all City of Portland funded development, redevelopment or enhancement projects as required by the City's September 2004 (or updated) Stormwater Management Manual.
- Any City of Portland funded development, redevelopment or enhancement project, that does not trigger the Stormwater Manual but requires a street opening permit or occurs in the right of way, shall pay into a "Percent for Green" Street fund.

Sustainable Procurement Policy

- City employees will procure materials, products or services in a manner that integrates fiscal responsibility, social equity, and community and environmental stewardship.
- Sustainable Procurement resources: www.portlandonline.com/buygreen

Toxics Reduction Strategy

- Purchase and use non-toxic cleaning products, including the products used by janitorial contractors; seek effective, least-toxic alternatives to disinfectants containing toxic substances or presenting other human health hazards.
- Specify low-mercury lamps for all fluorescent lighting, to be recycled at the end of use.
- Utilize integrated pest management practices to reduce/eliminate the use of pesticides of concern.
- Seek to use products that do not contain, release or produce polyvinyl chloride (PVC), heavy metals of concern or dioxins.
- Seek to use (wood & metal) products that are not treated or coated with heavy metals of concern or other toxic substances.

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Sustainable Paper Use Policy (and City Code 5.33.080, City Internal Operations Sustainability Goals)

- All white copier/printer paper must be 100 percent post-consumer waste (PCW) recycled content.
- All other paper products must meet (at minimum) the U.S. EPA Comprehensive Procurement Guidelines (CPG) for paper products.

Buying Lumber and Wood Products

- Purchase/specify responsibly harvested and sourced lumber and wood products (wood not from endangered forests). Check the Rainforest Relief's "Guidelines for Avoiding Wood from Endangered Forests" for information on preferable wood species per type of project/product. http://www.rainforestrelief.org/What_to_Avoid_and_Alternatives/Rainforest_Wood/What_to_Avoid_What_to_Choose.html

CITY STAFF

TOPIC AREA	CITY STAFF	BUREAU	PHONE NUMBER
General questions about policy, LEED and implementation guide	Alisa Kane	Planning and Sustainability	503-823-7082
Sustainable procurement, LEED Architect and Engineer RFP	Stacey Foremen	Purchasing	503-823-3508
Ecoroofs, General	Matt Burlin	Environmental Services	503-823-7863
Sustainable stormwater, General	Emily Hauth	Environmental Services	503-823-7378
Historic Resources, General	Liza Mickle	Planning and Sustainability	503-823-7666
Historic Resources, Central Portland	Nicholas Starin	Planning and Sustainability	503-823-5837
Design Review and Landmarks Commission	Tim Heron	Development Services	503-823-7726
Records management, Historic	Sara Drake	Development Services	503-823-0625
Facilities Services	Wendy Gibson	Office of Management and Finance	503-823-1181

ADDITIONAL REQUIREMENTS: CITY CODE AND POLICIES



PROJECT EXAMPLES

EXAMPLE LEED NC PROJECTS

THE METER SHOP

The Water Bureau's Meter Shop is an example of how LEED NC certification was built into project goals to achieve City requirements. The Meter Shop is a major renovation project. The upgraded building is expected to achieve LEED Gold certification and incorporates a number of green improvements:

- Energy efficient lighting and HVAC systems.
- Energy Star-rated roof (reduces heat island effect).
- Window placement to increase natural lighting and ventilation and reduce energy use.
- Low volatile organic compound (VOC) building materials.
- A portion of the building materials contain recycled content and were procured from local, regional sources.
- Construction waste recycled to LEED standards.
- Solar electric and solar water heating to reduce energy costs and reduce carbon emissions. Solar electric will provide for approximately 8 to 10 percent of the building's normal electrical load. The solar water heating system will provide for 100 percent of water heating needs during 5 to 6 months of the year.
- The process water used to test the water meters will be recycled and re-used, saving approximately 50 percent of water usage from the existing Meter Shop.
- The energy efficiency and HVAC improvements are expected to reduce the Water Bureau's energy and electrical use at this facility by 35 to 45 percent per year.

Budget: \$3.7 million (\$600,000 design; \$3.1 million construction)

of staff to be housed in the building: 20

For more information about the Meter Shop, contact Project Manager Mike Ross at michael.ross@portlandoregon.gov.

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EXAMPLE LEED EBOM PROJECTS

As of December 2009, there are no LEED EBOM projects in the City's portfolio. OMF-Facilities did an analysis of which LEED EBOM credits were likely/unlikely for the Portland Building. To review this analysis, contact Wendy Gibson, 503-823-1181.

The following projects were included to provide examples for project managers to review and highlight the benefits of pursuing LEED EBOM.

THE STANDARD PLAZA

Contact: Carrie Farrar, Sustainability Coordinator 971-321-6239

Via BUSINESS WIRE: Located in downtown Portland, the 217,000-square-foot, Class A home office building was originally built in 1963. The Gold Certification is the USGBC's second-highest rating.

LEED certification of Standard Plaza was based on a number of green design features and operational best practices that positively impact the property itself and the broader community. The sustainability programs successfully implemented at The Standard demonstrate how a building constructed 46 years ago can profitably achieve energy and resource efficiency that compares favorably with newer construction. "Gold" highlights of the Plaza building include:

- Plumbing retrofits which are resulting in a savings of 2.5 million gallons of potable water annually.
- High participation rate of building occupants utilizing alternative modes of transportation for commuting.
- Secure parking for 75 bicycles.
- Green cleaning and recycling programs that are improving indoor environmental quality, reducing toxic chemicals and diverting waste from landfills.
- Using a new "Green Lease" that asks tenants to partner with The Standard to help with green efforts.

To implement these features, The Standard invested more than \$208,000 in efficiency upgrades for equipment, operations and employee practices. These improvements are expected to generate approximately \$111,000 in annual savings, and have a simple payback period of 1.9 years. The energy performance of the building rates in the top 20 percent of similar facilities nationwide and has earned the EPA's Energy Star label, reflecting the company's commitment to being a smart energy consumer. By making the energy-saving improvements to the Plaza, The Standard estimates it will save the company approximately \$1.3 million in utility and operational savings over the next 15 years.

200 MARKET PLACE

The 19-story 200 Market Place building is among the first privately owned buildings in the country to achieve LEED for Existing Buildings (EB) Certification. Originally built in 1973 for Prudential Insurance Company, the Russell Development Company purchased the building in 1988. The owner, a long-time proponent of environmental responsibility, has implemented a variety of sustainable projects over the years. The LEED-EB path was chosen in order to quantify and qualify the facility's green building efforts. The property contains nearly 400,000 square feet of office and retail space and is managed by Cushman & Wakefield of Oregon. One of the most important objectives that the 200 Market project fulfilled was the water fixture retrofits. In addition, a thorough solid waste audit that included a "dumpster dive" was conducted to document the building's waste stream. They also installed the first gas-fired micro-turbine generator.

PROJECT EXAMPLES

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Some of the specific green strategies and achievements include converted smoke evacuation shafts to fresh air intake when outdoor temperature is below 72 degrees, water efficient fixtures and toilets with a 1.5 year payback period and 67 percent return on investment, 31.63 percent water use reduction beyond EPAAct, 96 percent of construction material diverted from the landfill and 81 percent of workspaces have views. – cited from Green Building Services.

OREGON CONVENTION CENTER

Contact: Stephanie Soden 503-274-6589; Ryan Thorpe 503-731-7872

In October 2008, The Oregon Convention Center became the first in convention center in the country to be recertified and achieve LEED-EB Silver rating from U.S. Green Building Council. In 2004, the center was rated LEED-EB, upon completion of the center's expansion. The new "silver" rating required proven sustainability accomplishments among areas of operation, maintenance and capital improvements.

The Oregon Convention Center partnered with Portland-based Green Building Services to earn the requisite points necessary. Areas of focus in the recertification process included installation of low-flow plumbing fixtures, adjustments to HVAC systems and the purchase of 40 percent renewable wind power.

The Oregon Convention Center is owned by Metro and operated by MERC. MERC also manages the Portland Expo Center and Portland Center for the Performing Arts and serves as a catalyst for culture, community and economic development. Visit www.mercvenues.org or www.oregoncc.org for more information.

EXAMPLE OFFICE REMODELS AND TENANT IMPROVEMENTS

Fire Station Upgrades and Renovations

All fire stations that have recently undergone remodeling have incorporated green construction practices that include efficient appliances, daylighting, natural ventilation, low-VOC finishes and furnishings, recycled rubber matting in the exercise rooms, linoleum in specific areas such as restrooms and laundry rooms, and wheatboard cabinets. Whenever possible, these projects have reused furniture and cabinets as well.

FIRE STATION 1

Contact: Connie Johnson 503-823-5562

The renovation of Fire Station 1 was a significant undertaking that included major changes to the building systems, features, and windows. Some of the major alterations included providing separately controlled HVAC zones throughout the workspace, installing efficient air distribution ductwork, upgrading windows, and providing individuals with the ability to adjust lighting to their needs.

Other improvements included noise control for walls, ceilings and floors, and providing green guidelines for maintenance staff. Fire Station 1 has also incorporated recycled paint, linoleum, steel and concrete and the handball court wood floor was salvaged and reused during the renovation. Finally, per standard practices, low-emitting paints, adhesives, and sealants were all used.

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CITYSHAPE FITNESS CENTER, PORTLAND BUILDING

Contact: Paul Wallman, Project Manager, 503-823-6948

The CityShape Fitness Center located in the Portland Building was remodeled in 2007 using the City's Green Tenant Improvement Guide as a guidance tool. Through the remodeling process, the project team implemented several Action Strategies that earned the renovated Fitness Center one of the City's G-Rated TI plaques. Some of the strategies incorporated into the remodel included sustainable flooring, such as bamboo wood flooring and recycled rubber mats. Low-emitting paints, coatings, adhesives and sealants were also used. Additionally, a lighting occupancy sensor, individual lighting controls and T-8 lighting bulbs were incorporated into the design.

In addition to green construction practices and material, the project team included green guidelines for maintenance staff and developed a plan for educating and training staff at initial occupancy and on a continuing basis. In order to ensure these standards were met, a G-Rated TI Checklist and a Guidelines section were included in the specifications, and documentation was gathered.



LEED RATING SYSTEMS AND CERTIFICATION PROCEDURES

WHAT IS LEED?

The LEED green building certification is a metric-based system developed by the United States Green Building Council (USGBC) to define and measure the achievements of "green buildings." The LEED certification process is administered by the Green Building Certification Institute (GBCI).

VERSIONS OF LEED

The LEED Rating System is revised on a regular basis. It is important to consider how a project's timeline affects the LEED eligibility during each phase of a multi-year project. A later phase of a multi-year timeline may be subject to a more current LEED rating system.

EXAMPLE: One of the Water Bureau's Bull Run Ultraviolet (UV) Treatment Facility's buildings may seek a LEED Gold certification. During the conceptual design phase of the project, LEED for New Construction (NC) version 2.2 was the current standard, and was used as a framework for decision making. Later phases of this project are expected to be subject to conforming to the new 2009 version of the LEED NC rating system.

LEED RATING SYSTEMS AND CERTIFICATION PROCEDURES

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LEED has multiple rating systems for different project types, including:

- New Construction and Major Renovations (NC).
- Existing Buildings Operations and Maintenance (EBOM).
- Commercial Interiors (CI).
- Core and Shell (CS).
- Retail (R).
- Homes (H).
- Neighborhood Development (ND).
- Schools (S).

The LEED for New Construction rating system is used as the predominant example for the purpose of this guide. The credits and processes for the other rating systems differ slightly, but possess a similar structure and process for certification.

LEED for New Construction (NC)

There are seven rating categories for LEED 2009 for New Construction and Major Renovations. Refer to the LEED 2009 for New Construction and Major Renovations Guidebook for further explanation of the seven rating categories listed below.

- Sustainable Sites (SS Credits).
- Water Efficiency (WE Credits).
- Energy and Atmosphere (EA Credits).
- Materials and Resources (MR Credits).
- Indoor Environmental Quality (IEQ Credits).
- Innovation in Design (ID Credits).
- Regional Priority (RP Credits).

Within each of the seven categories, there are required actions, or prerequisites, that must be completed for all LEED eligible projects. These prerequisites include criteria like:

- Tobacco smoke control.
- Refrigerant management.
- Storing and collecting recyclables.
- Pollution control during construction.
- Commissioning of the building's energy system.
- Minimum indoor air quality standards.
- Minimum energy performance.

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A menu of additional credits for each impact category can also be awarded. The total points a project earns depends upon which credits are chosen and successfully implemented. Some credits have a greater overall impact on the project, and are worth more LEED points. A LEED NC Gold level certification requires a rating of 60-79 points out of a maximum of 110 points.

LEED NC is not right for every project.

In addition to the exclusions outlined in the Definitions section, when determining whether or not your project is a good fit for LEED NC certification, confirm that it can meet the Minimum Program Requirements (MPR) identified by United States Green Building Council which states that projects must:

COMPLY WITH ENVIRONMENTAL LAWS

The LEED project building or space, all other real property within the LEED project boundary, and all project work must comply with all applicable federal, state, and local building-related environmental laws and regulations in place where the project is located. This condition must be satisfied from the date of LEED project registration or the initiation of schematic design, whichever comes first, until the date that the building receives a certificate of occupancy or similar official indication that it is ready for use.

BE A COMPLETE, PERMANENT BUILDING OR SPACE

All LEED projects must be designed for, constructed on, and operated on a permanent location on already existing land. No building or space that is designed to move at any point in its lifetime may pursue LEED Certification. LEED projects must include the new, ground-up design and construction, or major renovation, of at least one building in its entirety. Additionally, construction prerequisites and credits may not be submitted for review until substantial completion of construction has occurred.

USE A REASONABLE SITE BOUNDARY

- 1. The LEED project boundary must include all contiguous land that is associated with and supports normal building operations for the LEED project building, including all land that was or will be disturbed for the purpose of undertaking the LEED project.*
 - 2. The LEED project boundary may not include land that is owned by a party other than that which owns the LEED project unless that land is associated with and supports normal building operations for the LEED project building.*
 - 3. LEED projects located on a campus must have project boundaries such that if all the buildings on campus become LEED certified, then 100 percent of the gross land area on the campus would be included within a LEED boundary. If this requirement is in conflict with MPR #7, Must Comply with Minimum Building Area to Site Area Ratio, then MPR #7 will take precedence.*
 - 4. Any given parcel of real property may only be attributed to a single LEED project building.*
 - 5. Gerrymandering of a LEED project boundary is prohibited: the boundary may not unreasonably exclude sections of land to create boundaries in unreasonable shapes for the sole purpose of complying with prerequisites or credits.*
- 4. Must Comply with Minimum Floor Area Requirements.
The LEED project must include a minimum of 1,000 square feet (93 square meters) of gross floor area.*

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COMPLY WITH MINIMUM OCCUPANCY RATES

The LEED project must serve 1 or more Full Time Equivalent (FTE) occupant(s), calculated as an annual average in order to use LEED in its entirety. If the project serves less than 1 annualized FTE, optional credits from the Indoor Environmental Quality category may not be earned (the prerequisites must still be earned).

COMMIT TO SHARING WHOLE-BUILDING ENERGY AND WATER USAGE DATA

All certified projects must commit to sharing with USGBC and/or GBCI all available actual whole-project energy and water usage data for a period of at least 5 years. This period starts on the date that the LEED project begins typical physical occupancy, if certifying under New Construction, Core & Shell, Schools, or Commercial Interiors, or the date that the building is awarded certification, if certifying under Existing Buildings Operations & Maintenance. Sharing this data includes supplying information on a regular basis in a free, accessible, and secure online tool or, if necessary, taking any action to authorize the collection of information directly from service or utility providers. This commitment must carry forward if the building or space changes ownership or lessee.

COMPLY WITH A MINIMUM BUILDING AREA TO SITE AREA RATIO

The gross floor area of the LEED project building must be no less than 2 percent of the gross land area within the LEED project boundary.

Read more here: <http://www.usgbc.org/ShowFile.aspx?DocumentID=5546>

WHAT IS THE GENERAL PROCESS FOR LEED CERTIFICATION?

In order to receive certification, all prerequisites in each impact category above must be met. In addition, the Project Manager and Design Team must meet the City's performance requirements outlined in the previous sections. To achieve a LEED Gold rating, 60-79 total points are required.

Step 1: Select the Project Team

The Project Team may consist of the Project Manager, Architects, Landscape Architects, Engineers, LEED Accredited Professional who will serve as the LEED Project Administrator, the Building Contractor, and a Commissioning Agent. Each LEED credit and prerequisite has a unique set of documentation requirements that must be completed. While preparing the application, the project team selects the credits it has chosen to pursue and assigns the credits to the responsible team members.

Step 2: Draft Contracts

The Bureau of Purchases has examples of contract language that establishes and defines green building practices for new construction and major renovations (<http://www.portlandonline.com/omf/index.cfm?c=27573&>). It is important that any contract language includes reference to the LEED NC requirements when necessary to ensure credit compliance.

Project managers should include in the specifications language that requires construction techniques

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that minimize site impacts, provides for on-site stormwater management, maximizes use of alternative transportation, implements waste reduction strategies, promotes energy and water conservation, addresses the health issues relating to construction and indoor environments, utilizes day-lighting and natural ventilation strategies, and supports the use of durable, low maintenance materials as well as “environmentally preferable” local products. Specification language should also incorporate requirements from related City policies, as outlined in the Additional Requirements: City Code and Policies Related to Green Building section.

Step 3: Register

A LEED Project can be registered at anytime. Registering a project is a declaration of intent to certify a project under the LEED rating system. Registration provides access to LEED Online, software tools, critical communications and sample templates, all of which can assist with credit compliance. At the very minimum, registration must occur prior to application submittal. A flat fee is required to be paid at the time of registration.

Following registration, the Project Team should begin to collect information and perform calculations for all prerequisites and credits the project intends to pursue. This information will be submitted later for the application review process.

Step 4: Engage Commissioning Agent

Building commissioning helps ensure that building systems, like HVAC, operate efficiently, meet the needs of the end user, function as designed, and maintain occupant comfort. In the case of LEED certified buildings, commissioning verifies that points awarded for credits related to building operation are deserved. LEED Credits are also awarded for the act of commissioning in the Energy and Atmosphere rating category. Commissioning becomes more important as building technologies become more complex. The key elements of building commissioning include:

- *Thorough documentation of system design intent, operating sequences, and test procedures.*
- *Verification of system performance based on extensive functional testing and measurement.*
- *Training of building operations staff on system operation and maintenance procedures.*
- *Ongoing monitoring of system performance.*

Typically, an independent third party “Commissioning Agent” is contracted to perform commissioning. Commissioning begins during pre-design and continues through occupancy of the building. (Cited from Western Area Power Administration, US Dept. of Energy, www.wapa.gov/es/pubs/techbrf/blldcomm.htm)

Step 5: Submit Application

LEED documentation must be submitted by the designated LEED Project Administrator. There are deadlines for submittal called Rating System Sunset Dates. The submittal process for LEED NC can be broken down into two phases, Design and Construction. It is recommended that the LEED project team submit documentation to the USGBC in two phases:

- *The first submittal during the Design Phase will include the design credits and will be submitted for review prior to completion of final contract documents. This will allow for a project status review and potential modifications to the design prior to construction.*
- *The second submittal will include the construction credits and any remaining design credits not submitted for initial review. This submittal will take place after building occupancy in order to gather complete data on construction and commissioning.*

Once all credits are submitted during the Construction Phase, a final ruling on all credits is determined. The two-phase submittal allows project teams confirm whether or not they are on track to secure the level of certification desired and provides an opportunity for the team to redesign any credits that are not in compliance.

Step 6: Application Review by GBCI

The review occurs in up to two phases. It can be performed as a Combined Design and Construction Review, or as Split Design and Construction Reviews. In either case, there is a preliminary review followed by an optional final review. During this review, all documentation submitted with the application is reviewed for completeness. Each prerequisite and credit is designated as ‘anticipated,’ ‘pending,’ or ‘denied,’ and all project information forms are designated as ‘approved’ or ‘not approved’ and are accompanied by technical advice from the GBCI review team. The results of the preliminary review may be accepted, or the Project Team may respond to the GBCI review team’s technical recommendations. The submittal of a response to the preliminary review will trigger a final review.

Certification fees are due at the time of application review. The amount of these fees is determined based on the scale of the project and the rating system selected.

Optional Appeal – *A Project Team can elect to appeal a final decision by the LEED review team from GBCI. Appeals of final review decisions must occur within 25 business days of GBCI’s posting of the final review decision, and is subject to appeal review fees.*

Step 7: Certification

This is the final step in the LEED process. Once the final application review is complete, project teams can accept or appeal the final decision. Upon acceptance of the decision, a certificate will be issued.

For more information about LEED, please visit the USGBC’s website, www.usgbc.org.