

# TESTIMONY SIGN-UP FOR

35849

TC 9:30am - Green Building Initiative (Agenda # 1746)

IF YOU WISH TO SPEAK TO THE CITY COUNCIL,  
PLEASE PRINT YOUR NAME AND ADDRESS BELOW

NAME

ADDRESS & ZIP CODE

	NAME	ADDRESS & ZIP CODE
1	Tom PALADINO	6815 32ND AVE NE Seattle 98115
2	Steve CLAPP	REH CONSTRUCTION 97205 1530 SW TAYLOR ST PORTLAND
3	HANK ASHFORTH	ASHFORTH PACIFIC INC 875 NE MULTNOMAH PORTLAND
4	Ric Williams	MOLIN MARK 111 SW Columbia St
5	Doug Glancy	REACH CDI 1135 SE Salmon Portland 97214
6	KEZICIA TRADER	PDC
7	Margaret Mahoney	OPDR
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Date: 12/15/99

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## **Green Building Initiative**

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9:30-10:30 AM

City Hall Council Chambers

Downtown Portland, 1221 SW 4th Ave

### **Presentations:**

- Bob Wise, Chair, Sustainable Portland Commission - Introduction
- Susan Anderson, Director, Portland Energy Office - *Green Building Initiative* overview (10 minutes)
- Tom Paladino, President, Paladino Consulting - The advantages of going green (15 minutes)

### **Testimony (3 minutes each):**

- ✓ Lucia Athens, Sustainable Design and Construction Specialist, Seattle City Light - City of Seattle takes the LEED
- ✓ Steve Clapp, R & H Construction
- ✓ Rick Williams, Project Consultant, Melvin Mark
- ✓ Hank Ashforth, President, Ashforth Pacific
- ✓ Doug Glancy, Housing Development Coordinator, REACH Community Development
- ✓ Suzanne Zuniga, Executive Director, Portland Community Design
- ✓ David Kish, Director, Bureau of General Services
- ✓ Margaret Mahoney, Director, Office of Planning and Development Review
- ✓ Felicia Trader, Director, Portland Development Commission

7/15/99

## **DRAFT Sustainable Design, Construction and Operations Policy**

*This Draft policy has been developed by the City of Seattle's interdepartmental Green Building Team which includes representatives from City Light, SPU, the Facilities Division of ESD, DCLU, the Office of Environmental Management and the Lighting Design Lab. When completed, it will be incorporated into the City's Environmental Management Program.*

### **6.9 Sustainable Building**

#### **6.9.1 Purpose**

The purpose of a Citywide policy on sustainable design, construction and operations is to demonstrate the City's commitment to environmental, economic, and social stewardship, to yield cost savings to the City taxpayer's through reduced operating costs, to provide healthy work environments for staff and visitors, and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. Additionally, as a leader the City helps to set a community standard of sustainable building.

#### **6.9.2 Organizations Affected**

All City departments and offices and their contractors responsible for financing, planning, designing, developing, constructing and managing city-owned facilities and buildings.

#### **6.9.3 Definitions**

##### **Sustainable Design, Construction and Operations**

Sustainable building integrates building materials and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. Sustainable design, construction and operations merges sound, environmentally responsible practices into one discipline that looks at the environmental, economic and social effects of a building or built project as a whole. These sustainable aspects of the development process encompass the following broad topics: efficient management of energy and water resources, management of material resources and waste, protection of environmental quality, protection of health and indoor environmental quality, reinforcement of natural systems, and integrating the design approach.

##### **Life Cycle Cost Analysis**

An inclusive approach to costing a program, facility, or group of facilities that encompasses planning, design, construction, operation and maintenance over the useful life of the facilities and finally any decommissioning or disassembly costs. Life Cycle Cost Analysis looks at the net present value of design options as investments. The goal is to achieve the highest, most cost-effective environmental performance possible over the life of the project.

##### **LEED Rating System**

LEED stands for Leadership in Energy and Environmental Design, and is a voluntary, consensus-based, market-driven green building rating system. It is based on existing, proven technology and evaluates environmental performance from a "whole building" perspective. LEED is a self-certifying system designed for rating new and existing commercial, institutional, and multi-family residential buildings. It contains prerequisites and credits in five categories: Sustainable Site Planning, Improving Energy Efficiency, Conserving Materials and Resources, Embracing Indoor Environmental Quality, and Safeguarding Water. There are four rating levels: Bronze, Silver, Gold, and Platinum.

#### **6.9.4 Policy**

It shall be the policy of the City of Seattle to finance, plan, design, construct, manage, renovate, maintain, and decommission its facilities and buildings to be sustainable. This applies to new construction and major remodels in which the total project square footage meets the criteria given. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system and accompanying

Reference Guide shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards. All facilities and buildings over 5,000 gross square feet of conditioned space as defined by the Seattle Energy Code, shall meet at minimum LEED Silver rating. The Office of Environmental Management shall establish the minimum number of credits required in each of the LEED categories so that projects shall show demonstrate performance in all categories.

Design and project management teams are encouraged to meet higher LEED rating levels. A Mayor's Award for achieving a higher rating will be awarded. (See also *Energy and Water Conservation Policy and Landscape and Grounds Management Policy*)

### **6.9.5 Procedures and Responsibilities**

The Directors of all City Departments shall be responsible for ensuring that facilities and buildings shall comply with 6 9 4

The City's Office of Environmental Management (OEM) shall be responsible for coordinating any educational, technical and financial resources available to City departments that support and promote sustainable design and construction of city facilities. The City's OEM shall be responsible for annually evaluating and reporting to the Oversight Panel how well applicable City construction projects meet the goal of sustainability.

The City's Green Building Team, under the OEM, shall be responsible for reviewing and updating the City portion of the LEED reference manual annually, for providing technical expertise on specific sustainable building issues on a case by case basis, and coordinating LEED training programs.

### **6.9.6 Budgeting and Financing**

All capital construction which falls under this policy will be expected to budget to meet at minimum the LEED Silver rating. Budget planning and life cycle cost analysis to achieve a higher rating of gold or platinum is encouraged.

### **6.9.7 Training**

City capital project managers currently managing or likely to manage projects which fit the criteria in 6 9 4 will be responsible to attend introductory LEED training and annual follow-up training. LEED training will be offered through the Office of Environmental Management.

### **6.9.8 References**

*City of Seattle Sustainable Building Action Plan*  
*Seattle's Solid Waste Plan On the Path to Sustainability*  
*USGBC LEED Reference Manual*

### **For more information contact:**

Lucia Athens  
Chair, Green Building Team  
Seattle Public Utilities Resource Conservation  
684-4643

7/15/99

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Lucia Athens  
Chair, Green Building Team  
Seattle Public Utilities Resource Conservation  
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35849 #1746



CITY OF

**PORTLAND, OREGON**

**Dan Saltzman, Commissioner**  
1221 S.W. 4th Avenue, Room 230  
Portland, Oregon 97204  
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Internet: dsaltzman@ci.portland.or.us

DATE: December 14, 1999

TO: Mayor Katz  
Commissioner Francesconi  
Commissioner Hales  
Commissioner Sten

FROM: Dan Saltzman *Don*

RE: Sustainable Development and Green Building Incentive Plan

I appreciated the opportunity to discuss sustainable development at our retreat last week, and I hope my descriptions of sustainable development practices did it justice. In case they did not, I have enclosed a description of the **green innovations** in an office building recently built in King County. I also have included illustrations of many of the green investments to restore our rivers and streams and to reduce stormwater flow that we are proposing in the Clean River Plan.

I wanted to follow up on our discussion of what a temporary green building incentive fund might look like. As we discussed, a fundamental roadblock to green building is that those who build are not the same as those responsible for its operation and maintenance. As such, a builder seeks to minimize up-front costs, often at the expense of very worthwhile green investments with benefits over time to the operator and to the larger public. In the competitive office/industrial leasing market, there is no premium paid for green office or flex space like there is for other amenities or parking. It's slightly better in the multifamily residential market.

We need to develop a new building type that recognizes work life as a quality of life issue and rewards buildings that provide more fresh air, creative stormwater management, more daylight in interior spaces, improved air quality and increased energy and water conservation.

-OVER-

A green building incentive fund could catalyze substantial green building investments during this period in which Portland is undergoing significant redevelopment that will shape our city for years to come. I believe a properly leveraged incentive fund of \$1 to \$2 million/year for the next five years could really put Portland on the map as one of the seven wonders of the sustainable world. The incentive fund would be for multifamily residential and commercial/industrial that incorporate the best in low impact development and operation.

Sources for the incentive fund could come from the general fund, housing trust fund and tax increment, where applicable. I could also see the HCD block grant as a logical source for greening low and moderate income housing investments.

The green building incentive fund will also help to bolster our already significant reputation in this arena. Sustainable development is one of our targeted industries and we are gaining global prominence. We have an International Sustainable Development Foundation in Portland. Our professional services, technology products, and design/build services are among the leaders in applying sustainable development principles. Nike is far and away the most committed company in the US to green buildings from manufacturing to retail.

If I have your conceptual support, I would like to work with bureau managers and others to refine the qualified investments for a green building incentive fund.

I look forward to talking with you more about this.

Attachments:

*King County green office building description*  
*BES illustrations of green stormwater management investments*



# Seattle's Green Building

King Street Center Showcases Sustainable Construction and Operation

BY THERESA KOPPANG

The Evergreen State just got greener, thanks to the recent opening of the King Street Center office building in Seattle. Located near Pioneer Square, this eight-story structure harmonizes with the neighborhood's historic architecture while modeling the latest in resource-saving materials and methods.

King Street Center is the county's first project to be built by a partnership of public agencies and private contractors. The building's two major tenants, King County's Department of Natural Resources and Department of Transportation, wanted their new home to reflect their resource conservation missions, but eco-friendly features were neither budgeted nor included in the original design. Project Manager Laurel Rhoades, of the County's Department of Construction and Facilities Management, recalls the challenge: "We hadn't originally planned for the King Street Center to be a 'green' building. Initially, there was a bit of uncertainty and lots of questions from our developer and contractors."

However, developer Wright Runstad and general contractor Lease Crutcher Lewis and its numerous subcontractors faced the challenge with enthusiasm and ingenuity. They included progressive, environmentally friendly approaches in the building's

design, construction and operation, while staying within the project's budget and timeline. "It's really important to stress that sustainable building methods work," Rhoades emphasizes. "And the effort exerted to adhere to the sustainable building philosophy was well worth it. Beside the environmental benefits, there are cost and public relations benefits as well."

## SUSTAINABILITY FROM THE GROUND UP


"Sustainable" or "green" buildings ride on three basic principles: resource conservation, energy efficiency, and preserving and enhancing environmental quality. In keeping with the first principle, the King Street Center team managed to salvage and recycle 80 percent of its job-site materials. Included were 3,832 tons of concrete, 2,351 tons of contaminated soil, 668 tons of granite, 136 tons of wood waste, and 44 tons of steel. This outstanding effort qualified the general contractor for membership in the County's Construction Works Program. Construction Works recognizes companies that recycle on their job-sites, use recycled-content building materials and prevent waste from happening in the first place. Contractors like Lease



Crutcher Lewis raised the bar for their industry. They were able to reach an 80 percent job-site recycling rate on an urban site. To view case studies of Construction Works members visit the Web site at [www.metrokc.gov/dnr/swd/greenwrk/cdlstudy.htm](http://www.metrokc.gov/dnr/swd/greenwrk/cdlstudy.htm)

## LIGHTENING UP WITH LIGHTING

King Street Center includes a wealth of techniques and technologies that conserve energy. At a maximum of 86 watts per square foot—28.4 percent leaner than the code levels—its lighting system is the most energy-efficient to date within Seattle. Offices are arranged to make the most of the exterior perimeter's daylighting. Meanwhile, Seattle contractors Cochran Electric and Lambda Lighting used strategic light placement, occupancy sensors, and daylighting dimmers to reduce electricity use by responding to the level of daylight and the number of workers occupying



the offices. To address another major item in any building's energy budget, contractors installed heating, ventilating and air conditioning (HVAC) units that operate on variable speed drives for energy efficiency.

### **SAVING UP ON RAINY DAYS**

An especially resourceful and progressive feature of the King Street Center capitalizes on Seattle's most famous feature—rain. An on-site water reclamation system collects storm runoff that would normally flow into the sewer system, and stores it in three large storage tanks in the basement garage. After filtering, the water is used for flushing toilets. The project team estimates that 1.4 million gallons of water will be collected annually, which translates to roughly 64 percent of the water usage for flushing in the building. A domestic back-up water system is available if rainfall is inadequate.

### **ENVIRONMENTAL QUALITY ON THE JOB**

King Street Center's interiors are designed to provide a healthy, environmentally sound workplace for the estimated 1,500 people who will ultimately work there. Indoor air quality is a major health concern in many modern offices, but occupants of King Street Center are breathing easy, thanks in part to a roof-top enhanced air filtration system that provides 60 percent outside air filtration—nearly double the quantity of the average office building. To keep indoor air clean, copy rooms are "stacked" in the same location of each floor and are continually ventilated to the outside to eliminate particulates from copier toner. Designers also chose low-Volatile Organic Compound (VOC) options for materials such as adhesives and finishes that otherwise off-gas into the air, low-VOC latex paints recycled by King County's Hazardous Waste collection program, and brighten some interior surfaces.

### **WALKING ON BROKEN GLASS**

King Street Center's spacious modern interior does double duty as a showcase for recycled-content materials. Each elevator lobby is a "performance lab," demonstrating a different combination of clearly labeled, recycled-content wall finishes and flooring. Visitors and staff tread on such materials as "Environmental Stones," non-porous floor tiles made with 100 percent recycled glass, and "ASTRA" concrete tiles, which contain recycled beer bottles.

King Street Center is also home to the West Coast's largest installation, fully 32,000 square yards, of recycled carpeting. To make "Earthsquares," the Milliken Company collects old carpeting, cleans, fluffs, re-dyes and re-patterns it. The recycled product is long-wearing, more cost-effective than new carpeting, and uses a water-based adhesive that does not emit airborne toxins.

The appeal—both financial and aesthetic—of recycled carpet so impressed developer Wright Runstad that they are considering the product for use in other properties. It's a favorable response not lost on project manager Rhoades. "One of the positive side effects of sustainable building projects like King Street Center," she observes, "is that builders and contractors are introduced to the quality and affordability of using sustainable materials."

### **GREENER EMPLOYEES**

Tenants started moving into King Street Center in June 1999, and were immediately met with improved options for waste prevention. King County's Green Works Business Assistance program ([www.metrokc.gov/dnr/swd/greenwrk/](http://www.metrokc.gov/dnr/swd/greenwrk/)) helped produce common-sense solutions to workplace waste. In addition to using recycling bins in lunchrooms and beside desks, employees are encouraged to save paper by using electronic communication and storage and by making double-sided copies. A "re-use" room stores re-usable office supplies such as files, folders, and envelopes, saving money and resources. Lunchrooms come equipped with durable dishware

and storage containers, and energy- and water-efficient dishwashers to clean them, cutting down on paper and plastic disposables.

While the building houses 500 parking spaces, it also encourages clean commuting. A designated bike room features rack space for 80 bicycles, and there are showers for bike commuters.

### **BUILDING A SUSTAINABLE TRADITION**

The Pacific Northwest leads the nation in building with sustainable techniques and materials. In the Puget Sound area alone, 33 recycled-content buildings and landscapes demonstrate how efficient, cost-effective, and attractive these projects can be. Seattle projects include Pier 66, the Port of Seattle headquarters, and the Recreation Equipment, Inc. (REI) flagship store, which was voted one of the top ten Earth Day 1999 resource-efficient buildings by the American Institute of Architects.

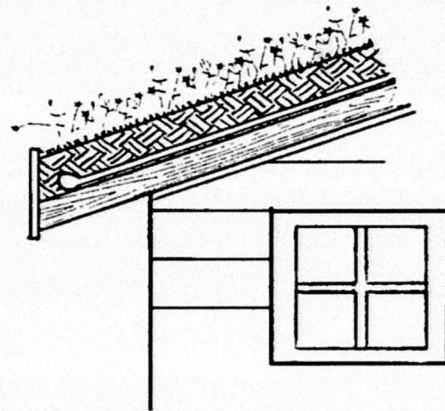
By participating in the building of King Street Center, the area's most resource-efficient building to date, King County is setting an example for builders, taxpayers, and other local governments. Anyone visiting or working in the building is introduced to the quality of recycled materials, employees are learning enhanced recycling options for the workplace and home, and design and building professionals will have a new standard of what can be accomplished—on time and on budget—while saving resources. It's an example worth building on. ♦

*Theresa Koppang is the Construction Works Program Manager with King County's Department of Natural Resources.*

### **POSTSCRIPT**

*The King County Procurement Program, set up for private and public contractors interested in contracting with King County projects, encourages companies that offer "green" products or eco-friendly construction methods to offer bids for contracts. For more information, visit [www.metrokc.gov/procure/green/](http://www.metrokc.gov/procure/green/)*

## Green/Landscaped Roofs



**Description:** The term green roof is used to describe many types of eco-roof systems of varying complexity. A traditional roof garden is a deep soil, irrigated system. An ecological roof garden is composed of a thin soil layer, and has little or no irrigation. Both can be installed on commercial or residential houses or buildings. The entire roof does not have to be eco-roofed for a roof to be classified as a green roof. Potted plants, trees, and small flower beds on a terrace can also constitute green roofs.

**How it Functions:** Stormwater is trapped in the plants and soils until it reaches its saturation point, at which point it runs off, through a drainage layer to the downspouts. A green roof helps to reduce CSOs by retaining the peak flow from a storm. Trees and shrubs in pots intercept rainfall before it reaches the roof top and through evapotranspiration runoff is reduced.

**Implementation/Constructability:** It may be difficult to get materials to the site, there may be limited access to the rooftop. Waterproof membranes and construction need to be high quality, in order to prevent leaks, sediment loss, and loss of vegetation, before it has been established. If a green roof is designed to hold a large volume of water, structural reinforcement may be necessary.

**Limitations:** A green roof adds to the deadload of the structure. Retrofitting may be difficult and expensive. Not effective at reducing runoff on very steep roofs.

**Example of Previous Use:** Several examples of green roofs are noted in the City of Portland, Oregon. PacWest Building, utilizes green roofs in two terraces on the 3rd and 20th floors. They consist of raised beds with pathways made of stone. Green roofs were also implemented at the Federal Courthouse; Crown Plaza has planter boxes and grass area; and Standard Insurance Plaza has a terrace. A developer in Kiel, Germany has covered 30,000 sqm of roofs with turf.

**Advantages:**

- Good insulation properties
- Reduction of stormwater runoff
- Masks ugly rooftops
- Acoustic insulation
- Attractive to clients and owner
- Psychological benefits to people seeing greenery
- Reduce urban "heat-island" effect/lower water temperature of runoff

**Disadvantages:**

- Thin soils can freeze
- Structural problems with existing structure
- Unattractive to some, especially in winter
- Higher cost
- Need irrigation and drainage
- Getting materials onto roof
- Problem if membrane leaks

**Attributes:**

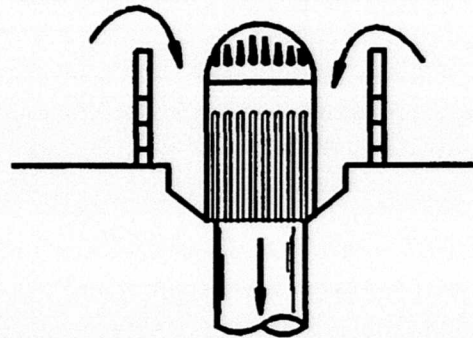
- Initial costs \_\_\_\_\_ ●
- Operation and maintenance costs \_\_\_\_\_ ●
- Overall effectiveness \_\_\_\_\_ ●
- Understandable to the public \_\_\_\_\_ ●
- Flexibility with respect to local objectives \_\_\_\_\_ ●  
and conditions

**KEY**

- High
- Moderate
- Low

**For More Information:** *Building Green*, Johnston, Jacklyn & Newton,  
John, London Ecology Unit, London

## Rooftop Storage



**Description:** Stormwater can be detained on a flat roof by installing flow restrictors on roof drains. Relatively flat roofs are usually designed to hold a substantial live load and are protected against leakage.

**How it Functions:** A flow restrictor fitted with a debris strainer is installed into the existing downspouts. Water ponds to a depth governed by the restrictor. Once maximum ponding depth is achieved water spills freely into the downspout.

**Implementation/Constructability:** Existing downspouts are easily fitted with restrictors. Roof tops will need to be adequately water-proofed to prevent against leakage. The roof and building structure must be designed or modified to carry the additional load of ponded water. The allowable drainage rate must be determined and maintained.

**Limitations:** Limited to flat roofs where ponding will not create structural or water damage problems. There are not many roofing manufacturers that will warrantee roofing materials for inundation. Zinc, copper, and lead may leach out of galvanized roofing materials found on industrial roofs.

**Example of Previous Use:** None located, yet.

**Advantages:**

- Amount of detention easily quantifiable
- Roofs typically need no structural modifications
- Use of existing facilities is maximized

**Disadvantages:**

- Failure to incorporate an emergency overflow plan will cause damage
- Clogged openings may result in damages
- Poor maintenance can result in flooding/excessive ponding
- Failures are catastrophic
- Risk of leakage
- Risk of excessive loads

**Attributes:**

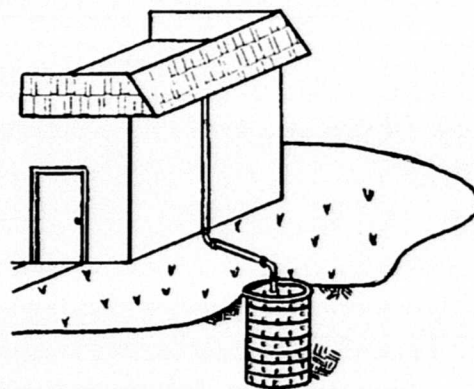
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and conditions

**KEY**

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**For More Information:** "Is Rooftop Runoff Really Clean?" Watershed Protection Techniques, Volume 1, Number 2, Technical Note 25. Summer 1994.

## Roof Downspout Disconnection



**Description:** Roof drains can be piped to a separate storm sewer or to on site dry wells. Dry wells are installed on private property, convey only flow generated from roofs on that property, and are maintained by property owners.

**How it Functions:** Roof drains divert flow in the following ways:

- To on site dry wells; does not contribute stormwater to collection system
- To street gutter via overland flow or underground laterals; stormwater is currently collected by inlets, now could be captured by sumps or stormwater treatment facility
- To sewer via a separate connection near the street; some of these directly connected drains could be discharged to gutters

**Implementation/Constructability:**

- Currently the commercial owners do not have an incentive or requirement to implement
- Requires separate stormwater removal system
- Commercial stormwater detention products are available to be integrated into a commercial downspout disconnection program

**Limitations:** Dependent on site soil characteristics, i.e. sumpability. Galvanized roof tops may have high heavy metal concentrations and introduce pollutants to the ground water, if sumped.

**Example of Previous Use:** Commercial downspout disconnection sites in Portland are being researched. Numerous private residences are participating in the City of Portland's downspout disconnection program.

**Advantages:**

- Potential for large inflow reductions in areas previously considered untouchable by cornerstone projects
- Sedimentation increases
- Large potential for infiltration given appropriate soil conditions
- Amount of stormwater from the CSO system is quantifiable

**Disadvantages:**

- Need to find an incentive for owners to implement
- Strictly limited by site characteristics
- Heavy metals from galvanized roofing materials may introduce pollutants to ground water

**Attributes:**

- Initial costs \_\_\_\_\_ ○
- Operation and maintenance costs \_\_\_\_\_ ●
- Overall effectiveness \_\_\_\_\_ ●
- Understandable to the public \_\_\_\_\_ ●
- Flexibility with respect to local objectives and conditions \_\_\_\_\_ ●

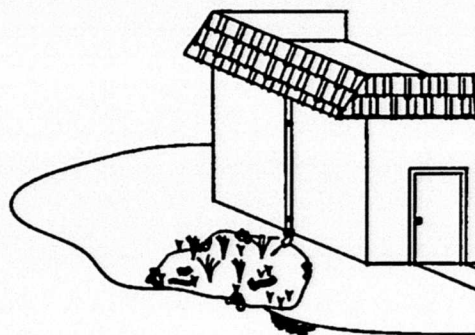
**KEY**

- High
- Moderate
- Low

**For More Information:** Interim Control Measures Study (HDR Engineering, May 1993).  
City of Portland, Bureau of Environmental Services, 1994 CSO Management Plan



## On-Site Capture & Treat



**Description:** On-site capture and treat facilities include but are not limited to, rain gardens and naturescaping. These facilities capture and treat stormwater to varying degrees, before releasing it to the combined system or recharging it to the groundwater. Suspended solids, BOD, COD, nutrients, and heavy metals are pollutants removed from the system through biodegradation, volatilization, and bioaccumulation into plants. In addition to water quality improvements, these facilities provide and improve wildlife habitat.

**How it Functions:** Stormwater enters the capture and treat facility via a roof drain disconnect or a pipe system. The detained water may infiltrate and/or evaporate. Infiltration and evaporation reduce the amount of storm water added to the combined system. Water quality is improved through sedimentation and plant uptake where pollutants sorb to soil particles which settle out in the facility, and plants take up nutrients.

**Implementation/Constructability:** Pretreatment facilities should be constructed to treat stormwater effluent from manufacturing or industrial areas. Rain gardens and naturescaping may be used in place of roof drain pipe which is now connected to the combined system.

**Limitations:** Slowly percolating soils, or shallow ground water tables may cause inundation of soil. May be difficult to get the community to voluntarily retrofit areas, and neighborhoods.

**Example of Previous Use:**

**Advantages:**

- Take advantage of natural soil pollutant removal processes
- Easy to monitor, modify, and maintain
- Meets multiple objectives such as water quality, habitat, education, detention, and creates open spaces

**Disadvantages:**

- Requires incentives for owners to retrofit existing sites
- Areas with high suspended solids may clog soils and prevent infiltration

**Attributes:**

Initial costs _____	●
Operation and maintenance costs _____	●
Overall effectiveness _____	●
Understandable to the public _____	●
Flexibility with respect to local objectives and conditions _____	●

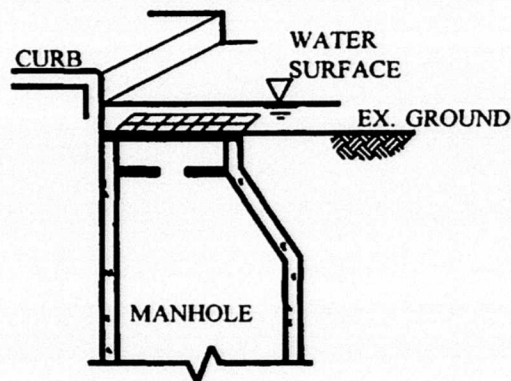
**KEY**

- High
- Moderate
- Low

**For More Information:** City of Portland Stormwater Quality Facilities, a Design Guidance Manual. March 1995.

EPA Project Summary, Potential for Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration, by Robert Pitt, Shirley Clark and Keith Parmer. EPA/600/sk 814/05. May 1994

## Impervious Storage



**Description:** Parking lots, storage yards, and other paved surfaces can be used as stormwater detention sites, while maintaining the original function of the area (i.e. parking lots for parking). Sites can be designed using speed bumps and inlet controls so that water only ponds during heavy rainfall events, and so ponding remains for only a short duration after the rainfall event has stopped.

**How it Functions:** Catch basins or manholes are fitted with flow restriction devices which cause water to backup during periods of intense rain. Water fills the catch basin or manhole and ponds on the surface above. Other inlets on the site are not restricted, which prevents ponding from covering areas that should not be obstructed.

**Implementation/Constructability:** Existing catch basins are easily fitted with a flow restrictor which causes the system to surcharge as designed during times of high flow.

**Limitations:** May only be used in areas which can accommodate periodic ponding. Owners must accept the idea. Inlets must be maintained to prevent clogging and continuous storage. May not be effective in areas with long steady rains where ponding would occur frequently.

**Example of Previous Use:** None determined, yet.

**Advantages:**

- With a good seal coat, no structural modification of pavement surface is needed
- Use of existing facilities is maximized

**Disadvantages:**

- Failure to incorporate an emergency overflow plan may cause damage
- Clogged openings may result in damage to subgrade and pavement that has been inundated
- Loss of parking spaces during storms
- Water temperatures may increase during summer storms

**Attributes:**

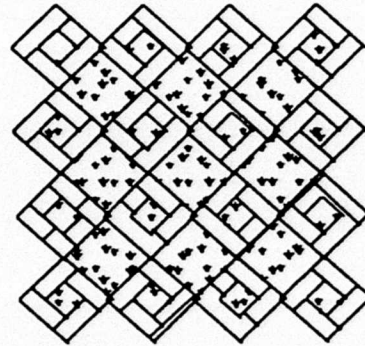
- Initial costs \_\_\_\_\_ ○
- Operation and maintenance costs \_\_\_\_\_ ●
- Overall effectiveness \_\_\_\_\_ ●
- Understandable to the public \_\_\_\_\_ ●
- Flexibility with respect to local objectives and conditions \_\_\_\_\_ ○

**KEY**

- High
- Moderate
- Low

**For More Information:** APWA, Urban Stormwater Management, Special Report No. 49, American Public Works Association. Chicago, Illinois, 1981.

## Porous Pavement Systems



**Description:** Permeable pavements are designed to function with similar characteristics of typical pavements, with the added feature of allowing water to infiltrate through it. Three categories for permeable pavements include poured-in-place pervious concrete and porous asphalt, unit paver-on-sand, and granular materials.

**How it Functions:** Permeable pavements provide the structural and functional characteristics of typical impervious pavements. Permeable pavements are designed with void spaces which allow water to infiltrate through the pavement and reach the subsurface. Permeable pavements are designed such that small particles do not clog the void spaces between the larger voids.

**Implementation/Constructability:** Easily implemented in areas of high permeability. A person crew can saw-cut and remove existing impervious concrete sections and install a slotted brick area.

**Limitations:** Most effective in areas of high permeability. However, combined with a French drain or other storage technology may have merit.

**Example of Previous Use:** San Francisco, California has attempted to use pervious asphalt but lack of conclusive testing, relative unfamiliarity, and special requirements have made the success of pervious asphalt in that area limited.

Waterfront Park, Portland, Oregon has permeable pavement near the fountain at the river.

**Advantages:**

- Easily installed or retrofitted in small areas
- Attractive patterns can be used and varied for different locations
- Easily maintained by removing individual broken or loose bricks

**Disadvantages:**

- Potential tripping hazard for pedestrians
- Placement governed by soil permeability
- Weed maintenance may be required
- Lack of independent testing limits knowledge of long term performance

**Attributes:**

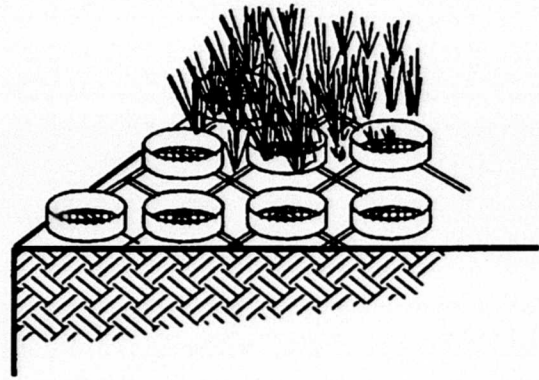
- Initial costs \_\_\_\_\_ ○
- Operation and maintenance costs \_\_\_\_\_ ○
- Overall effectiveness \_\_\_\_\_ ●
- Understandable to the public \_\_\_\_\_ ●
- Flexibility with respect to local objectives and conditions \_\_\_\_\_ ○

**KEY**

- High
- Moderate
- Low

**For More Information:** Start at the Source, Residential Site Planning and Design Guidance Manual for Stormwater Quality Practices. Bay Area Stormwater Management Agencies Association. January 1997.

## Porous Paving Systems Grasspave<sup>2</sup>®



**Description:** Grasspave<sup>2</sup> is a grid structure composed of thin-walled independent plastic rings connected by a supportive web. This grid structure is placed on a firm gravel base, filled with soil, and planted with grass. With this added reinforcement, grass areas can replace areas using asphalt concrete such as overflow parking areas, and maintenance roads. The grass surface allows for stormwater infiltration which decreases runoff.

**How it Functions:** The rings transfer loads from the surface to the grid structure and to the base course, thus preventing compaction of the upper root zone of the grass. Small loads, such as shoes, are supported by a single ring; tires and large loads are supported by several rings. Stormwater infiltrates through the permeable grass surface instead of entering the existing catchbasin/pipe system.

**Implementation/Constructability:** Installation is simple, provided adequate base preparation has been done. Grasspave<sup>2</sup> is available in rolls of various lengths and widths, designed to meet site specific needs.

**Limitations:** Requires a blended top soil to support loads, drain well, and support healthy turf. Grasspave is not suitable for travel lanes because of fatigue failure. Grasspave has a 15-year life cycle.

**Example of Previous Use:** Reed College in Portland has Grasspave<sup>2</sup> installed. Grasspave supports the Indy Car Transporter and Bus Paddock at the Detroit Grand Prix, where 80,000 lb transporters and buses for more than 30 racing teams are parked. Cars and maintenance trucks make hundreds of trips through the paddock and some 60,000 spectators use the aisle. Grasspave allows this 3.5 acre site to be fitted with a porous surface.

**Advantages:**

- Allows 100% grass coverage instead of asphalt
- Competes in cost with asphalt paving
- Maximum porosity: low to zero runoff, free air/water movement
- Supports vehicular and pedestrian traffic

**Disadvantages:**

- Maintenance due to mowing/irrigating
- Useful only in low traffic volume areas
- Requires extensive base course to support heavy loads

**Attributes:**

Initial costs \_\_\_\_\_ ●  
Operation and maintenance costs \_\_\_\_\_ ●  
Overall effectiveness \_\_\_\_\_ ●  
Understandable to the public \_\_\_\_\_ ●  
Flexibility with respect to local objectives and conditions \_\_\_\_\_ ●

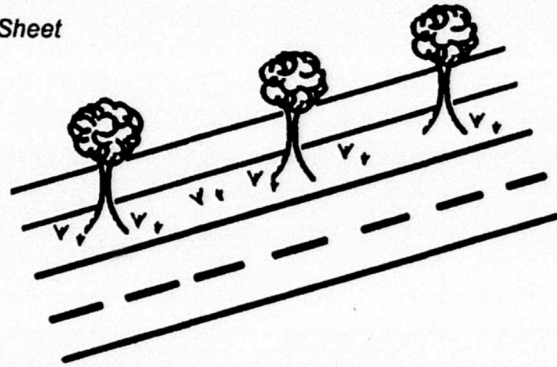
**KEY**

- High
- Moderate
- Low

**For More Information:** Invisible Structures, Inc., 14704-D East 33rd Place, Aurora, Colorado 80011-1218, 1-800-233-1510



## Landscaped Storage



**Description:** Landscaped storage facilities include but are not limited to tree strips and round-a-bouts. These facilities capture stormwater to varying degrees, before releasing it to the combined system or recharging it to the groundwater. In addition to detention, these facilities provide and improve pedestrian safety.

**How it Functions:** Stormwater enters the landscaped storage facility as overland sheet flow or precipitation. The detained water infiltrates, evaporates, and its release into the combined system is delayed. Infiltration, evaporation, and evapotranspiration reduce the amount of storm water added to the combined system.

**Implementation/Constructability:** Storage facilities should be constructed to hold stormwater effluent from sidewalks, roadways, or shoulders. Retrofitting sites with landscaped storage facilities is possible, but it is generally more applicable for new construction.

**Limitations:** May be difficult to get the community to voluntarily retrofit areas.

**Example of Previous Use:** The City of Portland has tree grates, tree strips, and round-a-bouts.

**Advantages:**

- Take advantage of natural soil pollutant removal processes
- Easy to monitor, modify, and maintain
- Meets multiple objectives such as providing open space and improving pedestrian safety.

**Disadvantages:**

- Within the right-of-way easier to implement.

**Attributes:**

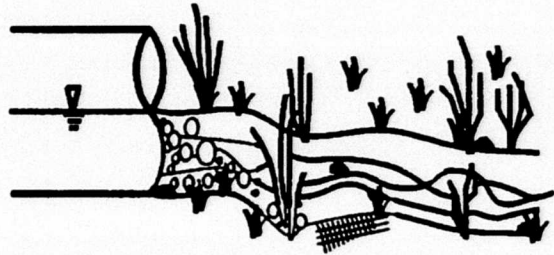
Initial costs \_\_\_\_\_ ●  
Operation and maintenance costs \_\_\_\_\_ ●  
Overall effectiveness \_\_\_\_\_ ●  
Understandable to the public \_\_\_\_\_ ●  
Flexibility with respect to local objectives \_\_\_\_\_ ●  
and conditions

**KEY**

- High
- Moderate
- Low

**For More Information:**

## Stream Diversion/Daylighting



**Description:** In the past, streams were channelized and routed into pipes, combined with sewage, and discharged to the Willamette River. Later interceptors were built to collect dry weather flow and carry it to a treatment plant. Currently, stream inflow competes with other basin inflow for interceptor capacity. Removal of stream flow by diverting it to a new storm drain system or daylighting the stream would provide additional interceptor capacity for combined sewage.

**How it Functions:** Streams are diverted out of the piped combined system by one of two methods: a separate storm system can be constructed, or the stream bed can be reconstructed and channeled to the river.

**Implementation/Constructability:** Construction can be difficult and requires putting in a new stormwater line in heavily paved areas possibly under highways and bridges. Suitable where soils have poor infiltration.

**Limitations:** These projects can be expensive, especially if property easements or ownership is required. Towns in Switzerland found stream diversion relatively cost effective compared to treatment costs.

**Example of Previous Use:** Locally, Tanner creek and a portion of Nicolai Basin are being separated from the combined system.

The 1994 CSO management plan recommended routes for the new stream diversion, storm drain lines were selected and pipe sizes required to carry the BES 10-year design storm were determined.

**Advantages:**

- May be combined with other City Parks projects and provide open spaces
- Substantial inflow reduction to the CSO system during dry and wet weather conditions
- If the stream is daylighted, it can enhance wildlife aquatic habitats

**Disadvantages:**

- Can be expensive
- May require sediment removal or stormwater treatment
- Possible slope stability or erosion problems
- Susceptible to upstream development
- Required land may not be available

**Attributes:**

Initial costs \_\_\_\_\_ ●  
Operation and maintenance costs \_\_\_\_\_ ●  
Overall effectiveness \_\_\_\_\_ ●  
Understandable to the public \_\_\_\_\_ ●  
Flexibility with respect to local objectives \_\_\_\_\_ ○  
and conditions

**KEY**

- High
- Moderate
- Low

**For More Information:** City of Portland, Bureau of Environmental Services, 1994 CSO Management Plan.



CITY OF  
**PORTLAND, OREGON**  
SUSTAINABLE PORTLAND  
COMMISSION

**Dan Saltzman, Commissioner**  
**Robert Wise, Chair**  
c/o Portland Energy Office  
1211 S W Fifth Ave, Suite 1170  
Portland, Oregon 97204-3711  
pdxenergy@ci.portland or us  
Phone 823-7222 FAX 823-5370

December 9, 1999

Mayor Vera Katz  
Commissioners Jim Francesconi, Charlie Hales, Dan Saltzman, and Erik Sten  
City Hall  
1221 SW Fourth Avenue  
Portland, OR 97204

Dear Mayor Katz and Commissioners Francesconi, Hales, Saltzman, and Sten,

The Sustainable Portland Commission would like to express its unanimous and strong support for the Green Building Initiative. Green building makes economic and environmental sense and must become standard practice if Portland is to remain a vibrant, livable community and minimize the impacts and costs of environmental problems such as those that triggered the Endangered Species Act listing.

The Green Building Initiative is the culmination of a year-long process involving extensive public participation and consultation with building industry groups, developers, City bureaus, and sustainability advocates. Over 200 people provided input, research, and review as the Initiative developed, and it is no accident that the Green Building Initiative has the endorsement of environmental groups, private-sector builders, and affordable-housing providers.

The Initiative integrates and enhances existing City efforts to conserve resources, reduce pollution, prevent environmental degradation and is the most comprehensive effort yet to put into practice Portland's Sustainable City Principles.

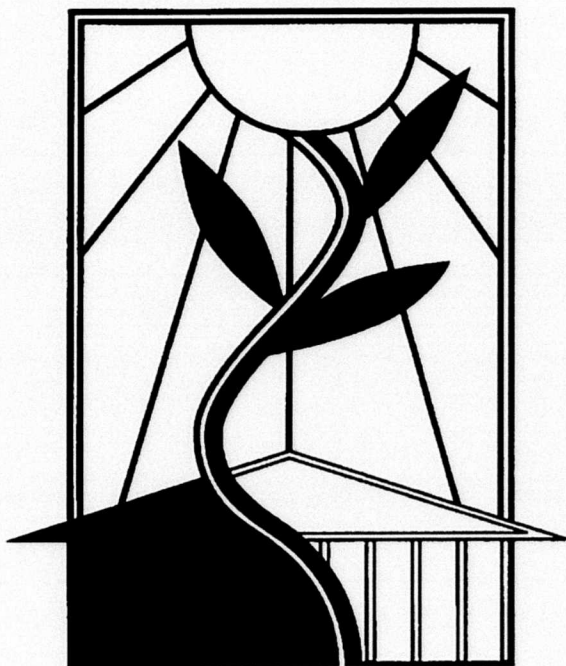
The Sustainable Portland Commission urges City Council to adopt the Green Building Initiative on December 15

Sincerely,

Robert Wise  
Chair  
Sustainable Portland Commission

# City of Portland Green Building Initiative

A Two-Year Action Plan for Promoting Resource-Efficient and  
Healthy Building Practices



## **Sustainable Portland Commission**

---

Robert Wise, Chairman  
Dan Saltzman, Commissioner  
Susan Anderson, Director  
Rob Bennett, Project Coordinator

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Portland, OR 97204  
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[pdxnrg@ci.portland.or.us](mailto:pdxnrg@ci.portland.or.us)

December 1999

## Acknowledgements

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The Sustainable Portland Commission (SPC) would like to express thanks and appreciation to each member of the Green Building Advisory Committee and Portland Energy Office for their interest, persistence, and guidance in developing the City's *Green Building Initiative*.

In addition, the SPC would like to acknowledge the work session participants who volunteered their time to this effort. Their expertise and dedication to the process and green building cannot be underscored enough.

The Portland Energy Office completed this plan under the direction of Susan Anderson. The research, writing, and assembling of work session results was coordinated by Rob Bennett with assistance from Michael Armstrong, Matt Emlen, Curt Nichols, and David Tooze.

This Action Plan was made possible through funding from the Rebuild America program of the U.S. Department of Energy.

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## I. The Green Building Initiative

The City of Portland has a national and international reputation for successfully balancing community development, growth management, and environmental stewardship. With Portland poised to continue to expand and redevelop its built environment into the new century, the time is right to improve the quality, cost effectiveness, and performance of buildings while simultaneously reducing stress on the environment.

The innovative building and site design techniques that can realize these goals—typically referred to as “green building”—are gaining currency in the design and construction industry. The spread of these practices is hindered, however, by a lack of information, regulatory disincentives, and financial barriers. Because of the current rapid pace of construction, the sooner these obstacles are removed, the greater the economic, social, and environmental benefits. By leveraging existing resources and developing innovative partnerships to provide training, outreach, and technical resources, the City can accelerate the adoption of cost-effective green building practices as *the* standard in Portland.

Green building provides the framework and tools to build in an economically advantageous manner while conserving natural resources and minimizing the ecological degradation from the built environment. Green building expertise and technologies are central elements in the emerging environmental industry sector and are potential export products. In addition, by promoting and applying green building practices the City can stimulate economic growth and build demand for innovative and efficient building materials, energy systems, and green building services provided by local firms.

The *Green Building Initiative* has two overarching principles:

1. **Expand market demand** by educating building industry professionals and the public about the benefits of green building, and
2. **Make green buildings practices easier to implement** by reducing regulatory and financial barriers and developing technical services and resources for building industry professionals.

The City of Portland's *Green Building Initiative* is an integrated effort to promote non-polluting and resource-efficient building and site design practices throughout the City. The effort coordinates the expertise and resources of six City bureaus—Energy, Environmental Services, General Services, Planning and Development Review, Portland Development Commission, and Water—to deliver comprehensive services to the development and building community, home owners, businesses, and the City's own project and facilities managers. Existing City programs related to green building will be folded into this expanded effort. The *Green Building Initiative* sets aggressive goals and recommends a carefully selected set of strategies to leverage local expertise and develop cost-effective solutions for builders, developers, and building owners and users.

### What is green building?

- Considering the true costs of building and site impacts on the local, regional, and global environment through life-cycle costing and assessment.
- Using natural resources efficiently, maximizing the use of local materials, and eliminating waste.
- Conserving and reusing water and treating stormwater runoff on-site.
- Using energy-efficient systems and products.
- Reducing building footprints, allowing ecosystems to function more naturally.
- Optimizing climatic conditions through site orientation and design.
- Integrating natural daylight and ventilation and improving indoor air quality.
- A transit-, bicycle-, and pedestrian-oriented project.
- Minimizing the use of mined rare metals and persistent synthetic compounds.
- Reducing, reusing, and recycling materials in all phases of construction and deconstruction.
- Including advanced telecommunications technology, allowing greater electronic access and reducing the need to travel.
- Planning for future flexibility, expansion, and building demolition.

## II. Action Plan Vision, Goal, and Objectives

### ***Vision***

To foster long-term social, economic, and environmental sustainability in building and development and make green building practices *the* standard building practice in the City of Portland

### ***Goal***

To adopt green building and site design practices in at least 600 units of housing and three million square feet of government, commercial and mixed-use development throughout the City over two years

### ***Objectives***

1. Establish an organizational framework to deliver integrated green building services and resources to City staff, building industry professionals, and the community
2. Make City facilities a model of green building and site design practices
3. Help minimize on-site and off-site environmental and infrastructure impacts from development, including degradation of habitat, air, soil, and stormwater through efficient site design and low-impact building practices and materials
4. Help reduce CO<sub>2</sub> emissions from building construction, operations, and building-related transportation
5. Enhance the City's response to the Endangered Species Act listing of steelhead trout and Chinook salmon populations
6. Establish financial and process incentives to accelerate the implementation of sustainable building practices
7. Create broad awareness of the benefits of green building practices to building industry professionals and consumers.

## III. Barriers

To accomplish these objectives, the *Green Building Initiative* must overcome three primary barriers—a lack of information, regulatory hurdles, and financial obstacles

### ***Lack of information***

Consumers, lenders, real estate agents, appraisers, developers, architects, builders, and permit reviewers are rarely well informed about the health, productivity, and environmental issues associated with buildings and sites. Even when individuals are aware of the differences between green and conventional buildings, the technical expertise to undertake green building projects is not readily available.

### ***Regulatory hurdles***

Securing approval for buildings designed with innovative features typically takes longer than acquiring permits for conventional buildings. Emerging technologies, materials, and practices are often not yet recognized as meeting building code requirements. In addition, the present structure of certain development-related fees and design requirements does not encourage resource-efficient building practices.

### ***Financing obstacles***

In many cases the first costs of a green building are comparable to those of a conventional building. However, green buildings can incur first costs that are higher than those of conventional building techniques. Although gains from lower utility costs and increased worker productivity may easily recover the higher initial investment, these savings rarely accrue to the same organization that designed and constructed a building, and most building tenants are poorly informed about the financial advantages of high-performance buildings.

Financial analyses also ignore the substantial costs of conventional building practices that are borne by the community as a whole—impacts on stormwater, road congestion, air pollution, and water quality, for example.

A complete analysis of the economic impacts of a building would include these costs, which ultimately are paid for by all residents of Portland and the region as a whole

#### **IV. Existing City Efforts**

The City and state have enacted a variety of separate policies over the past 20 years to promote aspects of resource-efficient building practices. Portland's Sustainable City Principles, Energy Policy, commercial construction recycling ordinance, and programs such as B E S T (Businesses for an Environmentally Sustainable Tomorrow), Climate Wise, the City Energy Challenge, the Pollution Prevention program, and the B I G (Business, Industry and Government) water conservation program, among others, encourage resource-efficient building practices.

Large gaps remain, however. Certain City policies regulating building are incompatible, marketing and outreach is limited, and existing programming is fragmented. To make green building practices *the* standard building practice in Portland requires a coordinated and comprehensive set of strategies and programmatic improvements. The *Green Building Initiative* proposes a course of action to accomplish this.

#### **V. The Green Building Action Plan**

This Action Plan moves Portland's *Green Building Initiative* from research and planning to implementation. This document follows the Sustainable Portland Commission's (SPC) Green Building Options Study (August 1999), a report identifying policy and program strategies to accelerate the implementation of green building practices in Portland. Following City Council's approval of the Options Study in September 1999, the SPC directed the Portland Energy Office to convene an Advisory Committee to guide the development of this Action Plan. The committee included developers, architects, and representatives of several City bureaus (see Appendix A). Participants in three public work sessions held in October and November contributed important insight on potential elements of the Action Plan, and members of public and City bureaus provided valuable feedback on drafts of this Plan as well.

The product of extensive public input, research, and review, the *Green Building Initiative* reflects the needs of the building and development community and addresses the barriers currently slowing the widespread application of ecological building practices.

#### **VI. Action Plan Strategies**

The recommendations that follow propose four strategies to achieve the goal and objectives identified above: organization and policy development, demonstration projects, technical resources and outreach, and incentives. These recommendations address the most important and cost-effective strategies to overcome current gaps in information and services related to green building practices.

## **Strategy #1: Organization and Policy Development**

---

**Strategy:** Develop a green building policy and ordinances for the City of Portland based on life-cycle costing and assessment. Establish an organizational structure to implement the policy and ordinances and provide green building services to the City and the building industry.

**Purpose:** Currently, the City of Portland has neither a policy nor program to promote resource-efficient building and procurement practices. As noted above, the City does offer a variety of building-related energy and resource conservation programs, but these efforts are fragmented and incomplete.

The City's *Green Building Initiative* will leverage resources and human capital to develop a model program that expands green building services and resources throughout Portland. It will reduce service fragmentation by pooling existing internal resources related to green building.

### **Deliverables:**

- 1 **Advisory Committee** appointed by the Sustainable Portland Commission to provide guidance and leadership
- 2 **Green Building Initiative staff**. Staff will include program manager, design and construction technical advisor, permit process coordinator, City facilities coordinator, and existing City staff currently working on green building-related efforts (see Staffing Overview, section IX)
- 3 A **two-year strategic plan** that details operations, services and resources to be delivered, benchmarks, timeline, and budget
- 4 **Partnerships** with trade associations, non-profit organizations, public agencies, and universities to leverage expertise and other resources
- 5 Develop and adopt
  - a **City green building policy** expressing the City's commitment to making green building *the* standard building practice in Portland
  - a **City facilities ordinance** that phases in requirements for new construction and remodels over time
  - an **ordinance addressing procurement standards** for all City purchases of building materials, office equipment, interior furnishings and operations and maintenance supplies
  - an **ordinance detailing criteria for City-funded projects** that reflect the long-term values associated with green building
  - a **resolution addressing voluntary guidelines for private development projects**

## **Strategy #2: Demonstration Projects**

---

**Strategy:** Facilitate the design and construction of at least four innovative demonstration green buildings in Portland.

**Purpose:** By facilitating green construction projects at two City fire stations, a large private development project, and an affordable housing project, the City will simultaneously raise the profile of green building in Portland and provide test cases for identifying regulatory and financing obstacles. The demonstration projects will also help identify technical resources that are needed to accelerate the adoption of state-of-the-art resource-efficiency practices. In addition, this effort will carefully document the construction process and features of these projects.

**Deliverables.**

- 1 Incorporation of green building practices into at least four demonstration projects by drawing on the technical resources described in Strategy #3 below
- 2 A standard process to **document, evaluate, and publicize demonstration projects**. Each project will be evaluated for innovative features and practices, natural resource, energy, water and waste savings, construction and operations and maintenance costs, regulatory and codes conflicts, and other research needs
- 3 Findings of the Portland Energy Office and Bureau of General Services' LEED-based<sup>1</sup> evaluation of three City facilities

**Strategy #3: Technical Resources and Outreach**

**Strategy:** Provide green building-related technical resources and outreach activities to facilitate the design and construction of healthy, ecologically sensitive, and resource-efficient buildings and surrounding landscapes

**Purpose:** While there are numerous organizations and individuals with expertise in green building practices, there is no central source for comprehensive information on green building. By working with these groups, the City will improve access to technical information and expertise, thereby facilitating the implementation of green building practices at City facilities and throughout the community. Outreach activities will further expand market demand for green buildings among building users and owners by creating a "green building brand."

**Deliverables:**

- 1 **Green building design and construction guidelines for both new construction and remodel projects.** These guidelines will cover components of design and construction, including predesign, site design, building design, construction process, operations and maintenance, reuse, and deconstruction.
- 2 **Green building ratings criteria and an evaluation tool** to set a threshold for eligibility for incentives. This evaluation tool will be flexible, easy to use, reflect Portland's climate, zoning and building code regulations, and community values, and build upon existing evaluation tools and environmental management systems, including PGE Earth Smart, LEED, and other tools.
- 3 **Technical expertise and information** to designers, developers, builders, business and homeowners. Services will integrate core staff, permit process coordinator, and BES, Water bureau, and Energy Office staff (see Staffing Overview, section IX).
- 4 Resolution of current **code and other regulatory conflicts** with green building practices.
- 5 **Trainings targeted at specific industry sectors.** Trainings will target contractors, lenders, appraisers, insurance providers, and real estate agents.
- 6 Assist and coordinate with other groups to develop a **regional green building resource guide** listing architects, engineers, builders, developers, lenders, and vendors.
- 7 Develop and distribute **marketing packets, fact sheets, and point-of-sale materials** to real estate agents, lenders, insurers, appraisers, and consumers.
- 8 Co-sponsor an **annual green building conference and trade show.**

<sup>1</sup> *LEED (Leadership in Energy and Environmental Design) Green Building Rating System* is a consensus-based self-certifying rating system for commercial, institutional, and high rise residential facilities developed by the US Green Building Council. See the US Green Building Council's website at [www.usgbc.org](http://www.usgbc.org) for details.

## Strategy #4: Incentives

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**Strategy** Develop green building-based financial incentives for developers and builders

**Purpose:** Financial incentives will stimulate green building and accelerate market transformation. While many green commercial buildings and housing developments have been built at similar or lower cost than with conventional building practices, green buildings often incur higher front-end costs. Over the long term, however, well-chosen green building practices reduce operating costs and cumulative environmental damage. Incentives offset financial and regulatory barriers to implementing green building practices. They also help counteract existing disincentives in rate structures and fees and incentives extended to conventional building practices.

Specific incentives will be developed in coordination with and based on the response to other strategies employed in the *Green Building Initiative*. The incentives described below were identified during the work sessions, research, and discussions and are proposed for evaluation and consideration.

### Deliverables

- 1 Performance-based grant program to fund innovative solid waste, stormwater, water, and waste water practices
- 2 Adopt five-percent green building practices set-aside from the City's Capital Improvement Plan for City facilities (new and retrofit). This set-aside can be applied to design and engineering fees, systems, materials, and other technologies that go beyond code.
- 3 Permit Center technical staff to reduce permitting delays for innovative building practices.
- 4 Develop and adopt zoning code incentives for green building practices (e.g. height and floor area ratio bonuses similar to the current FAR bonuses given for residential use, rooftop gardens, and child-care uses)
- 5 Identify and improve access to existing loans and rebates offered by local lenders, Fannie Mae, Pacific Power, PGE and Oregon Energy Office
- 6 Develop and implement a low-interest revolving loan fund (e.g. expand PDC/ShoreBank Pacific Green Loan)

## VII. Key Partners

### Key Community Partners

- ♦ American Institute of Architects
- ♦ appraisers
- ♦ building industry trade groups
- ♦ building inspectors
- ♦ building owners and users
- ♦ codes officials
- ♦ Community Development Network (CDN)
- ♦ contractors
- ♦ design and engineering professionals
- ♦ developers
- ♦ Eco-Building Guild
- ♦ financial institutions
- ♦ insurers
- ♦ local universities and colleges
- ♦ local utilities
- ♦ Metro
- ♦ Northwest Energy Efficiency Alliance
- ♦ Oregon Natural Step–Construction Subcommittee
- ♦ Oregon Office of Energy
- ♦ real estate agents
- ♦ research organizations
- ♦ Tri-Met
- ♦ US Green Building Council-Cascadia chapter
- ♦ vendors and manufacturers

### Key City Partners

- ♦ Bureau of Environmental Services
- ♦ Bureau of General Services
- ♦ Bureau of Housing and Community Development
- ♦ Bureau of Planning
- ♦ Bureau of Purchases and Stores
- ♦ Office of Finance and Administration
- ♦ Office of Planning and Development Review
- ♦ Parks and Recreation
- ♦ Portland Department of Transportation
- ♦ Portland Development Commission
- ♦ Portland Energy Office
- ♦ Sustainable Portland Commission

**VIII. Action Plan Timeline**

Strategy	Deliverable	Assigned to	Timeline												
			2000						2001						
			Jan - Mar	Apr - June	July - Sep	Oct - Dec	Jan - Mar	Apr - June	July - Sep	Oct - Dec					
Strategy #1 Organization and Policy Development	1 Advisory Committee	PM	-----												
	2 <i>Green Building Initiative</i> staff	PM		.....	-----										
	3 Two-year strategic plan	PM, FC, PC, TA	.....	.....	-----										
	4 Partnerships with trade associations, non-profit organizations, public agencies, and universities	PM	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	5 Develop and adopt - green building policy - City facilities ordinance - ordinance covering City procurement standards for purchases of building materials and O & M supplies - ordinance detailing criteria for City-funded projects - resolution addressing voluntary guidelines for private development projects	PM, TA, FC, PC	.....	-----	.....	-----	.....	-----	.....	-----	.....	-----	.....	-----	.....

**Key**

- PM = Program Manager
- TA = Design and Construction Technical Advisor
- FC = City Facilities Coordinator
- PC = Permit Process Coordinator
- OC = Outreach Coordinator

..... = research and development phase  
 ----- = implementation phase







## IX. Program Benchmarks & Evaluation

The goal of the *Green Building Initiative* during the first two years is to adopt green building and site design practices in at least 600 units of housing and three million square feet of government, commercial, and mixed-use development throughout the City. The following benchmarks will be tracked over two years on a project by project basis to help evaluate the success of the program.

### Energy Conservation

- CO<sub>2</sub> emissions reductions
- Energy savings (BTU's and kilowatts) above Oregon Energy Code
- Percent of energy produced on-site
- Innovative energy systems impacts

### Water Conservation

- Water savings above standard building code
- Percent of stormwater treated on-site
- Innovative storm and wastewater features impacts

### Materials Conservation and Waste Reduction

- Percent of materials having at least 20 percent post-consumer recycled content
- Percent of materials from sustainably harvested renewable sources
- Percent of non-toxic and low-VOC materials
- Percent of construction waste reused or recycled
- Percent of construction waste diverted from landfill

### Habitat and Biodiversity

- Acreage of habitat created or restored
- Site disturbance impacts
- Percentage of impermeable surface area of total site

### Transportation

- Access to transit (number of bus and MAX lines within 1/4 mile, frequency of service)
- Bicycle end-of-trip facilities
- Presence of high quality pedestrian-oriented design features
- Alternative transportation management plan for the building
- State-of-the-art fiber technology installed

### Productivity

- Absenteeism
- Site-specific workplace productivity measures

### Market Impact

- Percent of all City facilities square footage that meets the City's green building standards
- Percent of all City building permits that meet the City's green building standards

### Capacity Building

- Number of City staff trained in the principles of green building and the application of the rating system
- Number of educational workshops and trainings conducted
- Number of presentations to local governments, building trade groups, and community organizations
- Promotion and outreach: press coverage analysis, website hits, number of brochures distributed, number of presentations

## X. Staffing Overview

The Action Plan calls for eight staff positions<sup>2</sup> (5.5 FTE) from five bureaus to implement the *Green Building Initiative*, which will receive oversight from the Portland Energy Office. Green building staff is divided into direct and indirect services. Direct services include five positions (4 FTE) that are responsible for implementing the two-year Action Plan: the Program Manager, Design and Construction Technical Advisor, Outreach Coordinator, Permit Process Coordinator, and City Facilities Coordinator. The remaining three positions (1.5 FTE) provide technical assistance on an as-needed basis. The Initiative will be funded through a mix of general City fund, inter-bureau agreements, contracts, and grants. Staff includes

- **Program Manager** (1.0 FTE, Portland Energy Office) takes responsibility for all staffing and operations of City's *Green Building Initiative* and is directly responsible for implementing the Action Plan and corresponding two-year workplan. Duties to be performed: supervise personnel, direct workplan and annual program evaluation, develop green building ordinances, network and make presentations to key stakeholders, compile and publish case studies, develop and publish promotion and outreach materials, develop partnerships, and fundraise.
- **Design and Construction Technical Advisor** (1.0 FTE, Portland Energy Office) is responsible for the development and management of technical services and resources. Duties to be performed: develop and provide consultation services, intake and respond to inquiries for technical information, develop and publish design and construction guidelines, develop and publish evaluation tool and rating system, and provide technical information for case studies and other materials.
- **Outreach Coordinator** (0.5 FTE, Portland Energy Office) is responsible for education, training, outreach, and promotion efforts. Duties to be performed: cultivate education and training partnerships, develop an education and training curriculum, coordinate promotion and outreach efforts, and assist in development of all outreach materials.
- **Permit Process Coordinator** (1.0 FTE, Office of Planning and Development Review) is responsible for facilitating the processing of green building permits. Duties to be performed: develop permit review and processing strategy for green building projects, train relevant permit staff on green building practices, systems, and materials, and develop effective interface between green building technical services and Permit Center staff.
- **City Facilities Coordinator** (0.5 FTE, Bureau of General Services) is responsible for developing a green building ordinance and implementing and tracking its use in City facilities.
- **The BES Technician** (0.5 FTE, Bureau of Environmental Services) provides services related to sewer and stormwater conservation and innovative technologies, construction site recycling, and pollution prevention.
- **Water Bureau Technician** (0.5 FTE, Water Bureau) provides services related to water conservation and innovative technologies, as needed.
- **Energy Office Technician** (0.5 FTE, Portland Energy Office) provides services related to energy conservation, innovative technologies, and renewable on-site power generation.

## XI. Budget Overview: 2000 - 2002

The estimated annual budget requirement from the general fund is \$320,000. This includes salary and benefits for three full-time and two half-time staff (\$270,000), training and outreach (\$50,000). In addition, the Energy Office will seek to acquire at least \$100,000 annually in grants and contracts to support additional technical assistance, training, and outreach. Also, BES and Water Bureau funds for existing resource efficiency technical positions will be focused on green building efforts.

<sup>2</sup> Between January and June 2000, the Portland Energy Office will access grant resources to staff 1.0 FTE for the Green Building Initiative and begin implementing the workplan.

## **Appendix A: Green Building Advisory Committee**

- Steve Clapp, R & H Construction Co
- Rosemarie Cordello, Sustainable Communities Northwest, Sustainable Portland Commission
- Stuart Cowan, Ecotrust
- Skip Fresn, CH2M Hill
- Dave Gooley, Bureau of Environmental Services
- Jim Harris, Office of Planning and Development Review
- Thor Hinckley, Commissioner Dan Saltzman's Office
- Lee Jimerson, The Collins Companies
- Karen Kramer, Bureau of General Services
- Allen Lee, XENERGY Consulting, Inc , Sustainable Portland Commission
- Teri Liberator, Portland Water Bureau
- Tom McGuire, Bureau of Planning
- Michael O'Brien, Northwest Energy Efficiency Alliance
- Michael Ogan, Portland Development Commission
- Kelly Ross, Home Builders Association of Metro Portland
- Alan Scott, SERA Architects
- Bob Tomlinson, Office of Finance and Administration
- Scott Weigel, Ashforth Pacific
- Jerry Yudelson, Glumac International

## **Appendix B: Sustainable Portland Commission**

- Nancy Bond, Portland Public Schools
- Dave Brook, Oregon State University Extension Service
- James S Coon, Swanson, Thomas & Coon
- Rosemarie Cordello, Sustainable Communities Northwest
- Ned Dempsey, Century West Engineering
- Diane Dulken, Independent Media Consultant
- John Echlin, SERA Architects
- John Haines, ShoreBank Pacific
- Sheila Holden, Pacific Power
- Allen Lee, XENERGY Consulting, Inc.
- Wayne Lei, Portland General Electric
- Rick Schulberg, APEC Sustainable Development Network
- Kent Snyder, Snyder & Associates
- Robert Wise, Chairman, Cogan Owens Cogan

## Resolution No.

Accept the Sustainable Portland Commission's *Green Building Initiative* and direct the City of Portland Energy Office to implement the two-year inter-bureau Initiative. (Resolution)

WHEREAS, the City Council supports the SPC's obligation to encourage City bureaus and agencies to support sustainability as reflected in the *Sustainable City Principles* and The Natural Step system conditions; and

WHEREAS, the City Council recognizes that green building complements existing policies related to development and natural resource conservation, including the 1990 Energy Policy, 1993 CO<sub>2</sub> Reduction Strategy, Comprehensive Plan, and Metro 2040 Framework Plan; and

WHEREAS, the City of Portland recognizes and accepts its responsibility to implement and promote building practices that protect the quality of the air, water, and other natural resources; reduce the adverse impact of construction practices on native fish, vegetation, wildlife habitat and other ecosystems; and minimizes human impact on local and worldwide ecosystems; and

WHEREAS, the Energy Office; Office of Planning and Development Review; Bureaus of Environmental Services, Housing and Community Development, Water, and General Services; Portland Development Commission; and related bureaus will develop an inter-bureau team to implement the *Green Building Initiative*; and

WHEREAS, the City bureaus should take a leadership role by identifying actions that demonstrate the City's commitment to greening its own building practices and policies; and

WHEREAS, the City Council and City bureaus support the coordinated and efficient delivery of innovative, cost-effective technical and outreach services to promote energy and water conservation, on-site energy production, the use of healthy building materials, reduced stormwater runoff and erosion, pollution reduction, construction site reuse and recycling practices, and minimal site disturbance, and

WHEREAS, the City Council and City bureaus should be guided by the objective of revenue neutrality by *increasing* costs associated with building practices that cause disproportionate environmental damages and *reducing* costs associated with building practices that cause fewer environmental damages or have positive environmental impacts; and

WHEREAS, City Council and City bureaus should incorporate life-cycle and total cost (including external costs) accounting in the design, construction, operation, and maintenance of all city-owned and financed buildings, and

WHEREAS, City Council and City bureaus support sustainable economic development by encouraging the expansion of the environmental services and products sector, which includes green building practices.

NOW THEREFORE, BE IT RESOLVED, that the Portland City Council directs the Energy Office to lead the efforts of the Office of Planning and Development Review; Bureaus of

Environmental Services, Housing and Community Development, Water, and General Services;  
Portland Development Commission; and related bureaus to implement the *Green Building Initiative*.

FURTHER RESOLVED that the Energy Office will submit a report to Council on the progress  
of the Green Building Initiative on December 6, 2000.

COMMISSIONER DAN SALTZMAN  
December 15, 1999  
S Anderson/rb

Gary Blackmer  
Auditor of the City of Portland  
BY

Deputy

*Bette Olson*

**ADOPTED** by the Council

DEC 15 1999

RESOLUTION

35849

Title

Accept the Sustainable Portland Commission's *Green Building Initiative* and direct the City of Portland Energy Office to implement the two-year inter-bureau Initiative. (Resolution)

<p style="text-align: center;"><b>INTRODUCED BY</b></p> <p>Commissioner Dan Saltzman</p>	<p style="text-align: center;"><b>DATE FILED</b></p> <p style="text-align: center; font-size: 1.2em;"><b>DEC 10 1999</b></p>
<p style="text-align: center;"><b>NOTED BY COMMISSIONER</b></p> <p>Affairs <i>[Signature]</i></p> <p>Finance and Administration <i>[Signature]</i></p> <p>Safety</p> <p>Utilities</p> <p>Works</p>	<p style="text-align: center;">Gary Blackmer Auditor of the City of Portland</p> <p>By <u><i>Cary Kerstner</i></u> Deputy</p> <p>For Meeting of _____</p>
<p style="text-align: center;"><b>BUREAU APPROVAL</b></p> <p>Bureau Energy Office <i>Susan Anderson</i></p> <p>Prepared by      Date Rob Bennett/jy    12/15/99</p>	<p><b>ACTION TAKEN:</b></p>
<p>Budget Impact Review</p> <p><input checked="" type="checkbox"/> Completed      <input type="checkbox"/> Not Required</p>	
<p>Bureau Head Susan Anderson</p>	

AGENDA	FOUR-FIFTHS AGENDA	COMMISSIONERS VOTED AS FOLLOWS	
		YEAS	NAYS
Consent      Regular <input checked="" type="checkbox"/>	Francesconi	✓	
<b>NOTED BY</b>	Hales	_____	
City Attorney	Saltzman	✓	
City Auditor	Sten	✓	
City Engineer	Katz	✓	