

**Monroe County** 

**Green Building Policy** 

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Submitted by:



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## I. Executive Summary

Building construction practices deplete natural resources and are a major cause of air and water pollution, the generation of solid and toxic wastes, deforestation, health hazards, global warming, and other negative consequences. "Green Building" refers to practices that increase the efficiency with which buildings and their sites use energy, water, and materials, and reduce building impacts on human health and the environment.

Sustainable Performance Consulting (SPC) was commissioned by Monroe County to assist in the development of a Green Building policy to demonstrate the County's commitment to environmental, economic, and social stewardship, to yield cost savings to County taxpayers through reduced operating costs, to provide healthy work environments for staff and visitors, and to contribute to the County's goal protecting, conserving, and enhancing the region's environmental resources. Additionally, the County hopes to provide leadership by setting a community standard of sustainable/green building.

Monroe County will implement a Green Building Policy for all County new construction and major renovation projects of more than 5,000 gross square feet in size in accordance with the following:

- Monroe County will utilize the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED<sup>®</sup>) Green Building Rating System as the metric to measure successful incorporation of green building features into County building construction projects.
- 2. Green Building design practices shall be utilized to the greatest extent practicable for Monroe County new building construction and building renovation projects (including renovation projects in leased facilities) of more than 5,000 gross square feet in size. One of the following two outcomes will normally result:
  - a. The project design team should pursue formal LEED<sup>®</sup> certification (Certified, Gold, Silver or Platinum) and follow the registration process.
  - b. Certification under LEED<sup>®</sup> is not considered practical or achievable, but the project design team should apply the principles of sustainable design to the maximum extent possible. In addition the project design team should complete the LEED<sup>®</sup> scorecard and update the scorecard at each design phase and at the end of the project, thereby providing an internal measure of sustainable design achievement.
- 3. Green Building Policy oversight, monitoring, reporting and implementation shall be performed by an internal Design Review Team to be established by Monroe



County. During the initial stages of design, projects shall be reviewed with the County Design Review Team and evaluated for the appropriate level of sustainable achievement and possible LEED certification.

### II. Introduction

#### A. Green Building Background

Development and construction practices are main contributors to the depletion of natural resources and a major cause of air and water pollution, the generation of solid and toxic wastes, deforestation, health hazards, global warming, and other negative consequences. Buildings:

- use one-quarter of the entire world's wood harvest.
- consume two-fifths of all material and energy flows.
- account for forty-two percent of U.S. energy consumption.
- account for thirty-five percent of U.S. CO<sub>2</sub> emissions through construction and operation.<sup>1</sup>

As a trustee of public money, Monroe County makes investment decisions for County buildings that reflect both short-term budgetary realities and long-term asset values. With that in mind, the impact of alternate high performance green building policies were reviewed and analyzed. In addition, published documentation for the impacts associated with high performance green building design and construction were reviewed. As a result, this policy document provides information on the cost of building green, as well as the long-term benefits and justification to the County for investing in Green Building practices.

Green building refers to those practices that promote occupant health and comfort while minimizing negative impacts on the environment. There are different degrees of "greenness." Often, it is necessary to strike a balance between many different, sometimes conflicting, green options based on the particular conditions of a given project. For example, proper strategy for a sustainable retrofit project may differ from that of new construction design. The term "green" will be used synonymously and interchangeably with the term "sustainable" throughout this report.

Green Building practices offer an opportunity to create environmentally-sound and resource-efficient buildings by using an integrated approach to design. Green buildings promote resource conservation by including design features such as: energy efficiency, renewable energy, and water conservation. By promoting resource conservation, green building design creates healthy and comfortable environments, reduces operation and maintenance costs, considers environmental impacts of building construction and retrofit, and concentrates on waste minimization.

<sup>&</sup>lt;sup>1</sup> Levin, H. (1997) Systematic Evaluation and Assessment of Building Environmental Performance (SEABEP), paper for presentation to "Buildings and Environment", Paris, 9-12 June, 1997.



#### B. Benefits of Green Buildings

There are many benefits associated with Green Building practices, including:

• Lower Energy Bills – Criteria for energy efficiency are a cornerstone of LEED<sup>®</sup> certification. Included are prerequisites for minimum energy performance as well as additional credits for optimizing energy performance. The lower the energy use, the more credits a project can earn.

• Lower Water Bills – LEED<sup>®</sup> criteria also emphasize water efficiency. Credits for water efficient landscaping, innovative wastewater technologies and water use reduction challenge project teams to design for lower water bills. For example, LEED<sup>®</sup> credits for water conservation can be achieved by selecting native and drought-resistant plants and trees that eliminate the need for an irrigation system and reduce the need for pest control and maintenance. Stormwater from the roof can be routed into planted areas to hold and filter stormwater runoff. In addition, "low-flow" restroom faucets and toilets that conserve water may be considerations.

• Reduced Maintenance Costs – Application of high performance green building practices may also reduce maintenance costs in many instances. For example: improving air quality reduces the number of occupant complaints and time spent identifying and correcting air quality problems; installing low maintenance landscaped areas reduces the dependence on water and chemical applications; and optimizing controls for building systems allows for more effective trouble-shooting and monitoring of systems by personnel.

• Increased Employee Productivity – Sustainable building practices can improve the productivity of workers by making the work site a healthier and better place to work. Efficient lighting, for example, can help people see better, which reduces mistakes, increases work quality, and boosts productivity. Optimal heating and cooling systems can increase worker comfort and output. And, in a study of office worker performance and the indoor environment conducted by the California Energy Commission, better access to views consistently predicted better performance.

• Healthier Workspaces for Employees – Green buildings typically offer healthier and more satisfying work environments for tenants. Careful selection of building materials and chemicals used in a facility is particularly important. Use of less toxic materials can reduce exposure risks for employees and associated absenteeism.

• **Minimized Waste** – As construction and demolition (C&D) waste comprises a significant portion of the solid waste stream, sustainable building design can boost recycling and recovery rates from a building project. Currently, the



recycling of C&D waste can offer a cost savings over tipping fees for landfill disposal of heavy, bulky waste typical of building projects.

• **Community Benefits** – An additional benefit of Green Buildings is job creation. "Public policies that encourage the local development of firms in [sustainable] industry could yield long-run benefits for workers, communities, and the entire regional economy. In particular, policies promoting the application of sustainable practices to the design, construction, and operation of public buildings could be an important part of a regional economic-development strategy.<sup>2</sup>

• Lower Environmental Impacts – Buildings leave a large environmental footprint. By incorporating high performance green building practices such as resource reuse, use of products with increased recycled content, or rapidly renewable materials, these impacts can be reduced.

• **Reduced Dependence on Fossil Fuels –** By including credits for alternative transportation, green power, and energy efficiency, LEED<sup>®</sup> can aid in a transition to a renewable energy economy.

<sup>&</sup>lt;sup>2</sup> (Portland State University Center for Watershed and Community Health Report, Sustainable Practices, Public Buildings, and Jobs, 2001.)



## III. Financial Considerations for Green Buildings

Several comprehensive analyses of the financial costs and benefits of green buildings conducted to date have concluded that a minimal up-front investment of about two percent of construction costs ... typically yields life cycle savings of over ten times the initial investments.<sup>3</sup> Additionally, "many green buildings with integrated design cost no more to build – or are even less costly than alternatives because resource efficient strategies often allow downsizing of more costly mechanical, electrical or structural systems." Figure 1 illustrates the average cost premium for a Green Building.

Level of Green Standard		Average Green Cost Premium
Level 1 – Certified	8 Buildings	0.66%
Level 2 – Silver	18 Buildings	2.11%
Level 3 – Gold	6 Buildings	1.82%
Level 4 – Platinum	1 Building	6.50%
Average of 33 Buildings		1.84%

Source: USGBC, Capital E Analysis

"A data anomaly indicates that reported cost levels for LEED<sup>®</sup> Gold buildings are slightly lower than for Silver buildings, whereas the higher performance level requirements to achieve Gold would be expected to cost more than Silver levels. In part, this anomaly reflects the small data set – the Gold premium is an average across only six buildings. As additional green building data is assembled, costs are likely to more closely follow the rising cost levels associated with more rigorous levels of LEED<sup>® 4</sup>. "

Energy is a substantial and widely recognized cost of building operations that can be reduced through energy efficiency and related measures that are part of green building design. Therefore, the value of lower energy bills in green buildings can be significant. For a building with an average annual cost of energy of \$2.50/ sq ft, if the building were to achieve a 30% energy savings by building green, the energy cost savings for a

 $<sup>\</sup>mathbf{^{4}_{lbid}}$ 



<sup>&</sup>lt;sup>3</sup> "The Costs and Benefits of Green Buildings", A Report to California's Sustainable Building Task Force, October 20003. Principal author Greg Kats,

100,000 ft<sup>2</sup> office building would be \$75,000 per year - with the 20-year present value of expected energy savings worth over three-quarters of a million dollars. Figure 2 summarizes the reduced energy use of Green Buildings in comparison to conventional buildings.

Figure 2

Reduced Energy Use in Green Buildings as Compared with Conventional Buildings					
	Certified	Silver	Gold	Average	
Energy Efficiency (above standard code)	18%	30%	37%	28%	
On-Site Renewable Energy	0%	0%	4%	2%	
Green Power	10%	0%	7%	6%	
Total	28%	30%	48%	36%	

Source: USGBC, Capital E Analysis

There is a trend of declining costs associated with increased experience in green building design and construction. The conclusions indicate that while green buildings generally cost more than conventional buildings, the "green premium" is lower than is commonly perceived. As expected, the cost of green buildings generally rises as the level of greenness increases, while the premium to build green is coming down over time<sup>5</sup>.

<sup>&</sup>lt;sup>5</sup> The Costs and Benefits of Green Buildings", A Report to California's Sustainable Building Task Force, October 20003. Principal author Greg Kats,



## IV. Green Building Policy

#### A. Criteria Used to Develop Policy Recommendations

In developing these policy recommendations, criteria from existing policies across the United States, both statewide and county specific, were reviewed. Results of this review can be found in Appendix A. In addition, the following criteria were considered and evaluated:

- Life Cycle Cost: Long-term costs are important criteria used to recommend high performance green building practices for Monroe County. The up-front design and construction costs required for LEED<sup>®</sup>, as well as the life cycle savings for building operations and maintenance (such as energy, water, waste, and employee productivity), must both be considered in evaluating long-term costs.
- 2. Operational Integrity / Program Delivery: Green-building measures should not negatively impact the operations or services provided by Monroe County departments or offices occupying the facility. The primary purpose of a building is to house the operations and services of its occupants. A successful Green Building policy would enhance the primary functions of the building, rather than act as a detriment. Program delivery requirements may override Green Building practices (for example public safety, security, and public health)
- **3.** *Flexibility*: Flexibility is critical for different types of operations, asset management and program requirements. Monroe County facilities have diverse uses, including offices, hospitals, jails, clinics and laboratories. In addition, Monroe County may elect to use different guidelines for its facility portfolio depending on current occupancy, building conditions and long-range goals for the building.
- **4. Simplicity and Practicality:** Required for any policy to be effective, the Green Building Policy must be simple to understand, and practical to implement. In particular, the policy must be reasonable to implement with existing resources.
- **5. Standardization**: Standardization promotes shared opportunities and information among government agencies. Using established and recognized criteria should decrease development and implementation costs. Aligning recommendations with established policies and practices used by other government agencies may provide opportunities to share training and experience with other regional governments.
- 6. Benefits: Both financial and non-financial benefits must be considered.



#### B. Green Building Policy Recommendations

 Monroe County will utilize the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED<sup>®</sup>) Green Building Rating System as the metric to measure successful incorporation of green building features into County building construction projects.

The LEED<sup>®</sup> rating system allots points within seven specific categories for environmentally beneficial building materials and design, in categories such as site location, water efficiency, energy and the atmosphere, materials and resources, and indoor environmental quality. A variety of Green Building certification systems have been developed and adopted by governmental agencies. The primary certification system is the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED<sup>®</sup>). LEED<sup>®</sup> is the most comprehensive and widely recognized performance standard. The LEED<sup>®</sup> rating system has industry consensus and is research-based. Adoption of a common method of building performance evaluation ensures that all levels of government and the private sector are using the same set of criteria – demonstrating coordinated leadership.

- 2. Green Building design practices shall be utilized to the greatest extent practicable for Monroe County new building construction and building renovation projects (including renovation projects in leased facilities) of more than 5,000 gross square feet in size. One of the following two outcomes will normally result:
  - a. The project design team should pursue formal LEED<sup>®</sup> certification (Certified, Gold, Silver or Platinum) and follow the registration process.
  - b. Certification under LEED<sup>®</sup> is not considered practical or achievable, but the project design team should apply the principles of sustainable design to the maximum extent possible. In addition the project design team should complete the LEED<sup>®</sup> scorecard and update the scorecard at each design phase and at the end of the project, thereby providing an internal measure of sustainable design achievement.

The incorporation of green building practices will provide numerous benefits to the environment, building occupants, long-term facility operation and maintenance. Costs and benefits should be evaluated during the initial stages of project design. Flexibility is critical to the successful achievement of LEED<sup>®</sup> certification, and it is recognized that certification is not possible for all projects. Therefore, no one level for LEED<sup>®</sup> certification is recommended for County building projects. The County, through an internal Design Review Team, will evaluate the viability of certification for building projects.



3. Green Building Policy oversight, monitoring, reporting and implementation shall be performed by an internal Design Review Team to be established by Monroe County. During the initial stages of design, projects shall be reviewed with the County Design Review Team and evaluated for the appropriate level of sustainable achievement and possible LEED certification.

Monroe County will establish an internal Design Review Team responsible for the implementation of green building practices in County building projects. The County Design Review Team shall review and evaluate specific projects for the appropriate level of sustainable achievement, and monitor the level of incorporation of green building practices. A process of continuous improvement will require on-going progress measures and feedback to update and refine implementation strategies. As experience in Green Building practices is gained, different tools and strategies will emerge to facilitate the success of meeting Green Building goals. Periodic reporting should also provide quantifiable measures (i.e., energy and water savings, reductions in greenhouse gases and percentage of LEED<sup>®</sup> credits incorporated).



## V. Green Building Policy Implementation Considerations

Training of staff that will administer this policy on projects should be provided. Staff personnel should also utilize existing resources such as:

- The LEED<sup>®</sup> Reference Guide V2.2 for New Construction and Major Renovations
- LEED<sup>®</sup> Workshops that provide interpretation on credit intent and requirements and information on application.
- LEED<sup>®</sup> Accreditation professional accreditation exam as required to gain knowledge to successfully implement this policy.

The following steps shall be followed for all projects to which the Green Building Policy applies:

1. All County departments and offices responsible for financing, planning, designing, developing, constructing, and managing County owned facilities and buildings are affected by this policy.

County departments and offices should refer to the guidelines that will be developed for appropriate administrative procedures to implement this Green Building Policy.

- 2. Project-by-project implementation of this policy is the responsibility of the Project Manager assigned to the capital improvement project. The project design team is responsible for evaluating the costs and benefits for implementing LEED<sup>®</sup> criteria. The implementation strategy of this Green Building policy shall be documented in project files.
- 3. Project-specific justification and documentation shall be required for all projects. Whether a project will pursue certification or not, project design teams shall provide documentation of the sustainability measures incorporated into the building.
- 4. The Green Building Policy shall not be applied retroactively to projects that have already been budgeted or are in design or construction prior to the date this policy is adopted, except where cost effective.

Adding Green Building features late in the process can add costs that if not already budgeted may require cuts in other program components. However, Green Building criteria should still be evaluated and incorporated for these projects where possible and cost effective from a life cycle perspective.



5. Monroe County should develop the appropriate administrative procedures and management thereof, to implement this policy for the range of capital improvement projects impacted upon policy approval.

These recommendations do not include the detailed implementation procedure required to administer this policy. Upon adoption of this policy, the administrative procedures and level of staff training required to successfully implement Green Building practices need to be developed. Appendix B, Example Green Building Integration Flow Chart, is attached as an example of how the Green Building Policy may be implemented. Additionally, Appendix C provides an example of a Table of Contents for the development of an application guide.

 Monroe County green buildings can also benefit from specialized financial incentive programs (e.g. New York State Energy Research and Development Authority's programs) to offset the initial added capital cost of green buildings



Appendix A:

Sustainability Policy Matrix



## Sustainable Policy Matrix

Order	Policy Statement	Existing Buildings	New Construction	Major Renovations
	All agencies and departments shall seek to achieve			
	a reduction in energy consumption by all buildings	Effective immediately, State agencies and other affected entities		In the design, construction, operation and
	they own, lease or operate of 35 percent by 2010	shall implement energy efficiency practices with respect to the		maintenance of new buildings, State agencies and
	relative to 1990 levels. All state agencies and other	operation and maintenance of all buildings that they own, lease or	In the design, construction, operation and	other affected entities shall, to the maximum extent
	affected entities shall establish agency-wide	operate. Such practices may include, but shall not be limited to:	maintenance of new buildings, State agencies and	practicable, follow guidelines for the construction of
	reduction targets and associated schedules to	(1) shutting off office equipment when it is not being used	other affected entities shall, to the maximum extent	"Green Buildings," including guidelines set forth in
	reach this goal and shall also be responsible for	(2) adjusting the setting of space temperatures	practicable, follow guidelines for the construction of	Tax Law § 19, which created the Green Buildings
	establishing peak electric demand reduction targets	(3) turning off lighting in unoccupied areas	"Green Buildings," including guidelines set forth in	Tax Credit, and the U.S. Green Buildings Council's
	for each state facility by 2005 and 2010. No	(4) inspecting and re-commissioning or re-tuning neating, air	Tax Law § 19, which created the Green Buildings	LEED rating system. Effective immediately, for
	buildings will be exempt from these goals except	conditioning and ventilation equipment to ensure optimal	LED rating system Effective immediately. State	substantial renovation of existing buildings, State
	Vark State Energy Research and Development	(E) subling and restarting equipment on a staggered basis to shed	LEED failing system. Effective immediately, State	agencies and other anected entities shall achieve at
	Authority ("NIXCERDA") in consultation with the	(5) Cycling and restarting equipment on a staggered basis to shed	agencies and other anected entities engaged in the	least a ten percent improvement. State agencies
	Division of the Budget ("DOB"), the Office of	agencies and other affected entities shall strive to meet the	a 20 percept improvement in operav efficiency	afficient criteria consistent with ENERGY STAP and
	General Services ("OGS") and the Advisory Council	ENERGY STAR building criteria for energy performance and indoor	nerformance relative to levels required by the	any other energy efficiency levels as may be
New York State	on State Energy Efficiency ("Advisory Council") as	environmental quality in their existing buildings to the maximum	State's Energy Conservation Construction Code as	designated by NYSERDA into all specifications
Executive Order 111	established herein	extent practicable	amended	developed for a new construction and renovation
Executive of del 111			Consistent with or exceed rating standards	
			established in the USGBC's "silver" Leadership in	
			Energy and Environmental Design's (LEED) rating	
	This bill requires any new facility being constructed		system for new construction (silver being the	
	with state funds, including all housing projects and		second of four levels in the rating system). In	
	school buildings, to comply with energy		adopting the regulations, the secretary must	
State of Connecticut	conservation and environmental design regulations		consider energy saving devices that minimize light	
Executive Order	if the state is contributing at least half of the funds.		pollution.	
			These guidelines will apply to the operations and	
			construction of all new buildings, additions and	
			retrofit projects, including planning, siting,	
	The State of Wisconsin has a responsibility to save	Direct the Department of Administration to establish sustainable	budgeting, design, construction and deconstruction.	
	taxpayer dollars and promote economic	building operation guidelines (for owned and leased properties),	In addition, these guidelines will address	
	development while improving the environment and	which shall be adopted by the Division of State Facilities within six	sustainable operation and maintenance, including	
	health of Wisconsin citizens and future generations	(6) months following the date of this order, based on the	green cleaning, green purchasing waste reduction	
State of Wisconsin	by incorporating high performance green building	Leadership in Energy and Environmental Design (LEEDtm) Green	and recycling, pollution prevention, energy and	
	standards into the design, construction and	building Rating System for New Construction and existing Buildings	water efficiency, and light pollution in existing	
Executive Order	operations processes of state buildings; etc.	and other comparable sustainable guidelines and rating systems.	buildings.	
	All county projects initiated after July 1, 2003, had to			
	be LEED Silver Certified. This ordinance added			
	the County of Alamada. The County passed a groop			
	building ordinance which requires County			
	construction projects to be built to a LEED Silver			
	standard. Materials procured for construction as			
	well as furniture fixtures and other interiors will be			
	recyclable, durable, and have a low-environmental			
Alameda County CA	impact.			
county off				
	Cook County Commissioner Mike Quigley proposal			
	for an ordinance requiring LEED certification of all			
	county building projects passed. The ordinance			
	called for projects to earn a minimum of eight			
	credits in the Energy & Atmosphere category to			
Cook County IL	ensure best life-cycle returns.			

Order	Policy Statement	Existing Buildings	New Construction	Major Renovations
King County, WA	King County Executive Order FES 9-3 (AEP) requires all new public construction projects to seek LEED certification and encourages the application of LEED criteria to building retrofits and tenant improvements. There is a LEED supplement for King County projects.			
San Mateo County CA	Policy in 2001. The policy requires new projects and additions that are built by the County and greater than 5,000 sq. ft. to achieve certification at the highest practicable LEED rating level. Smaller projects are encouraged to follow LEED standards but are not required to submit documentation for certification.			
Gainsville County, FL	Ordinance # 1835		Requiring all government county buildings be LEED certified. Additionally, the county is providing a fast- track building permit incentive and a 50% reduction in the cost of building permit fees for private contractors who use LEED.	
San Jose, CA	The City of San Jose shall adopt the "San Jose LEED" Green Building Rating System as the green building design guideline for its ongoing and future program areas and incorporate this system into all City facility projects that are constructed, owned, managed or financed by the City. : The City of San Jose shall provide leadership and guidance to encourage the application of green building practices in private sector planning, design, construction, management, renovation, operations, and demolition of buildings by promoting the voluntary application of the San Jose Green Building Policy goals and the "San Jose LEED" Green Building Rating System.	Many projects do not meet the policy criteria, including buildings smaller than 10,000 gross square feet, unoccupied buildings, parks, roadways, and other infrastructure. City facility construction projects that are unoccupied or serve specialized functions (e.g. pump station, garage, storage building, etc.) are not subject to the City's green building guidelines and do not need to go through an exemption process. Even though projects may become exempt from the City's required green building guidelines, project managers and design teams are encouraged to apply the relevant portions of LEED, and develop goals that increase the environmental, social, and economic benefits of the project.	All new construction and major retrofit projects for all City facilities and buildings over 10,000 gross square feet of occupied space shall meet a "San Jose LEED" Certified rating effective with the FY 02- 03 Budget Allocations. Exemptions The City of San Jose Green Building Policy strategy of achieving LEED Certified shall not apply to current City facilities and major renovation projects that have been proposed in the FY01-02 Capital budget. However, these projects shall still implement City of San Jose Green Building policy goals and strategies to the maximum extent practicable. Documentation of ongoing efforts will be provided as part of the annual report.	
New York, NY	September 15, 2005, the City Council passed Int. No. 324-A http://www.nyccouncil.info/pdf_files/reports/greenbui Idings.pdf	all city- owned buildings with a construction cost of \$2 million or more to be LEED Silver.	All city- owned buildings with a construction cost of \$2 million or more to be LEED Silver.	all city- owned buildings with a construction cost of \$2 million or more to be LEED Silver.
Atlanta, GA	City Ordinance #03-0-1693		Requiring all city-funded projects over 5,000 square feet or costing \$2 million to meet a LEED Silver rating level. Projects exempt from this policy are required to complete a LEED checklist to assess any sustainable design techniques.	
Houston, TX	The city adopted Green Building Resolution #2004- 15 on June 23, 2004	all city owned buildings and facilities over 10,000 sq ft shall use LEED to the greatest extent practical and reasonable with a target of LEED Silver certification.	ft shall use LEED to the greatest extent practical and reasonable with a target of LEED Silver certification.	all city owned buildings and facilities over 10,000 sq ft shall use LEED to the greatest extent practical and reasonable with a target of LEED Silver certification.

Order	Policy Statement	Existing Buildings	New Construction	Major Renovations
San Francisco, CA Phoenix, AZ	On May 18, 2004, the Board of Supervisors of the City and County of San Francisco, CA adopted an ordinance (Chapter 7 of the Environment Code) Executive Order 2005-05		over 5000 square feet starting conceptual design on or after September 18 to achieve a LEED Silver certification by the USGBC. It also requires that a LEED Accredited Professional be a member of each design team and achievement of the LEED Additional Commissioning Credit for all projects. new state-funded buildings must also meet at least the "silver" LEED standard	over 5000 square feet starting conceptual design on or after September 18 to achieve a LEED Silver certification by the USGBC. It also requires that a LEED Accredited Professional be a member of each design team and achievement of the LEED Additional Commissioning Credit for all projects.
Scottsdale, AZ	LEED Gold certification requirements for all public projects			
Vancouver, British Columbia	LEED Gold certification requirements for all public projects			
La Mesa, CA	The purpose of a Citywide policy on sustainable building is to demonstrate the City's commitment to environmental, economic, and social stewardship, to yield cost savings to the City taxpayers through reduced operating costs, to provide healthy work environments and to contribute to the City's goals of protecting, conserving, and enhancing the region's environmental resources. It is the intent of the City to adopt best design and management practices to reduce storm water run-off, water consumption, traffic congestion, energy consumption, and landfill waste. It is also the intent of the City to provide healthy working environments for its employees. Additionally, the City helps to set a community standard of sustainable building.		The City of La Mesa shall evaluate incorporation of sustainable building principles and practices into the planning, design, construction, management, renovation, operations, and decommissioning of all City facilities that are constructed and owned by the City. This does not include those projects already under construction prior to the adoption of this policy. All newly constructed or renovated City facilities and buildings shall strive to meet a minimum LEED Silver rating and exceed current State of California Title 24 Energy Code requirements. Design and project management teams are encouraged to meet higher LEED rating levels. The US Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system shall be used as a design and measurement tool to determine what constitutes sustainable building by national standards.	
Boulder, CO	Requires all municipally funded new construction and major addition projects to achieve LEED Silver certification. Also considering requiring certification of commercial projects or developing a LEED- based incentive program.			
	State Government County Government			

City Government

Appendix B:

Example Green Building Integration Flow Chart



**Draft Sustainability Integration Cycle** 



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Appendix C:

Application Guide Example Table of Contents

<sup>&</sup>lt;sup>6</sup> Process Guide for Applying Sustainability to UC Projects, *November 2004, University of Cincinnati, Division of the University Architect* 



Programming Including Sustainability in the Program Statement Completing the Sustainable Design Process Form Why are Some Projects Excused from LEED Registration and Certification?
Project Budget Considerations Budgeting for Sustainable Design Explaining Sustainable Design to Client
A/E Selection Developing and Distributing the Request for Professional Design Services Interviewing A/E Candidates for Sustainable Design Projects Issuing the Request for Technical Proposal Preparing Design Contracts.
The Design Phases Predesign Activities Holding the Sustainable Design Kickoff Meeting Preparing LEED Registration Data for the SDC Chair Predesign Submission Requirements Schematic Design Activities Conducting a Design Charrette Submitting the Preliminary LEED Scorecard Internal and LEED Deliverables: Letter Templates Design Development Submission Requirements Construction Documents Submission Requirements
Construction Preparing for Commissioning Activities Commissioning Tests Providing construction Oversight Assembling the LEED Certification Submittal.
Turnover and Closeout Delivering the LEED Certification Submittal Responding to USGBC Reviews Administrative Review Technical Review Certification Performing Commissioning Tests Performing Post-Occupancy Evaluation. POE Scope and Methods POE Benefits



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Appendix D:

LEED NC V2.2 LEED EB V2.0 LEED CI V2.0 Project Checklists

<sup>&</sup>lt;sup>7</sup> Process Guide for Applying Sustainability to UC Projects, *November 2004, University of Cincinnati, Division of the University Architect* 



August 14, 2007\_\_\_\_\_

LEED-NC			e:			
Version	2.2 Project Checklist					
Yes ? No			Yes ? No			
0 0 0	Sustainable Sites	14 Points	0 0 0	Materia	s & Resources	13 Points
	Prereq 1       Construction Activity Pollution Prevention         Credit 1       Site Selection         Credit 2       Development Density & Community Connectivity         Credit 3       Brownfield Redevelopment         Credit 4.1       Alternative Transportation, Public Transportation Access         Credit 4.2       Alternative Transportation, Bicycle Storage & Changing Rooms         Credit 4.3       Alternative Transportation, Parking Capacity         Credit 5.1       Site Development, Protect of Restore Habitat	Required 1 1 1 1 1 1 1 1 1		Prereq 1 Credit 1.1 Credit 1.2 Credit 1.3 Credit 2.1 Credit 2.2 Credit 3.1 Credit 3.2 Credit 4.1	Storage & Collection of Recyclables Building Reuse, Maintain 75% of Existing Walls, Floors & Roof Building Reuse, Maintain 100% of Existing Walls, Floors & Roof Building Reuse, Maintain 50% of Interior Non-Structural Elements Construction Waste Management, Divert 50% from Disposal Construction Waste Management, Divert 75% from Disposal Materials Reuse, 5% Materials Reuse, 10% Recycled Content, 10% (post-consumer + ½ pre-consumer)	Required 1 1 1 1 1 1 1 1
Yes ? No	Credit 5.2       Site Development, Maximize Open Space         Credit 6.1       Stormwater Design, Quantity Control         Credit 6.2       Stormwater Design, Quality Control         Credit 7.1       Heat Island Effect, Non-Roof         Credit 7.2       Heat Island Effect, Roof         Credit 8       Light Pollution Reduction	1 1 1 1 1	Yes ? No 0 0 0	Credit 4.2 Credit 5.1 Credit 5.2 Credit 6 Credit 7	Recycled Content, 20% (post-consumer + ½ pre-consumer) Regional Materials, 10% Extracted, Processed & Manufactured Re Regional Materials, 20% Extracted, Processed & Manufactured Re Rapidly Renewable Materials Certified Wood	1 1 1 1 1 <b>15</b> Points
0 0 0	Water Efficiency	5 Points		5		Demined
Yes ? No	Credit 1.1 Water Efficient Landscaping, Reduce by 50% Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation Credit 2 Innovative Wastewater Technologies Credit 3.1 Water Use Reduction, 20% Reduction Credit 3.2 Water Use Reduction, 30% Reduction Energy & Atmosphere	1 1 1 1 1	Y 	Prereq 2 Credit 1 Credit 2 Credit 3.1 Credit 3.2 Credit 4.1 Credit 4.2	Minimum IAQ Performance Environmental Tobacco Smoke (ETS) Control Outdoor Air Delivery Monitoring Increased Ventilation Construction IAQ Management Plan, During Construction Construction IAQ Management Plan, Before Occupancy Low-Emitting Materials, Adhesives & Sealants Low-Emitting Materials, Paints & Coatings	Required Required 1 1 1 1 1
Y Y Y	Prereq 1       Fundamental Commissioning of the Building Energy Systems         Prereq 2       Minimum Energy Performance         Prereq 3       Fundamental Refrigerant Management         Credit 1       Optimize Energy Performance         Credit 2       On-Site Renewable Energy         Credit 3       Enhanced Commissioning         Credit 4       Enhanced Refrigerant Management         Credit 5       Measurement & Verification	Required Required Required 1 to 10 1 to 3 1 1 1		Credit 4.3 Credit 4.4 Credit 5 Credit 6.1 Credit 6.2 Credit 7.1 Credit 7.2 Credit 8.1 Credit 8.2	Low-Emitting Materials, Carpet Systems Low-Emitting Materials, Composite Wood & Agrifiber Products Indoor Chemical & Pollutant Source Control Controllability of Systems, Lighting Controllability of Systems, Thermal Comfort Thermal Comfort, Design Thermal Comfort, Verification Daylight & Views, Daylight 75% of Spaces Daylight & Views, Views for 90% of Spaces	1 1 1 1 1 1 1 1
Yes ? No 0 0 0	Innovation & Design Process	5 Points				
	Credit 1.1         Innovation in Design: Green Houskeeping           Credit 1.2         Innovation in Design: Education           Credit 1.3         Innovation in Design: Exemplary Performance - Recycled Content           Credit 1.4         Innovation in Design: Exemplary Performance - Showers/Bicycle Racks           Credit 2         LEED <sup>®</sup> Accredited Professional	1 1 5 1 1				
Yes ? No 0 0 0	Project Totals (pre-certification estimates) Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points	69 Points				



LEED for Existing Buildings v2.0 Registered Building Checklist Project Name: Project Address:

Yes	? No	_		
0	0 0	ļ	Sustainable Sites	14 Points
Y		Prereq 1	Erosion & Sedimentation Control	Required
Y		Prereq 2	Age of Building	Required
		Credit 1.1 Credit 1.2	Plan for Green Site & Building Exterior Management - 4 specific actions Plan for Green Site & Building Exterior Management - 8 specific actions	1
		Credit 2	High Development Density Building & Area	1
		Credit 3.1	Alternative Transportation - Public Transportation Access	1
		Credit 3.2 Credit 3.3	Alternative Transportation - Bicycle Storage & Changing Rooms Alternative Transportation - Alternative Fuel Vehicles	1
		Credit 3.3 Credit 3.4	Alternative Transportation - Car Pooling & Telecommuting	1
		Credit 4.1	Reduced Site Disturbance - Protect or Restore Open Space (50% of site area)	1
		Credit 4.2	Reduced Site Disturbance - Protect or Restore Open Space (75% of site area)	1
		Credit 5.1 Credit 5.2	Stormwater Management - 25% Rate and Quantity Reduction	1
		Credit 6.1	Heat Island Reduction - Non-Roof	1
		Credit 6.2	Heat Island Reduction - Roof	1
		Credit 7	Light Pollution Reduction	1
Yes	? No	-		
0	0 0		Water Efficiency	5 Points
Y		Prereq 1	Minimum Water Efficiency	Required
Y		Prereq 2	Discharge Water Compliance	Required
		Credit 1.1	Water Efficient Landscaping - Reduce Potable Water Use by 50%	1
		Credit 1.2 Credit 2	Innovative Wastewater Technologies	1
		Credit 3.1	Water Use Reduction - 10% Reduction	1
		Credit 3.2	Water Use Reduction - 20% Reduction	1
Yes	? No			
0	00		Energy & Atmosphere	23 Points
Y		Prerea 1	Existing Building Commissioning	Required
Ý		Prereq 2	Minimum Energy Performance - Energy Star 60	Required
Y		Prereq 3	Ozone Protection	Required
	U	Credit 1	Energy Performance	1 to 10
			Energy Star Rating - 67	2
			Energy Star Rating - 71	3
			Energy Star Rating - 75	4
			Energy Star Rating - 79	6
			Energy Star Rating - 87	7
			Energy Star Rating - 91	8
			Energy Star Rating - 99	10
		Credit 2.1	Renewable Energy - On-site 3% / Off-site 15%	1
		Credit 2.2	Renewable Energy - On-site 6% / Off-site 30%	1
		Credit 2.3	Renewable Energy - On-site 3% / Off-site 43%	1
		Credit 3.1	Building Operation & Maintenance - Staff Education	1
		Credit 3.2	Building Operation & Maintenance - Building Systems Maintenance	1
		Credit 3.3 Credit 4	Additional Ozone Protection	1
		Credit 5.1	Performance Measurement - Enhanced Metering (4 specific actions)	1
		Credit 5.2	Performance Measurement - Enhanced Metering (8 specific actions)	1
		Credit 5.3 Credit 5.4	Performance measurement - Ennanced Metering (12 specific actions) Performance Measurement - Emission Reduction Reporting	1
		Credit 6	Documenting Sustainable Building Cost Impacts	1
V	2 NI-	-		
0	· NO	]	Materials & Resources	16 Points
V.		Prores 1.4	Source Deduction & Waste Management - Waste Stream Audit	Poguirod
Y		Prerea 1.2	2 Source Reduction & Waste Management - Storage & Collection	Required
Y		Prereq 2	Toxic Material Source Reduction - Reduced Mercury in Light Bulbs	Required
		Credit 1.1	Construction, Demolition & Renovation Waste Management - Divert 50%	1
		Credit 1.2 Credit 2.1	Construction, Demolition & Renovation Waste Management - Divert 75% Optimize Use of Alternative Materials - 10% of Total Purchases	1 1
		Credit 2.2	Optimize Use of Alternative Materials - 20% of Total Purchases	1
		Credit 2.3	Optimize Use of Alternative Materials - 30% of Total Purchases	1
		Credit 2.4	Optimize Use of Alternative Materials - 40% of Total Purchases	1
		Credit 3.1	Optimize Use of IAQ Compliant Products - 45% of Annual Purchases	1
		Credit 3.2	Optimize Use of IAQ Compliant Products - 90% of Annual Purchases	1
		Credit 4.1	Sustainable Cleaning Products & Materials - 30% of Annual Purchases	1
		Credit 4.2 Credit 4.3	Sustainable Cleaning Froducts & Materials - 00% of Annual Purchases	1
		Credit 5.1	Occupant Recycling - Recycle 30% of the Total Waste Stream	1
		Credit 5.2	Occupant Recycling - Recycle 40% of the Total Waste Stream	1
		Credit 5.3 Credit 6	Additional Toxic Material Source Reduction - Reduced Mercurv in Light Bulbs	1
				•



# LEED for Existing Buildings v2.0 Registered Building Checklist Project Name: Project Address:

Yes	?	NO			
0	0	0	Indoor Environment	al Quality	22 Points
Y			Prereq 1 Outside A	Air Introduction & Exhaust Systems	Required
Y			Prereq 2 Environm	ental Tobacco Smoke (ETS) Control	Required
Y			Prereq 3 Asbestos	Removal or Encapsulation	Required
Y		_	Prereq 4 PCB Rem	oval	Required
			Credit 1 Outside A	Air Delivery Monitoring	1
			Credit 2 Increased	I Ventilation	1
			Credit 3 Construc	tion IAQ Management Plan	1
			Credit 4.1 Documer	ting Productivity Impacts - Absenteeism & Healthcare Cost Impacts	1
			Credit 4.2 Documer	ting Productivity Impacts - Other Productivity Impacts	1
			Credit 5.1 Indoor Cl	nemical & Pollutant Source Control - Reduce Particulates in Air System	1
			Credit 5.2 Indoor Cl	nemical & Pollutant Source Control - Isolation of High Volume Copy/Print/Fa	1
			Credit 6.1 Controlla	bility of Systems - Lighting	1
			Credit 6.2 Controlla	bility of Systems - Temperature & Ventilation	1
			Credit 7.1 Thermal	Comfort - Compliance	1
			Credit 7.2 Thermal	Comfort - Permanent Monitoring System	1
			Credit 8.1 Daylight	& Views - Daylight for 50% of Spaces	1
			Credit 8.2 Daylight	& Views - Daylight for 75% of Spaces	1
			Credit 8.3 Daylight	& Views - Views for 45% of Spaces	1
			Credit 8.4 Daylight	& Views - Views for 90% of Spaces	1
			Credit 9 Contemp	orary IAQ Practice	1
			Credit 10.1 Green Cle	eaning - Entryway Systems	1
			Credit 10.2 Green Cle	eaning - Isolation of Janitorial Closets	1
			Credit 10.3 Green Cle	eaning - Low Environmental Impact Cleaning Policy	1
			Credit 10.4 Green Cle	eaning - Low Environmental Impact Pest Management Policy	1
			Credit 10.5 Green Cle	eaning - Low Environmental Impact Pest Management Policy	1
			Credit 10.6 Green Cle	eaning - Low Environmental Impact Cleaning Equipment Policy	1
			-		
Yes	?	No			
0	0	0	Innovation & Design	Process	5 Points
		_			
			Credit 1.1 Innovatio	n in Upgrades, Operation & Maintenance	1
			Credit 1.2 Innovatio	n in Upgrades, Operation & Maintenance	1
			Credit 1.3 Innovatio	n in Upgrades, Operation & Maintenance	1
			Credit 1.4 Innovatio	n in Upgrades, Operation & Maintenance	1
			Credit 2 LEED™ A	ccredited Professional	1

Yes	?	No		
4	0	0	Project Totals (pre-certification estimates)	85 Points
			Certified: 32-39 points, Silver: 40-7 points, Gold: 48-63 points, Platinum: 64-85	

#### LEED for Commercial Interiors v2.0 Registered Project Checklist

Project Name: Project Address:

Yes 0	? 0	No 0	Sustaina	able Sites	7 Points
0	0	0	Credit 1 Credit 2 Credit 3.1 Credit 3.2 Credit 3.3	Site Selection         Select a LEED Certified Building         0 OR Locate the tenant space in a building with following characteristics:         Option 1A       Brownfield Redevelopment         Option 1B       Stormwater Management: Rate and Quantity         Option 1D       Heat Island Reduction: Non-Roof         Option 1F       Light Pollution Reduction: Roof         Option 1F       Light Pollution Reduction: Roof         Option 1F       Water Efficient Irrigation: Reduce by 50%         Option 1G       Water Efficient Irrigation: No Potable Use or No Irrigation         Option 1J       Unaver Use Reduction: 20% Reduction         Option 1J       Water Use Reduction: 20% Reduction         Option 1L       Oher Quantifiable Environmental Performance         Development Density and Community Connectivity         Alternative Transportation: Bicycle Storage & Changing Rooms         Alternative Transportation: Parking Availability	1 to 3 3 1 to 3 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
Yes 0	? 0	No 0	Water E	fficiency	2 Points
0	0	0	Credit 1.1 Credit 1.2	Water Use Reduction - 20% Reduction Water Use Reduction - 30% Reduction	1 1
Yes 0	? 0	No 0	Energy	& Atmosphere	12 Points
Y Y Y 0 0 0	0 0 0 0 0	0	Prereq 1 Prereq 2 Prereq 3 Credit 1.1 Credit 1.2 Credit 1.3 Credit 1.4 Credit 2 Credit 3 Credit 4	Fundamental Commissioning         Minimum Energy Performance         CFC Reduction in HVAC&R Equipment         Optimize Energy Performance - Lighting Power         Option A: Reduce lighting power density to 15% below the standard         Option B: Reduce lighting power density to 25% below the standard         Option C: Reduce lighting power density to 35% below the standard         Option C: Reduce lighting power density to 35% below the standard         Optimize Energy Performance - Lighting Controls         Option A: Equipment Efficiency and Zoning & Controls         Optimize Energy Performance - HVAC         Option B: Reduce Design Energy Cost         Optimize Energy Performance - Equipment and Appliances         70% of ENERGY STAR eligible equipment is ENERGY STAR rated         90% of ENERGY STAR eligible equipment is ENERGY STAR rated         Phanced Commissioning         Energy Use, Measurement & Payment Accountability         Ocase A: Projects with area less than 75% of total building area         Case B: Projects with area 75% or more of total building area         Green Power	Required Required Required 1 to 3 1 2 3 1 1 to 2 1 to 3 1
Yes 0	? 0	No 0	Material	s & Resources	14 Points
Y 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	Prereq 1 Credit 1.1 Credit 1.2 Credit 2.1 Credit 2.2 Credit 3.1 Credit 3.2 Credit 3.2 Credit 3.3 Credit 4.1 Credit 4.2 Credit 5.1 Credit 5.2 Credit 5.2 Credit 6 Credit 7	Storage and Collection of Recyclables Tenant Space, Long Term Commitment Building Reuse, Maintain 40% of Interior Non-Structural Components Building Reuse, Maintain 60% of Interior Non-Structural Components Construction Waste Management, Divert 50% From Landfill Construction Waste Management, Divert 75% From Landfill Resource Reuse, 5% Resource Reuse, 10% Resource Reuse, 30% Furniture and Furnishings Recycled Content, 10% (post-consumer + 1/2 pre-consumer) Recycled Content, 20% (post-consumer + 1/2 pre-consumer) Regional Materials, 20% Manufactured Regionally Regional Materials, 10% Extracted and Manufactured Regionally Rapidly Renewable Materials Certified Wood	Required 1 1 1 1 1 1 1 1 1 1 1 1 1 1

#### LEED for Commercial Interiors v2.0 Registered Project Checklist

Project Name: Project Address:

Yes	?	No			
0	0	0	Indoor	Environmental Quality	17 Points
V	r		Drover 4	Minimum IAO Derformence	Deguined
I V			Prereq 1	Minimum IAQ Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
0	0	0	Credit 1	Outside Air Delivery Monitoring	1
0	0	0	Credit 2	Increased Ventilation	1
0	0	0	Credit 3.1	Construction IAQ Management Plan, During Construction	1
0	0	0	Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
0	0	0	Credit 4.1	Low-Emitting Materials, Adhesives and Sealants	1
0	0	0	Credit 4.2	Low-Emitting Materials, Paints and Coatings	1
0	0	0	Credit 4.3	Low-Emitting Materials, Carpet Systems	1
0	0	0	Credit 4.4	Low-Emitting Materials, Composite Wood and Laminate Adhesives	1
0	0	0	Credit 4.5	Low-Emitting Materials, Systems Furniture and Seating	1
0	0	0	Credit 5	Indoor Chemical and Pollutant Source Control	1
0	0	0	Credit 6.1	Controllability of Systems, Lighting	1
0	0	0	Credit 6.2	Controllability of Systems, Temperature and Ventilation	1
0	0	0	Credit 7.1	Thermal Comfort - Compliance	1
0	0	0	Credit 7.2	Thermal Comfort - Monitoring	1
0	0	0	Credit 8.1	Daylight & Views - Daylight 75% of Spaces	1
0	0	0	Credit 8.2	Daylight & Views - Daylight 90% of Spaces	1
0	0	0	Credit 8.3	Daylight & Views - Views for 90% of Seated Spaces	1
Vee	2	Na			
1 es	, 0		Innova	tion & Design Process	5 Points
	Ū				
0	0	0	Credit 1.1	Innovation in Design: Provide Specific Title	1
0	0	0	Credit 1.2	Innovation in Design: Provide Specific Title	1
0	0	0	Credit 1.3	Innovation in Design: Provide Specific Title	1
0	0	0	Credit 1.4	Innovation in Design: Provide Specific Title	1
0	0	0	Credit 2	LEED™ Accredited Professional	1
Yes	?	No			
0	0	0	Project	t lotals (pre-certification estimates)	57 Points

Certified: 21 to 26 points, Silver: 27 to 31 points, Gold: 32 to 41 points, Platinum: 42 to 57 points

