Washington State Department of Enterprise Services

Sustainable Design Principles

For New Building Construction and Renovations
In response to Executive Order 13-03

Agencies shall strive to minimize impacts of Washington State facilities to the environment by reducing energy use, greenhouse gas emissions, water use and waste. Avoid land use impacts, materials choices, or actions that cause environmental degradation.

Definition of Sustainability

In 1987, the United Nations Brundtland Commission coined the common definition of sustainability still used today. It defined sustainable development as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This approach to development supports state government's mandate to be good stewards of public resources.[1]

Overview

Buildings use large amounts of energy and materials. The construction and operation of buildings is a major source of greenhouse gas emissions[2] and has other significant environmental impacts. Executive Order 13-03 asks Department of Enterprise Services (DES) to develop sustainable design principles for Washington State capital funded projects. These principles shall be applied to the siting, design and construction of new facilities, and renovation of existing facilities. Agencies shall strive to minimize impacts of state of Washington projects to the environment by reducing energy use, greenhouse gas emissions, water use, waste, and the creation of chemical or biological pollutants.

The Leadership in Energy and Environmental Design (LEED) rating system will be used as a dynamic guide for the Sustainable Design Principles process. Dynamic, because it is updated every three years, much like the Washington State Energy Code. This alignment is consistent with RCW 39.39D, the High Performance Green Building statute. Agencies striving to minimize environmental impacts will choose the most recent version of LEED at the initiation of the design phase, and pursue the highest possible LEED certification. Agencies should consider the Living Building Challenge Net Zero Energy Building certification.

Implementation of Sustainable Design Principles

The following sustainable design principles were developed to assist building design teams make thoughtful long term decisions regarding public infrastructure projects.

- Comply with existing laws and executive orders.
- Align 20 year capital plan and each project with agency greenhouse gas and energy reduction goals. Greenhouse gas and energy reduction goals will be met by not adding new

[1] The Report of the Brundtland Commission, Our Common Future, Oxford University Press, 1987
[2] American Institute of Architects 2030 Commitment, http://www.aia.org/about/initiatives/AIAB081490

building emissions and by reducing energy use in existing buildings. Consider net-zero energy goals for new buildings. Set goals for renovations that achieve substantial energy reductions.

- Develop and follow a long term plan for central plant and infrastructure. Consider improvements to central plant and infrastructure in the building project.

- When selecting an architectural and engineering firm, a General Contractor/Construction Manager (GCCM) firm, or a Design Build firm, consider its experience and measureable performance using life cycle costs, operating costs, energy efficiency measures, highly efficient systems, optimizing life-cycle costs, avoiding polluting, minimizing environmental and energy costs, and optimizing life-cycle operation and decommissioning of the facility. Consider the firm's successful implementation in areas such as Energy Savings Performance Contracts, sustainable design, energy efficient procurement, energy efficiency, water conservation, and renewable energy projects.

- Follow the Office of Financial Management (OFM) Life Cycle Cost (LCC) rules.

- Identify environmental impacts of the building design and propose how to reduce them in the predesign. Also consider site selection impacts, including but not limited to land use and vehicle miles traveled.

- Consider local natural resources to optimize the use of available biomass, bioenergy, geothermal or other naturally occurring energy sources.

- Design for ease of maintenance. Include facility maintenance staff in the design process.

- Set an Energy Use Intensity (EUI) goal in terms of kBtu/sf-yr. in the predesign, and in the DES Energy Life Cycle Cost Analysis. Measure and report the occupied EUI by monitoring utility bills in Environmental Protection Agency's Portfolio Manager.

- Consider using an operating performance contract or utility energy efficiency service contract to aid in constructing a sustainably designed building.

- Use the most recent version of LEED. Pursue the highest possible LEED certification to document achievement of sustainability goals.

- Consider elements from the Living Building Challenge Net Zero Energy Building.

- Design and construct a high performance building envelope to control moisture and air infiltration and control heat losses and gains. Limit window to wall ratio. Place windows strategically to take full advantage of passive solar and daylighting.

- Design the building to be flexible and easily modified for future uses. Reduce building square footage using good design, technology, and by combining functions. Minimize private offices.

- Consider renewable energy systems and avoid creating obstacles to the installation of future renewable systems. For instance, always enable future installation of solar technology by optimizing for solar exposure and orientation.

- Be transparent and accountable for achievement of sustainability goals. Provide public access to project goals and results.

- Plan for continuous monitoring and commissioning of energy using systems. Consider sub-metering and visual performance displays to inform building occupants of energy and water use. Consider using LEED for Existing Buildings to document sustainability of operations over the life of the building.

Tool and Resources
Tools and Resources for Implementation of EO13-03 Sustainability Principles:

Laws and Executive Orders
http://www.ecy.wa.gov/sustainability/exeorders.html

OFM Capital Budget Instructions (LCC)
http://www.ofm.wa.gov/budget/instructions/capital.asp

DES Energy Life Cycle Cost Analysis (ELCCA)
http://www.des.wa.gov/services/facilities/Energy/ELCCA/Pages/default.aspx

DES Energy Savings Performance Contracting (ESPC)
http://www.des.wa.gov/services/facilities/Energy/ESPC/Pages/default.aspx

DES Energy Portfolio Manager
http://www.des.wa.gov/services/facilities/Energy/EnergyStar/Pages/default.aspx

USGBC (LEED)
http://www.usgbc.org/

Living Building Challenge Net-Zero Energy Building Certification
https://ilbi.org/lbc/netzero

U.S. General Services Administration Sustainable Design
http://www.gsa.gov/portal/content/104462?utm_source=OGP&utm_medium=print-radio&utm_term=sustainabledesign&utm_campaign=shortcuts

Stanford University Sustainable Guidelines, Environmental Stewardship Committee
http://sustainable.stanford.edu/sites/sem.stanford.edu/files/documents/Stanford_sustainable_guidelines.pdf