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Green Building

SUSTAINABILITY IN COASTAL CONSTRUCTION

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Green Building

Green building (sustainable building) refers to a structure and using process that is environmentally responsible and resource-efficient throughout a building's life-cycle: from concept to design, construction, operation, maintenance, renovation, and demolition.



Objective

The common objective is that green buildings are designed to <u>reduce</u> <u>the overall impact</u> of the built environment on <u>human health and the</u> <u>natural environment</u> by:

Efficiently using energy, water, and other resources

Protecting occupant health and improving employee productivity

Reducing waste, pollution and environmental degradation

Sustainability

Sustainability may be defined as meeting the needs of present generations without compromising the ability of future generations to meet their needs





There are a number of motives to building green, including:

- Environmental
- Economic
- Social benefits





How do we achieve "green?"

Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and human health.

It often emphasizes taking advantage of renewable resources, such as:

- using sunlight through passive solar
- active solar
- photovoltaic techniques
- using plants and trees through green roofs, rain gardens, and for reduction of rainwater run-off.



How?

To reduce operating energy use:

- high-efficiency windows
- insulation in walls,
- ceilings, and floors
- increase the efficiency
- of the building
- envelope, (the barrier
- between conditioned
- and unconditioned
- space).



Daylighting

In addition, effective window placement (daylighting) can provide more natural light and lessen the need for electric lighting during the day. Solar water heating further reduces energy costs.



Water efficiency/conservation

Reducing water consumption and protecting water quality are key objectives in sustainable building.

One critical issue of water consumption is that in many areas, the demands on the supplying aquifer exceed its ability to replenish itself. To the maximum extent possible, facilities should increase their dependence on water that is collected, used, purified, and reused on-site.

Waste-water may be minimized by utilizing water conserving fixtures such as ultra-low flush toilets and low-flow shower heads.



Materials Efficiency

Building materials typically considered to be 'green' include:

- Lumber from forests that have been certified by an objective third-party standard
- Rapidly renewable plant materials like bamboo and straw
- Dimension stone
- Recycled stone
- Recycled metal
- And other products that are non-toxic, reusable, renewable, and/or recyclable.





Material Efficiency Cont.

Building materials should be extracted and manufactured locally to the building site to minimize the energy embedded in their transportation.



Power Generation

Power generation is typically the most expensive feature to add to a building.

Onsite generation of renewable energy through solar power, wind power, hydro-power, or biomass can significantly reduce the environmental impact of the building.



Solar

Some examples of green technologies that use the sun to increase efficiency or generate power include:

- Solar hot water heaters
- Passive solar design
- Photovoltaic solar power generation.



Solar Hot Water collectors

Domestic hot water (water that is consumed or used) must be heated to a useable temperature.

This can be accomplished by having water pumped through a solar panel, heated to a usable temp and then stored in a insulated tank to be used when needed.

The circulation pump only

runs when the system

calls for hot water.



Passive Solar

Another strategy, passive solar building design, is often implemented in low-energy homes. Designers orient windows and walls and place awnings, porches, and trees to shade windows and roofs during the summer while maximizing solar gain in the winter.



Photovoltaic Solar Power Generation

Photovoltaic (PV) is a method of generating electrical power by converting solar radiation into direct current (DC) electricity using semiconductors that exhibit the photovoltaic effect.

Photovoltaic power generation employs solar panels composed of a number of solar cells containing a photovoltaic material.



Water Power Generation



Wind Power Generation



Waste reduction



Resources

http://en.wikipedia.org/wiki/Green_building