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Sustainable Campus

Campus Committee on Sustainability Subcommittee On Capital Outlay

Problem Statement

Humboldt State University is seen as a model for environmental education and sustainability among other campuses in the state. To live up to this standard and to actively progress toward a sustainable campus, we must integrate ecological design principles into our campus's building process. While HSU is starting to shift toward this goal, more could be achieved with a focused look at ecological design aspects of building plans, and evaluating those plans based on sustainable building guidelines in order to more clearly see potential areas of improvement.

Goals

1. Implement green design principles into campus capital outlay projects in order to reduce material, energy, heat and water waste.
2. Increase green product uses such as recycled/reprocessed materials, sustainably harvested material, and materials with low embodied energy into capital outlay projects.

Objectives

1. Implement green design principles into the Forbes Complex project, with the intent to reduce energy use, water use, and landfill waste by 25%.
2. Increase the use of green products to 50% of all procurement purchases by 2005.

Alternative Solutions

In order to achieve the aforementioned objectives, various solutions were discussed. The solutions that we decided not to use for various reasons are discussed below.

1. Green Building Report Card: This project would have culminated in a "report card" that could be used to evaluate current buildings and plans for prospective buildings on campus. After reviewing our various solutions we decided not to use this project because it would only have been able to evaluate work already done. This is problematic because then university staff would have to dedicate new resources to correct problems found.
2. Capital Outlay Plan Evaluation: This project would entail evaluating the current capital outlay plan based on green design principles. Again this

project would be reactionary in nature and would force HSU staff to commit new resources in order to solve problems.

3. Green Building Cost/Benefit Analysis: This project involves comparing green buildings to conventional buildings and doing a cost benefit analysis to determine the economic feasibility of bringing campus buildings up to green building standards. While this project would be a valuable undertaking, we felt other solutions were more urgent. This would have been a lengthy and somewhat abstract process. This too would have reactionary, and we wanted to create something proactive.

Final Solutions

We decided to create a set of green building guidelines and a green building product guide as our final solutions. We chose these two projects because they were the most helpful of possible solutions and because they provided affirmative help rather than after-the-fact criticism.

1. Green Building Guidelines: This project involved creating a list of things that can be done to make a building project more environmentally benign. This project was chosen because it would give planners and builders tools that can be used during the design process. This differs from the Green Building Report Card, which would evaluate the planners already completed work, thus forcing him to do new work in order to remedy problems.

2. Green Building Product Guide: This project involved creating a list of products available to builders that are environmentally benign alternatives to current building materials. This is a valuable project because it gives planners, contractors, etc. a tool to help locate materials that they may have thought were unavailable. It also can save time by providing quick access to products' locations.

Implementation

After we decided on what projects to focus on this semester, we went about researching the topics. The rest of our class time was spent mostly in the computer lab, pouring through web pages on the Internet, and winnowing down our information. The process of compiling our two documents is described below.

1. First we started working on the green building guidelines. Most of our research came from the Hawaii and Oregon web pages, which we learned of from Panama Bartholomy and Dick Hansis respectively. The state of Hawaii's green building page had a large amount of information, and a comprehensive set of green building guidelines. It was from this that we developed the format for HSU's guidelines. Unfortunately, much of the information was impertinent, as Hawaii has a much different climate than Humboldt County. However, Oregon's

page, while much smaller than Hawaii's, was oriented towards a climate similar to ours. Most of our guidelines came directly or indirectly from these pages. Because of this we have asked both state agencies for permission for using their material. Hawaii quickly sent back a response saying that we have their permission. Oregon has not responded yet.

With this and other information we went about designing a list that was organized in an efficient manner (i.e. first the pre-design stage, then design, energy, water, etc.). Once the list was constructed and edited, we set a meeting with the rest of the Campus Committee on Sustainability's subcommittee on capital outlay, consisting of Ken Combs, Judy Walton, Panama Bartholomy, Hillary Kleeb, and Sean Dockery.

This meeting was held on Monday December 4 at 3:00pm. The first item on the agenda was discussion of the guidelines. At this point we went over the guidelines point by point, and made some minor edits. Ken Combs said he would implement the guidelines into the physical services planning process and would encourage plant operation personnel to read the document and follow the guidelines. As there are two departments in charge of buildings, one for the school (Plant Operations), and one for Housing and Dining, Ken Combs suggested that we speak with Housing and Dining to implement the guidelines there too. We also looked at the possibility of holding workshops to teach staff about different green building techniques. Panama has sent the Green Building Guidelines off to the CSU chancellor's office and to the state committee charged with carrying out Governor Davis's Executive Order to make all new state buildings "models of sustainability". These two parties have been in correspondence with Panama, and have requested copies.

While the university does plan to implement green building parameters into the Forbes Complex, we were unable to be instrumental in this, as the Forbes project is still a long ways off. The committee is planning on looking into green building ideas for the Forbes Complex soon, however, so that information will be available when implementation occurs.

2. After working on the Green Building Guidelines, we moved on to create a green product list. We started by finding websites that related to green building techniques and compiling useful sites. Unfortunately, after compiling a good list, the disk that we had saved the information to was obliterated, and we had to start over.

Our second version became more of an organized skeleton that can be added to over time, perhaps with the help from the procurement subcommittee. We have now separated the list out by topic. This will make it possible for the list's users to quickly find exactly what they are looking for. We hope to see more work on the list in the future.

Conclusions

Based on the meeting with the subcommittee on capital outlay and input from Panama Bartholomy and Ken Combs we feel that the Green Building Guidelines will be a useful tool for future planners at HSU. Future work could be done to make the list more effective, however. The list could be set up with corresponding instructions for implementation and resources such the related items on the product list. On the web page, this could be set up using hyperlinks. Future work for the green building list could include web page descriptions.

Problems we ran into were technologically based for the most part, which could have been remedied. For example doubling up on disks will prevent the loss of information. The only other real problem we faced was scheduling issues among the overbooked committee members.

Overall, we feel that based on the success of the Green Building Guidelines, such as the response from not only Physical Services, but also the state committee on EO16, our project was productive, and will be a valuable resource to the campus in the future.

Future Projects

Looking into the future of the CCS subcommittee on Capital Outlay, there are many projects that would be a worthy endeavor. First of all, there are the projects in the near future, such as workshops, expansion of the green products list and additional information about implementation of guidelines.

Other more intensive projects include doing a cost benefit analysis of green buildings versus conventional buildings (by square foot energy used, or per capita, etcetera), and using indicators to analyze how far HSU is coming along. Another project that the subcommittee will be getting involved in is collecting information and preparing predesign plans for the Forbes Complex.

Humboldt State University Green Building Checklist

Campus Committee on Sustainability

Compiled by Hillary Klee and Sean Dockery

This checklist is designed to be used as a tool in helping university administrators and engineers to design, build and retrofit buildings in an environmentally benign way. Using these guidelines in their entirety should help to create buildings which use less electricity and heating fuel, contain less embodied energy, efficiently use water, and have a low impact on the surrounding environment. In addition to being an environmental model these guidelines should help to create buildings which are more comfortable for their users and will save money over time.

I. Pre-Design:

- _ Create a "development team", (comprising the project manager, engineer, architect, faculty, staff, etc.) to work on initial designs of the project, in order to have interdisciplinary cohesiveness.
- _ Develop sustainable guideline goals to incorporate into the Schematic Design documents, to be selected from the following sections.
- _ Use Cost-Benefit Analysis to assess the economic benefit of the sustainability measures chosen.
- _ When possible, choose to remodel or retrofit existing buildings using appropriate environmentally benign building practices.

II. Design:

A. Site:

- _ Design building orientation to maximize solar exposure in winter and shade building from the summer sun. Design building overhangs to protect windows, doors, and people from weather.
- _ Design building to fit the natural characteristics of the site. Minimize disturbance of the site to avoid soil instability and erosion.

- _ Protect native vegetation. Assure adequate protection and clearance between construction and the root system of any trees and plants to be preserved.

- _ Retain existing topsoil and maintain soil health by clearing only the areas reserved for construction. Replant exposed soil areas as soon as possible.

- _ Locate buildings to encourage bicycle and pedestrian access. Provide bicycle and pedestrian paths, bicycle racks, etc. Racks should be visible and accessible to promote bicycle use.

- _ Grade slopes to a ratio of less than 2:1 (run to rise). Balance cut and fill to reduce hauling.

- _ Minimize disruption of water drainage patterns. Provide erosion controls, site drainage, and siltation basins to protect the site during and after construction.

- _ Minimize the area required for the building's footprint. Consolidate utility and infrastructure in common corridors to minimize site degradation and cost, improve efficiency, and reduce impermeable surfaces.

B. Energy Use:

- _ Use site orientation to take advantage of day lighting, solar heating and natural ventilation.

- _ Use energy efficient appliances to compensate passive systems (see green product links section on HSU's Campus Committee on Sustainability web site).

- _ Design classrooms and office areas to be thermally separate from less energy consuming zones like entry, storage, mechanical, and utility areas.

- _ Provide thermal curtains for windows and skylights.

- _ Use renewable energy. Use solar water heaters, photovoltaics, and co-generation when applicable.

C. Future Use:

- _ Design foundation to accommodate additional floors in the future.

_ Avoid interior load bearing walls to accommodate changing needs and uses.

D. Water Use:

_ Establish water catchment systems that can be used for irrigation of landscaping. Provide adequate site drainage to avoid flooding during the rainy season.

_ Provide accessible main valve and branch lines for water service. Insulate hot water pipes. Use water conserving plumbing fixtures. Incorporate solar water heating for hot water needs. Provide adequate exterior water to maintain healthy landscaping.

_ Establish areas of water cleansing plants (e.g. marsh plants) next to impermeable surfaces to absorb and filter rain runoff.

E. Transportation:

_ Accommodate alternate modes of transportation (i.e. walking, bicycling), energy saving transportation (carpooling), and mass transit.

III. **Building Materials:**

_ Minimize use of hazardous materials. When no alternate is available, provide properly designed separate storage.

_ Minimize exposure of construction and building occupants to toxic materials. Use safe, biodegradable materials and alternatives to hazardous materials. Require and monitor safe handling and disposal of any hazardous materials.

_ Avoid using materials that cannot be easily repaired if damaged.

_ Consider using insulated concrete forms for many construction applications.

_ Use re-milled salvage lumber where appropriate and available.

- _ Use certified sustainable wood products, finger-jointed lumber or otherwise resource-efficient building materials. Avoid the use of old-growth lumber, other than “recovered” or “reused” materials.

- _ Use advanced framing systems that reduce waste (for wood structures), two stud corners, engineered structural products and prefabricated panel systems.

- _ Use products with low embodied energy and/or high recycled content (see green product links section on HSU’s Campus Committee on Sustainability web site).

- _ Use locally produced products, such as plastic, lumber, insulation, glass tiles, and compost.

- _ Use no-VOC or low-VOC paints, sealants, and adhesives.

- _ Use natural linoleum or other vinyl alternate. Use a finished concrete floor for the first story of multi-story buildings.

- _ Commit to a material selection program that emphasizes efficient and environmentally sensitive use of building materials, and that uses locally available products.

IV. Construction:

- _ Designate area on the construction site to collect scrap materials for on-site reuse later in the project or to be marked into the secondary materials market. Require recycling of non-reusable material. Provide adequate space for comprehensive recycling services for building occupants.

- _ Minimize or prohibit non-recyclable/non-reusable packaging both during construction and later in building operation.

- _ Provide flush-out period to remove airborne contaminants from the building and systems.

- _ Protect site from runoff erosion during construction.

Green Product Resource List

Campus Committee on Sustainability

Roofing Materials:

www.renewwood.com

- Recycled shingles
- (800) 420-7576

www.polar-ply.com

- Radiant barrier sheathing for roofs can lower cooling costs by up to 25%

Insulation:

www.foam-tech.com

- Insulation

Flooring:

www.warmlyyours.com

- Heated flooring

www.greenbuilder.com/sourcebook/FloorCoverings.html

- Sustainable Building Sourcebook

Recycled/Sustainable Building Materials:

Collins Wood (no website)

- Smartwood particle board
- (800) 329-1219

www.cascadiaforestgoods.com

- Smartwood products (flooring, panels, etc)

Windows:

www.viceroy.com/html/super_windows.html

- Superwindows

Lighting:

www.expertlighting.com/home.htm

-Energy efficient lighting system consultations

www.eela.com/

-Energy efficient lighting association

HVAC:

www.econar.com/econar.html

-Geothermal heating and cooling

www.natalsac.com

-Energy efficient heating and cooling

Resources:

www.iris.ba.cnr.it

-Nonprofit promoting sustainable buildings

www.naropa.edu/sustainablestudio.html

-Information of building materials

www.greenbuilder.com/sourcebook/contents.html

-Information on green building materials

<http://dea.human.cornell.edu>

-Cornell University's ecotecture worksheets

www.mcn.org/a/mendomotive/default.htm

-Information of renewables-shelter design, permaculture, transportation, products and services

www.ci.tacoma.wa.us/power/energyservices/sustain.htm

-Green materials, resource efficient construction

www.buildinggreen.com/ebn/toc4.html

-The Environmental Building News-newsletter on environmentally responsible building design and construction

www.ci.austin.tx.us/greenbuilder/

-City of Austin, Texas' green building program homepage

www.greenbuilder.com/conference/

-Green building conferences

www.realgoods.com/index.cfm?fp=4&sw=800

-Real Goods, a local resource

WebMail - RE: Sustainable Building Guidelines

Delete File Create Reply Reply All Forward Previous Next Options Index

Help

Date Sent: Thursday, November 02, 2000 3:41 PM

From: "Office of Environmental Quality Control, State of Hawaii" <oeqc@health.state.hi.us> [Add to Address Book](#)

To: hmk3

Subject: RE: Sustainable Building Guidelines

Status: Urgent New

You have our permission.

Jeyan
Planner

----- Original Message -----
From: "hmk3" <hmk3@humboldt.edu>
To: <oeqc@pixi.com>
Sent: Tuesday, October 31, 2000 2:58 PM
Subject: Sustainable Building Guidelines

> My name is Hillary Kleeb and I am a student at Humboldt State University
in
> California. I am working on creating green building checklist to be
> implemented in our school, and I've found your guidelines to be
particularly
> useful in my research. I'm writing to request permission to use parts of
your
> guidelines in our green building checklist.
>
> Feel free to contact me by any means necessary.
>
> Thank you for your time.
> Sincerely,
> Hillary Kleeb
>
> 1826 Blakeslee Ave
> Arcata, CA 95521
> (707) 822-7729
> hmk3@axe.humboldt.edu
>
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