

Description

Analysis

Strategy

Local/ Regional Materials

The use of regional building materials reduces transportation activities and the accompanying pollution. Regional Building materials are often consistent with regional aesthetics and are sometimes more responsive to the local climate when compared with materials from other regions.

Consider incorporation of regional building materials early in the schematic design phase.

Establish a baseline radius from the site to obtain materials from. A radius of 500 mile from the site includes major cities like Sacramento, San Francisco, Oakland, Los Angeles, Reno and parts of Oregon.

Sourcing Materials-Within 500 Miles



Establish a project goal for locally sourced materials and identify materials, material suppliers, and manufacturers that can achieve this goal.

Some materials that may be easily available include concrete, planting, brick, reclaimed wood, wall board.

Sourcing Materials- Manufactured And Assembled Within 500 miles



Diverting and Recycling Waste

Recycling is the collection, reprocessing, marketing and use of materials that were diverted or recovered from the solid waste stream.

Designate well- marked collection and storage areas for recyclables including office paper, newspaper, cardboard, glass, metals and plastics.

Locate a central collection and storage area with easy access for collection vehicles.

Recycling requires minimal cost and offers significant savings in reduced landfill disposal costs.

Storage And Collection Of Recyclables



Description

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect re-usable materials to appropriate sites.

Analysis

Develop and institute a construction waste management plan that identifies proposed deconstruction and salvage opportunities, on-site reprocessing and reuse opportunities, recommended recycling activities, licensed haulers and processors of recyclables and potential markets for salvaged materials. The plan should also include estimated costs associated with recycling, salvaging and reusing materials and should also address source reduction of materials use.

Strategy

Demolition Waste



Consider reuse of existing buildings, include structure, shell, and non-shell elements. Remove elements that pose contamination risk to building occupants and upgrade outdated components such as windows, mechanical systems, and plumbing fixtures.

Reusing existing building reduces construction waste generated. Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transportation. Also typically requires less infrastructure development for utilities and roads.

Salvage/ Re-Use Of Existing Buildings



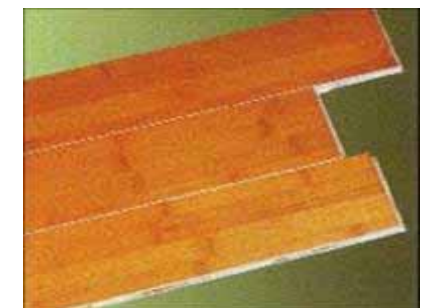
Sourcing Material

Use wood-based materials and products, certified in accordance with the Forest Stewardship Council's Principles and Criteria for wood building components including structural framing, flooring, finishes, and furnishings.

Encourage environmentally responsible forest management. Establish a project goal in which 50% of wood based materials in the project should be FSC certified.

Identify all major areas of wood usage in the project to determine the types of products needed. Research the availability of wood species and products that are available from FSC certified sources.

FSC Certified Wood



Description

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Strategy

Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of new virgin materials.

Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal. Ensure that recycled content materials perform equally or better than virgin materials in terms of strength, maintenance and lifetime. Encourage the reuse of building materials over recycling. Many commonly available products include metals, concrete, masonry, acoustic tile, carpet, ceramic tile, and insulation.

Recycled Content



Consider materials such as bamboo flooring, wool carpets, straw board, cotton batt insulation, linoleum flooring, poplar OSB, sunflower seed board, wheatgrass cabinetry and others.

Reduce the use and depletion of finite raw materials by replacing them with rapidly renewable materials. These building materials and products (made from plants that are typically harvested within a ten-year cycle or shorter) for 5% of the total value of all building materials and products used in the project.

Rapidly Renewable Materials



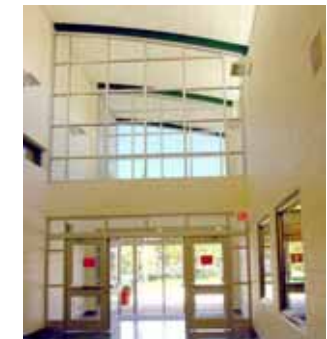
Daylight / Views

Daylight is the controlled admission of natural light into a space through glazing with the intent of reducing or eliminating electric lighting.

Day lighting design involves a careful balance of heat gain and loss, glare control and variations in daylight availability. Shading devices, light shelves, courtyards, atriums and window glazing are all strategies employed in day lighting design. Important considerations include building orientation, window size and spacing, glass selection, reflectance of interior finishes, and locations of interior walls.

By the optimized use of solar light, day lighting creates a simulating and productive environment for building occupants. Establish a baseline daylight factor required for all perimeter spaces.

Day lighting



Description

Provide for the building occupants a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Analysis

Strategies include building orientation, shallow floor plates, increased building perimeter, exterior and interior permanent shading devices, high-performance glazing, and photo-integrated light sensors.

Day lighting reduces the need for electric lighting of building interiors, resulting in decreased energy use. Daylit spaces also improve the indoor environment and increase the occupant productivity. In addition, day lighting and outdoor views provide a connection with the building site and adjacent sites, creating a more integrated neighborhood.

Strategy

Views



Air Quality

VOC's (Volatile Organic Compounds) are chemicals compounds that contribute to air pollution inside and outside of buildings. They impact indoor air quality and contribute to sick building syndrome, building related illnesses and multiple chemical sensitivities.

Projects should strive to limit the use of VOC emitting materials in the building. Develop a project outline specification in early design stages and include criteria for materials with low VOC characteristics.

Materials to address include construction and finishing materials, identify manufacturers and suppliers of low emitting materials such as adhesives, sealants, paints, coatings, carpet, and composite wood.

Low-Emitting Materials



A permanent air monitoring system enables building owners, maintenance personnel and occupants to detect air quality problems.

High CO2 levels are generally an indication of poor indoor air quality (IAQ).

Maintaining low CO2 concentrations similar to those found outdoors is one strategy by which indoor air quality can be optimized.

CO2 Monitoring



Description

Analysis

Strategy

Incentive Programs

Administered by California's four investor-owned utilities under the auspices of the California Public Utilities Commission (CPUC), the Savings by Design program offers incentive to Owners of up to 150,000 and Design Teams up to \$50,000. SBD includes:

- Design assistance, analysis and resources to aid building owners and design teams with energy-efficient facility design
- Systems Approach (Monetary Incentive), a simplified method for documenting energy savings
- Whole Building Approach (Monetary Incentive), uses a detailed energy model to document energy savings as compared to a Title-24 baseline

Refer to <http://www.savingsbydesign.com> for more information about the program process.

As a general rule, Savings by Design yields the greatest incentive (per time input) to:

- Large and relatively energy intensive buildings
- Large and easily documented buildings
- Large projects that do not include sustainability consultation as a covered scope and hence require additional consultation to educate and uncover improvements to the project team

As an example using one of the larger buildings on campus, planned 65,000 s.f. Student Services building, if saving 50% as compared to Title-24 (no small task!), the incentive would be roughly \$50,000. For smaller buildings, or those with less efficiency, the incentive would be further reduced.

Savings By Design



The California Energy Commission oversees this program initiated in 1998. Incentives are awarded to the following technologies at the highlighted monetary level and capped capacity:

- Photovoltaics - \$2.80/W for systems less than 30 kW in capacity
- Wind Generators - \$1.70/W for first 7.5 kW and \$0.70/W for increments >7.5 kW up to 30 kW
- Solar thermal electric - \$3.20/W
- Fuel cells using renewable fuels - \$3.20/W

Incentive levels are slated to decrease by \$0.20 every 6 months (January 1st/July 1st) until exhausted. The CEC also offers a performance based incentive pilot program for PV that is awarded at a rate of: \$0.50/kWh for three years.

Refer to <http://www.consumerenergycenter.org> for more information.

This program is likely one of the most attractive to Las Positas College in the short term as funds are not fully subscribed and multiple technologies considered possible strategies for LPC (photovoltaics, wind, fuel cells, etc) are eligible for funding.

CEC Emerging Renewables Buydown Program



Description

The California Public Utilities Commission oversees this program. Incentives are awarded to the following technologies at the highlighted monetary level and under the given restrictions. Incentive levels are slated to decrease by \$0.20 every 6 months. The incentive program is anticipated to sunset in January 2008. See <http://www.cpuc.ca.gov> for more information.

Incentive Levels	Eligible Technologies	Incentive Offered (\$/Watt)	Min System Size	Max System Size	Max Incentive Size
Level 1	Renewable Fuel Cells	\$4.50/W	30 kW	5 MW	1 MW
	Photovoltaics	\$3.50/W			
	Wind Turbines	\$1.50/W			
Level 2	Non-renewable Fuel Cells	\$2.50/W	None	5 MW	1 MW
Level 3-R	Renewable fuel micro-turbines	\$1.30/W	None	5 MW	1 MW
	Renewable fuel internal combustion engines and large gas turbines	\$1.00/W			
Level 3-N	Non-renewable & waste gas fuel micro-turbines	\$0.80/W	None	5 MW	1 MW
	Non-renewable & waste gas fuel internal combustion engines and large gas turbines	\$0.60/W			

Established in 1995, the Database of State Incentives for Renewable Energy (DSIRE) is an ongoing project of the Interstate Renewable Energy Council (IREC), funded by the U.S. Department of Energy and managed by the North Carolina Solar Center. The database covers state, local, utility, and selected federal incentive programs across all 50 states, providing an up to date summary of incentive levels, limitations, eligibility, and contact information.

Analysis

Unfortunately, as of the date of publication, this program is significantly over subscribed with an outstanding project wait list exceeding \$380 million and an annual budget of only \$18 million. The program is not currently accepting any further applications. Depending on how many of the projects on the wait list reach construction is a key to understanding whether or not funds will become available at a future date. The program can be reached via the DSIRE website at <http://dsireusa.org>.

Incentive programs change on a frequent basis. Indeed, there is likelihood that by the time this master plan is being read, most of the aforementioned incentives will have changed to a greater or lesser degree and still others will have been introduced. As a result, the Database of State Incentives for Renewable Energy is put forward as a consistently up to date and exhaustive website suitable for keeping LPC up to date and in the know with regard to renewable energy incentives. See <http://dsireusa.org> for more information.

Strategy

CPUC Self-Generation Program



Database Of State Incentives For Renewable Energy (DSIRE)



The following Plant Palette is comprised of existing plant material established on campus with native and drought tolerant plants known to thrive in this region. This list is not intended to limit the species that may be planted on campus; rather it should be used as a basis for design.

TREES

BOTANICAL NAME	COMMON NAME
<i>*Acer macrophyllum</i>	Bigleaf Maple
<i>Acer negundo 'Variegatumum'</i>	Variegated Box Elder
<i>*Acer palmatum</i>	Japanese Maple
<i>*Aesculus californica</i>	Buckeye
<i>Arbutus unedo</i>	Strawberry Tree
<i>*Betula jacquemontii</i>	Whitebarked Himalayan Birch
<i>*Betula pendula</i>	Weeping Birch
<i>*Catalpa speciosa</i>	Western Catalpa
<i>Cedrus atlantica</i>	Atlas Cedar
<i>Cedrus deodara</i>	Deodar Cedar
<i>*Celtis occidentalis</i>	Hackberry
<i>Cercis occidentalis</i>	Western Redbud
<i>*Chionanthus virginicus</i>	Fringe Tree
<i>*Chitalpa tashkentensis</i>	Chitalpa
<i>*Feijoa sellowiana</i>	Pineapple Guava
<i>Ginkgo biloba</i>	Ginkgo
<i>*Koelreuteria bipinnata</i>	Chinese Flame Tree
<i>*Lagerstroemia indica</i>	Crape Myrtle
<i>*Liriodendron tulipifera</i>	Tulip Tree
<i>*Nyssa sylvatica</i>	Black Tupelo
<i>Pinus canariensis</i>	Canary Island Pine
<i>Pinus eldarica</i>	Afghan Pine
<i>*Pinus halepensis</i>	Aleppo Pine
<i>Pinus pinea</i>	Italian Stone Pine
<i>Pinus sabiniana</i>	Foothill Pine
<i>*Pistacia chinensis</i>	Chinese Pistache
<i>*Platanus acerifolia 'Yarwood'</i>	London Plane Tree
<i>*Prunus cerasifera 'Krauter Vesuvius'</i>	Purple-leaf Plum
<i>*Prunus lyonii</i>	Catalina Cherry
<i>*Pyrus calleryana 'Aristocrat'</i>	Flowering Pear
<i>*Pyrus kawakamii</i>	Evergreen Pear
<i>*Quercus agrifolia</i>	Coast Live Oak
<i>*Quercus lobata</i>	Valley Oak
<i>*Quercus suber</i>	Cork Oak
<i>*Sapium sebiferum</i>	Chinese Tallow Tree
<i>*Sequoia sempervirens</i>	Coastal Redwood
<i>*Sequoiadendron giganteum</i>	Giant Sequoia
<i>*Tilia cordata</i>	Little-Leaf Linden
<i>*Umbellularia californica</i>	California Bay Laurel
<i>Zelkova serrata</i>	Sawleaf Zelkova

SHRUBS / VINES

BOTANICAL NAME	COMMON NAME
<i>Abelia grandiflora</i>	Glossy Abelia
<i>Achillea millefolium 'californica'</i>	Yarrow
<i>Arctostaphylos manzanita</i>	No. California manzanita
<i>Artemisia 'Powis Castle'</i>	
<i>Bacharris pilularis 'Twin Peaks'</i>	Dwarf Coyote Brush
<i>Berberis thunbergii spp.</i>	Barberry
<i>Calamagrostis X acutiflora 'Karl Forester'</i>	Forester's Feather Reed Grass
<i>*Camellia japonica</i>	
<i>*Camellia sasanqua</i>	
<i>*Carpenteria californica</i>	Bush Anemone
<i>Castilleja coccinea</i>	Indian Paintbrush
<i>*Ceanothus 'Julia Phelps'</i>	Wild Lilac
<i>*Ceanothus 'Ray Hartman'</i>	Wild Lilac
<i>Cistus purpureus</i>	Orchid Rockrose
<i>Coprosma pumila 'Verde Vista'</i>	
<i>Cotoneaster spp.</i>	Cotoneaster
<i>Diplacus</i>	Azalea Flowered Diplacus
<i>*Diplacus aurantiacus</i>	Monkey Flower
<i>Diplacus calycinus</i>	Rock Monkey Flower
<i>Elymus glaucus (Leymus arenarius)</i>	Blue Wildrye
<i>Escallonia 'Newport Dwarf'</i>	
<i>Eschscholzia californica crocea</i>	California Poppy
<i>Eschscholzia californica peninsularis</i>	California Poppy
<i>Euonymus 'Aureo marginita'</i>	
<i>Euonymus fortunei 'Emerald 'n Gold'</i>	NCN
<i>Euonymus japonica 'Microphylla'</i>	Box Leaf Euonymus
<i>*Euryops pectinatus</i>	NCN
<i>*Garrya elliptica</i>	Coast Silktassel
<i>Garrya fremontii</i>	Fremontii Silktassel
<i>Grevillea Noellii</i>	NCN
<i>Helleborus argutifolius</i>	Corsican Hellebore
<i>Helleborus orientalis</i>	Lenten Rose
<i>*Helleborus spp.</i>	
<i>Hemerocallis 'Hybrids' / Daylily</i>	Daylily
<i>Heteromeles arbutifolia</i>	Toyon
<i>*Heuchera sanguinea</i>	Coral Bells
<i>Ilex cornuta 'Rotunda'</i>	Dwarf Chinese Holly
<i>Iris douglasiana</i>	Douglas Iris
<i>*Iris spp.</i>	Bearded Iris
<i>Juniperus californica</i>	California Juniper
<i>Juniperus occidentalis</i>	Western Juniper
<i>*Juniperus spp.</i>	
<i>Lavandula intermedia 'Grosso'</i>	Grosso Frnch Lavender
<i>*Lavandula stoechas</i>	Spanish Lavender
<i>Leptospermum laevigatum 'Compactum'</i>	Tea Tree
<i>Leptospermum scoparium</i>	New Zealand Tea Tree

<i>Linum lewisii</i>	Blue Flax
<i>Lupinus albifrons</i>	Silver Bush Lupine
<i>Lupinus nanus</i>	Sky Lupine
<i>Lupinus succulentus</i>	Arroyo Lupine
<i>Mahonia 'Golden Abundance'</i>	NCN
<i>Mahonia aquifolium</i>	Oregon Grape
<i>Mahonia aquifolium</i>	Oregon Grape
<i>*Mahonia lomariifolia</i>	Chinese Holly Grape
<i>Mahonia repens</i>	Creeping Mahonia
<i>Muhlenbergia rigens</i>	Deer Grass
<i>*Nandina domestica</i>	Heavenly Bamboo
<i>*Nandina nana</i>	Dwarf Bamboo
<i>Osmanthus fortunei 'San Jose'</i>	NCN
<i>*Osmanthus fragrans</i>	Sweet Olive
<i>Philadelphus coronarius</i>	Mock Orange
<i>Philadelphus lewisii</i>	Lewis Mock Orange
<i>Philadelphus microphyllus</i>	Gray Littleleaf Mock Orange
<i>Polystichum munitum</i>	Sword Fern
<i>*Rhamnus californica</i>	Coffeeberry
<i>Rhamnus californica 'Eve Case'</i>	Coffeeberry
<i>*Raphiolepis indica</i>	Pink Lady
<i>*Rhododendron spp.</i>	
<i>Rhus integrifolia</i>	Lemonade Berry
<i>*Rhus ovata</i>	Sugar Bush
<i>*Ribes aureum</i>	Golden Current
<i>Ribes malvaceum</i>	Chaparral Currant
<i>Ribes sanguineum</i>	Red Flowering Currant
<i>*Romneya coulteri</i>	Matilija Poppy
<i>Rosa californica</i>	California Wild Rose
<i>Rosa spp.</i>	Rose
<i>*Rosmarinus officinalis 'Prostratus'</i>	Dwarf Rosemary
<i>*Rosmarinus officinalis 'Tuscan Blue'</i>	Rosemary
<i>*Salvia leucantha</i>	Mexican bush Sage
<i>Salvia somomensis</i>	Salvia
<i>Sisyrinchium bellum</i>	Blue Eyed Grass
<i>*Tecomaria capensis</i>	Cape Honeysuckle
<i>*Tulbaghia violacea</i>	Society Garlic
<i>Wisteria sinensis</i>	Chinese Wisteria
<i>Zauschneria californica mexicana</i>	Common Cal. Fuchsia

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TURF / GROUNDCOVER

BOTANICAL NAME	COMMON NAME
*Campus Turf	"Fast Track" Seeded Perennial Rye
<i>Arctostaphylos 'Emerald Carpet'</i>	Manzanita
<i>Carex pansa</i>	Cal. Meadow Sedge
* <i>Cotoneaster dammeri 'Lowfast'</i>	Cotoneaster
<i>Trachelospermum asiaticum</i>	Asian Jasmine
<i>Vinca minor</i>	Dwarf Periwinkle
* <i>Trachelospermum jasminoides</i>	Star Jasmine