University of California, Santa Cruz

Campus Green Building
Baseline Narrative

Submitted To:
University of California
Office of the President
Facilities Administration
Planning, Design and Construction

June 30, 2005
Revision 1: August 29, 2007

Submitted By:
Office of Physical Planning and Construction
University of California
Santa Cruz

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
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## Campus Scorecard

### University of California - Santa Cruz

![LEED Logo]

**Sustainable Sites**

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<th>Point Subtotals</th>
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**LEED Category Point Totals:** 14

### Water Efficiency

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<td>Credit 4</td>
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**LEED Category Point Totals:** 5

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**Certified:** 26 to 32 points  **Silver:** 33 to 38 points  **Gold:** 39 to 51 points  **Platinum:** 52 or more points

**Prerequisite**  **UCCC Baseline**

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Green Building Baseline Narrative
revised August 29, 2007
## Energy & Atmosphere

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<tr>
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## Materials & Resources

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**LEED Category Point Totals 15**

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<td><strong>Credit 1.3</strong> Innovation in Design</td>
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<td><strong>Credit 1.4</strong> Innovation in Design</td>
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<td><strong>Credit 2</strong> LEED™ Accredited Professional</td>
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**LEED Category Point Totals 5**

**Total Baseline Points 22**
Sustainable Sites
Prerequisite 1
Erosion & Sedimentation Control

Required Prerequisite

Intent
Control erosion to reduce negative impacts on water and air quality.

Requirements
Design a sediment and erosion control plan, specific to the site, that conforms to United States Environmental Protection Agency (EPA) Document No. EPA 832/R-92-005 (September 1992), Storm Water Management for Construction Activities, Chapter 3, OR local erosion and sedimentation control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

Substantiation
UCSC Campus Standard Specification Section 01560 - Erosion and Sediment Control (attached) requires contractors on all projects involving site development to prepare, submit and follow a Storm Water Pollution Prevention Plan (SWPPP) conforming to stringent State Water Resources Control Board standards. In particular, the contractor must engage a registered civil engineer or qualified environmental protection company to prepare an erosion and sediment control plan whenever construction will occur between October 1 and May 31.

Submittals
- Declare by signed letter template that a conforming erosion and sediment control plan has been prepared by the contractor.

Evaluation
All projects on campus meet this prerequisite.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 1
Site Selection

1 Point - project discretionary

Intent
Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site.

Requirements
Do not develop buildings, roads or parking areas on portions of sites that meet any one of the following criteria:

• Prime farmland as defined by the United States Department of Agriculture in the United States Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 (citation 7CFR657.5).
• Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA).
• Land which is specifically identified as habitat for any species on Federal or State threatened or endangered lists.
• Within 100 feet of any water including wetlands as defined by United States Code of Federal Regulations 40 CFR, Parts 230-233 and Part 22, and isolated wetlands or areas of special concern identified by state or local rule, OR greater than distances given in state or local regulations as defined by local or state rule or law, whichever is more stringent.
• Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (Park Authority projects are exempt).

Submittals
• Provide a signed letter template, signed by the civil engineer or responsible party, declaring that the project site meets the credit requirements.

Discussion
The presence of several Federal and State listed species and of several potential wetlands at UCSC means that this cannot be established as a baseline credit. This credit will be determined on a project by project basis.

_______________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 2
Development Density

1 Point - not possible

Intent
Channel development to urban areas with existing infrastructure, protect greenfields and preserve habitat and natural resources.

Requirements
Increase localized density to conform to existing or desired density goals by utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre (two story downtown development).

Submittals
• Provide a signed letter template, signed by the civil engineer, architect or other responsible party, declaring that the project has achieved the required development densities. Provide density for the project and for the surrounding area.
• Provide an area plan with the project location highlighted.

Discussion
Not possible due to low development density on the UCSC campus.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Sustainable Sites**  
**Credit 3**  
**Brownfield Redevelopment**  

1 Point - not possible

**Intent**  
Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

**Requirements**  
Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment) OR on a site classified as a brownfield by a local, state or federal government agency. Effectively remediate site contamination.

**Submittals**

- Provide a copy of the pertinent sections of the ASTM E1903-97 Phase II Environmental Site Assessment documenting the site contamination OR provide a letter from a local, state or federal regulatory agency confirming that the site is classified as a brownfield by that agency.
- Provide a signed letter template, signed by the civil engineer or responsible party, declaring the type of damage that existed on the site and describing the remediation performed.

**Discussion**  
No known UCSC campus locations qualify as brownfields.

---

Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
**Sustainable Sites**

**Credit 4.1**

*Alternative Transportation: Public Transportation Access*

1 Point - baseline credit

**Intent**
Reduce pollution and land development impacts from automobile use.

**Requirements**
Locate project within 1/2 mile of a commuter rail, light rail or subway station or 1/4 mile of two or more public or campus bus lines usable by building occupants.

**Submittals**
- Provide a signed letter template, signed by an appropriate party, declaring that the project building(s) are located within required proximity to mass transit.
- Provide an area drawing or transit map highlighting the building location and the fixed rail stations and bus lines, and indicate the distances between them. Include a scale bar for distance measurement.

**Discussion**
UCSC is currently served by eight Santa Cruz Metropolitan Transit District (SCMTD) routes and four Campus Transit Routes. As shown in the diagram on the following page, every campus facility is within 1/4 mile of either an SCMTD transit or a Campus Transit route.

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Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 4.1
Alternative Transportation: Public Transportation Access
(continued)
Sustainable Sites
Credit 4.2
Alternative Transportation: Bicycle Storage & Changing Rooms
1 Point - project discretionary

Intent
Reduce pollution and land development impacts from automobile use.

Requirements
For commercial or institutional buildings, provide secure bicycle storage with convenient changing/shower facilities (within 200 yards of the building) for 5% or more of regular building occupants. For residential buildings, provide covered storage facilities for securing bicycles for 15% or more of building occupants in lieu of changing/shower facilities.

Submittals
- For commercial projects: provide a signed letter template, signed by the Architect or responsible party, declaring the distance to bicycle storage and showers from the building entrance and demonstrating that these facilities can accommodate at least 5% of building occupants.

OR
- For residential projects: provide a signed letter template, signed by the architect or responsible party, declaring the design occupancy for the buildings, number of covered bicycle storage facilities for securing bicycles, and demonstrating that these facilities can accommodate at least 15% of building occupants.

Discussion
The achievement of this credit can be accomplished with the bicycle racks that are frequently a part of campus projects.

________________________________________________________________________

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction

UC Santa Cruz
Green Building Baseline Narrative
June 30, 2005
**Sustainable Sites**

**Credit 4.3**

**Alternative Transportation: Alternative Fuel Vehicles**

1 Point - not currently possible

*(will re-evaluate following development of SCMTD CNG base station)*

**Intent**

Reduce pollution and land development impacts from automobile use.

**Requirements**

Provide alternative fuel vehicles for 3% of building occupants AND provide preferred parking for these vehicles,

OR

Install alternative-fuel refueling stations for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors.

**Submittals**

- Provide a signed letter template and proof of ownership of, or 2 year lease agreement for, alternative fuel vehicles and calculations indicating that alternative fuel vehicles will serve 3% of building occupants. Provide site drawings or parking plan highlighting preferred parking for alternative fuel vehicles.

OR

- Provide a signed letter template with specifications and site drawings highlighting alternative-fuel refueling stations. Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.

**Discussion**

The campus would like to request that this credit be evaluated as a baseline credit pending development of a CNG (compressed natural gas) base station by the Santa Cruz Metropolitan Transit District (SCMTD) and more CNG buses purchased by UCSC. (The campus has 1 CNG and 14 biodiesel vehicles in its shuttle fleet. UCSC recently installed a CNG refueling station on campus that went into operation in April 2005. The campus vehicle fleet currently includes 30 electric vehicles, 8 propane fueled vehicles, 6 CNG fueled vehicle, and 10 dual fueled vehicles, and is in the process of adding more.)

This credit could become a baseline credit if the campus and SCMTD fleets contain adequate alternative fuel vehicles and it is determined that the 3% target can be calculated campuswide. Intra-campus trip elimination could be part of calculating this credit. (Note that 600 on-campus staff members out of 3,760 currently ride SCMTD buses to and from work.)

---

Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Sustainable Sites
Credit 4.4
Alternative Transportation: Parking Capacity

1 Point - not possible

Intent
Reduce pollution and land development impacts from single occupancy vehicle use.

Requirements
Size parking capacity to meet, but not exceed, minimum local zoning requirements AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants; OR add no new parking for rehabilitation projects AND provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants.

Submittals
- For new projects: provide a signed letter template, signed by the civil engineer or responsible party, stating any relevant minimum zoning requirements and declaring that parking capacity is sized to meet, but not exceed them. State the number of preferred parking spaces for carpools.
- OR
- For rehabilitation projects: provide a signed letter template, signed by the civil engineer or responsible party, declaring that no new parking capacity has been added. State the number of preferred parking spaces for carpools.

Discussion
Parking management and allocation is handled on a campuswide (rather than a project-by-project) basis. The campus would like to request that this be considered as a baseline credit because the campus has in place a number of aggressive traffic and parking demand management measures.

UCSC Transportation and Parking Services (TAPS) has found that parking management (i.e. parking fees, parking restrictions, etc.) serve as a powerful incentive toward promoting the use of alternative transportation modes (carpooling and vanpooling, public transit, and bicycling).

Carpooling is UCSC’s most popular alternative transportation mode, with more than 28% of all person-trips made via a multi-occupant car. While the typical close-in parking fee costs $756 annually, formal carpoolers qualify for a $432 annual permit split among the carpool participants and, in some high-demand parking lots, reserved carpool parking spaces. 54 such carpool spaces are currently reserved on campus. For the 2003-04 academic year, TAPS sold 221 “A Carpool Permits” to faculty and staff, resulting in a minimum of 442 carpoolers. TAPS also operates 16 commuter vanpools serving more than 220 participants daily; 13 reserved vanpool parking spaces are designated on campus. Taken together, carpoolers and vanpoolers represent 662 faculty and staff members, or 17.6% of the on-campus faculty/staff population of 3,760.

In addition to carpooling and vanpooling programs, a subsidized bus pass program accommodates more than 750 faculty/staff passengers and 9,100 student passengers per day on the SCMTD public transit system. Thanks to this high ridership, SCMTD transit accommodates more than 23% of all person-trips to and from the campus. TAPS also
operates a Bike Shuttle that transports an average of 80 passengers per day up the 600' elevation gain to the central campus, from which they then travel by bike.

Together, these programs have resulted in UCSC achieving an overall observed Average Vehicle Ridership (AVR) of 1.76 passengers per vehicle—a very high figure, especially when compared with the local Santa Cruz community figure of approximately 1.25 passengers per vehicle.

UCSC’s 1988 LRDP permits a maximum of 8,400 parking spaces to be built on campus, and requires that no new parking spaces can be built in any geographical zone of the campus until a 90% utilization rate is achieved among existing spaces. The success of the campus’s alternative transportation programs and its limitation on building new parking spaces is reflected by the fact that the campus has only about 4,800 automobile parking spaces, a number that has remained relatively constant for more than a decade.

______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites

Credit 5.1
Reduced Site Disturbance: Protect or Restore Open Space

1 Point - baseline credit

Intent
Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements
On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the constructed area;

OR,

On previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adapted vegetation.

Discussion
The wooded character of the UCSC campus make it difficult to establish this as a baseline credit if applied as written, because priorities of tree preservation and protection can result in construction staging areas that extend more than 40 feet beyond the building perimeter. Accordingly, UCSC will limit the total area of site disruption to an area no greater than that created by measuring 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches, and 25 feet beyond constructed area areas with permeable surfaces, as established in the LEED requirements. This equivalent disturbance area can respond to local site sensitivities and conditions by being distributed so as to fit between existing tree clusters and other site features.

Submittals
• For greenfield sites, provide a signed letter template prepared by the civil engineer or responsible party demonstrating and declaring that site disturbance (including earthwork and clearing of vegetation) has been limited to an area as described above; provide site drawings and specifications highlighting limits of construction disturbance. For previously developed sites, provide a signed letter template prepared by the civil engineer or responsible party, declaring and describing restoration of degraded habitat areas and include highlighted site drawings with area calculations demonstrating that 50% of the site area that does not fall within the building footprint has been restored.

______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 5.2
Reduced Site Disturbance: Development Footprint

1 Point - baseline credit

Intent
Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirements
Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning’s open space requirement for the site by 25%. For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the development footprint.

Submittals
- For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the development footprint. Provide a letter from the property owner stating that the open space will be conserved for the life of the building.

Discussion
The LEED Campus Application guide tentatively states that a campus may combine multiple open spaces to satisfy this credits requirements, so long as the space utilized as open space is interconnected among each other.

Both UCSC’s current Long Range Development Plan and its Draft 2020 LRDP protect significant land areas as open space as follows:

<table>
<thead>
<tr>
<th></th>
<th>1988 LRDP</th>
<th>Draft 2020 LRDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Reserve</td>
<td>393 acres</td>
<td>420 acres</td>
</tr>
<tr>
<td>Protected Landscape</td>
<td>312 acres</td>
<td>505 acres</td>
</tr>
<tr>
<td>Potential Development Areas</td>
<td>672 acres</td>
<td>601 acres</td>
</tr>
</tbody>
</table>

In each case, open space area (i.e., lands designated Environmental Reserve and Protected Landscape) exceeds potential development area, in the 1988 LRDP land use plan by about 5% and in the Draft 2020 LRDP land use plan by over 50%. (Note as well that substantial portions of potential development areas will remain as open space.)

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Land Use Map
UC Santa Cruz
Draft LRDP 2005
Sustainable Sites
Credit 6.1
Stormwater Management: Rate and Quantity

1 Point - baseline credit

Intent
Limit disruption and pollution of natural water flows by managing stormwater runoff.

Requirements
If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate.
OR
If existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.

Submittals
• Provide a signed letter template, signed by the civil engineer or responsible party, declaring that the rate and quantity of stormwater runoff meets the above requirements.

Discussion
Appendix D - Erosion Control Standards (attached) of UCSC’s published Campus Standards provide as follows:

7. RUNOFF CONTROL. Runoff shall be properly controlled to prevent erosion. The following measures shall be used for runoff control, and shall be adequate to control runoff from a ten-year storm:

A. On soils having high permeability (more than two inches/hour), all runoff in excess of predevelopment levels shall be retained on the site. This may be accomplished through the use of infiltration basins, percolation pits or trenches, or other suitable means. This requirement may be waived where the University determines that high groundwater, slope stability problems, etc., would inhibit or be aggravated by onsite retention, or where retention will provide no benefits for groundwater recharge or erosion control.

B. On projects where onsite percolation is not feasible, all runoff should be detained or dispersed over nonerodible vegetated surfaces so that the runoff rate does not exceed the predevelopment level. Onsite detention may be required by the University where excessive runoff would contribute to downstream erosion or flooding. Any policies and regulations for any drainage zones where the project is located will also apply.

C. Any concentrated runoff which cannot be effectively dispersed without causing erosion, shall be carried in nonerodible channels or conduits to the nearest drainage course designated for such purpose by the University or to onsite percolation devices. Where water will be discharged to natural ground or channels, appropriate energy dissipators shall be installed to prevent erosion at the point of discharge.

D. Runoff from disturbed areas shall be detained or filtered by berms, vegetated filter strips, catch basins, or other means as necessary to prevent the escape of
sediment from the disturbed area.

E. No earth or organic material shall be deposited or placed where it may be directly carried into a stream, marsh, slough, lagoon, or body of standing water.

Very little stormwater leaves the UCSC campus as surface runoff. The campus’s approach to stormwater management has been to reinforce this natural pattern by retaining water on sites with highly permeable soil, and directing other runoff water to sinkholes and similar areas where groundwater recharge can occur. (Detailed technical information is available in The UCSC Stormwater & Drainage Master Plan, Kennedy-Jenks Consultants and Balance Hydrologics, Inc., 2004.)

The provisions of the LEED campus application guide permit evaluating runoff on a campuswide basis. A centralized approach based on groundwater recharge is the means of rate and quantity reduction upon which UCSC has established this as a baseline credit.

______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 6.2
Stormwater Management: Treatment

1 Point - project discretionary

Intent
Limit disruption of natural water flows by eliminating stormwater runoff, increasing on-site infiltration and eliminating contaminants.

Requirements
Construct site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. Do so by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency’s (EPA’s) Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, January 1993 (Document No. EPA-840-B-92-002) or the local government’s BMP document (whichever is more stringent).

Submittals
- Provide a signed letter template, prepared by the civil engineer or responsible party, declaring that the design complies with or exceeds EPA or local government Best Management Practices (whichever set is more stringent) for removal of total suspended solids and total phosphorous.

Discussion
UCSC campus standards require mitigation for runoff from loading docks and from parking lots with more than 25 spaces; in practice, we have been requiring mitigation for smaller lots that discharge into sensitive areas.

The campus is currently required (through delegated authority from EPA to the Regional Water Quality Control Board), to develop a Stormwater Management Plan that details how the campus will manage its stormwater to ensure water quality. The UCSC Plan must include specific BMPs that adequately address, at a minimum, the following six major plan areas: Public Education, Public Participation, Illicit Discharge Detection and Elimination, Construction Site Storm Water Runoff Control, and Post Construction Storm Water Management.

Regarding TSS and phosphorus contamination removal, all Best Management Practices (BMPs) will be required to reduce the discharge of pollutants to the “maximum extent practicable” (MEP). UCSC’s Stormwater Management Plan will be required to identify potential sources of TSS and phosphorous stormwater contamination and to implement BMPs that achieve reduction of these contaminants to the maximum extent practicable.

Following Plan implementation with updated campus design standards, we will know how our practices compare to the LEED credit.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction

UC Santa Cruz
Green Building Baseline Narrative
June 30, 2005
Sustainable Sites
Credit 7.1
Heat Island Effect: Non-Roof

1 Point - baseline credit

Intent
Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements
Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site’s non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area.

Submittals
• Provide a signed letter template, signed by the civil engineer or responsible party, referencing the site plan to demonstrate areas of paving, landscaping (list species) and building footprint, and declaring that meet the above requirements

Discussion
This will be a baseline credit for UCSC. Campus design standards will be updated by October 1, 2005.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 7.2
Heat Island Effect: Roof

1 Point - project discretionary

Intent
Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements
Use ENERGY STAR® compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a “green” (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

Submittals
• Provide a signed letter template, signed by the architect, civil engineer or responsible party, referencing the building plan and declaring that the roofing materials comply with the ENERGY STAR® Label requirements and have a minimum emissivity of 0.9. Demonstrate that high-albedo and vegetated roof areas combined constitute at least 75% of the total roof area.

OR
• Provide a signed letter template, signed by the architect, civil engineer or responsible party, referencing the building plan and demonstrating that vegetated roof areas constitute at least 50% of the total roof area.

Discussion
The achievement of this credit is dependant on the roofing material that is used.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Sustainable Sites
Credit 8
Light Pollution Reduction

1 Point - baseline credit

Intent
Eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments.

Requirements
Meet or provide lower light levels and uniformity ratios than those recommended by the Illuminating Engineering Society of North America (IESNA) Recommended Practice Manual: Lighting for Exterior Environments (RP-33-99). Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior lighting shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light from that luminaire crosses the property boundary.

Submittals
• Provide a signed letter template, signed by an appropriate party, declaring that the credit requirements have been met.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Campus standard specifications will be updated as necessary by October 1, 2005.

______________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Water Efficiency**  
**Credit 1.1**  
**Water Efficient Landscaping: Reduce by 50%**  
1 Point - baseline credit

**Intent**  
Limit or eliminate the use of potable water for landscape irrigation.

**Requirements**  
Use high-efficiency irrigation technology OR use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

**Submittals**  
- Provide a signed letter template, signed by the architect, engineer or responsible party, declaring that potable water consumption for site irrigation has been reduced by 50%. Include a brief narrative of the equipment used and/or the use of drought-tolerant or native plants.

**Discussion**  
This credit will be a baseline for all campus projects. Campus landscape design standards will be updated by October 1, 2005.

__________________________________________  
Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Water Efficiency
Credit 1.2
Water Efficient Landscaping: No Potable Use or No Irrigation
1 Point - project discretionary

Intent
Limit or eliminate the use of potable water for landscape irrigation.

Requirements
Use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering to establish plants), OR do not install permanent landscape irrigation systems.

Submittals
  • Provide a signed letter template, signed by the responsible architect and/or engineer, declaring that the project site will not use potable water for irrigation. Include a narrative describing the captured rain system, the recycled site water system, and their holding capacity. List all the plant species used. Include calculations demonstrating that irrigation requirements can be met from captured rain or recycled site water.

OR
  • Provide a signed letter template, signed by the landscape architect or responsible party, declaring that the project site does not have a permanent landscape irrigation system. Include a narrative describing how the landscape design allows for this.

Discussion
Although it is UCSC campus practice to minimize the use of potable water for irrigation, and to avoid installing permanent landscape irrigation systems when appropriate to the site, some building programs and sites require irrigated landscape. This will be a project discretionary credit.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Water Efficiency
Credit 2
Innovative Wastewater Technologies

1 Point - project discretionary

Intent
Reduce generation of wastewater and potable water demand, while increasing the local aquifer recharge.

Requirements
Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR treat 100% of wastewater on site to tertiary standards.

Submittals
- Provide a signed letter template, signed by the architect, MEP engineer or responsible party, declaring that water for building sewage conveyance will be reduced by at least 50%. Include the spreadsheet calculation and a narrative demonstrating the measures used to reduce wastewater by at least 50% from baseline conditions.

OR
- Provide a signed letter template, signed by the civil engineer or responsible party, declaring that 100% of wastewater will be treated to tertiary standards on site. Include a narrative describing the on-site wastewater treatment system.

Discussion
The use of waterless urinals and dual flush toilets is the most applicable method of credit achievement. There have been some maintenance and operational issues with waterless urinals, but the campus will continue to investigate alternatives.

______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Water Efficiency**

*Credit 3.1*

**Water Use Reduction: 20% Reduction**

1 Point - project discretionary

**Intent**
Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

**Requirements**
Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

**Submittals**
- Provide a signed letter template, signed by the MEP engineer or responsible party, declaring that the project uses 20% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 20% compared to baseline conditions.

**Discussion**
Energy Policy Act of 1992 requirements are already fairly stringent, requiring 1.6 gpf toilets, 1.0 gpf urinals, and 2.5 gpm sink and lavatory fixtures. Using waterless urinals will not, by itself, result in the necessary 20% reduction. Other ultra-low flow fixtures (e.g., 0.8 gpf toilets) are a technology not yet tested at UCSC.

______________________________

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Water Efficiency
Credit 3.2
Water Use Reduction: 30% Reduction

1 Point - project discretionary

Intent
Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirements
Employ strategies that in aggregate use 30% less water than the water use baseline calculated for the building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements.

Submittals
- Provide a signed letter template, signed by the MEP engineer or responsible party, declaring that the project uses 30% less water than the baseline fixture performance requirements of the Energy Policy Act of 1992.
- Provide the spreadsheet calculation demonstrating that water-consuming fixtures specified for the stated occupancy and use of the building reduce occupancy-based potable water consumption by 30% compared to baseline conditions.

Discussion
See discussion for credit 3.1. Also we exceed the water use reductions by over 40%, we can submit for an innovation credit for exemplary water use reduction.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Energy & Atmosphere**

**Prerequisite 1**

**Fundamental Building Systems Commissioning**

Required Prerequisite

**Intent**
Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

**Requirements**
Implement or have a contract in place to implement the following fundamental best practice commissioning procedures.

- Engage a commissioning team that does not include individuals directly responsible for project design or construction management.
- Review the design intent and the basis of design documentation.
- Incorporate commissioning requirements into the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and operation and maintenance documentation.
- Complete a commissioning report.

**Submittals**
- Provide a signed letter template, signed by the owner or commissioning agent(s), confirming that the fundamental commissioning requirements have been successfully executed or will be provided under existing contract(s).

**Discussion**
All future projects will be commissioned in accordance with the prerequisite requirements. UCSC’s Physical Plant staff includes individuals trained in building commissioning who are not directly responsible for project design or construction management. UCSC will develop a commissioning program and incorporate it into its campus design standards by October 1, 2005.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Energy & Atmosphere**  
*Prerequisite 2*  
*Minimum Energy Performance*  

**Required Prerequisite**

**Intent**  
Establish the minimum level of energy efficiency for the base building and systems.

**Requirements**  
Design the building to comply with ASHRAE/IESNA Standard 90.1-1999 (without amendments) or the local energy code, whichever is more stringent.

**Submittals**

- Provide a LEED Letter Template, signed by a licensed professional engineer or architect, stating that the building complies with ASHRAE/IESNA 90.1-1999 or local energy codes. If local energy codes were applied, demonstrate that the local code is equivalent to, or more stringent than, ASHRAE/IESNA 90.1-1999 (without amendments).

**Discussion**  
All new projects achieve this prerequisite based on the fact that California CCR Title 24 is the most stringent code currently available.

---

**Frank Zwart, AIA**  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Energy & Atmosphere
Prerequisite 3
CFC Reduction in HVAC&R Equipment

Required Prerequisite

Intent
Reduce ozone depletion.

Requirements
Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion.

Submittals
- Declare by signed letter template that there are no CFC-based refrigerants in the HVAC and refrigeration systems. If necessary, provide a letter of commitment from the campus describing its intention to phase-out CFCs and summarize the phase-out plan of action and timeline.
- Demonstrate that any existing CFC containing equipment meets EPA Title VI, Rule 608, for reduction of leakage. If connecting to a central system containing CFC refrigerants operate according to USEPA criteria and plan for phasing out the CFC refrigerants.

Discussion
All equipment currently specified meets this prerequisite; campus standard specifications will be updated to reflect this by October 1, 2005.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Energy & Atmosphere**

**Credit 1**

**Optimize Energy Performance**

4 points baseline credit
6 points project discretionary

**Intent**

Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

**Requirements**

Reduce design energy cost compared to the energy cost budget for energy systems regulated by ASHRAE/IESNA Standard 90.1-1999 (without amendments), as demonstrated by a whole building simulation using the Energy Cost Budget Method described in Section 11 of the Standard.

<table>
<thead>
<tr>
<th>New Bldgs.</th>
<th>Existing Bldgs. and Title 24 States</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>20%</td>
<td>10%</td>
<td>2</td>
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<td>25%</td>
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</tr>
<tr>
<td>60%</td>
<td>50%</td>
<td>10</td>
</tr>
</tbody>
</table>

Regulated energy systems include HVAC (heating, cooling, fans and pumps), service hot water and interior lighting. Non-regulated systems include plug loads, exterior lighting, garage ventilation and elevators (vertical transportation).

Two methods may be used to separate energy consumption for regulated systems. The energy consumption for each fuel may be prorated according to the fraction of energy used by regulated and non-regulated energy. Alternatively, separate meters (accounting) may be created in the energy simulation program for regulated and non-regulated energy uses. If an analysis has been made comparing the proposed design to local energy standards and a defensible equivalency (at minimum) to ASHRAE/IESNA Standard 90.1-1999 has been established, then the comparison against the local code may be used in lieu of the ASHRAE Standard. Project teams are encouraged to apply for innovation credits if the energy consumption of non-regulated systems is also reduced.

**Submittals**

- Complete a signed letter template incorporating a quantitative summary table showing the energy saving strategies incorporated in the building design.
- Demonstrate via summary printout from energy simulation software that the design energy cost is less than the energy cost budget as defined in ASHRAE/IESNA 90.1-1999, Section 11.
Discussion
The UC Green Building Standard requires a minimum 20% increase of efficiency above the Title 24 requirements. All projects are being designed to this level. To increase the level of efficiency the design teams will present the options to the owner for review and acceptance. A cost benefit analysis will be performed to evaluate the level of optimization that each project will strive toward.

UCSC has a long-standing campus practice of not providing air conditioning for comfort and is looking for an appropriate methodology to secure appropriate LEED credit for this strategy. The current methodology for measuring optimization does not account for the benefits of naturally ventilated spaces. If natural ventilation could be credited as an optimization in the modeling for LEED than an additional 10%-40% increase could be counted.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 2.1
Renewable Energy: 5%

1 Point - not targeted

Intent
Encourage and recognize increasing levels of on-site renewable energy self supply in order to reduce environmental impacts associated with fossil fuel energy use.

Requirements
Supply at least 5% of the building’s total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals
• Provide a signed letter template, signed by the architect, owner or responsible party, declaring that at least 5% of the building’s energy is provided by on-site renewable energy. Include a narrative describing onsite renewable energy systems installed in the building and calculations demonstrating that at least 5% of total energy costs are supplied by the renewable energy system(s).

Discussion
This credit is not targeted currently due to the high cost impact. The cost benefit analysis does not yield favorable cost performance at current first costs.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 2.2
Renewable Energy: 10%

1 Point - not targeted

Intent
Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements
Supply at least 10% of the building’s total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals
• Provide a signed letter template, signed by the architect, owner or responsible party, declaring that at least 10% of the building’s energy is provided by on-site renewable energy. Include a narrative describing onsite renewable energy systems installed in the building and calculations demonstrating that at least 10% of total energy costs are supplied by the renewable energy system(s).

Discussion
This credit is not targeted currently due to the high cost impact. The cost benefit analysis does not yield favorable cost performance at current first costs.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 2.3
Renewable Energy: 20%

1 Point - not targeted

Intent
Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirements
Supply at least 20% of the building’s total energy use (as expressed as a fraction of annual energy cost) through the use of on-site renewable energy systems.

Submittals
- Provide a signed letter template, signed by the architect, owner or responsible party, declaring that at least 20% of the building’s energy is provided by on-site renewable energy. Include a narrative describing onsite renewable energy systems installed in the building and calculations demonstrating that at least 20% of total energy costs are supplied by the renewable energy system(s).

Discussion
This credit is not targeted currently due to the high cost impact. The cost benefit analysis does not yield favorable cost performance at current first costs.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 3
Additional Commissioning

1 Point - project discretionary

Intent
Verify and ensure that the entire building is designed, constructed and calibrated to operate as intended.

Requirements
In addition to the Fundamental Building Commissioning prerequisite, implement or have a contract in place to implement the following additional commissioning tasks:

1. A commissioning authority independent of the design team shall conduct a review of the design prior to the construction documents phase.
2. An independent commissioning authority shall conduct a review of the construction documents near completion of the construction document development and prior to issuing the contract documents for construction.
3. An independent commissioning authority shall review the contractor submittals relative to systems being commissioned.
4. Provide the owner with a single manual that contains the information required for re-commissioning building systems.
5. Have a contract in place to review building operation with O&M staff, including a plan for resolution of outstanding commissioning-related issues within one year after construction completion date.

Submittals
- Provide a signed letter template, signed by the owner or independent commissioning agent(s) as appropriate, confirming that the required additional commissioning tasks have been successfully executed or will be provided under existing contract(s).

Discussion
The achievement of this credit will require additional design peer reviews, development of a commissioning plan, and post occupancy review.

__________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 4
Ozone Protection

1 Point - baseline credit

Intent
Reduce ozone depletion and support early compliance with the Montreal Protocol.

Requirements
Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFCs or Halons. If the building(s) is(are) connected to a central chilled water system, that system must be HCFC free or a commitment to phasing out HCFC-based refrigerants with a firm plan must be in place.

Submittals
• Provide a signed letter template, signed by the architect or engineer, stating that HVAC&R systems as-built are free of HCFCs and Halons.

Discussion
All current new projects specify non-HCFC refrigerants. A prohibition of using HCFCs or Halons in HVAC and refrigeration systems will be incorporated into campus design standards and standard specifications by October 1, 2005.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere
Credit 5
Measurement and Verification

1 Point - project discretionary

Intent
Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirements
Install continuous metering equipment for the following end-uses:

- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/ton)
- Cooling load
- Air and water economizer and heat recovery cycles
- Air distribution static pressures and ventilation air volumes
- Boiler efficiencies
- Building-related process energy systems and equipment
- Indoor water risers and outdoor irrigation systems

Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings.

Submittals

- Provide a signed letter template, signed by the licensed engineer or other responsible party, indicating that metering equipment has been installed for each end-use and declaring the option to be followed under IPMVP version 2001.
- Provide a copy of the M&V plan following IPMVP, 2001 version, including an executive summary.

Discussion
UCSC’s energy management system is capable of ongoing accountability and optimization, and currently provides continuous metering equipment for its major building projects. Because small variable frequency drives, lighting controls and water risers are currently not part of UCSC’s current building management system parameters, current campus practice does not support designation of this as a baseline credit.

__________________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Energy & Atmosphere

Credit 6
Green Power

1 Point - baseline credit
revised August 2007

Intent
Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirements
Provide at least 50% of the building’s electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are as defined by the Center for Resource Solutions (CRS) Green-e products certification requirements.

Submittals
• Provide a signed letter template, signed by the owner or other responsible party, documenting that the supplied renewable power is equal to 50% of the project’s energy consumption and the sources meet the Green-e definition of renewable energy.
• Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources.

Discussion
UC Santa Cruz students voted during Spring Quarter 2006 to pay a fee that would fund the purchase of clean, sustainable energy. This allowed the campus to purchase 50 million kilowatt hours of clean energy in the form of renewable energy certificates. The purchase, on top of UCSC’s previously existing electrical contract for 5 million kilowatt hours of renewable power, means the campus is now 100 percent green. The initial contract term is four years, and will be renewed or extended since the student fee does not have an expiration date.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Prerequisite 1
Storage & Collection of Recyclables

Required Prerequisite

Intent
Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirements
Provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

Submittals
- Provide a signed letter template, signed by the architect or owner, declaring that the area dedicated to recycling is easily accessible and accommodates the building’s recycling needs.
- Provide a plan showing the area(s) dedicated to recycled material collection and storage.

Discussion
The campus currently has a recycling program that is in compliance with the LEED requirements. All projects will have the space for the recycling infrastructure. Campus design standards will be updated as necessary by October 1, 2005.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources

Credit 1.1

Building Reuse: Maintain 75% of Existing Walls, Floors and Roof

1 Point - not targeted

Intent
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 transport.

Requirements
Maintain at least 75% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material).

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, listing the retained elements and declaring that the credit requirements have been met.

Discussion
This credit is only available to projects that are major renovations to existing buildings.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Materials & Resources**

**Credit 1.2**

**Building Reuse: Maintain 100% of Existing Walls, Floors & Roof**

1 Point - not targeted

**Intent**

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 transport.

**Requirements**

Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing, excluding window assemblies and nonstructural roofing material).

**Submittals**

- Provide a signed letter template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the credit requirements have been met.

**Discussion**

This credit is only available to the projects that are major renovations to existing buildings.

_______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 1.3
Building Reuse: Maintain 100% of Shell/Structure and 50% of Non-Shell/Non-Structure

1 Point - not targeted

Intent
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 transport.

Requirements
Maintain 100% of existing building structure and shell (exterior skin and framing, excluding window assemblies and non-structural roofing material) AND at least 50% of non-shell areas (interior walls, doors, floor coverings and ceiling systems).

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, demonstrating the retained elements and declaring that the credit requirements have been met.

Discussion
This credit is only available to the projects that are major renovations to existing buildings.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 2.1
Construction Waste Management: Divert 50% From Landfill

1 Point - baseline credit

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

Requirements
Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage at least 50% of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Because this credit is evaluated in the field by the contractor, the campus will add appropriate requirements to Division 1 of its standard construction specifications by October 1, 2005.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 2.2
Construction Waste Management: Divert 75% From Landfill
1 Point - project discretionary

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

Requirements
Develop and implement a waste management plan, quantifying material diversion goals. Recycle and/or salvage an additional 25% (75% total) of construction, demolition and land clearing waste. Calculations can be done by weight or volume, but must be consistent throughout.

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, tabulating the total waste material, quantities diverted and the means by which diverted, and declaring that the credit requirements have been met.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 3.1  
Resource Reuse: Specify 5%

1 Point - not targeted

Intent
Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirements
Use salvaged, refurbished or reused materials, products and furnishings for at least 5% of building materials.

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of materials for the project.

Discussion
Due to the scope of these types of projects, the use of salvaged, refurbished or reused materials is not being targeted at this time.

______________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 3.2
Resource Reuse: Specify 10%

1 Point - not targeted

Intent
Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirements
Use salvaged, refurbished or reused materials, products and furnishings for at least 10% of building materials.

Submittals
- Provide a signed letter template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing each material or product used to meet the credit. Include details demonstrating that the project incorporates the required percentage of reused materials and products and showing their costs and the total cost of all materials for the project.

Discussion
Due to the scope of these types of projects, the use of salvaged, refurbished or reused materials is not being targeted at this time.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 4.1
Recycled Content: 5% (post-consumer + 1/2 post-industrial)  
1 Point - project discretionary

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

Requirements
Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 5% of the total value of the materials in the project. The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at www.ftc.gov/bcp/grnrule/guides980427.htm

Submittals
• Provide a signed letter template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

Discussion
Currently there are a variety of recycled content materials specified on campus projects.

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Recycled Content Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Steel</td>
<td>50% - 90% Recycled Content</td>
</tr>
<tr>
<td>Miscellaneous Metals</td>
<td>50% - 90% Recycled Content</td>
</tr>
<tr>
<td>Steel Stud Framing</td>
<td>70% - 90% Recycled Content</td>
</tr>
<tr>
<td>Gypsum Wall Board</td>
<td>10% - 70% Recycled Content</td>
</tr>
<tr>
<td>Aluminum Glazing Systems</td>
<td>10% - 30% Recycled Content</td>
</tr>
<tr>
<td>Concrete ( w/ Fly Ash )</td>
<td>5% - 15% Recycled Content</td>
</tr>
<tr>
<td>Carpet Products</td>
<td>49% - 54% Recycled Content</td>
</tr>
<tr>
<td>Acoustical Ceiling Tiles</td>
<td>30% - 74% Recycled Content</td>
</tr>
<tr>
<td>Acoustical Ceiling Grid Suspension System</td>
<td>25% - 90% Recycled Content</td>
</tr>
</tbody>
</table>

The achievement of this credit depends in large part on the building type and building systems selected for each project. Due to the fact that this credit requires a cost calculation based on actual subcontracts, the full documentation of this credit will not be available until construction is completed. The design teams and contractors need to perform a full review of the specification and pricing analysis to determine what is the amount of recycled content.
Materials & Resources
Credit 4.2
Recycled Content: 10% (post-consumer + 1/2 post-industrial)
1 Point - project discretionary

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

Requirements
Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% of the total value of the materials in the project. The value of the recycled content portion of a material or furnishing shall be determined by dividing the weight of recycled content in the item by the total weight of all material in the item, then multiplying the resulting percentage by the total value of the item.

Mechanical and electrical components shall not be included in this calculation. Recycled content materials shall be defined in accordance with the Federal Trade Commission document, Guides for the Use of Environmental Marketing Claims, 16 CFR 260.7 (e), available at www.ftc.gov/bcp/grnrule/guides980427.htm

Submittals
- Provide a signed letter template, signed by the architect, owner or other responsible party, declaring that the credit requirements have been met and listing the recycled content products used. Include details demonstrating that the project incorporates the required percentage of recycled content materials and products and showing their cost and percentage(s) of post-consumer and/or post-industrial content, and the total cost of all materials for the project.

Discussion
The achievement of this credit depends in large part on the building type and building systems selected for each project. This credit will be targeted, but it will be the responsibility of each project team to track the status of this credit. See Narrative for credit 4.1 above.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources

Credit 5.1

Regional Materials: 20% manufactured regionally

1 Point - project discretionary

Intent
Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

Requirements
Use a minimum of 20% of building materials and products that are manufactured* regionally within a radius of 500 miles. * Manufacturing refers to the final assembly of components into the building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Dallas, Texas, the lumber from Vancouver, British Columbia, and the joist is assembled in Kent, Washington; then the location of the final assembly is Kent, Washington.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

Discussion
The achievement of this credit depends in large part on the building type and building systems selected for each project. Due to the fact that this credit requires a cost calculation based on actual subcontracts, the full documentation of this credit will not be available until construction is completed on a project.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources

Credit 5.2

Regional Materials: 50% extracted regionally

1 Point - project discretionary

Intent
Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

Requirements
Of the regionally manufactured materials documented for MR Credit 5.1, use a minimum of 50% of building materials and products that are extracted, harvested or recovered (as well as manufactured) within 500 miles of the project site.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of regional materials/products and showing their cost, percentage of regional components, distance from project to manufacturer, and the total cost of all materials for the project.

Discussion
Unlike the previous credit, this credit requires that 50% of the materials in Credit 5.1 be extracted, harvested, or recovered from the same 500 mile radius around the project site. This credit requires analysis from design through construction.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources
Credit 6
Rapidly Renewable Materials

1 Point - project discretionary

Intent
Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

Requirements
Use rapidly renewable 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.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, declaring that the credit requirements have been met. Include calculations demonstrating that the project incorporates the required percentage of rapidly renewable products. Show their cost and percentage of rapidly renewable components, and the total cost of all materials for the project.

Discussion
This credit will be evaluated from project to project.

_______________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Materials & Resources

Credit 7
Certified Wood

1 Point - project discretionary

Intent
Encourage environmentally responsible forest management.

Requirements
Use a minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council’s Principles and Criteria, for wood building components including, but not limited to, structural framing and general dimensional framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers.

Submittals
• Provide a signed letter template, signed by the architect, owner or responsible party, declaring that the credit requirements have been met and listing the FSC-certified materials and products used. Include calculations demonstrating that the project incorporates the required percentage of FSC-certified materials/products and their cost together with the total cost of all materials for the project. For each material/product used to meet these requirements, provide the vendor’s or manufacturer’s Forest Stewardship Council chain-of-custody certificate number.

Discussion
This credit will be evaluated from project to project.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality
Prerequisite 1
Minimum IAQ Performance

Required Prerequisite

**Intent**
Establish minimum indoor air quality (IAQ) performance to prevent the development of indoor air quality problems in buildings, thus contributing to the comfort and well-being of the occupants.

**Requirements**

**Submittals**
- Provide a signed letter template, signed by the mechanical engineer or responsible party, declaring that the project is fully compliant with ASHRAE 62-1999 and all published Addenda and describing the procedure employed in the IAQ analysis (Ventilation Rate Procedure).

**Discussion**
ASHRAE 62-1999 is the existing campus standard.

----------------------------------
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality
Prerequisite 2
Environmental Tobacco Smoke (ETS) Control

Required Prerequisite

Intent
Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirements
Zero exposure of non-smokers to ETS by EITHER:

- Prohibiting smoking in the building and locating any exterior designated smoking areas away from entries and operable windows;

OR

- Providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge). Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Submittals

- Provide a signed letter template, signed by the building owner or responsible party, declaring that the building will be operated under a policy prohibiting smoking.

OR

- Provide a signed letter template, signed by the mechanical engineer or responsible party, declaring and demonstrating that designated smoking rooms are exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable deck-to-deck partitions, operated at a negative pressure compared with the surrounding spaces of at least 7 PA (0.03 inches of water gauge), and performance has been verified using the method described in the credit requirements.

Discussion
UCSC’s no smoking policy, which can be found at http://www.ucsc.edu/ppmanual/html/ehs0001.htm meets the requirements of this prerequisite.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Indoor Environmental Quality**  
**Credit 1**  
**Carbon Dioxide (CO₂) Monitoring**  
1 Point - project discretionary

**Intent**  
Provide capacity for indoor air quality (IAQ) monitoring to help sustain long-term occupant comfort and well-being.

**Requirements**  
Install a permanent carbon dioxide (CO₂) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments. Refer to the CO₂ differential for all types of occupancy in accordance with ASHRAE 62-2001, Appendix D.

**Submittals**  
- Provide a signed letter template, signed by the mechanical engineer or responsible party, declaring and summarizing the installation, operational design and controls/zones for the carbon dioxide monitoring system. For mixed-use buildings, calculate CO₂ levels for each separate activity level and use.

**Discussion**  
UCSC is increasingly monitoring carbon monoxide in appropriate areas (e.g., lecture hall, performance spaces, and the like), but has not established it as a campus standard for all buildings and is not prepared to establish it as a baseline credit.

________________________
Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Indoor Environmental Quality

Credit 2
Ventilation Effectiveness

1 Point - project discretionary

Intent
Provide for the effective delivery and mixing of fresh air to support the safety, comfort and well-being of building occupants.

Requirements
For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (Eac) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.

Submittals

• For mechanically ventilated spaces: provide a signed letter template, signed by the mechanical engineer or responsible party, declaring that the design achieves an air change effectiveness (Eac) of 0.9 or greater in each ventilated zone. Complete the table summarizing the air change effectiveness achieved for each zone.

OR

• For mechanically ventilated spaces: provide a signed letter template, signed by the mechanical engineer or responsible party, declaring that the design complies with the recommended design approaches in ASHRAE 2001 Fundamentals Chapter 32, Space Air Diffusion.

OR

• For naturally ventilated spaces: provide a signed letter template, signed by the mechanical engineer or responsible party, declaring that the design provides effective ventilation in at least 90% of each room or zone area in the direction of airflow for at least 95% of hours of occupancy. Include a table summarizing the airflow simulation results for each zone. Include sketches indicating the airflow pattern for each zone.

Discussion
Current mechanical designs at UCSC do not utilize an underfloor air distribution system for delivery, which currently is one of the only ways that the USGBC accepts that the proper air change effectiveness (Eac) can be achieved. The programs of most campus projects do not benefit from the reconfiguration potential of underfloor raised flooring systems.
Indoor Environmental Quality

Credit 3.1

Construction IAQ Management Plan: During Construction

1 Point - baseline credit

Intent
Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.

Requirements
Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

• During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
• Protect stored on-site or installed absorptive materials from moisture damage.
• If air handlers must be used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.
• Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction.

Submittals
• Provide a signed letter template, signed by the general contractor or responsible party, declaring that a Construction IAQ Management Plan has been developed and implemented, and listing each air filter used during construction and at the end of construction. Include the MERV value, manufacturer name and model number.

AND EITHER
• Provide 18 photographs—six photographs taken on three different occasions during construction—along with identification of the SMACNA approach featured by each photograph, in order to show consistent adherence to the credit requirements

OR
• Declare the five Design Approaches of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3, which were used during building construction. Include a brief description of some of the important design approaches employed.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Campus standards and standard specifications Division 1 will be updated appropriately by October 1, 2005.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction

UC Santa Cruz
Green Building Baseline Narrative
June 30, 2005
Indoor Environmental Quality  
**Credit 3.2**  
*Construction IAQ Management Plan: Before Occupancy*

1 Point - baseline credit  

**Intent**
Prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants.  

**Requirements**
Develop and implement an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase as follows:  

- After construction ends and prior to occupancy conduct a minimum two-week building flush-out with new Minimum Efficiency Reporting Value (MERV) 13 filtration media at 100% outside air. After the flushout, replace the filtration media with new MERV 13 filtration media, except the filters solely processing outside air.  

OR  

- Conduct a baseline indoor air quality testing procedure consistent with the United States Environmental Protection Agency’s current Protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445.  

**Submittals**
- Provide a signed letter template, signed by the architect, general contractor or responsible party, describing the building flush-out procedures and dates.  

OR  

- Provide a signed letter template, signed by the architect or responsible party, declaring that the referenced standard’s IAQ testing protocol has been followed. Include a copy of the testing results.  

**Discussion**
The achievement of this credit is being established as a UCSC baseline credit. Campus standards and standard specifications Division 1 will be updated appropriately by October 1, 2005.

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Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Indoor Environmental Quality

Credit 4.1
Low-Emitting Materials: Adhesives & Sealants

1 Point - baseline credit

Intent
Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements
The VOC content of adhesives and sealants used must be less than the current VOC content limits of South Coast Air Quality Management District (SCAQMD) Rule #1168, AND all sealants used as fillers must meet or exceed the requirements of the Bay Area Air Quality Management District Regulation 8, Rule 51.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, listing the adhesives and sealants used in the building and declaring that they meet the noted requirements.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Sealants and adhesives currently specified meet these credit requirements; campus standard specifications will be updated by October 1, 2005.

Table 1a: South Coast Rule #1168 VOC Limits

<table>
<thead>
<tr>
<th>Welding &amp; Installation</th>
<th>VOC Limit [g/L]</th>
<th>Welding &amp; Installation</th>
<th>VOC Limit [g/L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-vinyl backed installation</td>
<td>150</td>
<td>PVC welding</td>
<td>510</td>
</tr>
<tr>
<td>Carpet pad installation</td>
<td>150</td>
<td>CPVC welding</td>
<td>490</td>
</tr>
<tr>
<td>Wood flooring installation</td>
<td>150</td>
<td>ABS welding</td>
<td>400</td>
</tr>
<tr>
<td>Ceramic tile installation</td>
<td>130</td>
<td>Plastic cement welding</td>
<td>350</td>
</tr>
<tr>
<td>Dry wall &amp; panel installation</td>
<td>200</td>
<td>Cove base installation</td>
<td>150</td>
</tr>
<tr>
<td>Subfloor installation</td>
<td>200</td>
<td>Adhesive primer for plastic</td>
<td>650</td>
</tr>
<tr>
<td>Rubber floor installation</td>
<td>150</td>
<td>All others</td>
<td>250</td>
</tr>
<tr>
<td>VCT &amp; asphalt tile installation</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 1b: Substrate VOC Limits

<table>
<thead>
<tr>
<th>Substrates</th>
<th>VOC Limit [g/L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal to metal</td>
<td>30</td>
</tr>
<tr>
<td>Plastic foams</td>
<td>120</td>
</tr>
<tr>
<td>Porous material except wood</td>
<td>120</td>
</tr>
<tr>
<td>Wood</td>
<td>30</td>
</tr>
<tr>
<td>Fiberglass</td>
<td>200</td>
</tr>
</tbody>
</table>

### Table 2: Sealant VOC Limits

<table>
<thead>
<tr>
<th>Sealants</th>
<th>VOC Limit [g/L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural</td>
<td>250</td>
</tr>
<tr>
<td>Roadways</td>
<td>250</td>
</tr>
<tr>
<td>Roofing material installation</td>
<td>450</td>
</tr>
<tr>
<td>PVC welding</td>
<td>480</td>
</tr>
<tr>
<td>Other</td>
<td>420</td>
</tr>
</tbody>
</table>

### Table 3: Sealant Primer VOC Limits

<table>
<thead>
<tr>
<th>Sealant Primer</th>
<th>VOC Limit [g/L]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural (non-porous)</td>
<td>250</td>
</tr>
<tr>
<td>Architectural (porous)</td>
<td>775</td>
</tr>
<tr>
<td>Other</td>
<td>750</td>
</tr>
</tbody>
</table>

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Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Indoor Environmental Quality
Credit 4.2
Low-Emitting Materials: Paints and Coatings

1 Point - baseline credit

Intent
Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements
VOC emissions from paints and coatings must not exceed the VOC and chemical component limits of Green Seal’s Standard GS-11 requirements.

Submittals
- Provide a signed letter template, signed by the architect or responsible party, listing all the interior paints and coatings used in the building that are addressed by Green Seal Standard GS-11 and stating that they comply with the current VOC and chemical component limits of the standard.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. The project paints and coatings need to be fully reviewed to insure that no high VOC paints are specified. Campus design and specification standards will be updated by October 1, 2005.

<table>
<thead>
<tr>
<th>Paint</th>
<th>VOC Limit [g/l]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-flat</td>
<td>150</td>
</tr>
<tr>
<td>Flat</td>
<td>50</td>
</tr>
</tbody>
</table>

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction

UC Santa Cruz
Green Building Baseline Narrative
June 30, 2005
Indoor Environmental Quality
Credit 4.3
Low-Emitting Materials: Carpet

1 Point - baseline credit

Intent
Reduce the quantity of indoor air contaminants that are odorous, potentially irritating
and/or harmful to the comfort and well-being of installers and occupants.

Requirements
Carpet systems must meet or exceed the requirements of the Carpet and Rug
Institute’s Green Label Indoor Air Quality Test Program.

Submittals
• Provide a signed letter template, signed by the architect or responsible party,
  listing all the carpet systems used in the building and stating that they comply
  with the current VOC limits of the Carpet and Rug Institute’s Green Label Indoor
  Air Quality Test Program.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Campus
design and specification standards will be updated by October 1, 2005.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality
Credit 4.4
Low-Emitting Materials: Composite Wood

1 Point - project discretionary

Intent
Reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants.

Requirements
Composite wood and agrifiber products must contain no added urea-formaldehyde resins.

Submittals
- Provide a signed letter template, signed by the architect or responsible party, listing all the composite wood products used in the building and stating that they contain no added urea-formaldehyde resins.

____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Indoor Environmental Quality**  
**Credit 5**  
**Indoor Chemical & Pollutant Source Control**

1 Point - project discretionary

**Intent**
Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

**Requirements**
Design to minimize pollutant cross-contamination of regularly occupied areas:

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways.
- Where chemical use occurs (including housekeeping areas and copying/printing rooms), provide segregated areas with deck-to-deck partitions with separate outside exhaust at a rate of at least 0.50 cubic feet per minute per square foot, no air re-circulation and maintaining a negative pressure of at least 7 PA (0.03 inches of water gauge).
- Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

**Submittals**
Provide a signed letter template, signed by the architect or responsible party, declaring that:

- Permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. are provided at all high volume entryways.
- Chemical use areas and copy rooms have been physically separated with deck-to-deck partitions; independent exhaust ventilation has been installed at 0.50 cfm/square foot and that a negative pressure differential of 7 PA has been achieved.
- In spaces where water and chemical concentrate mixing occurs, drains are plumbed for environmentally appropriate disposal of liquid waste.

**Discussion**
Compliance with this credit needs to be evaluated on a project-by-project basis. The analysis should include an evaluation of maintenance reductions that are a result of less debris being brought into the building through the main entryways.

______________________________
Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Indoor Environmental Quality
Credit 6.1
Controllability of Systems: Perimeter Spaces

1 Point - project discretionary

Intent
Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and wellbeing of building occupants.

Requirements
Provide at least an average of one operable window and one lighting control zone per 200 square feet for all regularly occupied areas within 15 feet of the perimeter wall.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, demonstrating and declaring that for regularly occupied perimeter areas of the building a minimum of one operable window and one lighting control zone are provided per 200 square feet on average.

Discussion
UCSC’s practice of not air conditioning for comfort means that operable windows are frequently, but not always, provided. Therefore this credit needs to be evaluated by each project team.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality

Credit 6.2

Controllability of Systems: Non-Perimeter Spaces

1 Point - not targeted

Intent
Provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and wellbeing of building occupants.

Requirements
Provide controls for each individual for airflow, temperature and lighting for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Submittals
• Provide a signed letter template, signed by the architect or responsible party, demonstrating and declaring that controls for individual airflow, temperature and lighting are provided for at least 50% of the occupants in non-perimeter, regularly occupied areas.

Discussion
The achievement of this credit is not targeted due to the requirement of individual controls for occupants.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality

Credit 7.1
Thermal Comfort: Compliance with ASHRAE 55-1992

1 Point - baseline credit

Intent
Provide a thermally comfortable environment that supports the productivity and well-being of building occupants.

Requirements
Comply with ASHRAE Standard 55-1992, Addenda 1995, for thermal comfort standards including humidity control within established ranges per climate zone. For naturally ventilated buildings, utilize the adaptive comfort temperature boundaries, using the 90% acceptability limits as defined in the California High Performance Schools (CHPS) Best Practices Manual, Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

Submittals
- For mechanically ventilated and air conditioned spaces: provide a signed letter template, signed by the engineer or responsible party, declaring that the project complies with ASHRAE Standard 55-1992, Addenda 1995. Include a table that identifies each thermally controlled zone, and that summarizes for each zone the temperature and humidity control ranges and the method of control used.

OR
- For naturally ventilated spaces: provide a signed letter template, signed by the engineer or responsible party declaring that the project complies with the 90% acceptability limits of the adaptive comfort temperature boundaries in the California High Performance Schools (CHPS) Best Practices Manual Appendix C – A Field Based Thermal Comfort Standard for Naturally Ventilated Buildings, Figure 2.

Discussion
The achievement of this credit is being established as a UCSC baseline credit. Campus standards will be updated by October 1, 2005.

Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
**Indoor Environmental Quality**  
**Credit 7.2**  
*Thermal Comfort: Permanent Monitoring System*  
1 Point - requested baseline credit

**Intent**  
Provide a thermally comfortable environment that supports the productivity and well-being of building occupants.

**Requirements**  
Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and the effectiveness of humidification and/or dehumidification systems in the building.

**Submittals**  
- Provide a signed letter template, signed by the engineer or responsible party, declaring that a permanent temperature and humidity monitoring system will operate throughout all seasons to permit control of the building zones within the seasonal thermal comfort ranges defined in ASHRAE 55-1992, Addenda 1995. Confirm that the temperature and humidity controls were (or will be) tested as part of the scope of work for Energy and Atmosphere Prerequisite 1, Fundamental Building Systems Commissioning. Include the document name and section number where the commissioning work is listed.

**Discussion**  
The achievement of this credit is being established as a UCSC baseline credit. Currently permanent temperature monitoring is part of each campus project; because humidity is not a comfort problem in Santa Cruz, the campus does not monitor for or control humidity except for special purpose areas (e.g., library special collections).

____________________________________
Frank Zwart, AIA  
Campus Architect  
Associate Vice Chancellor  
Physical Planning and Construction
Indoor Environmental Quality

Credit 8.1
Daylight and Views: Daylight 75% of Spaces

1 Point - project discretionary

Intent
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.

Requirements
Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks. Spaces excluded from this requirement include copy rooms, storage areas, mechanical plant rooms, laundry and other low occupancy support areas. Other exceptions for spaces where tasks would be hindered by the use of daylight will be considered on their merits.

Submittals
• Provide a signed letter template signed by the architect or responsible party. Provide area calculations that define the daylight zone and provide prediction calculations or daylight simulation.

Discussion
The attainment of this credit needs to be evaluated on a project by project basis.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Indoor Environmental Quality

Credit 8.2

Daylight and Views: Views for 90% of Spaces

1 Point - project discretionary

Intent
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.

Requirements
Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied spaces. Examples of exceptions include copy rooms, storage areas, mechanical, laundry and other low occupancy support areas. Other exceptions will be considered on their merits.

Submittals
- Provide a signed letter template and calculations describing, demonstrating and declaring that the building occupants in 90% of regularly occupied spaces will have direct lines of site to perimeter glazing. Provide drawings highlighting the direct line of sight zones.

Discussion
The attainment of this credit needs to be evaluated on a project by project basis.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Innovation & Design Process
Credits 1.1 to 1.4
Innovation in Design: To be Determined

4 Points - project discretionary

Intent
To provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

Requirements
Credits 1.1 to 1.4. In writing, identify the intent of the proposed innovation credit, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the design approach (strategies) that might be used to meet the requirements.

Submittals
• Provide the proposal(s) within a signed letter template (including intent, requirement, submittals and possible strategies) and relevant evidence of performance achieved.

_____________________________________
Frank Zwart, AIA
Campus Architect
Associate Vice Chancellor
Physical Planning and Construction
Innovation & Design Process
Credit 2
LEED Accredited Professional

1 Point - baseline credit

Intent
To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.

Requirement
At least one principal participant of the project team that has successfully completed the LEED Accredited Professional exam

Submittals
Provide a signed letter template stating the LEED Accredited Professional’s name, title, company and contact information. Include a copy of this person’s LEED Accredited Professional Certificate.

Discussion
Campus standards and design professional agreements will be updated by October 1, 2005.