# Sustainable Features key to LEED Categories at the Language Arts and Social Sciences (LA/SS) Building

By

West Valley College LEED INTERNSHIP

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| **Controllability of Systems** | IEQc6.1 - Lighting Systems  
IEQc6.2 - Thermal Comfort                                                        | 3,7      | Indoor Environmental Quality, IEQc6.1, IEQc6.2                                |                                                                                        |
| **Daylighting**             | Roof and non-roof                                                          | 4,5,6,7  | Indoor Environmental Quality, Daylighting and views IEQc8.1                   |                                                                                        |
| **Heat Island Effect**      | 1. Adhesives and Sealants  
2. Flooring Systems  
3. Composite Wood and Agrifiber Products                                      | 1        | Sustainable Sites SSc7.1, SSc7.2                                              | 50% of the project site's hardscape is either grey portland cement or under shade. Roof is a cool roof. |
| **Low Emitting Materials**  | 1. Adhesives and Sealants  
2. Flooring Systems  
3. Composite Wood and Agrifiber Products                                      | 3,4,5    | Indoor Environmental Quality, IEQc4.1, IEQc4.3, IEQ 4.4                       |                                                                                        |
| **Recycled Content**        |                                                                              | 3        | Materials and Resources, Recycled Content, MRC4                               |                                                                                        |
| **Recycled Redwood**        |                                                                              | 1,4      | Materials and Resources, Building Reuse, MRC1.1                               | Reuse of existing redwood in the building                                              |
| **Stormwater Runoff**       |                                                                              | 3, Exterior main                   | Water Efficient Landscaping WEc1                                              | List of native plants                                                                 |
Chilled Beams

A chilled beam is a type of convection HVAC system designed to heat or cool large buildings. Pipes of water pass through a "beam" (a heat exchanger) either integrated into standard suspended ceiling systems or are suspended a short distance from the room's ceiling. As the beam chills the air around it, the air becomes denser and falls to the floor. It is replaced by warmer air moving up from below, causing a constant flow of convection and cooling the room. There are two types of chilled beams. Some passive types rely solely on convection whilst there is a "Radiant"/convective passive type which cools through a combination of radiant exchange (40%) and convection (60%) which can provide higher thermal comfort levels, while the active type (also called an "induction diffuser") uses ducts to push ("induce") air toward the unit (increasing its heating and cooling capacity).
Controllability of Systems

Controllability of Lighting systems - requires 90% of occupants to have control over the task lighting.

Controllability of Thermal Comfort - requires 50% of occupants to have control over the HVAC systems (such as thermostats, operable diffusers and/or operable windows)

Daylighting
Access to daylight inside a buildings results in a healthier and more comfortable environment for the occupants and also is also linked to greater productivity. Efficient daylighting design results in high-quality light while reducing energy use for lighting and cooling. At least 75 percent of spaces must have daylighting.

Heat Island Effect
- 50% of all hard scape within the project site scope is either grey Portland cement concrete (no color added) or is shaded.
- The roof of this building is a cool roof.

Definition:

The term "heat island" describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. In the evening, the difference can be as high as 22°F (12°C). Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illnesses, mortality, and water quality.

Cool Roof:

A high solar reflectance—or albedo—is the most important characteristic of a cool roof as it helps to reflect sunlight and heat away from a building, reducing roof temperatures. A high thermal emittance also plays a role, particularly in climates that are warm and sunny. Together, these properties help roofs to absorb less heat and stay up to 50–60°F (28–33°C) cooler than conventional materials during peak summer weather.

Cool roofs provide a number of benefits beyond urban heat island mitigation, including:

- *Reduced energy use*: A cool roof transfers less heat to the building below, so the building stays cooler and uses less energy for air conditioning.
- *Reduced air pollution and greenhouse gas emissions*: By lowering energy use, cool roofs decrease the production of associated air pollution and greenhouse gas emissions.
- *Improved human health and comfort*: Cool roofs can reduce air temperatures inside buildings with and without air conditioning, helping to prevent heat-related illnesses and deaths.
Low Emitting Materials

- Adhesives & Sealants:

Low-emitting adhesives and sealants were used for this project.

- Flooring system:

Installation of low-VOC carpet systems. Carpet and carpet pad were used to meet CRI Green Label Plus certification.

- Composite wood and agrifiber products:

Composite wood and agrifiber products have no added urea-formaldehyde binders

Definition:

The reason for using low-emitting materials is to 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.

Examples of low emitting materials that had been used in the project:

- Plastic Laminate that been used in mill work throughout U.O.N
- Plastic Laminate that been used in vertical surfaces typical U.O.N
- Plastic Laminate that been used in vertical surfaces at SOC desk, kitchenette and conf. room wall.
For more information go to: http://www.formica.com/

- Quartz Surface that had been used in counter tops.
For more information go to: http://www.caesarstoneus.com/

- Acoustical fabricWall Panel that had been used on Lecture Hall Walls
For more information go to: http://www.carnegiefabrics.com

- Linoleum Tackable Wall Panels
For more information go to: http://www.forboflooringna.com
And:  http://www.wolfgordon.com/

- Toilet Compartments and Urinal Screens: Material does not contain urea-formaldehyde resins.

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Recycled Content

Construction materials that had been used in the building have 10% recycled content, for example: aluminum, steel, rebar, drywall, aggregate, concrete (flyash), ceiling tiles, batt insulation, and cement board.

Definition:

Recycled Content: feedstock materials that have been recovered from consumer or industrial waste streams. Recycled content is classified into two types:

1. Consumer waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.
2. Post-Industrial: material diverted from the waste stream during the manufacturing process. Excluded is re-utilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

Examples of material that have Recycled Content are:

- Ceramic tiles that had been used on floors and walls: a major component of floor tile products is a by-product from a manufacturing process that makes products for the roofing industry, which was formerly disposed of as waste.
- For more information go to http://www.daltile.com/
- Quartz Surface that had been used in counter tops.
- For more information go to: http://www.caesarstoneus.com/
- Ceiling tiles that made from mineral fiber with at least 24% recycled content.
- For more information go to: http://www.armstrong.com/
- Acoustic ceiling tiles manufactured from high grade gypsum boards. The gypsum boards are made from following gypsum types:
- naturally occurring gypsum, found in large quantities in the ground
- gypsum produced from by-products at local power plants during desulfurisation – a chemical process in which the sulfur dioxide is removed using limestone powder mixed with water to
form the by-product gypsum

- pre-consumer recycled gypsum waste produced through a production processes
- post-consumer recycled gypsum, is plasterboard waste that is received from Gips Recycling, a Danish company gathering and recycling gypsum waste from building sites across Denmark
- For more information go to: http://knaufdanoline.com/
- Resilient Base that has between 73%-88% Post-consumer Content
- For more information go to: http://www.burkeflooring.com/
- Linoleum that contain pre-consumer recycled content. Post-consumer content is found in many North American products. This post-consumer recycled content may come from used floors recycled into new VCT or windshield glass used in Azterra, Color Essence and Cortina Grande.
- For more information go to: http://www.johnsonite.com/
- Resilient Tile Flooring that made from mineral fiber with at least 24% recycled content.
- For more information go to: http://www.armstrong.com/
- Carpet tiles that have post-consumer; For more information go to: http://www.shawcontractgroup.com/
- Fabric Wall Covering that had been used on walls at Administrative Building U.O.N.: this fabric has recycle content.
- For more information go to: http://www.maharam.com/
- Toilet Compartments and Urinal Screens: has a min of 10% recycle content
- For more information: http://www.bobrick.com/
- CUSTOM BULLETIN BOARD (also see Site Metalwork): Recycled rubber tackboard
  For more information go to: http://www.ghent.com/

Examples of recycled content materials - desktop finishes, paneling, carpet tiles. Photo Credit: Krishnaveni Meka
Stormwater Runoff

Stormwater Runoff is captured by bioswales. Bioswale materials include indigenous stones which are smooth river water stones 4" to 8" diameter, a mineral component consisting of sand or loamy sand, 1/2" to 1" diameter rock, and organic material. After the earth is prepared for the bioswale by performing necessary grading and compaction, a mineral component is placed first and then stones are placed over it per specifications.

Source: http://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcs142p2_004866.jpg

Bioswale in front of LA/SS building. Photo Credit: Corey Chetcuti, LEED
LIST OF NATIVE PLANTS IN THE LANDSCAPE
The native plant list and pictures provided by Corey Chetcuti, LEED Internship

Artemisia californica
Arbutus

Calamagrostis
Tubular Skylights
Solatube Brighten-up series - 14 and 21 inch transparent UV and impact resistant dome with flashing base supporting dome and top of tube were used in the LASS building. For more information on these type of Solatubes go to http://www.solatube.com/commercial/brighten-up#roof-mount-options.
Solatube in one of the classrooms in LA/SS building. Photo Credit: Krishnaveni Meka