

Green Tour Talking Points and Signs

Points are listed in the order of a possible tour route. However, please choose whatever order is most comfortable for you.

Introduction

LEED (Leadership in Energy and Environmental Design): The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is the national benchmark for high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health:

- sustainable site development
- water savings
- energy efficiency
- materials selection
- indoor environmental quality

For more info: US Green Building Council, www.usgbc.org

Outside front

Site selection: The TCES site was chosen to reduce the environmental impact of the building. For example:

- The building site does not include sensitive site elements or restrictive land types (e.g. riparian or wetland areas).
- The building is well out of the 100-year floodplain.
- A bus stop is located within 100 yards (across Country Club Drive from the TCES driveway).

Footprint: The building was designed with the smallest footprint possible. The parking area was also minimally sized based on local zoning requirements in order to reduce overall disturbed land.

Heat Island Effect: Light colors and careful landscaping were used to increase shading and reduce the “heat island effect” that large asphalt parking areas can cause.

- “Heat island” refers to urban air and surface temperatures that are higher (up to 10°F) than surrounding rural areas.
- Increased heat causes increased energy use (for cooling) and thus an increase in CO₂ emissions. It can also affect human health by decreasing air quality and increasing ground-level ozone production (www.epa.gov/heatislands).

Construction Pollution Prevention: Construction pollution such as soil erosion, waterway sedimentation, and airborne dust generation were controlled using temporary and permanent seeding, mulching, earth dikes, silt fencing, sediment traps and sediment basins.

Construction Materials Recycled: Special dumpsters were brought to the site to recycle various construction wastes.

Light Pollution: All light is directed down and/or to the sides, preventing light from shining up into the night sky and reducing electricity use.

- Light pollution is excess or obtrusive light created by humans. Among other effects, it can cause adverse health effects, obscures stars to city dwellers, interferes with astronomical observatories, wastes energy and disrupts ecosystems.
- Energy audit data demonstrates that about 30 to 60 percent of energy consumed in lighting is unneeded or gratuitous (en.wikipedia.org/wiki/Light_pollution).

Stormwater Management: The most stringent Best Management Practices (BMPs) were used to ensure that water is infiltrated on site and does not contribute to the run-off polluting Lake Tahoe.

- Best Management Practices (BMPs) are methods to help developed properties function more like natural, undisturbed forest and meadowland. Water that is conveyed to a lake by an undisturbed watershed is usually very clean, because the watershed's soils and plants act as a natural water purification system. BMPs help developed properties mimic natural conditions, preventing sediment and nutrients from entering our surface waters.
- By implementing BMPs, property owners can help slow the loss of lake clarity. BMPs prescribed for residential properties usually fall into the following categories: vegetating and mulching bare, disturbed soils; infiltrating stormwater runoff from impervious surfaces; paving dirt driveways and roads; and stabilizing or retaining steep slopes and loose soils.

Landscape Rock and Stone: All of the rock and stone used in exterior landscaping and BMPs came from the hole dug for the foundation.

Native Plants: Only native plants were used in the landscaping. Once established, native plants require no irrigation or fertilization and are resistant to most pests and diseases.

- TRPA regulations require that native and/or adaptive vegetation be planted.

Temporary Irrigation: A temporary irrigation system was installed, but will be removed in three years when native plants are established.

*Mulch: Chips and branches from the trees in the building's footprint were mulched and used for planting areas.

Bicycle Storage: Racks and showering/changing facilities are provided to encourage building occupants to use alternative transportation.

Inside Lobby

*Fly-ash Concrete: Concrete containing fly-ash, a waste product of burning coal, is stronger and reduces the waste going to landfills.

Concrete Floor: The stained concrete floor eliminated the need for linoleum and adhesives.

*Recycled Wood: Trees harvested from the building's footprint were milled on-site and used for interior trim.

*Atrium: Large skylights provide natural daylight, which reduces the need for electrical lighting, and the open space allows air circulation.

- Natural light also has health benefits and increases work productivity.

*Recycled Steel: The steel used for the third floor structure above the concrete line is at least 95% recycled.

Radiant Hydronic Heating: Water warmed by a gas-fired generator moves through pipes in the floor to heat the building.

*Recycled Insulation: Blue jean insulation is an example of recycling a product that would otherwise become waste.

Dual Flush Toilets: A high (1.6 g)/low (0.8 g) flush toilet uses up to 80% less water than a standard toilet uses every year.

Rain and Snow: These toilets get their water from a system on the roof that captures rainwater and snowmelt.

Solar Faucets with Low-Flow Nozzles: Sink faucets are aerated and turn off automatically to reduce water waste.

Waterless Urinals: Anti-bacterial, odor-absorbing cartridges eliminate the need for water.

Greenhouse

*Greenhouse: The greenhouse's large, south-facing windows let light into the student lounge and can open to reduce over-heating in warm weather.

*Dual-Paned Windows: These windows are designed to insulate, with argon gas between the panes to provide an additional barrier.

Low-Emissivity Coating: Controls heat transfer through windows and can reduce energy loss by 30-50%.

- A low-emissivity coating is a microscopically thin, virtually invisible, metal or metallic oxide layer deposited directly on the surface of one or more of the panes of glass. The low-emissivity coating reduces the infrared radiation from a warm pane of glass to a cooler pane.
- To keep the sun's heat out of the house (for hot climates, east and west-facing windows, and unshaded south-facing windows), the low-E coating should be applied to the outside pane of glass. If the windows are designed to provide heat energy in the winter and keep heat inside the house (typical of cold climates), the low-emissivity coating should be applied to the inside pane of glass.

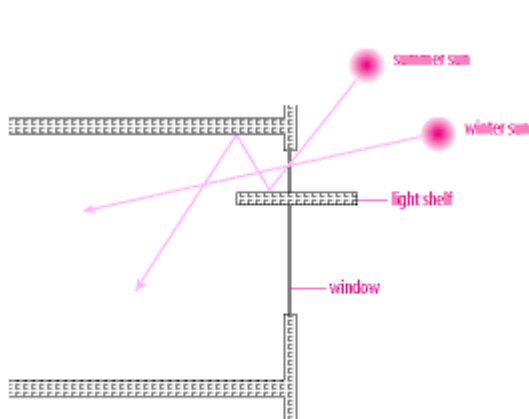
Outside back

*Photo-Voltaic Panels: 875 solar panels collect energy from the sun to provide electricity used in the building.

- The system provides 4,400 kilowatt hours to the building each month.

Concrete Paneling: The "wood" siding is actually a concrete mixture. It is long-lasting, fire resistant, low maintenance, and saves trees.

- Concrete buildings are more energy efficient than wood-frame buildings and therefore require less energy to heat and cool.
- Concrete is made of some of the earth's most common and abundant minerals. The amount of land used to extract the materials needed to make concrete is only a fraction of that used to cut down our forests for lumber. Sources of aggregates are diverse and plentiful: sand, gravel, crushed stone, and an ever-increasing array of consumer and industrial waste products. Crushed concrete from demolition is often used as aggregate for concrete. Concrete is an ideal recycling medium, with no degradation of strength or performance.



A light shelf that divides a window into a view section below and a clerestory section above.

Light Shelves: Act as eaves to shield windows from direct sun, but also reflect natural light into the building up to 25 feet.

A light shelf is a passive architectural device that permits daylight to enter deep into a building, thereby reducing electricity use and increasing occupant comfort and productivity. Light shelves may be interior or exterior; exterior light shelves may also function as sunshades.

*Trex Enclosure: Trex is made of recycled plastics and waste wood and resists moisture, insects, and sunlight.

*Solar Thermal Panels: Using only the sun, two panels capture thermal energy used to pre-heat hot water.

*Cooling Tower: The evaporative cooling tower replaces traditional air-conditioning and uses only 5-10% of the energy.

Cold Water Storage Tanks: Each tank holds 25,000 gallons of water chilled by nighttime ambient temperatures.

CNG Fueling Stations: Compressed Natural Gas (CNG) fueling station provides alternative fuel.

Landscaping: Deciduous trees were planted on the south side of the building to provide shade in summer, but not in winter.

Basement

*Hot Water: Pre-heated water is piped to two high-efficiency, gas-powered water heaters: one for domestic and one for industrial (laboratory) use (see Green Systems).

*Co-generation System: Heat from the gas-fired generator is captured and used to heat the building (see Green Systems).

Plenum: Brings 100% fresh air into the building (see Green Systems).

Air Filter: Air from the plenum is filtered to remove dust and pollen.

Humidifier: After the air is filtered, it is humidified for occupant health.

*Heat Recovery Loop: Water warmed by roof exhaust pre-heats the air (see Green Systems).

Rain/Snowmelt Storage Tank: This 3000 gallon tank holds rainwater and snowmelt before it is filtered and sterilized for the building's toilets (see Green Systems).

*Chilled Water Circulation System: Pumps chilled water from outdoor storage tanks to cool the building (see Green Systems).

Photo-Voltaic Panel Inverters: These blue boxes convert the direct current (DC) from the solar panels on the roof into alternating current (AC)—the kind of electricity in your home.

Stairwell

*Motion Sensors: Automatically turn high efficiency 32-watt lights on and off to reduce electrical consumption.

2nd Floor

*Carpet: The carpet is made of recycled materials and comes in squares for easy replacement and less waste.

*Low VOC Materials: The paint, adhesives, carpet, linoleum, and furniture are virtually odor-free and do not release volatile organic compounds.

- The Environmental Protection Agency (EPA) has identified indoor air pollution as one of the four greatest risks to human health. The World Health Organization estimates that 30% of new and remodeled buildings worldwide experience indoor air quality problems. These problems translate into lost productivity and illnesses costing businesses billions each year.
- Volatile organic compounds (VOCs) are organic chemical compounds that vaporize at normal temperature and pressure and enter the atmosphere. VOC's are often used in paint, plastics, and cosmetics. The United States Environmental Protection Agency (EPA) has found concentrations of VOCs in indoor air to be 2 to 5 times greater than in outdoor air. During certain activities indoor levels of VOCs may reach 1,000 times that of the outside air. Not all organic compounds are volatile; many plastics (polymers) and other large molecules may not have significant vapor pressure at normal temperatures.

Laboratory

North-Facing Windows: Large north-facing window are not standard, but were added for occupant comfort.

*Gray Countertops: Light-colored countertops reduce the lighting requirements in laboratory spaces.

CO₂ Sensors: These sensors trigger fresh air flow when carbon dioxide levels reach a certain threshold.