

College of Southern Idaho

Health Science and Human Services Building

Sustainability is the Foundation and Medium of Design Excellence

60% CO₂ Reduction 2003 CBCECS
 55.4% Better than Current Energy Code (ASHRAE 90.1-2004)
 34.1% Reduction in Potable Water Use
 50% Reduction in Site Water Use

"Buildings account for 39.9% of energy consumption in the U.S." Industry accounts for 32% & Transportation the remaining 28.1%

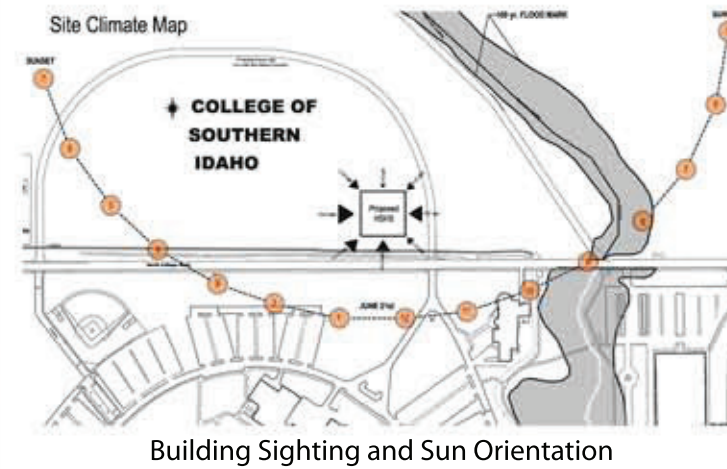
-2009 data from U.S. Department of Energy.

Estimated Annual Energy Savings: \$42,046.00

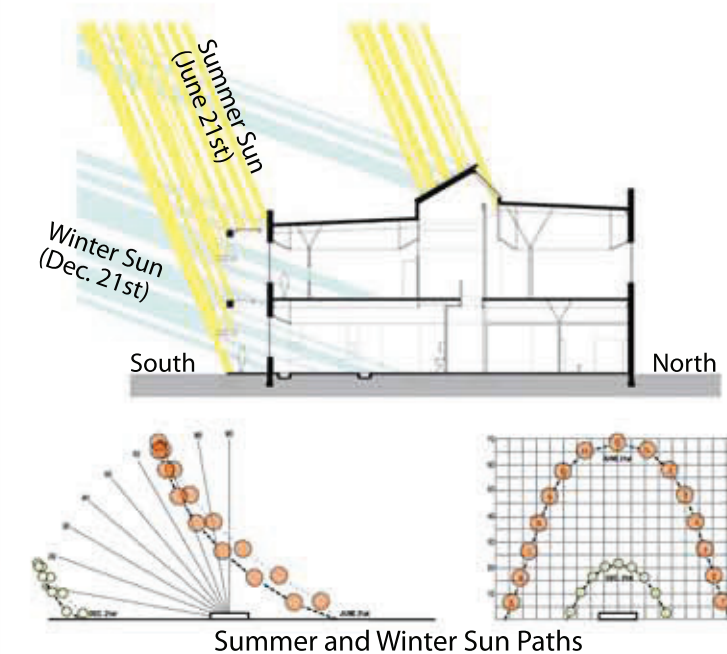
LEED Facts	
CSI Health Science & Human Service Building Twin Falls, Idaho	
LEED for New Construction Certification Pending	
Gold	48*
Sustainable Sites	8/14
Water Efficiency	4/5
Energy & Atmosphere	13/17
Materials & Resources	7/13
Indoor Environmental Quality	12/15
Innovation & Design	4/5
*Out of a possible 69 points	



LEED Leadership in Energy and Environmental Design. "LEED" is a nationally recognized green building certification system which verifies that a building has been designed and built with improved performance in CO emissions reduction, energy savings, improved indoor environmental quality, stewardship of resources, and water efficiency. The Building design is anticipated to receive a LEED rating of "Gold".



Solar analysis: The buildings geometry and orientation are a response to extensive studying of day-lighting through day-lighting model studies. The result is a reduced need for electric lighting and mechanical cooling. Direct hot summer sun is blocked and warm winter sun allowed to penetrate the shell to help heat the space in the winter.



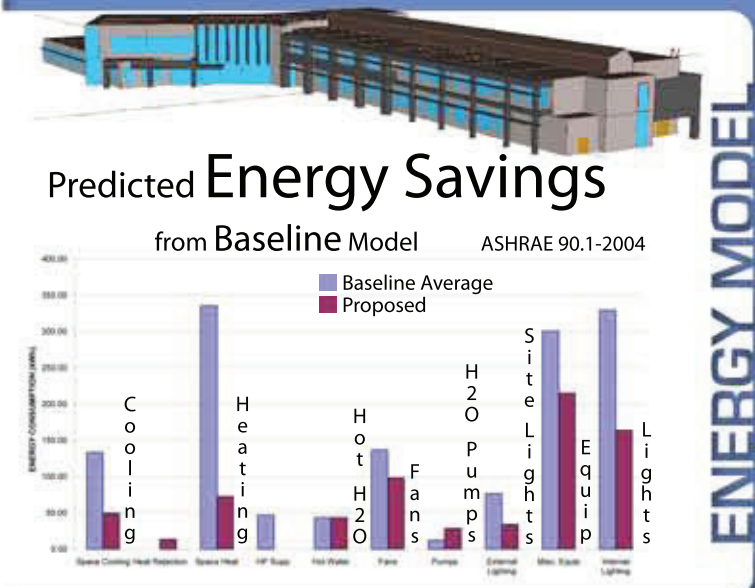
Energy modeling was studied to analyze the buildings performance and energy efficiency. These models show a reduction in energy consumption from a typical baseline model of equal type, size and use from current ASHRAE 90.1-2004 standards. The design was adjusted for increased performance based on investigations of the energy model data.

OCCUPANTS Studies support evidence that access to natural light, views of nature, and circadian rhythms of the change of light color through the day improves learning and increases the well being of building occupants.

24.8% into Lighting
 12.6% into Space Cooling
 12.1% into Space Heating
 7.5% into Electronics
 6.7% into Ventilation
 6.3% into Water Heating
 4.1% into Refrigeration
 3.8% into Computers
 2.0% into Cooking
 13.2% Other (5)

A Firm UNDERSTANDING of Overall **Building Energy USE** is Critical to Design Excellence

Average U.S. Commercial Building Energy Consumption -2008 data from the U.S. Department of Energy



Location: Twin Falls, Idaho
 Total Sq. Ft.: 72,270
 Total Site Development area: 7.13 Acres
 Client: State of Idaho/ College of Southern Idaho
 Design Build Contractor: Starr Corporation
 Commissioning Agent: Test Comm
 Architect: CTA Inc
 Interior Design: CTA Inc
 Structural: CTA Inc
 M/P/E: CTA Inc
 Civil: CTA Inc
 Landscape Arch: CTA Inc
Programs / Ratings:
 LEED 2.2 NC
 Energy Star
 The 2030 Challenge



SUSTAINABILITY The systems of the building are integrated with energy saving strategies that result in a more sustainable design. The design integrates multiple low energy systems including: Geothermal heat, daylighting, water conservation, occupancy sensing controls, efficient building envelope, environmentally responsive use of materials and increased indoor air quality.



SUSTAINABLE FEATURES



LIGHTING

BUILDING ORIENTATION Increased area of north/south facade allowing control of sun exposure. South East oriented courtyard for comfortable winter exposure.

DAYLIGHT Windows are placed along north and south sides of building to best capture natural light and reduce the need for electrical lighting.

OCCUPANCY & PHOTO SENSORS Automatically turn off lights in spaces that are vacant. Saves energy use.

SHADING DEVICES Reduce Solar heat gain and glare during summer sun orientation.

SITE LIGHTING Designed to minimize light pollution on neighboring buildings.

CLERESTORIES Allow natural daylight deep into interior spaces enhancing natural lighting and decreasing the need for electric lighting.



WATER

PLANTS AND IRRIGATION Site landscaping irrigated with non potable canal water. Irrigation system utilizes water efficient drip and spray technologies to decrease volume use. Plantings were chosen that are native or drought tolerant to require minimal watering.

CONSTRUCTION PRACTICES The construction team has strictly adhered to city codes and ordinances to minimize any occurrence of storm water pollution.

HIGH EFFICIENCY PLUMBING FIXTURES This project has high efficiency plumbing fixtures that conserve water use.

STORM WATER CONTROL AND BIOSWALES Uses landscaping plants to filter and condition parking lot and roof storm water runoff. This prevents erosion and decreases pollution from entering the natural water systems.



HEATING & COOLING

SHADING DEVICES Shading devices are oriented to minimize solar heat gain thru window openings.

BUILDING ENVELOPE Energy efficient exterior wall assemblies have minimum of R-24 rated insulation values. The ASHRAE code baseline requires only a R-12.

HIGH-TECH GLASS 2 types of Low-E High tech glass (PPG Sungate 500 and Solarban 70) in 3 different shades to maximize light passage and minimize solar heat gain. Placement of glass type based on solar orientation.

HEAT PUMPS These high efficiency heating and cooling units enabled the use of geothermal energy and decrease consumption due to heating and cooling demands.

VARIABLE AIR VOLUME BOXES (VAV) This system regulates zonal airflows to allow only air required to condition and ventilate into the space thus decreasing overall fan power energy use.

FAN WALL AIR HANDLING UNITS

Fan unit made up of multiple fans, number of fans in use decrease when ventilation demands decrease thus lowering overall energy use.

VARIABLE FREQUENCY PUMPS Water pumps slow or increase speed to meet demand. Pump energy use matches demand & thus decrease overall energy use.

GEO THERMAL Building heat system utilizes only residual heat from campus's geothermal waste line to minimize energy use from new heat source.

HIGHLY REFLECTIVE ROOF MEMBRANE Reduces infrared heat on roof surface which reduces heat gain and "heat island" effect.

SITE SHADING Landscape islands with trees incorporated into parking lots to reduce asphalt heat generation.



MATERIALS

REGIONAL MATERIALS 20 % of the building materials are manufactured and sourced from within 500 miles of project location.

RECYCLED CONTENT Over 20% of the construction materials in the building have post consumer and post industrial recycled content.

DIVERT CONSTRUCTION WASTE 77% of construction waste was DIVERTED from landfills through local recycling programs.

CLEANING MATERIALS Maintenance staff will use "Green Seal" rated sustainable products for cleaning and maintaining the facility.

LONGEVITY OF FINISHES Interior finishes with 20 + year expected lifetime reducing investment of material resources.

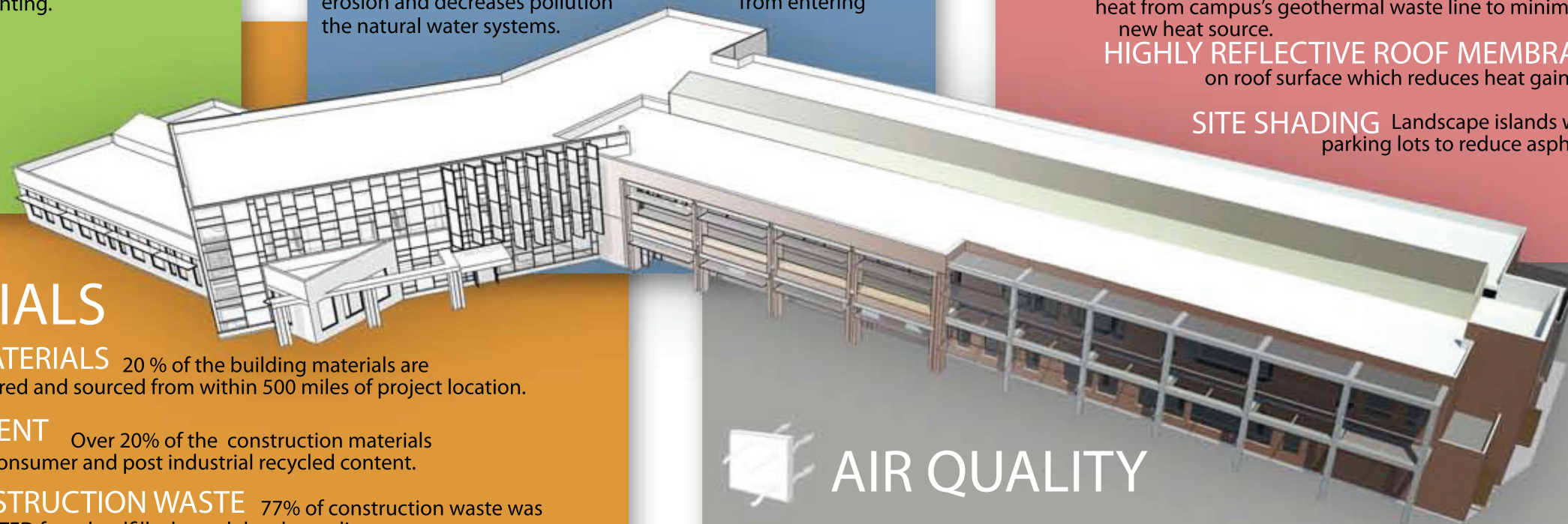


AIR QUALITY

LOW VOC MATERIALS Materials used have strict requirements for very low gas emitting paints, adhesives, carpeting etc.

DEDICATED FRESH AIR Fresh air supplied based on occupant load. Fan wall utilizes only desired (dedicated) amount of fresh air reducing energy required to temper outside air and reducing overall energy.

FRESH AIR INTAKE Increased ventilation providing 30 % more fresh air per person than required by code. Improved indoor air quality improving occupant comfort and productivity.



Resources for further reference:

- Integrated Design Lab (IDL) – www.idlboise.com
- Architecture 2030 Challenge – www.architecture2030.org
- "LEED" and the United States Green Building Council – www.usgbc.org
- US Department of Energy (DOE) – www.energy.gov/index.htm
- CTA Inc Architect Engineers – www.ctagroup.com
- Starr Corporation – www.starrcorporation.com

