INTRODUCTION

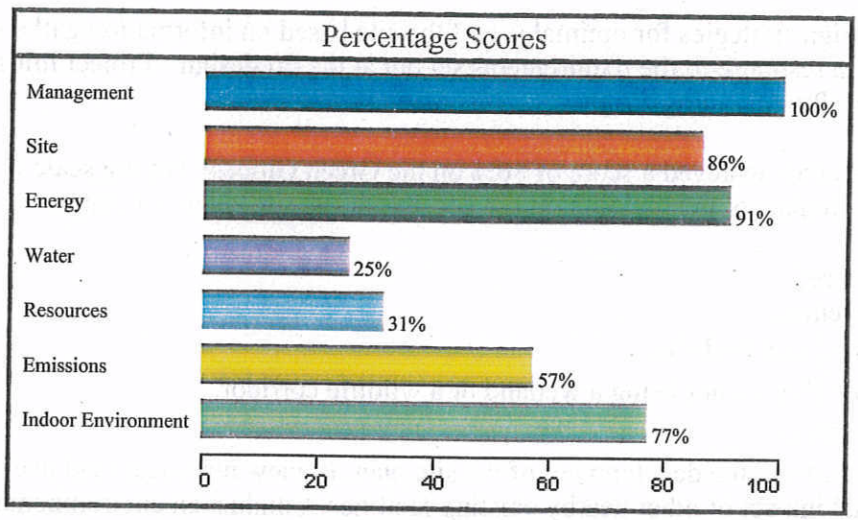
Valley Brook Childcare Center, Breckenridge, Colorado is a 1 story, 8,100 ft² building. The projected construction cost is $300/sq.ft.

Valley Brook Childcare Center is described as follows:

Preschool facility for 60 students, ages 1.5 months through 5 years old.

The client is Town of Breckenridge. The architect is Matthew Stais Architects, Breckenridge, Colorado. The mechanical engineer is Sol Chavez & Associates, Colorado Springs, the electrical engineer is Design Electric Inc, Silverthorne and the structural engineer is SA Miro & Associates, Frisco, Colorado.

Percentage of points achieved by Valley Brook Childcare Center for each module:



Summary of Your Achievement: Valley Brook Childcare Center achieved an overall rating of 76%.

To find out how the performance of Valley Brook Childcare Center compares to other buildings that have been assessed, and to obtain certification, the data must be verified by a licensed engineer or architect who has undergone the Green Globes training and certification.

PROJECT MANAGEMENT POLICIES AND PRACTICES Rating Earned: **100%**

This section evaluates the extent to which an integrated design process and a team approach are being used to generate design solutions that will meet the needs identified in previous stages, as well as the purchasing policy and the commissioning plan.

Valley Brook Childcare Center achieved a score of 100% on the Green Globes™ rating scale for its integrated design process, integration of environmental purchasing and commissioning plan.

Integrated design process
Summary of Your Achievements

An integrated design process is being used for site selection and the building design concept.

The design process uses a team approach.

Green design facilitation is being used to support green integration.

Integration of environmental purchasing
Summary of Your Achievements

Environmental purchasing, including the procurement of energy-efficient equipment is being addressed.

Commissioning plan - documentation
Summary of Your Achievements

The Designer has produced a Schematic Design Report which includes Design Intents, Basis of Design, Design criteria, an O&M Report and budget, and a description of the service contracts that will be needed.

Basis of Design documentation is being prepared.

The Designer has established design criteria to meet the functional and operational requirements of the building.

SITERating Earned: **86%**

This section evaluates design strategies for optimal use of the site based on information gathered during the Predesign - Site Analysis Stage, and in response to the requirements set out at the Predesign - Project Initiation Stage and further outlined in the Predesign - Programming Stage.

Valley Brook Childcare Center achieved a score of 86% on the Green Globes™ rating scale for site design and measures to minimize the impact of the building on the site and/or the site enhancement.

Analysis of development area
Summary of Your Achievements

The site is an existing serviced site.

The site has been verified as not being a wetland or a wildlife corridor.

Opportunities for improvement

Apply the site analysis results to the development of the site plan. Review historical land use records and consider the cumulative environmental impact of other nearby existing facilities. Conduct an environmental or an ecological risk assessment for new construction as well as major building renovations where required.

Development of strategies to minimize ecological impact
Summary of Your Achievements

The design recommends that undeveloped areas on the site, that is areas which will not be build upon or used for parking or access roads, remain undisturbed.

The Schematic Design proposes the integration of native planting and landscape naturalization.

The design proposes exterior lighting that avoids glare, light trespass and night sky glow.

Opportunities for improvement

Develop strategies to avoid creating heat islands. Consider the use of vegetation or artificial shading, aiming for at least 35% shading of impermeable surfaces of the property. Use light-colored, high-albedo materials with at least 30% reflectance on surfaces such as roofing.

Integration and enhancement of watershed features
Summary of Your Achievements

Site grading will be used to increase infiltration, reduce run-off and divert water from the building.

The design proposes biological stormwater management features along drainage courses to retain and/or treat stormwater on-site.

The design proposes that hardscapes be minimized and pervious material and vegetated areas be maximized on the site.

Strategies to enhance site ecology
Summary of Your Achievements

There are strategies to enhance the site's natural features.

ENERGY Rating Earned: **91%**

This section evaluates strategies that are being considered to reduce the energy consumption of the building. The proposed solutions should be developed using an integrated design process that considers a wide range of factors such as the site's microclimate, space optimization, the integration of energy- efficient systems and transportation.

Building systems such as HVAC, lighting and heating of water use large amounts of energy. Energy is an important environmental parameter because it relates directly to climate change and global warming as well as a variety of air emissions. These include sulfur dioxide and oxides of nitrogen, which produce acid rain; as well as hydrocarbons and airborne particles. There is also a direct relationship between energy savings and cost savings.

Valley Brook Childcare Center achieved a score of 91% on the Green Globes™ rating scale for energy efficiency. This represents the weighted integration of the sub-scores for: modeling and simulation of the building energy performance, energy demand minimization strategies, integration of energy-efficient systems, integration of renewable energy sources, and planning energy-efficient transportation.

Modeling and simulation of building energy performance; establishing an energy target.

Valley Brook Childcare Center achieved a sub-score of 100% for its energy consumption, based on the reported annual energy use of 0.062 kBtu per gross square foot per year.

It was not not possible to obtain energy use and cost target information from the Energy Star® Target Finder because building type "Other" was specified. To obtain target information from the Target Finder the building type must be set to one of the primary space types defined by the Target Finder (in the Basic Information section) and then answers required for the building type specified must be provided in the Energy section.
Opportunities for improvement

Perform a preliminary energy simulation. Develop feasible combinations of strategies to achieve levels of performance (i.e. 30%, 40% and 50%) better than those of a building that meets the ASHRAE 90.1 energy code. Determine initial and operating costs related to each strategy. Based on annual energy use calculations, compare various strategies. Confirm that the design is projected to meet or exceed a energy consumption target.

To ensure achievement of the targets, carry out an energy analysis during the design process and after occupancy.

Energy demand minimization strategies

The use of energy in buildings impacts on the environment through the consumption of non-renewable resources and by contributing to global pollution through greenhouse gas emissions. The reduction of this impact and improved comfort conditions start with the space planning of the building and consideration of microclimatic conditions. The *ASHRAE* 90.1-2004 standard sets out the design requirements for improving the energy performance of buildings, focusing on both the building envelope and the building systems and equipment.

Valley Brook Childcare Center achieved a sub-score of 95% based on a review of space optimization, response to microclimate and topography, daylighting and design features of the building envelope that would be expected to affect the building's energy use and hence its carbon dioxide emissions.
Summary of Your Achievements

Space optimization

The design proposes the optimization of space use to maximize energy efficiency.

Response to microclimate and topography

The design proposes that spaces and openings be configured to optimize passive solar gains.

The design proposes that the building be configured to minimize snow deposition and thermal loss due to wind.

The design recommends that the building form, occupied spaces and fenestration be coordinated to allow natural or hybrid ventilation.

Daylighting

The building will be located and oriented to maximize opportunities for daylighting.

The window sizing and placement are being designed to optimize energy-savings and maximize daylighting.

Design strategies are being implemented to bring light deeper into occupied spaces, provide uniform lighting and prevent glare.

The design proposes that window glazing be used to optimize energy-savings and daylighting.

The design proposes that shading devices are to be integrated to minimize overheating and glare.

Optimization of building envelope

The design proposes the use of building form and thermal massing to minimize heat loss through the building envelope.

The design proposes that glazing with a low U-factor be used.

The design explores material selection strategies to respond to ambient conditions, including wind, precipitation and other environmental forces, which would meet or exceed the performance requirements of the *Model National Energy Code for Buildings*.

Measures are being proposed to prevent groundwater or driven rain from penetrating into the building.

The design proposes a continuous air barrier.

Opportunities for improvement

Daylighting

Explore design options that use light-sensing controls to adjust electric lighting in response to available daylight in zones with daylighting potential. Take into account daily and seasonal variations. Plan for thorough commissioning.

Integration of energy-efficient systems

Building systems such as HVAC, lighting and heating of water use large amounts of energy. The *ASHRAE* 90.1 standard focuses on improving the energy consumption performance of commercial buildings based on both the building envelope and the building systems and equipment.

Valley Brook Childcare Center achieved a sub-score of 70% based on a review of individual design features of the building services that would be expected to affect the building's energy use and hence its carbon dioxide emissions.

Summary of Your Achievements

The design proposes the integration of the following lighting features:

- high efficiency lamps
- task lighting where suitable

High efficiency boilers will be used.

The design proposes the integration of heat pumps.

The design proposes the integration of the following:

- variable speed drives on variable air volume distribution systems

- energy-efficient motors

The design provides for the integration of hot water saving devices.

Other energy-saving systems or measures are proposed, described thus:

Heat recovery ventilation system is being considered. Ground source heat/cooling system is also being considered.

Opportunities for improvement

Consider integrating the following lighting features:

- Fluorescent lamps with electronic ballasts.
- The integration of separate lighting controls for small functional spaces, and/or devices such as occupancy sensors, motion detectors, and daylighting controls.

Explore the feasibility of integrating co-generation at the building or the district scale.

The Designer should decide which building systems should be controlled and integrated and at what level of complexity, and then choose the BAS accordingly.

Integration of renewable energy sources

Renewable energy sources are those that produce electricity or thermal energy without depleting resources or producing greenhouse gas. They include solar, wind, water, earth and biomass power, and energy from waste.

Valley Brook Childcare Center received a sub-score of 100% for integration of renewable energy sources.

The following energy systems are being considered:

- active solar-heating
- wind energy
- photovoltaic panels

Opportunities for improvement

Explore strategies to integrate, where appropriate, the following renewable energy systems into the design:

- High efficiency, low emissions biomass combustion systems

Planning energy-efficient transportation

A daily journey totaling as little as 5 miles by car can, over one year, emit as much CO_2 as that emitted to provide heat, light and power for a person in an office.

Valley Brook Childcare Center received a sub-score of 89% for facilitating alternatives to automobile commuting.

Summary of Your Achievements

Public transport

The site design will integrate the following features to reduce automotive commuting:

- good access to public transport
- features promoting shared vehicle transport (car-pooling)

Cycling facilities

The design proposes secure, sheltered and accessible bicycle storage.

The design includes staff changing facilities in the building.

Opportunities for improvement

Public transport

Consider installing alternative fuel re-fueling stations either on-site or in reasonable proximity.

WATERRating Earned: 25%

This section calls for the development of strategies to conserve treated water and minimize the need for off-site treatment of water.

Valley Brook Childcare Center achieved 25% on the Green Globes™ rating scale for water consumption and measures to minimize water use.

Meeting a water performance target

Opportunities for improvement

Estimate the water usage targets for the building based on the integration of water-conserving features and strategies.

Water conserving strategies

Summary of Your Achievements

Strategies to minimize consumption of potable water

The following water fixtures are being considered:

- low flush toilets (less than 1.6 gallons/flush)
- water-saving fixtures on faucets (2.0 gallons/minute) and showerheads (2.4 gallons/minute)

Strategies to minimize water for irrigation

The design addresses the principles of xeriscaping with integration of native, drought-resistant species into the landscape.

Opportunities for improvement

Strategies to minimize consumption of potable water

Depending on the uses and quantities of water consumed in the building, determine the extent to which water needs to be metered and address this in the Schematic Design. As with electricity meters, water meters need to be accommodated in an appropriate enclosure and location, usually in the basement. If the intention is to connect water metering to a BAS, an appropriate conduit needs to be provided.

Integrate water saving devices such as:

- other appropriate water-saving fixtures or appliances

Strategies to reduce off-site treatment of water

If a graywater system is to be used, evaluate how the various graywater technologies could be integrated into the design.

RESOURCES, BUILDING MATERIALS AND SOLID WASTERating Earned: 31%

This section evaluates strategies and design approaches, material selection and construction systems that use fewer resources, or enable materials to be reused or recycled. The design of facilities for storing recyclable waste is also considered.

Valley Brook Childcare Center achieved a score of 31% on the Green Globes™ rating scale for managing resources through waste reduction and site stewardship.

Integration of systems and materials with low environmental impact
Opportunities for improvement

Conduct a preliminary research and evaluation of building materials generically, such as concrete, steel, and wood. Explore the environmental effects of different design options or material mixes.

Strategies to minimize the use of non-renewable resources
Summary of Your Achievements

The Schematic Design recommends the incorporation of building materials that contain recycled content.

The utilization of locally manufactured materials is proposed for the project.

The design stipulates that tropical hardwoods be avoided and solid lumber and timber panel products originate from certified or sustainable sources.

Opportunities for improvement

Research local sources to assess the availability of construction & demolition (C&D) waste for use in the project. Avoid products that contain hazardous materials or that do not meet current performance standards.

Design strategies for building durability, adaptability and disassembly
Summary of Your Achievements

The design proposes the incorporation of durable, low-maintenance building materials and components, particularly in areas likely to experience high levels of wear and tear.

Opportunities for improvement

Explore strategies to accommodate future growth or alterations of the facility, with respect to the footprint, façades, floor to floor height and column spacing, spatial definition, mechanical systems, components and finishes.

Explore systems that are fastened in such a way as to facilitate disassembly, thereby avoiding their destruction and allowing the components to be reused when the building is demolished.

Strategies to reuse and recycle demolition waste
Summary of Your Achievements

A construction, demolition and renovation waste management plan is proposed.

Facilities for recycling and composting
Summary of Your Achievements

The design proposes facilities for future occupants to handle and store consumer recyclables.

Opportunities for improvement

Investigate the feasibility of composting either on or off-site.

EMISSIONS, EFFLUENTS AND OTHER IMPACTS Rating Earned: **57%**

This section evaluates strategies to avoid or minimize air emissions, ozone-depleting substances, effluents, pesticides, and hazardous materials. Note that it is assumed that halon-containing materials will not be introduced into the building.

Valley Brook Childcare Center achieved 57% on the Green Globes™ rating scale for emissions, effluents and other environmental impacts.

Strategies to minimize air emissions
Summary of Your Achievements

Low-NOx burner technology is being investigated.

Strategies to avoid ozone-depleting refrigerants
Opportunities for improvement

Investigate cooling and air-conditioning solutions, which do not use ozone-depleting substances (ODS) or potent industrial greenhouse gases (e.g. PIGGs-HFCs, PFCs and SF6).Wherever possible, integrate passive solutions (e.g. shading, insulation, building orientation, natural and forced ventilation) into new buildings and major renovations to reduce the cooling load. Consider evaporative cooling, natural ventilation or hybrid ventilation as alternatives to reduce the need for ODS refrigerants.

Strategies to control surface run-off and prevent sewer contamination
Summary of Your Achievements

Design measures will be taken to prevent sewer contamination.

There will be measures to prevent stormwater run-off from the roof from entering public utilities.

Pollution reduction strategies
Summary of Your Achievements

Strategies to control other pollutants (PCBs, asbestos, radon)

Design measures are being taken to prevent the accumulation and penetration of harmful chemicals and gases (such as radon) into the building.

Strategies for proper storage and control of hazardous materials

The design provides proper storage of hazardous materials.

Opportunities for improvement

Strategies to control other pollutants (PCBs, asbestos, radon)

In the case of a retro-fit, ensure that any PCBs present in the building meet applicable regulatory requirements. Provide a PCB management program that designates responsibilities, requires an inventory of all materials containing PCBs including transformers, requires the labeling of transformers, includes records showing the locations of major PCB-containing equipment, stipulates storage requirements and describes a strategy for phasing out and disposing of PCB-containing equipment.

In the case of a retro-fit, remove or encapsulate all friable asbestos. Removal is preferred, however, encapsulating asbestos is an acceptable and cost-effective option, as long as it does not compromise the health and safety of those involved, such as workers and occupants.

Strategies for integrated pest management

Avoid architectural/structural perforations and openings that could allow pests to enter and plan proper storage facilities to protect garbage and kitchen waste from pests. Outdoors, select native, pest-resistant vegetation and integrate it into the landscaping.

INDOOR ENVIRONMENT Rating Earned: **77%**

This section evaluates the strategies that are being used to ensure that the indoor environment is healthy and comfortable, in terms of providing a high level of indoor air quality, effective lighting, thermal comfort and suitable acoustic conditions.

Valley Brook Childcare Center achieved 77% on the Green Globes™ rating scale for indoor environment and the measures to provide healthy, productive and comfortable environment.

Strategies for effective ventilation
Summary of Your Achievements

The design proposes that air intakes be positioned so that they are far from sources of pollution and prevent recirculation. The openings will be protected.

The suggested ventilation system provides sufficient ventilation rates in accordance with ANSI/ASHRAE 62.1-2004.

A strategy for effectively delivering ventilation is being developed.

The design proposes a CO_2 monitoring system to ensure that levels do not exceed 800 ppm.

The intended control systems will allow ventilation rates to be adjusted to meet varying needs throughout the building.

The design will allow occupants to have personal control over the ventilation rates.

The design provides for easy access for cleaning and inspecting air filters.

Strategies for the source control of indoor pollutants

Summary of Your Achievements

There are design measures for controlling moisture build-up in the building and to prevent the growth of mold.

The air-handling units will be easily accessible for regular maintenance and drainage.

The hot water design will help to avoid the occurrence of *Legionella*.

The design proposes local exhausts for areas where contaminants are likely to be centrally generated.

Strategies to optimize lighting

Summary of Your Achievements

Daylighting

The lighting is being designed using an integrated, sequenced approach.

The orientation and visual access of the building are being considered in terms of daylighting potential.

The heights and depths of the perimeter spaces are being designed to optimize daylighting.

The Schematic Design indicates how much of the floor plan will receive direct daylight and the approximate value.

The Schematic Design indicates the daylight factor of those areas that require good or moderate daylighting.

Lighting design

The design proposes electronic ballasts fitted to luminaires.

Measures to minimize glare will be integrated.

The design proposes suitable task lighting.

The local lighting controls will be adjustable to meet requirements relating to room occupancy, circulation space, and daylighting.

Opportunities for improvement

Lighting design

Calculate luminance levels for the building spaces based on ANSI/IES *Office Lighting*, and IESNA *Recommended Practice for Office Lighting* (RP1) and integrate these into the design.

Strategies for thermal comfort

Opportunities for improvement

Consider conducting a thermal comfort evaluation, particularly in the design of naturally ventilated buildings.

Strategies for acoustic comfort

Summary of Your Achievements

There are design measures, such as zoning or isolating certain spaces, to achieve the required acoustic privacy

and minimize the potential for occupancy-related acoustic problems.

Design strategies exist to achieve reverberation control/acoustic absorbency, consistent with speech intelligibility requirements.

Opportunities for improvement

Develop strategies to acoustically zone building spaces so as to maximize the distances between noise sources and acoustically sensitive areas.

Where undesirable noise originates on the site, integrate noise attenuation in the design of building envelope.

Consider the acoustic performance of the structural elements of the building. Use sound attenuation strategies to suit occupancy requirements.

Plan the layout, size and shapes of the ductworks and acoustically zone the building to minimize noise from mechanical systems and equipment.