



The Signature Centre (2008)

Developer: Aardex LLC

2008 Green Development Award Winner

COMMITMENT TO SUSTAINABILITY

Author of the 2004 book *User Effective@ Buildings*, Aardex knew sustainable buildings could be built at standard construction costs if the entire project (development, design, construction and property management) could be controlled by a single entity. This book was predicated on the awareness that only a five percent increase in human productivity returns more benefit than the cost of the building encouraging that increase. User Effective was the Aardex philosophy; and the Signature Centre became the prototype.

FAST FACTS

Address: Golden, Colorado

Company/Developer: Aardex LLC

Project Specs: Speculative

Project Type: Office

Square Feet: 186,000 square feet of office space and 112,000 square feet of parking under building

Project History: Signature Centre was developed from a book called *User Effective@ Buildings*. Goals of the project included: increase occupant productivity; reduce utility consumption; rely on green products and methods; and maintain schedule and construction cost at or less than conventional design. The building achieved these goals plus LEED Platinum with no extra cost. The building was 100% pre-leased prior to opening. The lofty goal was to show that today's office buildings can transform what was once a real estate commodity into a business performance tool.

GREEN FEATURES

ECONOMIC ANALYSIS

- The financial goals and objectives set at inception included the mandate that all design elements must contribute value to the project in real, competitive and measurable terms. Every design strategy or system was exposed to a rigorous cost/benefit analysis prior to incorporation into the project. This process imposed a rigid 3 year payback limit for design choices that had higher initial cost.
- An average 30% in energy savings while the building cost to achieve sustainability was a modest 3% increase.
- Financial Incentives: Xcel energy design assistance program is estimated to be \$100,000.
- Increased Life Cycle: There are less moving parts in the building due to underfloor air, e.g. no ducting in the ceiling, no electrical in the walls. There is a longer demand for the building due to its energy usage/savings and longer leases.
- Building Operation Cost Justification: ASHRAE Standard 90.1 will save 28.3% in annual energy cost and 36.3% on annual energy use (Mbtu).

SITE SUSTAINABILITY/MATERIALS USE

- Bike racks, locker rooms, two new bus stops and preferred green parking onsite for alternative and fuel-efficient vehicles.
- Most of the parking and truck services are in back of the building, segregating cars from people. The pedestrian friendly design extends from the building to sidewalks; encouraging walking to neighborhood commercial areas and enhancing community vitality.
- The park functions as a human repose and wildlife habitat as well as for watershed maintenance and habitat restoration. Pervious pathway, storm water bio-swales and landscape of indigenous plants provide habitat and allow water to refurbish the underground aquifer.
- 23% recycled content in the materials and more than 98% of construction waste was recycled.
- Local materials used on the project include all pre-cast concrete and all steel.
- The building was constructed with 6,900 tons of CIP concrete, 20% from recycled products.
- 245 tons of rebar – 100% from recycled products.
- 3.7 miles of ceiling track, 4-1/3 acres of acoustical ceiling tile, 80% from recycled products.
- Building skin included ~1¼ football fields of state of the art performance glass and an acre of Hi-Tech Metal Panels – approximately 30% recycled.
- 860 tons of structural steel plus another 240 tons of other steel products – mostly recycled, as well as 190 tons of recycled (but undocumented) structural aluminum.
- The site was previously a parking lot; 1,828 tons of asphalt and 659 tons of concrete were diverted from land fills and sent to be recycled; in turn the asphalt and concrete used in the construction of the new parking lot incorporated up to 20% recycled product.
- Other material used include: VOC free adhesives, carpets, sealants and finishes, high performance, low-E glazing, underfloor air distribution, recyclable carpet tiles and 50% FSC certified wood.



ENERGY EFFICIENCY

- Low-velocity under floor ventilation achieved by high efficiency roof top units with outside air economizer.
- Building perimeter conditioned with natural convection chilled beams and radiant heaters.
- Hot water supplied from high efficient condensing boilers. Chilled water supplied from evaporative cooled condensing chilled water units with variable volume pumping distribution.
- Lighting controlled by occupancy sensors, dimmable switches and photo sensors.
- Perimeter glass is Solarban 70; the newest and highest performing glass in the world today – reducing solar thermal gain by 10-30%.
- A white TPO roof reduces heat gain by 70%.
- Combining all of these features, the building will reduce its total annual usage by 37.3% and save 32.8% in annual energy costs. 100% of all building electricity is offset with clean renewably powered wind energy through the utility green power program.

WATER EFFICIENCY

- The public park serves detention requirements with pervious landscape. Use of river rock as well as natural vegetation, water sensors and indigenous grasses that are drought tolerant and native to the state use much less water. These water saving measures are anticipated to save 56% on annual water usage.
- The project improved not only the Signature Centre site water quality but the community's as well by increasing capacity and porosity in an adjacent detention area, limiting the amount of water sent downstream.
- Auto faucets with infrared sensors, ultra low-flow hydropowered lavatories, dual flush toilets and waterless urinals were used. The fitness center has low flow showerheads that use less than 1.5gpm. Combined annual water savings is projected at 46.5% when compared to an EPACT-1992 baseline.
- The detention and treatment area of the community was improved; converting the surrounding acreage from a stillwater pond to a vegetated and landscaped community portrait.



INNOVATION

- “Evolutionary” mechanical system includes several components that appeared to be more expensive than a conventional system. But when the costs are offset by the benefits, such as reduced building height (10” per floor less skin), no ducting, higher delivery air temperatures, reduced operating cost, cleaner more comfortable air for the occupants resulting in lower absenteeism, etc., the choice was obvious and efficient by any measure.