# ADA COUNTY COURTHOUSE
CASE STUDY

BETTERBRICKS

## PROJECT OVERVIEW

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| Size: | 350,000 square feet |
| Location: | Boise, ID |
| Utilities: | Idaho Power, City of Boise Geothermal System, Intermountain Gas |
| Completion date: | January 2002 |
| Technologies: | Forced-air heating with geothermal heat exchanger and natural gas back-up boilers; daylighting; T-8 lamps with electronic ballasts and compact fluorescent bulbs with multi-level switching; building commissioning; water-efficient landscaping; onsite stormwater management; construction and office waste recycling; reuse of a former "brownfield" rail yard. |

The Ada County Courthouse in Boise, Idaho features a geothermal heating system, efficient lighting and a carefully executed commissioning plan. The five-story, 350,000 square-foot facility houses courtrooms, assembly and hearing rooms, secure holding areas, Ada County's administrative offices, retail stores and underground parking. The county merged these diverse functions (formerly housed in three buildings) into a single sustainable high performance building that is energy-efficient, cost-efficient, secure and attractive. The courthouse also exceeds Idaho's new energy code requirements, is registered with the LEED Existing Building (EB) pilot program, and serves as a model for other county projects.

In particular, the courthouse benefits from geothermal energy provided by the City of Boise. "Geothermal energy reduces our costs, and is renewable and locally available," said Dave Logan, Director of Ada County's Operations Department.

A public-private partnership consisting of the Capital City Development Corporation, Ada County and Civic Partners began planning the courthouse in the mid-1990s. The partners created a team of architects, engineers, contractors, and a commissioning agent to ensure that the building would meet the county's goals, Rebuild America guidelines, and Idaho's new energy code and LEED EB certification standards.

"We believe it was our responsibility to build a sustainable structure and incorporate energy efficiency in the construction from day one," Logan said. "The building is safe and comfortable for employees and visitors, and easy and cost-effective to operate and maintain."

## FEATURES

- Geothermal water circulates through a closed-loop ground-source heat exchanger connected to the forced-air heating system and returns to the aquifer via an injection well. A Direct Digital Control system regulates zones throughout the day along with an automatic night setback. Employees adjust temperatures in individual spaces. The cooling system consists of two modular staged chillers with variable-frequency drives and a cooling tower.
- High-efficiency exterior windows and relights in interior walls and doors maximize daylighting.
- The lighting includes T-8 lamps with electronic ballasts, compact fluorescent lamps, and task lights. Multi-level switching controls, which are less expensive to install than lighting controllers, allow building occupants to adjust light levels in individual workspaces. Custodial staff shuts off lights after cleaning each space. The county plans to add occupancy sensors in 2004.
- A commissioning plan implemented early in the design-build process identified more than 350 items to improve building performance and occupants' comfort, and prevent change orders. To boost efficiency, as part of the building commissioning plan, employees are trained about the daylighting, lighting and HVAC systems.
- Other sustainable high-performance features include indoor air quality controls used during construction and occupancy, water-efficient landscaping, stormwater management, construction waste recovery and recycling, and office waste recycling.

Ada County Courthouse. Boise, ID.

## FINANCIAL ANALYSIS

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| Total project cost: | $47 million ($134/sf) |
| Incremental cost: | $310,000 |
| Annual savings: | $159,500<br>Electricity: $22,750<br>Avoided Gas Heat Cost: $134,000<br>Other gas savings: $2,750 |
| Incentives: | $90,000 from the Northwest Energy Efficiency Alliance for commissioning. |

## BENEFITS

**ENERGY SAVINGS.** Using geothermal energy reduces heating costs by 70% compared to the natural gas alternative.

The courthouse uses 22% less electricity per square foot than the three buildings it replaced.

Overall, as a result of the energy efficiency measures and enhanced O&M, the new courthouse uses 40% less electricity per square foot per year than similar buildings in the Boise area (15 kWh/sf/yr vs 25 kWh/sf/yr).

**UP-FRONT CAPITAL SAVINGS.** The commissioning agent identified more than 350 items that cut energy bills an estimated $25,500 per year, and prevented an estimated $11,000 in unnecessary change orders. Commissioning also helped bring the fixed-price design-build contract in on time and on budget.

**ACCESS TO NATURAL LIGHT.** Over 95% of the workspaces have direct or indirect daylighting.

**HEALTHY ENVIRONMENT.** Implementation of the Operations Department's new county-wide indoor air quality plan minimized health hazards during construction, and ensures healthy indoor conditions for employees and visitors.

## LESSONS LEARNED

**IMPLEMENT A COMMISSIONING PLAN FROM THE BEGINNING OF THE PROJECT AND STAY WITH THE PLAN.** Energy conservation and sustainable building design must be incorporated into a project from its inception. Commissioning is an effective tool to help avoid costly add-ons and bring projects in on time and on budget. "Commissioning has a lot of value, including saving us a lot of money," Logan said. "Our team, including our commissioning efforts, helped me get the building working right during and after construction. It also helped us move 550 people from seven locations into one building exactly as planned."

**SEEK SUPPORT FROM PROGRAMS SUCH AS BETTERBRICKS AND LEED™.** These programs offer technical expertise and other resources, and will help publicize projects.

**INVOLVE EMPLOYEES IN THE PROCESS.** Employees have creative and effective ideas to improve their workspace. Their buy-in will maximize employee satisfaction and building performance.

*Dave Logan inspecting the chillers.*

**COMMUNICATE TO THE COMMUNITY.** Publicity about sustainability and energy efficiency will contribute to the public's confidence in and excitement about a project, and will encourage others to follow the example.

## CONTACTS AND RESOURCES

BETTERBRICKS
www.betterbricks.com
1.888.216.5357

ADA COUNTY OPERATIONS DEPARTMENT
Dave Logan, Director
www.adaweb.net
208.287.7100

IDAHO ENERGY DIVISION
Sue Seifert, Senior Energy Specialist
www.idwr.state.id.us/energy
208.327.7973

## TEAM

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| Building Owner: | Ada County, ID |
| Architect: | Lombard-Conrad Architects, Boise, ID |
| Designer/Builder: | MK (now Washington Group), Boise, ID |
| Developer: | Civic Partners, Boise, ID |
| Commissioning: | CH2M Hill, Portland, OR |