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BUILDING COMMISSIONING

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CASE STUDY

DISTRICT VERIFIES DELIVERY OF A GREEN ENERGY-EFFICIENT SCHOOL

When the North Clackamas School District outside of Portland, Oregon received voter approval to build a new high school, they decided to ensure the building would offer the best in energy efficient and environmentally friendly design.

The district used the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program as the standard. This national program issues certification ratings to buildings that meet standards for high performance and sustainability. The new Clackamas High School earned a silver rating and national recognition for innovative school design. Part of the LEED Program requires that owners must commission the building. North Clackamas School District found this process to be invaluable in its own right.

The new school is 250,000 square feet on 42 acres and was built to serve 1,850 students. It was designed to use 44 percent less energy than a building constructed to the state energy code. The district specified daylighting, natural ventilation, native plants, recyclable concrete, certified wood, low-toxicity building products, low-maintenance materials and numerous other "green" features to build a highly acclaimed school facility.

The commissioning process began early in the construction phase and ended after initial occupancy.

BUILDING COMMISSIONING

Is a systematic and documented process of ensuring that the owner's operational needs are met, building systems perform efficiently, and building operators are properly trained.



North Clackamas High School exterior.
Photo by Michael Mathers.

"Compared with other buildings, the Commissioning process significantly reduced the time the maintenance staff needed to address and solve the problems associated with building operations."

- David Church, Facilities Manager,
North Clackamas High School

COMMISSIONING QUICK FACTS

- Building: North Clackamas High School
- Location: Clackamas, Oregon
- Completion date: Fall of 2000
- Scope of project: New construction
- Commissioning cost: \$85,000¹
- First-year cost benefit: \$27,000²
- Annual energy savings: \$13,700³

¹ Commissioning providers fee only.

² Cost reduction or avoidance.

³ Annual energy savings based on cost of electricity of \$0.0494/kWh and natural gas of \$0.755 /therm.

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*This is one in a series of case studies on commissioning.
To review other case studies go to www.betterbricks.com/commissioning.*



North Clackamas High School interior.

The process identified 75 issues of which 15 were considered significant. Some of the major issues concerned:

- Improperly calibrated static pressure controllers
- Faulty carbon dioxide sensors
- Excessive running of pumps and exhaust fans
- Damper adjustment and repair
- Incorrect lighting control sequences.

Resolving the significant issues assured a reduction in electricity usage by about 35,800 kWh/year and natural gas usage by 6,100 therms/year. These savings lowered energy costs by about \$7,700 annually for the district. The resolution of issues also meant that students and teachers could be more comfortable and would have fewer complaints about the new building, maintenance staff would have fewer operating problems to resolve, and everyone could enjoy the beautiful new school.

LESSONS LEARNED

- A clearly defined scope of work and timeline with all contractors involved in the commissioning work is critical.
- Begin the commissioning process early in the design phase, to maximize the benefits commissioning provides.
- Use the commissioning plan to establish channels of communication to all parties.

COMMISSIONING BENEFITS

- Developed an effective maintenance protocol
- Reduced energy costs (and thus operating costs)
- Increased occupant comfort and indoor air quality

“The fact that the general contractor was involved in the commissioning work allowed for proper communication with all parties, and therefore effective results.”

- Josh Welborn, Construction Manager

PROJECT PARTNERS

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