



IDAP Support Sparks Innovation at CSU's Powerhouse Energy Campus

When planning the expansion of Colorado State University's Powerhouse Energy Campus, designers partnered with Fort Collins Utilities' Integrated Design Assistance Program (IDAP) to create a building that would be a model for sustainability and energy efficiency.

Completed in 2014, the expansion added 65,000 square feet of lab, office and community space to the original 1936 building, while earning LEED Platinum certification. IDAP contributed \$80,000 in design and performance incentives, and helped integrate energy efficient features that had never been used on a project of this scale.

INNOVATIVE FEATURES

- Exterior insulation maximizes the performance of the thermal mass provided by the concrete structure
- Triple glazed windows (two glass and an internal membrane) with coatings optimized to the orientation and location on the building
- Fiberglass window frames on all windows, including the large curtain wall, offer higher insulation values over aluminum. They also ensure better long-term sealing, as the fiberglass and windows expand and contract at the same rate
- The building's thermal mass is so large, heating and cooling needs are determined by weather forecasts
- Radiant slab heating and cooling is delivered through the ceiling on all four levels
- A cooling tower provides evaporative-cooled water to the slabs, replacing the need for a chiller
- Heating is provided by a condensing boiler system utilizing variable speed pumps
- Vertical axis wind turbines replaced the original smoke stacks

POWERHOUSE ENERGY CAMPUS

The Powerhouse Energy Campus was originally home to the Fort Collins Municipal Light and Power Plant, built in 1936. The latest renovation created a 100,000 square foot LEED Platinum energy research complex, home to the Energy Institute. The Institute aims to increase collaboration with industry and governmental partners to solve real-world energy problems and create new research and educational opportunities for CSU faculty and students.

ADDITIONAL INNOVATIONS

- Ventilation air is delivered via raised flooring, conditioning the air as it moves over the slab
- Custom LED lighting is fed by a 24-volt DC distribution system. The light bars mount to the structural steel which serves as the heat sink for the individual LEDs
- 25kW of generation from thin film solar panels
- Infrastructure built in to add solar water heating at a later time

KEY CONTRIBUTORS

Colorado State University Energy Institute: Dr. Bryan Willson, Dr. Morgan DeFoort, Kirk Evans, Mac McGoldrick

The Neenan Company: Architectural Design and Building Construction: Bob Hosanna (Architect), Fred Roberts (Energy Modeling), Sergio Ortiz (Project Manager), Bob Meserve (Project Executive), Travis Huppert (Field Superintendent)

AE Associates: Alicia Thorpe, P.E. (Mechanical Engineering)

Clanton and Associates: Dane Sanders, Josie Wratten (Lighting/Daylighting)

SRB Consulting Engineers: Larry Smith (Electrical/Plumbing Engineering)

Gregory Electric: Rod Bryant (Electrical Contractor)

Lind's Plumbing: Jeff Makepeace (Hydronic Contractor)

JPL Development: Jeff Jensen (Owners Representative)



Fresh air moving under the floor is conditioned prior to entering the room through the vents shown. LED light bars are mounted to overhead beams.

INTEGRATED DESIGN ASSISTANCE PROGRAM (IDAP)

IDAP helps project owners, developers, design professionals and builders create high-performing buildings. Financial incentives for building owners and design teams are available. To participate, visit fcgov.com/idap.



Detail of the radiant heating/cooling tubing and manifolds driven by a VSD pump.

