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Lab uses green office as guinea pig

When a local architecture firm built a new office in Boise about two years ago, it designed the building to show clients how an environmentally friendly building looks and feels.

Now, Insight Architects wants to find out how efficiently its natural light and ventilation systems are working and how much money the company is saving.

Russ Phillips, co-owner of Insight Architects, believes he is saving a significant amount each month because the company rarely turns on any lights, and the air conditioner kicks on only between noon and 3 p.m. most days. Still, Phillips doesn't know exactly how much money his company is saving.

"That's why the lab is helping us out," Phillips said.

Insight Architects made its tall, one-story office, located on Broadway Avenue between Boise Avenue and Federal Way, the test site for Integrated Design Lab, a lab in Downtown Boise that provides commercial developers with resources to learn about "green" architecture methods. The lab has been experimenting this summer with Insight's natural ventilation system, which pulls warm indoor air out of windows near the ceiling and helps the lower half of the building stay cool with concrete floors.

Insight's building also uses "daylighting" — natural light, but not direct sunlight, to provide indoor light. Insight uses tinted windows and other special materials to filter the direct sunlight that enters the building.

The data collected should help Insight and other architects and developers learn how much money daylighting and natural ventilation save and how they can design more efficient systems.

The lab is funded by the University of Idaho, Idaho Energy Division, Idaho Power Co. and grants from the Northwest Energy Efficiency Alliance, a nonprofit group of government agencies and electric utilities in the Northwest.

The lab usually doesn't conduct tests at buildings around the Treasure Valley because it is swamped with several projects. But Insight's office gave the lab a unique opportunity, said Kevin Van Den Wymelenberg, director of Integrated Design Lab.

"Not a lot of folks have a building that we can test like this," Van Den Wymelenberg said.

The lab helped Insight design its daylighting and natural ventilation systems, and now Van Den Wymelenberg said the lab has an opportunity to see how the systems work in a real-life situation.

Natural light floods nearly every corner of Insight's office. Every desk has its own window, and each of those windows is tinted slightly to block ultraviolet rays. Three-inch-thick blocks placed high on the walls facing east and west are made with white insulation spun through the blocks' centers to diffuse direct sunlight, Phillips said.

The natural ventilation system keeps the interior at a comfortable 71 to 78 degrees through the winter and summer with little help from the heating or air-conditioning systems.

Phillips said he cracks open a few windows slightly during the evening to let cool air in.

Lab officials stop by Insight's office about once a week to monitor the temperature, relative humidity, lighting and air conditioner use. After lab officials take measurements, they ask Insight to adjust the ventilation system over the next few days.

At the beginning of the summer, Insight ran its system as it normally would to create a base reading. Then, Insight staffers flipped on inside lights and air conditioning even when it wasn't necessary so the lab could measure the amount of electricity the company saves, Van Den Wymelenberg said.

The office also has made more specific changes during the test period, such as opening the windows during certain times of the day and closing them at other times, he said.

The adjustments to the building's ventilation system have made it slightly warmer than usual in the office at times.

"The first couple of weeks it was stuffy because we couldn't have the windows open," said Stillman Anderson, an Insight architect. The lab also has prevented the office from turning on its air conditioner at all during certain weeks of the test period, which has warmed the office to around 80 degrees on some days, he said.

Phillips altered the dress code this summer to let employees wear shorts on days when the temperatures in the building get warmer.

"It's a learning process," Anderson said. "What's nice about it ... is when we do other buildings, we can point to this building and say, 'This is what we've done. This is what we've learned.' "

Phillips added, "Everyone here is anxious to build buildings that respond better to the environment."

The lab is finishing collecting data this month and expects to analyze its measurements in the coming weeks, Van Den Wymelenberg said.