



PROVEN RESULTS FROM COMMERCIAL RETROFIT INSULATION

INCREASING ENERGY EFFICIENCY AND GUEST COMFORT WITH JM SPIDER® FIBER GLASS INSULATION

In recent years, Breckenridge, Colorado, has been one of the top two most-visited ski areas in all of North America. With more than 1.6 million skier visits during the 2010–2011 season, that number is expected to climb for the resort's 50th anniversary in 2011–2012.

For properties like Marriott's Mountain Valley Lodge, this level of exposure is an opportunity to showcase the Marriott Vacation Club brand as a whole. And for general manager Todd Lebow, it means making sure that each guest is as comfortable as possible.

The lodge is at the south end of town and consists of luxury studios and one-bedroom villas. Built in 1984, Marriott Ownership Resorts, Inc. took over the existing site with remaining developer inventory in 1994. While converting the property to timeshare villas, Marriott combined some of the studios to create one-bedroom villas and completed interior renovations. While having undergone substantial work, the building still contained many original materials including the windows, doors and insulation. As a result, energy-efficiency levels have declined over time and the number of guest complaints have increased during recent years—an unwelcome trend for a property at the base of a ski resort receiving more and more visitors each winter.

By the end of the 2010–2011 season, Lebow estimated that more than 25 percent of all guest complaints at Marriott’s Mountain Valley Lodge were related to the temperature in the rooms. He needed to ensure guest comfort and reduce the operating loss from decreased energy efficiency. He also needed a process that would be quick, inconspicuous and result in a fast return on investment to gain approval from the resort’s board of directors.

HEAT LOSS: FINDING THE OBSTACLE TO ENERGY EFFICIENCY

To find a cause for the decrease in energy efficiency, Lebow contacted Dennis Brachfeld, a BPI certified energy consultant and the owner of the AboutSavingHeat.Com (ASHCom). Brachfeld, who has retrofitted more than 34,000 homes and commercial buildings, initially thought heat was being lost through the resort’s outdated windows, which were located just above the electric-based heaters in each room.

Replacing the windows in 160 units is not inexpensive. At an estimated cost of \$2,000 per window, changing the windows in the villas throughout the entire property will cost approximately \$320,000. Lebow knew this expense was not scheduled until 2015, so he decided to work with Brachfeld to pinpoint the exact cause before taking any action to move the window project timeline. After conducting a series of tests that included temperature and infrared readings on a wide sampling of rooms, they discovered heat escaping through the R-19 unfaced insulation batts in the walls located just behind the heaters and around each window.

“Initially, when Dennis and I went out, we thought we had a greater heat loss through the windows,” Lebow said. “That’s when we discovered, even with seal failures, the loss was really through the wall, which was insulated with a low-density fiber glass batt and not air sealed.”

Because of the vast temperature differential between the heaters and the outside air, the migration of heat was rapid. “Heat travels from hot to cold in the path of least resistance,” Brachfeld said. “And the speed in which it travels depends on the temperature differential. That means on the coldest days you have the most heat loss. Where you have the most differential is really where you have the most heat loss, so you target that area. It’s the biggest bang for your buck.”





BY THE NUMBERS: MARRIOTT'S MOUNTAIN VALLEY LODGE

- Originally constructed in 1984
- 160 original studio units; currently 49
- Over 25 percent of all guest complaints were temperature related
- Originally insulated with R-19 fiber glass batts
- A sampling of test units insulated with JM Spider fiber glass insulation in 2010 led to 8.1 percent decrease in energy consumption from January through April 2011
- With \$4,800 in projected annual savings the payback period for re-insulating all 160 units will be less than four years

INVESTIGATING A RESOLUTION: JM SPIDER FIBER GLASS INSULATION

Once the discovery was made that the poorly air-sealed walls behind the heater and around the windows were causing the heat loss, Brachfeld recommended retrofitting the wall cavities with new insulation. Based on the property's need to increase guest comfort and energy efficiency in a timely and unobtrusive manner, he suggested drilling holes in the walls and filling them with JM Spider fiber glass insulation.

According to Brachfeld, dense packing the walls with JM Spider fiber glass insulation will virtually eliminate air flow through the wall. He added that his installation crews are also more efficient when they install JM Spider insulation since the product is more consistent, resulting in a more even flow of fiber into the wall and less clogging of the fill tube. And when compared with cellulose, JM Spider fiber glass packs better, creates a tighter building seal and provides a higher R-value.

"The size and consistency of the JM Spider fiber glass fibers make it the perfect product for this project since it enables installers to blow it in even when the walls are already partially insulated, resulting in a higher R-value and a tighter seal," Brachfeld said.

Taking Brachfeld's suggestion, in January 2011 Lebow decided to let ASHCom retrofit three different test units to see if it resulted in any significant decrease in energy consumption. Here are the results:

WINTER TEMPS PROVIDE TESTING GROUND AT MARRIOTT'S MOUNTAIN VALLEY LODGE

INCREASED ENERGY EFFICIENCY: THE NUMBERS SPEAK FOR THEMSELVES

Before Lebow could recommend specific action to the resort's board of directors, he needed to prove that the drill-and-fill application of JM Spider fiber glass insulation would make sense financially. There had to be proof the resort would see a return on its investment.

After Brachfeld added JM Spider fiber glass insulation into the wall cavities behind and around the heater and window of three different test rooms, Lebow collected utility consumption measurements from January through April 2011. The team analyzed these results in comparison with figures from the same four months of the previous year. The demonstrated energy consumption savings was significant.

“You are looking at a three-to-four-year return on investment, and that’s a very conservative number because the test units were showing around a 17 percent variance year over year,” Lebow said.

This translated to an anticipated energy usage improvement of 8.1 percent in the winter months with a projected savings of \$4,800 and a return on investment of 3.7 years. Brachfeld also pointed out that retrofit insulation could have an even greater return depending on future energy prices, which, at best, are uncertain.

“When prices go up, your energy savings go up,” Brachfeld said. “So, it’s really a hedge against future increases.”

ENERGY SAVINGS IN TEST ROOMS VS. TOTAL ENERGY CONSUMPTION

Percentage of change from 2010 to 2011

	JANUARY	FEBRUARY	MARCH	APRIL
Total Unit Average	11.62%	-4.34%	-18.88%	24.90%
Test Unit Average	-7.5%	-17.25%	-23.16%	7.51%
% Savings Test Units over Average Units	-19.13%	-12.90%	-4.28%	-17.40%

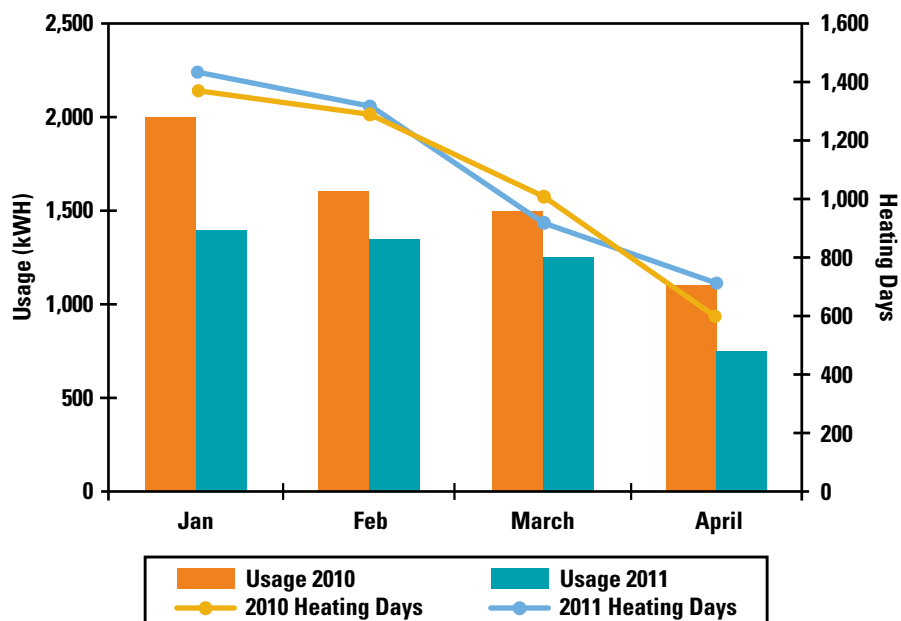
YEARLY VARIABLES: ACHIEVING RESULTS DESPITE COLDER TEMPERATURES

One major inconsistency between the test year and the previous year was the number of heating days. Colder weather in 2011 threatened to skew results, which would make it harder for Lebow to provide data convincing the board of directors to take action.

Despite the test year’s harsher winter, the results still showed a vast improvement on energy efficiency over the previous season. The kilowatt per hour usage continued to be lower in the test rooms in 2011 versus 2010, even though there were more heating days in 2011.

DECREASED KILOWATT CONSUMPTION DESPITE COLDER TEMPERATURES

kWH usage in 2010 vs. 2011



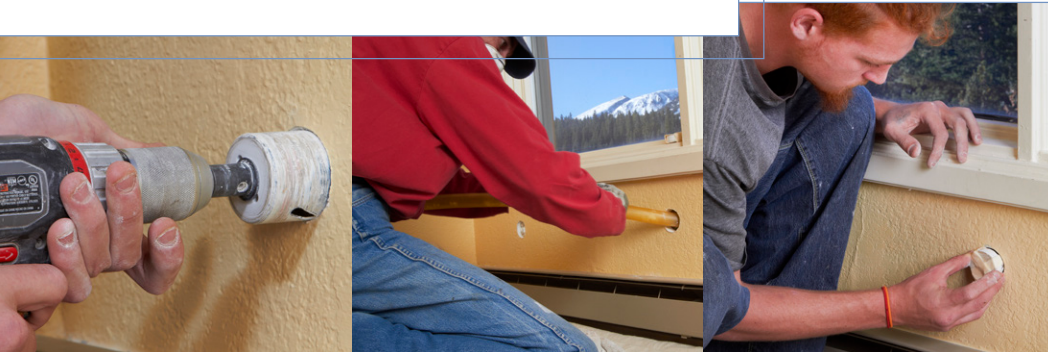
GUEST OPINION: THE RESULT THAT MATTERS MOST

Over the course of 2011, the three test units housed guests just like they did the year before. In 2011, though, opinions about the rooms' comfort levels had changed.

"The test units did not receive a single complaint related to heating after the insulation was installed," Lebow said.

With this sampling of subjective opinions supporting the same conclusions as the empirical data, Lebow could now go to the board. Using JM Spider fiber glass insulation with Brachfeld's drill-and-fill methods increased energy efficiency despite an even colder season, and more important, it improved guest comfort. The board reviewed these facts and quickly granted approval to retrofit the remaining 156 units with JM Spider fiber glass insulation.

THE PROCESS



HOW JM SPIDER FIBER GLASS INSULATION HELPED THE INSTALLATION TEAM MEET TIGHT DEADLINES

The installation process took place during the first few weeks of November, which is typically a slow time of year in Breckenridge. Still, the resort could not close to complete the work, and with the busy ski season fast approaching, the team at ASHCom had to be quick and well organized.

During installation, the first team member drilled four holes, one for each cavity in the wall. They next blew in the JM Spider fiber glass insulation. The final steps included filling the hole. The resort team then took over adding caulk to reseal the wall, texturing and sanding the wall, painting and finally cleaning the room.

The process was organized into thirds. Each day, installers applied insulation to 12 units, the resort team textured and sanded 12 units, and then painted 12 more. According to team members, JM Spider fiber glass insulation increased their efficiency because the consistency of the product allowed for easy flow from the blow-in machine, and it filled gaps and voids without any problems. They also said it was less dusty than cellulose, resulting in less time spent cleaning up after installation was complete.

"The installation process was less invasive than expected," Lebow said. "There was no mess in the rooms, and after three days the villas were restored back to perfect condition. Keeping pace of doing 12 units a day allowed us to finish in 14 days."

THE ADVANTAGES OF JM SPIDER FIBER GLASS INSULATION

- Thermal resistance of up to R-15 in a 3.5" cavity and R-23 in a 5.5" cavity
- Completely fills gaps and voids in the cavity and does not settle
- Certified Formaldehyde-free™ fiber glass formula improves indoor air quality
- Controls sound and reduces acoustic transmission
- Ability to install in walls with existing insulation
- Consistent fiber size with less clogging of blow-in machines than cellulose
- Reduced dust and debris results in less time to cleanup



RETROFIT INSULATION IN COLORADO SKI COUNTRY

Everyone associated with Marriott's Mountain Valley Lodge retrofit insulation project is anxious to see results from the 2011–2012 season. They expect to see savings on the utility line of their financial statement, and they are predicting fewer guest complaints about temperature or comfort levels.

Moving forward at the property, Lebow is considering an additional insulation retrofit into the kneewalls located on the top floor of the resort. He anticipates this will help increase energy efficiency even more.

Throughout Summit County, expectations are that insulation retrofits will become common, partially because they are investments with quick returns and also because the concept reflects the eco-conscious nature of the region. Though Marriott's Mountain Valley Lodge is the first resort that Brachfeld knows of in Summit County to embrace retrofit, he doesn't anticipate it being the last.

"People come from all over the country, and it sets an example of change for the better," Brachfeld said about the Marriott project. "As I like to say, if you're green you're growing; if you're ripe, you're rotting."

Please look for updates and additional data from Marriott's Mountain Valley Lodge as it becomes available.

ABOUT SAVING HEAT COMPANY (ASHCom)

Dennis Brachfeld started the About Saving Heat Company in 1975, one year after graduating from the University of Denver School of Business with a degree in real estate finance and construction management. With more than 36 years of experience helping more than 34,000 homeowners and property owners, ASHCom's certified energy experts help people stay cooler in summer and warmer in winter, while being energy efficient year-round.

"I named my company 'About Saving Heat Company' so I could do what's best for the customer, and not be locked into product specific solutions," Brachfeld said.



- JM was the first to make a complete line of certified Formaldehyde-free™ fiber glass building insulation
- JM is the only manufacturer to make both spray foam and fiber glass insulation
- JM has 150 years of industry experience



ABOUT JOHNS MANVILLE

In their 150-year history, Johns Manville has been at the forefront of insulation production. They were the first manufacturer to have a complete line of certified Formaldehyde-free™ fiber glass building insulation, and because they are dedicated to providing a one-stop hybrid solution, they are the only manufacturer to make both spray foam and fiber glass insulation products.

With a dedication to quality and a reputation for being the best to work with, JM's best-in-class insulation solutions are the logical choice for net-zero construction.

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BID-0132 03/12
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