

# CASE NO. 13

BUILDING TYPE: *Hotel*  
*(National Park)*

APPLICATION: *Radiant*  
*Hot Heat & Snow Melt*

LOCATION: *Banff,*  
*Alberta, Canada*

## Radiant Heat and Control System Increases Comfort & Well-being at Banff Hot Springs

**PROBLEM:** It's one of the oldest recreational hot springs in all of Canada. Situated in the heart of ski country, Banff Hot Springs in Banff National Park had been in operation for the better part of the 10th century when a major renovation took place in 1996. The high sulfur content in the spring water had badly corroded nearly all of the piping at the facility. Since this had to be reworked, it was the perfect opportunity to update the pool area and adjacent building with a more modern heating system—something more in tune with the *therapeutic* nature of the hot springs.

There was room for improvement in both the pool area and nearby building which housed shower and change rooms. Although the outdoor pool was naturally heated, the surrounding deck and walkways were unprotected from outdoor moisture that might freeze and cause discomfort or even a safety risk to visitors. Inside the building, the showers and dressing rooms were heated with forced air. While forced air was adequate, the facility wanted to explore other means of heat that were less intrusive in terms of appearance and distribution.

**SOLUTION:** Radiant floor heat was the obvious solution for the shower and change rooms. Not only is this type of heat hidden from view, it helps keep floors dry and sanitary. Hot water circulates through Pex tubing which is installed beneath the floor, so the moisture dries quickly, and floors are warm and comfortable for the many bare feet that tread from the building to the pool. The same type of system was chosen to provide snow melting for the deck and walkways.

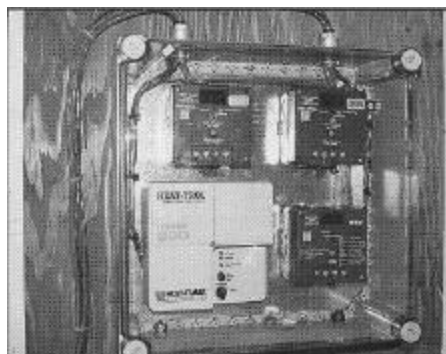
The next challenge was to design a low maintenance control system that provided maximum comfort and efficiency. Most importantly, the system had to be protected from the corrosive elements that emanated from the springs.

Robert Bean of DeJaegher Sales used a combination of set point and modulating temperature controls for both the snow melt system and floor heating system.

### *Snow Melt Control: Automation without Overkill*

For the snow melt system, Bean selected a Heat-Timer Digital Set point Control (SPC) to monitor the temperature of the outdoor slab. Once the slab temperature drops below 34 degrees, the SPC activates a Heat-Timer Residential Snow Melt (RSM) control. This control monitors outdoor temperature and adjusts the heat output of the system accordingly by increasing the temperature of the water circulating beneath the deck and walkways. In this case, the RSM modulates a Heat-Timer 3-way motorized valve, letting more hot water into the outdoor snow melting loops as needed. This control also lets you adjust the Delta T to the system design.

This clever dual control approach adds extra automation to the snow melt system. There are many days at the resort when outdoor temperatures are below freezing, but outdoor surface areas, exposed to bright sunlight, are several degrees warmer. Under these circumstances, it's not necessary or economical to activate the snow melt system. With the SPC monitoring the slab temperature, the RSM remains idle until there is a real threat of freezing. When the slab temperature drops below set point, the RSM moves into action, supplying just the right amount of heat to prevent any snow or ice from forming on the slab. The RSM could also be activated via a Building Management System.



CONTROL SYSTEM FOR  
 RADIANT FLOOR  
 HEATING  
 & SNOW MELT  
 APPLICATIONS

### Space Heating with Outdoor Reset and Set point Control

A similar strategy was used to control the radiant floor heat in the nearby building. In this case, an SPC interfaces with a Heat-Timer Outdoor Reset Control (Heat-Trol1200) to control the discharge temperature to the floor heating system. The SPC senses floor temperature and activates the Heat-Trol once the temperature drops below set point. The Heat-Trol then modulates the 3-way valve as needed to adjust the temperature of the circulating water.

Since the Heat-Trol is designed to maintain indoor comfort, its operation is more complex than the snow melt system. First of all, the Heat-Trol senses both outdoor temperature and system water temperature. It adjusts the temperature of the circulating water according to an adjustable indoor/outdoor temperature reset ratio.

The control also stores information about the rate of change in the heating system as outdoor temperatures change. Based on this data, the Heat-Trol actually anticipates heat requirements, so a more constant, comfortable indoor temperature is maintained. With this capability (known as Pill type logic) the Heat-Trol becomes increasingly effective at maintaining comfort and efficiency.

### Protection from a Corrosive Environment

One of the advantages of using Heat-Timer controls is that the sensors can be located far away from the actual control. In this case, all of the Heat-Timer controls were located in a clear Plexiglass enclosure, several hundred feet from the temperature sensors. This enclosure protects the control from the corrosive effects of the hot springs.

### Controls with Built-in Flexibility

Although this installation was certainly unique, the controls required no modification. They were basic, off-the-shelf Heat-Timer controls, configured together to suit the needs of the application. This flexibility appealed to Brian Wheeldon of Warm Floor Heating, the contractor who installed the controls and the heating system.

"Heat-Timer lets you take simple, individual controls and build them into a more comprehensive control," said Wheeldon, noting that competing products are often quite specific in what they can and can't do.

A Sense of Well Being Wheeldon has experienced the comfort of the new system

first hand, as a patron of the Banff Springs. He's also been to other hot spring facilities where electric forced air is still used to heat the dressing rooms and noted a marked difference in the level of comfort. Furthermore, says Wheeldon, facilities without snow melt systems typically have to post signs warning patrons about ice on the deck and walkways.

Not so at Banff. In fact, you might say that with the help of the new radiant heat systems ( Banff has achieved a new level of health and well-being for its patrons. Best of all, the control system makes this increased comfort virtually effortless- indoors and out.

### TYPICAL RSM APPLICATION:

