



SNOW AND ICE MELTING
SYSTEMS

SKI RESORT

CASE STUDY



Ski Resort Benefits from Uponor Snow and Ice Melting System

Beaver Creek, a luxurious ski resort located near Vail, Colo., receives an average of 330 inches of snow annually. With numbers like that, winter could be a nuisance, not to mention a liability.

However, Beaver Creek's village center, Market Square Plaza, took proactive steps to ensure convenience and safety for its visitors by installing an Uponor snow and ice melting system.

The system removes snow and ice from the Market Square Plaza's 80,000 square feet of walkways and driveways. This village center features elegant resort hotels, mountainside condos, fine dining establishments, upscale retail stores, a performing arts theater, an art gallery and a year-round, outdoor ice-skating rink.

Visitors to Market Square Plaza enjoy the benefits of walking safely on the snow- and ice-free stairs, hotel and store entrances. The snow and ice melting system also ensures safe conditions in the parking ramps and loading docks.

Additionally, an innovative snow-melt pit conveniently heats and melts the excess snow and ice that is removed from the ice rink.



Since installing the Uponor snow and ice-melting system, visitors to the Beaver Creek ski resort enjoy snow- and ice-free walkways.

The Beaver Creek plaza area was not designed to accommodate vehicles so manpower and labor with snow blowers would be significant. The noise of snow blowers and loaders would also be a major disturbance to condo owners.

Uponor's snow and ice melting system eliminates maintenance costs associated with the more traditional forms of snow removal (e.g., snow blowers, front loaders, salt, sand, etc.) With virtually no place to dump plowed snow at the resort, the Uponor system also eliminates that problem.

Jerry Hensel, manager of operations for the Beaver Creek Resort

Company, is very pleased with the results from the Uponor snow and ice melting system.

"It's just wonderful," he says. "It's relatively maintenance free and the appearance is just amazing."

The Beaver Creek Resort Company has been so impressed with the snow and ice melting system that they are expanding the system into other areas within the ski resort.

"I'm also in the snow-removal business," says Hensel. "And this system makes my job a lot easier than getting someone in at 4 a.m. to remove snow."

Summary of Benefits

Safety and Liability

The Uponor snow and ice melting system allows visitors to walk safely during snow season and helps to avoid accidents associated with winter weather conditions. This offers peace of mind to visitors and alleviates liability concerns for business owners.

Convenience

Business owners don't have to worry about removing snow and ice from their entrances, and visitors don't have to worry about slipping, sliding and trudging through snow and slush. The ice rink's snow-melt pit is another convenient and value-added incentive, allowing skaters to enjoy their activity without the hassle of snow and ice. Additionally, the disruptive noise associated with traditional forms of snow removal is eliminated with the quiet Uponor snow and ice melting system.

Maintenance-free

Uponor's snow and ice melting system is virtually maintenance-free and eliminates costs associated with other snow-removal methods (e.g., snow blowers, front loaders, salt, sand, etc.).



The design information in this case study is provided for illustrative purposes only. The actual requirements of similar projects will depend on regional climatic conditions, project-specific heat loss, owner expectations, applicable building codes, etc. Please contact your Uponor representative for assistance in designing your specific projects.

Mechanical System Information

For the Beaver Creek Market Square Plaza, the Uponor snow and ice melting system was installed in several phases. Tubing for the parking ramps was installed first, followed by the retail and condo structure, the performing arts theater and the ice rink access.

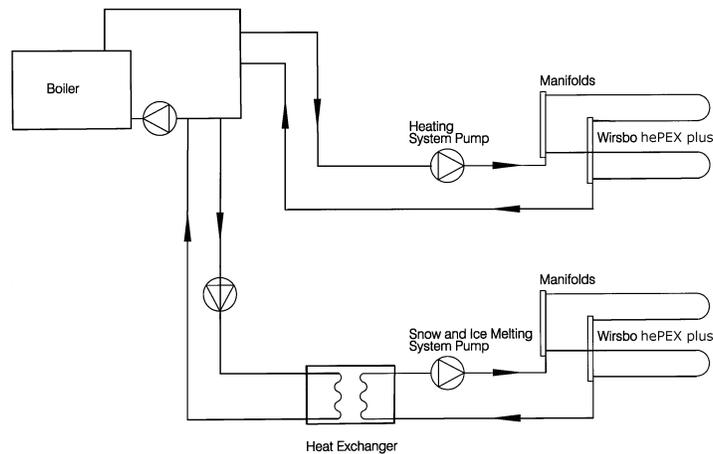
The majority of the Market Square Plaza consists of pavers over a 2-inch sand bed with Uponor's 3/8" Wirsbo hePEX™ plus tubing embedded in the sand.

Other areas include tubing over structural slabs, such as the parking ramps and the performing arts theater, and tubing in the cement of the stairs and drive areas (i.e., road access, parking ramps and loading docks).

The system's heat source is located in the boiler plant which serves the entire complex. A plate-and-frame heat exchanger separates the snow-melting system from the building loads. The system is filled with a 50% water, 50% propylene glycol solution.

When the outdoor temperature drops below 40°F, the Uponor snow and ice melting system activates. The system consists of five snow-melt zones controlled automatically by snow and ice sensors. The snow-melt pit is controlled manually.

An outdoor thermostat activates and maintains the slab temperature in another separate zone. Two system pumps, with variable frequency drives, adjust the amount of flow to the zones based on the demand.



Project Data

Area Heated:	80,000 square feet (97,000 linear feet)
Design Temperature:	20°F
Slab Surface Temperature:	38°F
Load:	125 BTU/h/ft ²
Tubing Type:	Wirsbo hePEX™ plus
Tubing Spacing:	10" on center
Average Loop Length:	250 linear feet
Supply Water Temperature:	120°F
Differential Temperature:	20°F
System Flow:	1,000 gallons per minute (gpm)