

Sub-Surface Assists

By Mike Dahl, LC/DBM



Installing heating and cooling elements underneath pavers is an excellent add-on service to present to customers where frigid winters render driveways, walkways and patios dangerously slippery and sometimes impassable, or blistering summers make walking on paved areas uncomfortable, and possibly painful.

Here, LC/DBM presents three examples of this type of work to point out the varied options, and provide guidance on installation procedures.

Heating Up While Cooling Down

PHOTOS: THERMA-HEXX CORPORATION (EXCEPT WHERE NOTED)

When Gateway Canyons Resort in Gateway, Colorado wanted to switch to a solar heating system to warm their two pools and a spa, the plans called for thermal solar collectors on top of the carports in the parking area. They chose Cloward H2O of Provo, Utah as the water and pool engineering company to give them a hand.

Cloward suggested they instead opt for the ThermaPANEL system from Therma-HEXX, a sub-surface system that collects solar heat from the patios to provide 24 hour heating of the pools from the retained energy in the thermal mass of the pavers, cool those pavers during the heat of the day, and eliminate the need to install screening to hide roof-based solar collectors.

Landscape architect Greg White of DTJ Design in Boulder, Colorado designed the project and FCI Constructors of Grand Junction, Colorado supervised the build. Since it was a ground mounted installation, it required an ICPI approved sub-base, with a thin layer of sand on top of the base to fill any voids in the rough base material.

Therma-HEXX installed the solar thermal system, which consisted of 2,000 1.4-inch-thick solar panels with one-inch-thick, three pound density EPS foam insulation mounted to the back of them. The panels are factory connected in rows up to 50-feet-long, and then folded into 6-foot-long boxes for shipping.

At the job site, the bundles were set out at one end, unfolded into place, and then hooked up to send/return manifolds with polyethylene raised temperature (PE-RT) tubing row by row until the entire zone

Above: A ThermaPANEL system from Therma-HEXX, which is a sub-surface system that collects solar heat from pavement, not only provides 100 percent of the heat to warm the two pools and a spa at Gateway Canyons Resort in western Colorado, it has also cooled the pavers down from 185 degrees to 125 degrees.

PHOTO: DTJ DESIGN, INC.



Top, Right: About 2,000 solar panels, each 1.4"-thick with 1"-thick, 3-lb density EPS foam insulation mounted to the back of them, were needed to cover the area. The panels are delivered from the factory already connected together in rows up to 50'-long, and folded into 6'-long boxes for shipping. After being set out, they were hooked up to send/return manifolds with polyethylene raised temperature (PE-RT) tubing and then pressure tested.

Above, Right: Rocky Mountain Hardscapes of Denver installed 10,000 square feet of 3"-thick segmented pavers on a 1" base. The panels actually provide structure to the base and add full support to the paver array.

was connected and pressure tested.

Then the hardscape installer, Rocky Mountain Hardscapes of Denver, applied one inch of bedding sand and tamped it into the voids. The manufacturer advises using a vibraplate with a plastic base or a hand tamp. After pre-compacting the sand, it was then screeded to the correct depth. The panels provide structure to the base and add full support to the paver array: 10,000 square feet of 3-inch-thick segmented pavers, which were set and compacted as usual.

In the end, the two pools and spa are each on their own heating system. It was conservatively projected that the system would provide 60 percent of their yearly heating requirements. After two years in operation,

it reportedly provides 100 percent, to the point that because the supplemental heaters never came on, the maintenance people had to test them to make sure they still worked.

The pavers retain enough energy in the evening to keep the pools and spa up to their designated temperatures 24 hours a day in warm-weather months, and above freezing in the winter. The system is also capable of assisting with melting snow as water heated by the dormant boilers could be pumped through the panels to clear the patio area.

But maybe just as importantly, in the summer when the days can reach 105 degrees and heat the pavers to 185 degrees, the actions of the system cool the pavers to a safe temperature level.