

The Anvil Experience

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Geothermal Energy Keeps Las Vegas Motor Speedway on Track

With all its glitz and glamour, it's easy to forget that Las Vegas is, at its most basic level, a phenomenal achievement: a thriving city built in a harsh environment that theoretically should not be able to sustain it.

Every construction project must overcome the challenges of the desert's punishing climate — and the expense that comes with it. Under these conditions, going green is often the most effective way to control costs while still serving the project's overall goals. Green solutions can take on some surprising and unexpected forms. During the recent renovation of the Las Vegas Motor Speedway, for example, Behade Builders — the hired contractor — discovered that their solution was literally right under their feet. Ultimately, it took combining the principles of geothermal energy with Anvil International products to make it all happen within the project's high-velocity time frame.

Geothermal Energy Keeps Las Vegas Motor Speedway on Track



The Las Vegas Motor Speedway, one of the premier NASCAR racetracks in the United States.



Green Design Gets the Green Flag

The main goal of the multimillion-dollar renovation was to elevate the Las Vegas Motor Speedway to one of the premier NASCAR tracks in the United States. The owner implemented a number of structural changes that would make the racing experience much more exciting for its spectators. Banks along the track were increased from 12 degrees to 20, which raised the track by 8 feet in some areas. This increased driving speeds by as much as 20 miles per hour. In addition, the pit road was moved 150 feet closer to the grandstand.

This emphasis on a fan-friendly and accessible atmosphere affected all aspects of the renovation, including

the construction of a new two-level, 32,000-square-foot garage area. The garage area's 52,000-square-foot roof deck gives racing enthusiasts the ability to look directly down into individual garage stalls and watch the teams work on their cars.

But the crown jewel of the entire project is, without a doubt, the 58,000-square-foot media center situated in the infield. Encapsulating all the energy, fun and glamour of its native city, this state-of-the-art facility houses all the TV, NASCAR, pit crew and fire alarm communications — along with a wealth of amenities. From its luxury corporate suites and veranda down through its meeting rooms, widescreen sports bars and cafeterias to its spa for drivers and their families, the media center can accommodate more than 500 members of the media in the highest comfort. And with all communication equipment built into a special underground vault, the center allows sufficient floor space for performances from the biggest entertainment acts in Las Vegas.

Behade Builders

Behade Builders is a family-owned general contracting company that specializes in design build and design assist projects. With more than 10 years of experience in the Las Vegas area, Behade is committed to working with each and every client as if the project were its own. The company brings an extra level of service to its

About BEHADE BUILDERS

Behade Builders, a family-owned general contracting company that specializes in design build and design assist projects, has more than 10 years of experience in the Las Vegas area. Behade continuously researches new means of construction that are as cost-efficient as they are innovative.



customers by continuously researching new and innovative means of construction — without driving up long-term operational or lifecycle costs. This dual focus on innovation and cost-efficiency made Behade Builders the ideal contractor for the project.

The “Three Days” Challenge

Unfortunately, before they could implement any of the speedway’s new attractions, Behade Builders had to contend with a tremendous stumbling block stemming from the logistics of the venue’s usage. Other than occasional private events, the speedway only operates at full capacity for three days each year. However, the buildings must be climate-controlled year-round in order to protect the interior finishes from the punishing desert heat. Powering the climate control system for such a massive (and frequently unoccupied) facility via traditional methods would have made it impossible to realize a return on investment. Therefore, green solution was crucial to cutting operation costs, boosting energy efficiency and ensuring the project’s feasibility. The solution came in the form of a revolutionary trend in engineering: *GeoExchange® heating and cooling*.

GeoExchange® — the “Underground” Energy Source

During their research, Behade discovered that the principles of hybrid ground-source heating and cooling had the

potential to resolve all of the speedway’s energy dilemmas — and that the Nevada desert proved a natural candidate for this innovative engineering method. As designed by Sound Geothermal Corporation of Salt Lake City, hybrid GeoExchange, or ground-source heat pump systems, involve generating energy via the heat stored below the earth’s surface during the cooling months, then reusing that energy during the heating months. Excess energy, while cooling, is saved during the day and rejected at night, when power costs are lower and the cooler air requires less water and a smaller cooling tower to reject the heat. Though it currently accounts for less than one percent of the planet’s HVAC use, ground-source heating and cooling is catching on, particularly in geological areas that are well-suited to the practice. For the past 10 years, the Austin Texas School District, for example, has used GeoExchange for the majority of its new facilities.

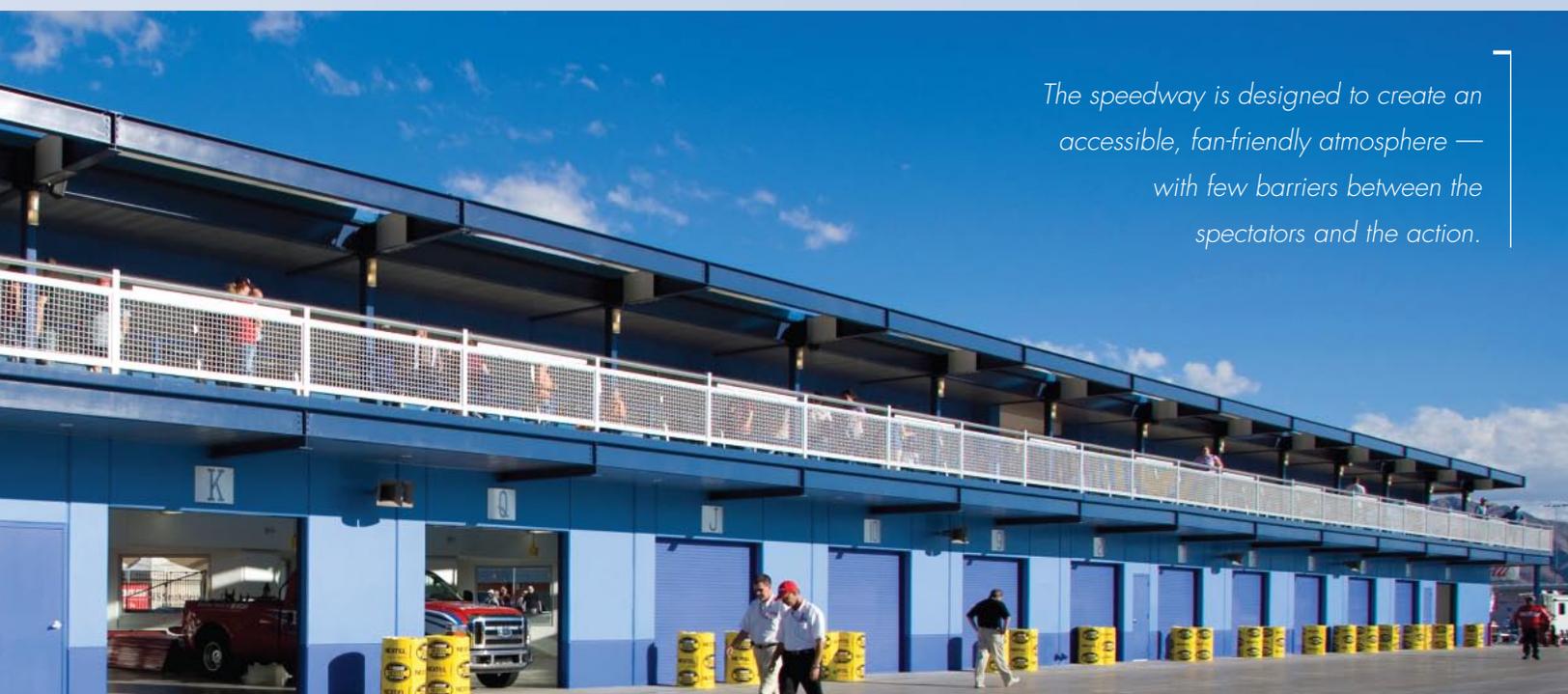
The principal advantages of GeoExchange are that it is clean, environmentally safe and sustainable, since it involves no on-site combustion and the energy can be stored and reused. Geothermal heat pump systems are also extremely price-competitive (average cost reduction is 45 percent), as it reduces reliance on fossil fuels and their subsequent price fluctuations.

Behade Builders had found its solution, but they still needed to implement it, and the clock was ticking. Needing an experienced



Top: Amenities include luxury suites, widescreen sports bars, cafeterias, spas and room for special events.

Bottom: Due to the facility’s open layout, a lot of piping had to fit a very small space. A grooved system proved the fastest, most flexible and cost-effective option.



The speedway is designed to create an accessible, fan-friendly atmosphere — with few barriers between the spectators and the action.



Top: The garage area's spacious roof deck gives racing enthusiasts a bird's-eye view of teams as they work on their cars.

Right: The combination of geothermal energy and Gruvlok® products has reduced the Speedway's electrical usage by 60 percent and maintains an air conditioning capacity far larger than the 90 tons required by the media center.



piping manufacturer to handle the above-ground construction to their geothermal system — one that could match their fast-track schedule — they turned to their Anvil distributors both locally and in the region.

The High Groove to Green

Construction began with the development of a geothermal system that generates energy drawn from 150 wells that go 400 feet down into the ground below the facility. From there, Behade set to work building the above-ground piping portion of the energy system for the media center. The facility's layout is naturally very open, which meant that a lot of piping had to fit into a very tight space within the walls and ceilings. The contractors quickly determined that construction would be faster, more flexible and more cost-efficient with a grooved piping system than with a welded system.

Behade employed the Gruvlok® line of products, as well as Anvil Strut™, Anvil

pipe hangers and Anvil malleable and cast iron fittings. Behade specified these products by name because they had proven trouble-free on numerous past projects, which in turn has led to a long-term, ongoing relationship between Behade and Anvil.

Behade managed to complete its part of the project in 10 months. "This arena is all about speed, and so was the project timeline. All of us here wanted to prove that we could keep up with the pace without sacrificing the quality of our work," said Paul Dean, president of Behade Builders.

To top it all off, the media center's walls were outfitted with super-insulated panels comprised of 3/8" coated steel sandwiched between three inches of polystyrene. Likewise, the 6" space between interior and exterior walls were filled with fiberglass insulation, while the 3/8"-thick high-efficiency windows further reduced glare and internal cooling requirements.

Reaching Victory Lane

As a result, the designers could not be happier with the improvements. The initial capital cost for building this system was equal to that of installing conventional boilers and chillers, but the geothermal system reduces the speedway's electrical usage by 60 percent. With the geothermal wells cooling the compressors during the day and cooling the water at night, the system boasts a 250-ton air conditioning capacity, well above the 90 tons the media center would require at most.

The entire facility is now operating at maximum efficiency. Even the urinals are saving 700,000 gallons of water by going waterless. Thanks to green initiatives, Behade's expertise, and the Gruvlok product line, spectators at the Las Vegas Motor Speedway now enjoy a Vegas-sized entertainment extravaganza without putting a Vegas-sized strain on the environment.

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