



Commercial Case Study

Maryland's I-70 Project Warmly Welcomes Motorists

When motorists take a break along Maryland's I-70 near Myersville, westbound or east, they'll be pleasantly surprised by the state-of-the-art welcome centers on both sides of the highway. Large, open spaces, upscale food, radiantly heated floors and ground-source air conditioning are making pit stops more comfortable.

The state's newest welcome centers – two buildings near each other, on opposite sides of the highway – required a budget of \$1.5 million for identical geothermal heating and cooling, including water-to-water heat for extensive radiant heat systems. The innovative approach by Kinsley Construction and Advanced Heating & Cooling LLC, out of Reisterstown, MD, contributed significantly in the winning of LEED Silver certifications for both rest area structures.

In the beginning

"When we were asked to bid on this job we initially turned down the opportunity because there were only a few days to prepare the bid, and there were many components to the project. But we were asked to reconsider," said Rick Gilmore, vice president of



Advanced Heating & Cooling, based in Reisterstown, Maryland.

"Ultimately, we agreed to bid the project. To be awarded the job would either demonstrate our strengths or expose our weaknesses. Either way, due to the size of the job and the size of our company, we knew it would be a challenge. This was the largest mechanical project Advanced Heating & Cooling had done."

Each of the identical buildings is 10,200 s.f., comprised of a tourist center, conference room, restrooms, a breezeway, media room and vending areas. Through various phases of construction, the water-to-water and water-to-air systems were installed in both the buildings over the course of a year.

As a minority contractor on a federally-funded job, Advanced was not allowed to subcontract work that was within the scope of their trade. The two-building project required erection of two buildings simultaneously, though with an intentional, six-week lag time between them.

"Being a company of only 16 employees, we had to be creative to man the job, while maintaining all the other jobs on our plate. One of the solutions was to tap the resources of a couple skilled labor companies," said

Gilmore. "After approval, we temporarily hired some additional tradesmen to help staff the job. For several months we consistently had 12-15 workers on the job, and were able to keep on schedule.

The solution's many parts n' pieces

One of the early needs at each job site was to vertically drill, pipe and grout the geexchange fields. Each welcome center has 16 vertical bore holes 420 feet deep. Michael Barlow Drilling, in Bel Air MD, drilled and fused the well fields, and trenched the lines to the building. From that point on, Advanced Heating and Cooling's IGSPHA certified installers were in control.

"There was some discrepancy as to where the exchange fields were to be located," recalled Gilmore. "The field on the westbound side actually changed locations several times during the planning phase, creating a few challenges to overcome. The bore holes are now under the parking lot." The exchange field for the eastbound Welcome Center is located behind the facility.



The original bid design of the mechanical system had a single outdoor unit for each building, to be fed by 460 volt, three-phase power. It was later determined that there was only 240 volt, single-phase power to the building. This changed the design substantially and meant that we had to go with multiple units of a smaller capacity. Due to the lack of three-phase power, the engineer's design called for two heat pumps in series with one another, with a third as stand-by.

"After some research and investigation, we concluded that a three-phase pump motor could be used in conjunction with a properly sized variable frequency drive (VFD)," said Gilmore. "This change would allow us to use 'off the shelf' motors in the event of a breakdown. The modification would save the Highway



I-70 Welcome Centers Near Myersville, MD

Administration nearly \$13,000 per year in operating costs. It also saves space in the already crowded mechanical rooms.

When it came time to pour the building slabs, 8,500 lineal feet of one-half inch Watts Radiant PEX tubing was set under five inches of concrete, spaced at 12 inches, to serve as the main heat source for each building. The radiant system, a primary/ secondary loop configuration, sources BTUs from a dedicated 10-ton ClimateMaster heat pump.



In the event of failure, or if outdoor temperatures falls below the 8°F system design temp, the building's water-to-air system kicks in as a source for back-up heat. The same units act as the building's AC system during the summer months.

The system incorporates a second ten-ton water-to-water unit for domestic hot water. This unit feeds a 460 gallon storage tank, with a storage temperature of 125°F. Supply temperatures are mixed down to 105°F at each point of use.

All public restroom facilities have air-side back up heat and air conditioning. The source for each: four, 48,000 BTU ClimateMaster geothermal units. The smaller office staff bathrooms are served by a two-ton unit.

Across the breezeway from the bathroom, three more water-to-air units serve the other rooms in the building; a pair of four-ton units takes care of the tourist center, media room and vestibule, while a separate three-ton system cools the conference room. To make sure no energy is wasted at the cost of proper ventilation, an ERV is installed in each the restroom facility and the tourist center.

Exemplary work

The winter of '10-'11 came in with a cold, icy blast. Before the end of December '10, temperatures in Myersville dipped to 16°F with blasts of wind in the 25-35 mph range. Yet, Maryland's tourists and travelers experienced extreme comfort inside new buildings thanks to stored solar warmth, smartly harvested and delivered by geothermal heating.

Adding to the challenge for Advanced employees was the job site's location. "The project was a 75 mile hike from our shop, so it took some dedication to get everyone on site by 6:30 every morning," added Gilmore.

"We believe you have to earn your stripes every day," he said. "It's that attitude that helped us rise with the challenges on this project, to complete it on schedule and beyond expectation."

Advanced Heating and Cooling earned an 'A' grade from the state, and entered the Welcome Center project in the ABC (Associated Builders and Contractors Inc.) Awards of Excellence program.

"The entry for the Awards of Excellence is very exciting for us," said Gilmore. "As a fairly new company, we worked hard to make an excellent name for ourselves in the industry. The Welcome Center projects are a perfect example of the quality of work we're capable of."





I-70 Welcome Centers
Near Myersville, MD

Contractor:
Kinsley Construction,
Reisterstown, Maryland

Advanced Heating & Cooling,
Reisterstown, Maryland

Driller:
Michael Barlow Drilling, Bel Air, MD

HVAC Manufacturer:
ClimateMaster, Inc.
climatemaster.com

Equipment:
16 -Tranquility® 20 (TS) Horizontal and Vertical Units
4 - Genesis (GSW) Water-to-Water Units



ClimateMaster is the world's largest and most progressive manufacturer of geothermal heat pumps. The company is committed to innovation and dedicated to environmentally clean, economically sound and superbly comfortable home and business environments.

ClimateMaster has been designing and building equipment that enhances the environments we live and work in every day for more than 50 years. In addition to geothermal heat pumps, ClimateMaster offers the most extensive product line of water-source heat pumps for use in a wide variety of applications. ClimateMaster products are proudly built in the U.S.A.



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