

# Memphis Business Journal

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## Marion fire station to feature geothermal technology for low-cost climate control

Memphis Business Journal - by [John Scruggs](#)

Ground heat exchange will keep Marion, Ark., firefighters both cool and warm in their new station house, thanks to the latest in HVAC technology for climate control in the building.

The new fire house, the first municipal building constructed in Marion since the early 1990s, will be heated and cooled using a system of ground heat exchange pumps to adjust internal temperature using the constant ground temperature.

Jordan Northcross, project manager and architect with **Fisher & Arnold**, says the system uses looped pipes running 160 feet below the surface.

"The ground is a constant temperature at that depth, so by circulating water through the pipes, you can change the temperature of the water to heat or cool an interior," Northcross says. "The water then runs through a heat exchange system that adjusts air temperature."

The technology, which requires no use of natural gases, uses limited electricity to transfer heat from one location to another. Duct fans then transport temperature-adjusted air throughout a building.

The interest in using geothermal heating for the new Marion Fire Station came from Mayor Frank Fogelman, who had some concerns about future gas prices.

"Obviously we wanted to look as far down the road as possible," Fogelman says. "I've been exposed to some of the aspects of this relatively new technology and it will cost around 20% more than a conventional heating and cooling system."

Fogelman says the payback for that initial investment will come in five years, and that's with calculating the return based on present-day energy prices.

"For a building that could conceivably last 50 years, the savings will be significant," he says.

Fisher & Arnold also has planned for use of radiant floor heating in the three planned engine bays.

Northcross says even though it's a relatively small project, a lot of progressive ideas and technology are going into the fire house plan.

The \$780,000 proposed project, and its inclusion of the geothermal heat exchange technology, received 92% approval from voters in Marion.



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Computer-generated image of fire station in Marion

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Others in Arkansas are utilizing the new heating and cooling systems.

The **Marion United Methodist Church** has designed its new sanctuary with geothermal climate control in the plans. Ground heat exchange will also heat and cool the new **Marion Junior High School**.

Memphis and Shelby County are stuck with traditional systems because of the area's aquifer some 350 feet below ground.

Concerns about compromising the purity of waters in both the Memphis and Fort Pillow aquifers prevent the deep vertical drilling required for geothermal heat exchange pipes.

"You even have to get a permit to do soil testing on a job site at 20 feet deep in Shelby County," Northcross says.

### **Fisher & Arnold**

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