



Energy-Efficient Apartments Choose Geothermal System

Case Study



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Geothermal Comfort In Each Apartment at the Solaire Apartments

Background

The Solaire apartments, located in Brighton, Colorado, just 20 minutes outside Denver, offer residents a variety of lifestyle choices. Incorporating renewable geothermal energy to heat and cool their apartments delivers energy cost savings while reducing demand on the city's power grid. The 252 unit, 12-building complex uses 112 geothermal wells to provide 326 tons of heating and cooling capacity. Energy efficient construction meets or exceeds 2012 Model Energy Code. Among the sustainable features:

- Geothermal heating & cooling for all apartments
- Solar lighting at community mailbox kiosk
- Wind turbines with solar panels
- Buildings are pre-wired for solar panels
- Water conserving plumbing fixtures and low-emission insulated windows
- Water sensing and online weather data technology for irrigation system
- Blown cellulose insulation for tight building envelope

Installation Summary

According to installer Conald (Con) Frank of SMC Geothermal, the apartment developer chose to install 252 Bosch BP Series water-to-air geothermal heat pumps for their reliability, efficiency and supported by an industry-leading residential limited 10-year warranty. "There are two sets of five wells for each of the 11 apartment buildings," explained Frank.

"As the two-inch supply lines enter the building, they merge into a three-inch hydro-separator. On the other side, they split back to dual, two-inch lines once again; one set for each half of the building." Throughout the building, Bosch water-to-air heat pumps are tucked away in closets, and pull water from the supply lines. Each apartment has its own heat pump.

Each of the eleven buildings plus clubhouse uses 20 to 24 geothermal units supplied by vertical ground loops for each building. A mechanical room in each apartment houses the geothermal unit and transfer fluid is pumped back to ground loop with variable speed circulating pumps. Each geothermal unit supplies heated or cooled air through ductwork with no additional auxiliary fans or backup heating system required.

"SMC Geothermal reworked the original geothermal system design to significantly reduce cost. The city of Brighton and United Power utility offered incentives and offsets so that the system is even more cost-effective than a conventional HVAC system,"



Solaire Apartment complex

remarked Frank. GeoSource Geothermal Systems distributes geothermal equipment in Colorado, New Mexico, Montana, Wyoming and Arizona. Brian Fowler remarked that “This was one of the largest residential geothermal heat pump projects we’ve supplied. Units were delivered in multiple phases as buildings were prepared for installation.”

Summary and Conclusion

“While the first costs of installing geothermal to serve the Solaire residences was more expensive than conventional HVAC, the ability to eliminate a portion of the per-unit energy costs makes our community more affordable for residents,” said Brock Vinton, developer of Solaire. “As energy costs rise in the future, we believe that the sustainable aspects of Solaire will help us in tenant retention and overall cost competitiveness in our marketplace.”

Vinton hopes that the Solaire project can serve as a blueprint for the development of other sustainable communities in Colorado and beyond. Key aspects that made the project feasible were the combination of power company and municipal incentives as well as partnering with reputable companies such as SMC Geothermal, the company that designed and installed the geothermal systems there.

Overall energy use for heating and cooling is anticipated to cost approximately \$110/year for one-bedroom apartments and \$160/year for two to three-bedroom units. Lower energy costs, coupled with reliability and Bosch’s standard limited ten-year warranty, are strong points to attract residents.



252 Bosch BP Series water-to-air geothermal heat pumps can provide 326 tons of heating and cooling to serve all the apartments



Project Name:

- ▶ Solaire Energy Smart Apartments, Brighton, CO

Property Owner / Developer:

- ▶ Greystar, McLean, VA

Application:

- ▶ 252 Bosch BP Series water-to-air geothermal heat pumps

Installing Contractor:

- ▶ SMC Geothermal, Foxfield, CO

Geothermal Distributor:

- ▶ Geosource, Loveland, CO

Project Completion:

- ▶ Spring 2014