Geothermal Heating & Cooling at Piquette Square Apartments

Case Study

Bosch FHP Geothermal Heat Pumps
Apartments for Homeless Veterans in Detroit

Project Goals:
- Individual apartment control of heating/cooling
- Environmental control for common spaces
- Ease of service and maintenance

Background
Piquette Square is a 150-unit apartment project in Detroit built to house and care for homeless veterans. Piquette Square offers comprehensive support services to help the veterans develop self-sufficiency and reintegrate into the community. Southwest Housing Solutions owns and manages Piquette Square, a four story brick building with 11,000 sq ft of common area and commercial space completed in 2010.

Installation Summary
The sales engineer on the project for FHP Manufacturing (division of Bosch Thermotechnology) was Dave Cunningham, and Kurt Peterson was Manufacturer’s Representative for FHP. Large capacity two-stage 20-ton water-to-water FHP 240 units were selected to heat or chill water piped to individual apartments through four-pipe 50/50 fan coils provided by the Whalen Company. The fan coils provide advantages of a four-pipe system but reduce pump and piping requirements by 50%, according to the manufacturer. The design allows pump and motor usage to be stages as heating or cooling conditions require, reducing overall energy demands and requiring no dampers or flow control valves. FHP provided four water-to-water geothermal heat pumps with two stages of 10 ton capacity, totaling 20 tons. Two storage tanks provide chilled water at 45F up to 120F. Two circulating pump systems feed chilled or hot water to the fan coils installed in individual apartments, depending on the season. The system also provides environmental control for common areas and

office space on the main floor. The geothermal loop uses water and 20% glycol solution. An additional 19 water-to-air FHP model EC heat pumps provide conditioned air to commercial space on the ground level. EC models are available from ½ through 30 tons capacity. FHP’s two-stage WW 240 Series water-to-water modular reverse cycle heat pumps can be utilized for chilled water and hydronic heating, make-up air applications or swimming pool heating among their potential applications. The small cabinet modular design offers flexibility to install units individually or in any combination to match the exact load requirement for a commercial project. They are great choices for retrofit or new construction because they can fit through a standard 36 service door. The two-stage WW Series is available in sizes from 3 to 35 tons. Building owners will benefit from the ease of service when utilizing FHP W2W Series, as any standard refrigeration/air conditioning technician can service them, unlike a large centrifugal chiller system requiring specialized service.

Benefits and Conclusion

According to Dave Cunningham, the all-electric heat pump system provides up to 30% in energy savings over traditional fossil-fuel HVAC system. With the advantages of individual unit control, and no outdoor equipment to house or roof penetration required for exhaust, the system is significantly more space efficient and cost-effective than air-to-air units. In addition, no backup heating system is required, thus saving cost and complexity.

FHP water to water and water to air heat pumps provide heating and cooling to Piquette Square apartments and common areas.

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Project Name:
- Piquette Square Apartments, Detroit, MI

Building Owner:
- Southwest Housing Solutions.

Equipment Installed:
- Four FHP WW240 water-to-water two-stage geothermal heat pumps
- 19 water-to-air FHP model EC heat pumps

Manufacturer’s Representative:
- Facility Technologies, LLC

General Contractor:
- O’Brien Construction, Troy, MI

Consulting Engineers:
- EAM Engineers, Inc., Troy MI

Completion Date:
- June 2010