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JM Coull building F.W. Webb facility; installs hybrid solar-geothermal system

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JM Coull, Inc. is building F.W. Webb's newest branch facility at 570 Vauxhall St. JM Coull has teamed with Design Science architects to deliver the $5 million design-build project for April 2011. Construction began in July on the multi-purpose building, which will feature a showroom for F.W. Webb's plumbing supply products, office and self-serve areas and a warehouse.

A feature of the project is the closed loop hybrid solar-geothermal system, to be used for heating and cooling the facility and for hot water. The system combines geothermal and solar technologies to handle 85% of the heating and cooling load for the building. Built-in efficiencies maximize system performance, saving energy and reducing operating costs.

JM Coull hired Turner Building Science & Design to advise F.W. Webb on the selection and engineering of the hybrid system. In addition to supporting the company's "Go Green" initiative, an analysis of the cost and relative inefficiency of propane (the alternative fuel source in the area) demonstrated the financial wisdom of the choice. Jeffrey Harrison, Turner's senior vice president and the engineer who designed the system, said F.W. Webb can expect to save $24,000 to $60,000 annually, depending upon fluctuations in the cost of propane.

Twelve 500-foot earth coupled boreholesâ€”each of which contains a closed-loop, U-tube heat exchangerâ€”will allow the building to make use of the relatively constant temperatures below the earth's surfaceâ€”warmer than the surface in winter and cooler in summer. Variable-frequency-driven (VFD) pumps will circulate water through the system, saving energy by matching the pump speed to the fluctuations in demand.

Fifty roof-mounted thermal solar panels are integral to the system, harnessing solar energy and feeding it into the 10,000-gallon underground solar storage tank. High efficiency and lower environmental risk- features include the use of a solar panel drain-back configuration using plain water instead of glycol which eliminates the need for efficiency-robbing heat exchangers or glycol additives. A single evacuated tube, high-temperature thermal solar panel will provide domestic hot water.

JM Coull preconstruction project manager Andrew McBeth has worked with F.W. Webb to evaluate options for using geothermal and solar technology in several of its recent construction projects. A recently completed facility in Hyannis, Mass., and a project that will soon begin construction in Boston, both include hybrid solar/geothermal systems.

"Technological advancements in alternative energy have provided us with a variety of options to consider," said McBeth. "We used an open-loop system in Hyannis because it was well suited to the sandy soil conditions." An open-loop system uses water pumped directly from the ground and returns it to the same aquifer via another well. Sandy soil is easily infiltrated and naturally filtered, helping the open-loop system to operate efficiently.

"In Waterford," said McBeth, "we originally considered using two 2,000-foot boreholes, but the cost of drilling proved prohibitive. We settled on the 12 shallower holes because the loss in efficiency was minimal and the return on investment made better sense. F.W. Webb can expect to see a return in six to 10 years, when the cost of the system will be balanced by fuel savings. "

An added benefit for F.W. Webb is the opportunity to showcase the equipment they sell for geothermal and solar heating and cooling systems. The Waterford project will include a training room for demonstrating F.W. Webb products. An area in the warehouse near the training room will afford an open view of the operational geothermal system.

Construction of the new facility will make use of pre-engineered technology, employing a 67,000 s/f metal building from Butler Manufacturing with split-faced masonry block. A 30-foot clear height, combined with a narrow-aisle racking system, will maximize storage area in the warehouse. The site also accommodates parking and 40,000 s/f of paved, outside storage.

Earthwork encompassed half of the 20-acre site and included 40,000 cubic yards of cut and fill. The excavation included the creation of two large storm water infiltration basins and a vegetated swale.

"The Waterford location is important to F.W. Webb's expansion into Connecticut. It provides excellent access for our customers, in addition to creating 30 new jobs in the area," said Phil Vultaggio, general manager of the Waterford facility. "F.W. Webb is excited about the opportunity to serve the market in the Waterford area.

"We're particularly enthusiastic about having the hybrid solar-geothermal system in our new facility. Webb is committed to helping our customers explore options for alternative energy, and this just makes it easier to demonstrate what these systems can do," said Vultaggio.