



WHISPER VALLEY WINNING FOR THE ENVIRONMENT

Sustainable Community Geothermal Project
 Also Earns Industry Honors

AUSTIN, Texas – While achieving Net-Zero for one building is somewhat practical, the developer of Whisper Valley here decided that the entire 2,000-acre community with some 7,200 homes would be Net-Zero Ready. All structures will be ground source geothermal and solar equipped to meet the Net-Zero energy - carbon neutral - standard adopted by the City of Austin's Municipal Building Code. The \$2 billion development that also includes apartments, several million square feet of commercial space, schools and other buildings, will be the largest zero-energy capable housing community in the nation. The key component for getting to Net-Zero is the geothermal, or geexchange, cooling and heating system and its underground distribution piping system.

Each of the 237 homes in Phase I is equipped with a REHAU RAUGEO™ PEXa double U-bend pipe loop and a ground source heat pump. A total of 313,000 linear feet (95,400 m) of the pipe was used. All builders in Whisper Valley are required to hook up to EcoSmart's GeoGrid, a five-mile loop of underground distribution piping that links each home to a geexchange network, engineered by b2E Consulting Engineers. This geothermal system is predicted to reduce heating/cooling energy costs for homeowners by up to 65 percent as compared with conventional air-source heat pumps. EcoSmart Solution LLC is a subsidiary of Taurus Investment Holdings, developer and owner of the site.



"This project is a great example of the use of plastic tubing for geexchange loops, and all the benefits that ground source systems deliver," explained Lance MacNevin, P.Eng, director of engineering for the Building and Construction Division of the Plastics Pipe Institute, Inc. (PPI). "The PEX piping material is tough and durable and will provide decades of reliable service. Plus, the REHAU double U-bends increase the output of each borehole by up to 30 percent compared to single U-bends. This reduced the required depth of each borehole, as well as the number of boreholes required. And, naturally, cut drilling costs and the number of days spent drilling on the Whisper Valley jobsite."





Whisper Valley will consist of seven separate villages with a fire department station and two schools for its nearly 30,000 residents.



Homes and buildings are located next to access roads and on top of the integrated geothermal district loop that will significantly reduce energy costs for homeowners. Those lots are sold to homebuilders with specifications for sustainable construction including hooking up to the loop. The end result will be highly energy efficient Net-Zero Ready homes with very low energy costs.

To use the earth's relatively constant temperature (45 to 75°F in this location) for heating and cooling, the design incorporates boreholes up to 335 feet (102 m) deep drilled on each lot, into which the REHAU pipe loops were inserted. Boreholes were grouted after pipe insertion. As with all geothermal systems, fluid circulates through the pipes, exchanging heat to and from the earth for cooling or heating operation, respectively.

Each PEX vertical pipe loop connects to a system of horizontal pipes. This larger integrated 'geo loop' is augmented by two 250-

ton cooling towers for meeting peak cooling loads during periods of high ambient temperatures.

It is estimated that homeowners will pay a monthly service fee of \$60 for access to the system.

"This project shows how PEX pipe in a geexchange application can help in the reduction of the overall carbon footprint by minimizing the energy required to heat and cool homes," stated Tony Radoszewski, CAE, president of PPI. "The developer providing the geexchange network and requiring builders to connect to it, is game changing. It removes the primary barrier that prevents more widespread adoption of geo-exchange systems. Whisper Valley is a successful business model that, we understand, Taurus plans to take nationwide. I'm sure other developers will duplicate it, especially as more municipalities set Net-Zero targets. Not only is this project a unique application for PEX pipe, it is also at the forefront of community geothermal technology."

Whisper Valley was named the 2019 PPI Project of the Year for the association's Building and Construction Division.

To further support the geothermal market, PPI has established the Geothermal Steering Committee within the Building and Construction Division. MacNevin stated, "PPI and our members promote the adoption of geothermal technologies to help reduce energy consumption for heating and cooling buildings, saving owners money. Other benefits of ground source systems are better reliability and building resiliency, with no exposed outdoor components. Also, water-to-water heat pumps are a perfect match for hydronic heating and cooling distribution systems, which are comfortable and efficient technologies for



use in both residential and high-performance commercial construction.

"It is also important to note that the U.S. Bipartisan Budget Act of 2018 reinstated the tax credit for fuel cells, small wind, and geothermal heat pumps. Signed into law in February 2018, it provides a 30 percent federal tax credit for geothermal, which, in some states, also qualifies for a state rebate."

The PPI Geothermal Steering Committee's activities include supporting industry efforts to update geothermal standards and codes, such as ANSI/CSA/IGSHPA C448, IAPMO's UMC and USHGC, and ICC's IMC and IRC; working closely with IGSHPA, GEO and other related organizations; publishing documents about the use of plastic piping systems for geothermal applications; and serving as a technical resource for geothermal system designers, with regards to plastic piping technologies. PPI also is a sponsor of the DOE's Solar Decathlon

– Design Challenge, a design competition focused on zero-energy ready construction. Whisper Valley has received wide recognition including being named the 2019 Sustainable Community of the Year by Green Builder Media and receiving a Merit Award in the Best Innovative Energy Design category in the 2018 Gold Nugget Awards presented by PCBC.

According to Phil Schoen, president of Geo Enterprise Inc., (Tulsa, Okla.) that installed the system, "Whisper Valley's district GeoGrid is already performing 20 to 30 percent better than projected. The system will gain efficiencies as it expands and the team works to wring out every possible Btu."

Additional information can be found at the PPI website: www.plasticpipe.org.

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About PPI:

The Plastics Pipe Institute, Inc. (PPI) is the major North American trade association representing all segments of the plastic pipe industry and is dedicated to promoting plastic as the materials of choice for pipe and conduit applications. PPI is the premier technical, engineering and industry knowledge resource publishing data for use in the development and design of plastic pipe and conduit systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods.