



### PROJECT RESULTS

- \$23,300 in annual energy cost savings
- 120,000 kWh and 9,634 therms in annual energy use savings
- \$14,000 program incentive from PG&E

*“Everything is going really smoothly because all applications [mixer, pipe machine] are getting air without problems. The new compressor even fits so well that we hardly notice that it’s there.”*

Anita Simpson  
Co-owner, Piranha Pipe and Precast

## CONCRETE PIPE MANUFACTURER INCREASES PRODUCTION AND SAVES ENERGY BY DESIGNING NEW PLANT

Early in the design of their new concrete pipe manufacturing plant in Chowchilla, California, Piranha Pipe and Precast (formerly Clovis Concrete Pipe) decided to implement several energy-efficient features. A steady increase in demand for the company’s products and the need to remain competitive guided the company’s decision to design and build a new plant. However, because of increasing energy costs, Piranha’s management also decided to design the plant for optimal energy efficiency.

To help make their new plant more efficient, the company turned to a Pacific Gas and Electric Company (PG&E) energy efficiency program to assess the proposed facility. The company’s objective was to create a facility producing 125 yards/day of dry cast and 25 yards/day of wet cast pipes to meet demand. The company’s builders worked with PG&E representatives before construction began, exploring ways to make the plant as energy efficient as possible. They generated a plant-wide approach enabling them to design and build a highly efficient facility.

The resulting facility is a 25,000 square foot complex with state of the art equipment, including a 50-hp variable-speed drive (VSD) compressor, forty skylights to reduce lighting demand, an automated process control system to stagger energy-intensive tasks and an advanced curing process requiring less energy than conventional processes.

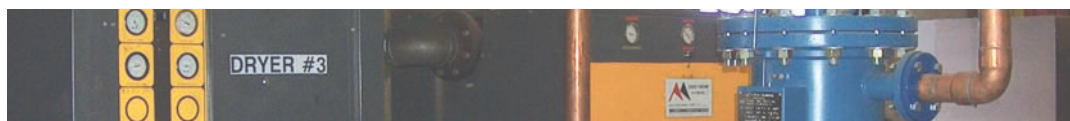
### THE NEW CHOWCHILLA CONCRETE PLANT

PG&E’s recommendations focused on three essential areas: compressed air, lighting and curing. To adequately serve the dry cast process, Piranha Pipe personnel recognized that the compressed air demand at the new facility would be greater than what was required at their previous location. The old facility required a 10-hp compressor to support the pneumatic tools. However, because of the dust collection, mixing and vibrating tasks that exist in the dry cast process, the new plant’s air demand and pressure level would be substantially greater than at the Clovis facility.

One of the options under consideration for plant-wide controls was a programmable logic control (PLC)-based automation system. The energy efficiency analysis showed that with this automated control package, the



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Plants manufacturing concrete products can be very energy intensive due to the curing, dust collecting, mixing, shaping and consolidation production processes. These tasks are supported by industrial kilns, compressors, fans, pumps and sophisticated vibration equipment. If a concrete plant is expanded or converted from a wet cast to a dry cast process, it is important to assess the process and motor systems to ensure they can adequately and efficiently support the new production parameters.

plant's air demand could be adequately supported by a 50-hp VSD compressor, instead of a fixed speed, 60-hp unit required for more standard controls. The automated control system is able to stagger certain tasks so the compressed air applications do not operate simultaneously, thereby reducing peak air demand from 250 scfm to 175 scfm.

To discharge condensate efficiently from the compressed air system, the report advised using zero-loss condensate drains instead of solenoid-operated ones. Although zero-loss condensate drains are more expensive initially, they actually cost less over the life of the drain because they waste much less compressed air than solenoid-operated ones when discharging condensate.

The evaluation also showed that with proper amount of high efficiency metal halide lighting and skylights, Piranha Pipe could operate effectively with 10 percent less lighting demand (kW) than originally planned. A conventional estimate called for 30 kW worth of lighting in the new facility. However, the installation of single-step on/off controls and forty 3' by 10' skylights covering 4.8 percent of the building's total area allowed lighting to be automatically turned off during the day. This saved an additional 51,446 kWh in energy use annually and about 27 kW in on-peak demand on average.

Finally, the analysis demonstrated that the installation of a vapor mist curing system and use of a fast-curing concrete instead of regular concrete would require less curing during the production process, thereby saving natural gas. The recommended fast-curing concrete sets more quickly than conventional concrete, which improves the plant's energy efficiency by eliminating the need to heat kilns during curing.

### PROJECT SUCCESSES AND LESSONS

Piranha Pipe has built an innovative and energy-efficient concrete plant with support from PG&E engineers. Since project completion, the company has met the estimated annual savings of \$23,300 in energy costs and 120,000 kWh and 9,634 therms in energy use. By designing an energy efficient plant, Piranha uses a smaller compressor, less lighting and heats its kilns for less time. This has enabled the company to earn a \$14,000 incentive from PG&E. With total costs of \$119,000 more than a less efficiently designed plant, the project achieved a simple payback of 5.4 years. In addition, Piranha's production capacity is 500% greater than that at its previous facility and includes a more diverse product mix, enabling Piranha to expand its market reach.

**PG&E'S ENERGY MANAGEMENT SOLUTIONS** can help you control your operating expenses through building energy efficiency and demand response capabilities into your new and existing facilities, and your long-range planning. Services include energy analyses of existing facilities, design assistance for planned projects, equipment rebates, project incentives, and education and training. For more information call PG&E's Business Customer Center at (800) 468-4743 or visit [www.pge.com/business](http://www.pge.com/business)

