

New for Plumbing Engineer
Engineering Spotlight

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Dave Moreno (l) & Jake Lawrence stand tall amid the backdrop of steel framing for a replacement hospital in New Jersey.



Also Inside:

- Solar Commercial Hot Water Design
- Rainwater Harvesting
- GeoExchange System

Challenge met at 1,000,000-square-foot covert government facility

DALLAS — In a recent address to the nation, President Obama announced his plan for reviving the weakened U.S. economy. One of the plan's primary focuses is on energy efficiency; by investing in the greening of homes and lifestyles, America can reduce waste and spur innovative opportunities.

The speech was well received; many people saw the trend even before President Obama announced it. One example of this forward thinking is the partnership between United Mechanical in Dallas, a private design and build contractor with more than 60 years of experience in specialized skill projects, and a 1 million-square-foot government facility that had an antiquated boiler system serving its modern hot water needs.

The facility (its identity undisclosed due to security)

features an onsite commercial kitchen, showers, numerous lavatories and a salon. There are four food preparation sinks, five hand sinks, one commercial dishwasher, two pot sinks, 30 dishwashers throughout the offices, 131 restroom lavatories and more.



Three pairs of Eternal Hybrid Water Heaters serve three different zones of the facility. The units are on a header system, allowing for easy swap-out and recirculation to provide quick hot water delivery. Six 200 K Btu heaters can closely match the output of the original 2M Btu boilers.



Mike Edenstrom, head installer who built the system at the government project, readies for another day at the job site.

Two 1-million Btu gas fired-boilers, along with a 2,000-gallon storage tank that took up 200 square feet, had been serving the entire compound for decades. When the new administration made its green intentions known, the facility contacted United Mechanical for advice and help.

Gary Scoggins, design engineer, tackled the challenge of sizing a system that can handle the facility's demands, reduce energy consumption and ensure reliable operations. By traditional means of Btu sizing, the new equipment should match the original equipment's two million Btu input. Btu input rating is often misleading, however, as output is the key to satisfying demand. For example, with a 60% thermal efficiency rating, the original equipment is capable of a 1.2 M Btu output. With high efficiency modulating equipment such as Eternal Hybrid, six 200 K Btu heaters can closely match the output of the original 2M Btu boilers.

By closely monitoring usage patterns, Gary discovered that, while the commercial dishwasher required 12 gallons of water per minute, it filled in just 45 seconds. Knowing this, he chose Eternal for its ability to leverage built-in storage for short burst demands. Otherwise, he would have had to use a 380 K Btu tankless to achieve the required flow rate.

The end result is a system with three pairs of Eternals serving three different zones of the facility. The units are on a header system, allowing for easy swap-out and recirculation to provide quick hot water delivery. The facility is very pleased with the result, and the maintenance crew is happy that the new system takes up just over 10 square feet of space. ■