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Stanford University
Steam-to-Hot-Water Conversion Case Study

URECON
PRE-INSULATED PIPE

Founded in 1891, Stanford University is recognized as one of the world's top academic institutions. Primarily a research university, Stanford in continually developing solutions to global environmental challenges… starting by implementing them on campus.

They take sustainability seriously.

This commitment is integrated into all facets of campus life but best manifests itself through the 'Sustainable Stanford' program.

The program is dedicated to reducing environmental impact and preserving resources. Sustainable Stanford develops initiatives that lead to healthier environments—on campus in Palo Alto, and beyond.

Efficiency and innovation are chief among Stanford's mission of sustainability. A recent demonstration of this is the Stanford Energy System Innovations program. SESI is a strategic plan which addresses growing campus energy needs while reducing cost, CO_2 emissions and water use.

At $438 million, SESI is a big project and will take many years to complete – but savings are expected to be worth the investment… $639 million by 2050, mostly through reduced operating costs and lower utility bills. The campus will go from fossil fuel based cogeneration to a far more efficient electric heat recovery system.

The new heat recovery power plant is at the heart of SESI. After it becomes operational in 2015, Stanford greenhouse gas emissions will be reduced to 50% lower than 1990 levels. The design will pull out low grade waste heat from the chilled water loop and transfer this energy into a new hot water distribution system—replacing the current steam pipe network… resulting in 70% more efficiency.

This conversion from steam to modern hot water piping is already underway. Eventually, over 20 miles of pipe will be replaced—from 2" to 24" diameter.

The new hot water distribution system utilizes European Standard (EN 253) factory insulated thin walled steel pipe and HDPE outer jacket complete with a integral leak detection system—made by Logstor of Denmark. Several major North American university campuses have done similar successful steam-to-hot-water conversions using EN 253 Logstor piping… but not to the same scale as Stanford.

> "Stanford selected a piping system that provided the lowest cost and quickest installation, while still meeting or exceeding all thermal and operational performance criteria."

Joe Stagner
Executive Director of the Department of Sustainability and Energy Management at Stanford University

"Our experience with Urecon was entirely positive. Being our first time working with Logstor piping, we initially needed some help. Urecon trained and certified our staff in proper installation methods and provided quick support and detailed solutions throughout the entire process. They are true experts in EN253 piping systems."

Joel Schimmer
Project Manager, The Whiting Turner Contracting Company

The team at Stanford elected to go with Logstor EN 253 piping for many reasons – most having to do with quality and design flexibility. Here are a few specific examples:

- **Strict EN standards.** District heating with hot water has a long-standing history in Europe and is based on well-proven EN technology. There are five distinct standards that make up a working 'system'. These include EN 253 (pipe); EN 448 (pre-insulated fittings); EN 488 (pre-insulated valves); EN 489 (joint kits); and EN 13941 (design and installation). Compliance guarantees the highest level of quality plus allows accurate prediction of long term behavior underground. There are no similar codes in North America.
- **Thinner wall steel pipe.** The schedule 10-20 steel results in reduced overall stress versus conventional schedule 40 steel—allowing numerous laying methods often saving in number of expansion loops and welds. Thin walled steel is also more flexible allowing for fewer fittings.
- **Design.** Shallow bury piping allows fast installation and relatively long runs. Minimum cover on this project is two feet. 10 miles of pipe was installed from June 2012 to June 2013.
- **Valves and anchors.** Pre-insulated EN valves are direct buried—no need for vaults or manholes. Bonded EN pipe systems rarely require anchors. These points equate to large savings—especially in congested areas.
- **Reliable joints.** The Logstor 'BX' joint kit was selected for its high performance and simple contractor-friendly installation.
- **Leak detection.** Simple and effective central surveillance that constantly monitors the pipe network for faults (and precise location). Even minor irregularities can be detected providing basis for preventative maintenance.
- **Quality and 30 year service life.** The Logstor EN 253 system is a fully welded system (no flanges) that exceeds the EN standards. It comes complete a with five year warranty.

Photos courtesy of Stanford University

For more information on SESI, please see

http://sustainablestanford.stanford.edu/climate_action

Logstor
logstor.com

Headquartered in Denmark, Logstor is the world's pre-eminent producer of pre-insulated pipe systems employing over 1400 people in 10 production facilities across the globe.

Logstor is credited with having invented pre-insulated pipe technology and have supplied more than 170,000 km (105,500 miles) of pipe with over 50 years experience in fine tuning every detail.

Urecon Ltd.
urecon.com

Urecon is a North American manufacturer of pre-insulated pipe systems specializing in freeze protection, HVAC and industrial applications. Urecon has been distributing and supporting Logstor district heating pipe systems in the USA and Canada since 1981.

With over 90 years combined experience, Urecon and Logstor supply North American solutions and expertise in EN hot water piping systems.

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Contact Carl Vreugde or Jean Laganiere for more information or to schedule a technical presentation.

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