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**OAK RIDGE NATIONAL LABORATORY
BIOMASS GASIFICATION SYSTEM**

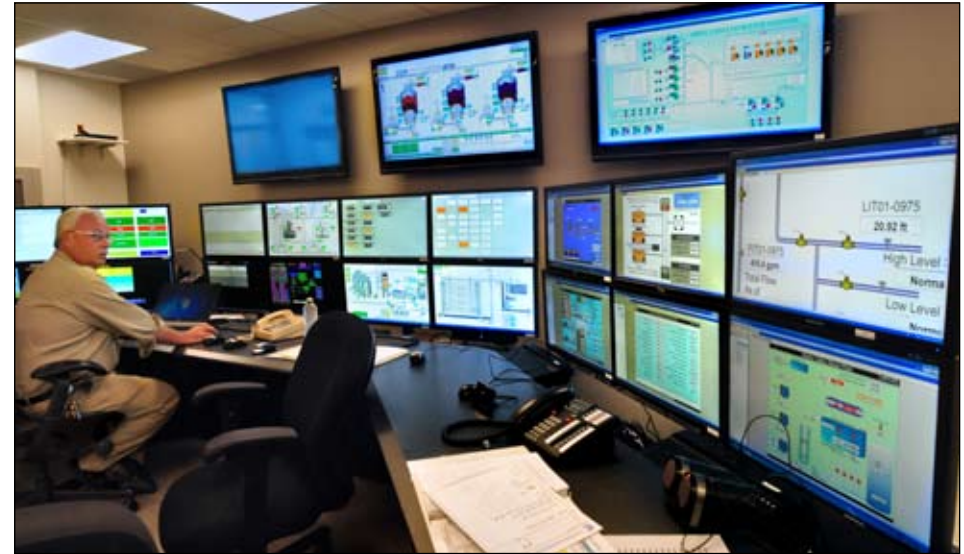


■ Project Description

- Customer: Johnson Controls Inc. and US Department of Energy for Oak Ridge National Laboratory (ORNL)
- Location: Oak Ridge, Tennessee
- Application: Steam plant for heating the ORNL campus
- Nexterra Scope of Work: Supply only of turnkey energy-from-renewable-waste system
- Capacity: 60,000 lbs/hr of 187 psig steam
- Fuel Source: Locally sourced wood residue
- Fuel Moisture Content: 10 - 50%

■ System Highlights

- Allows ORNL to shut down 4 fossil fuel boilers
- Research tool for ORNL BioEnergy Science Center
- Reduce natural gas consumption by 80%
- Reduce greenhouse gas emissions by 23,000 tonnes/year CO₂e



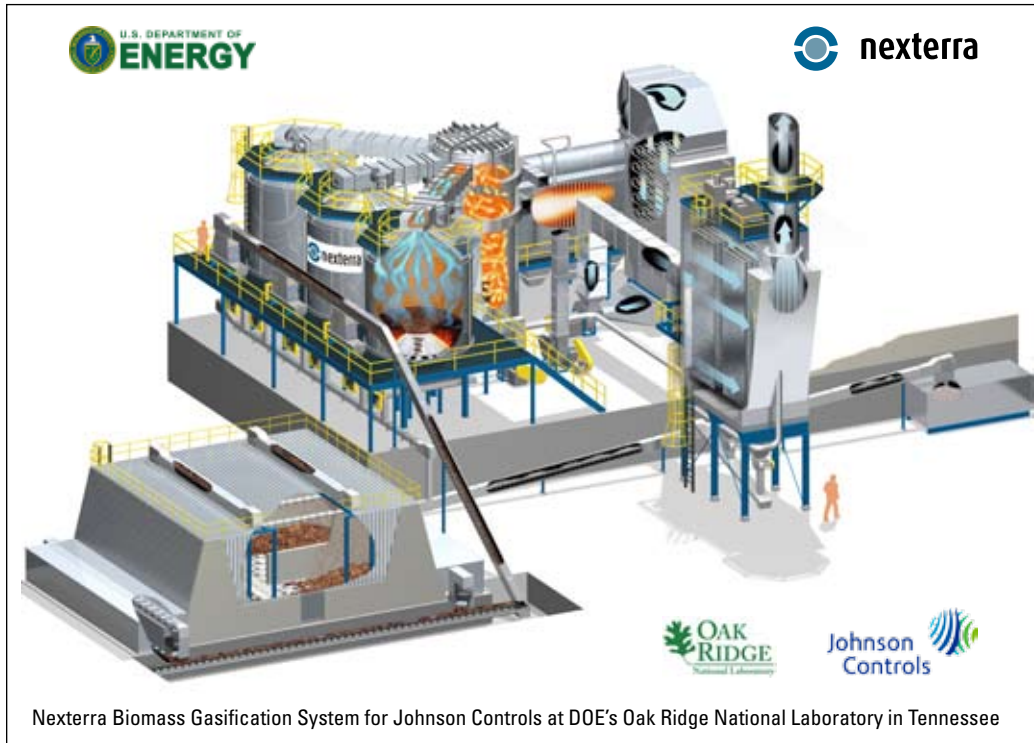
■ Expected System Performance

Natural Gas Displacement	75 MMBtu/yr
Annual Fossil Fuel Savings	\$3 - 4 million/yr
Reduced CO ₂ Emissions	23,000 tonnes/yr
Avoided CO ₂ Emissions (Car Equivalent)	4,000 cars/yr

■ Nexterra's energy-from-renewable-waste system officially opened by US DOE on July 19, 2012

"This project showcases the opportunity for public institutions to partner with the private sector to deploy innovative clean energy technologies that can make us more energy independent. We have a terrific partner in Johnson Controls and a proven gasification technology leader in Nexterra."

- Dr. Thom Mason, Director, Oak Ridge National Laboratory



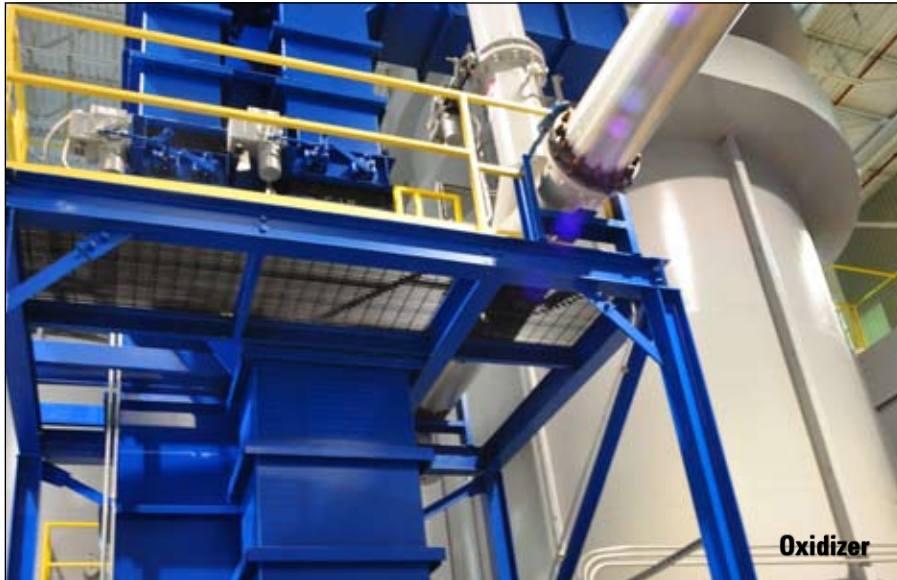
■ Process

- Fuel trucks unload wood into fuel unloading hopper. Wood is stored in a live bottom fuel storage bin.
- 3 gasifiers convert wood biomass to combustible syngas.
- Clean syngas is burned in the oxidizer.
- The hot flue gas is directed through a steam boiler.
- The steam is then distributed to all ORNL campus buildings.
- An SNCR is utilized to reduce NOx in flue gas.
- The ESP further cleans flue gas before releasing it out the stack.
- A condensing economizer maximizes system efficiency.

“Nexterra has consistently demonstrated that its technology is a new standard for converting biomass into energy that is clean, reliable, versatile and ideally suited to institutional and urban environments.”

- Don Albinger, Vice President of Renewable Solutions,
Johnson Controls





Oxidizer



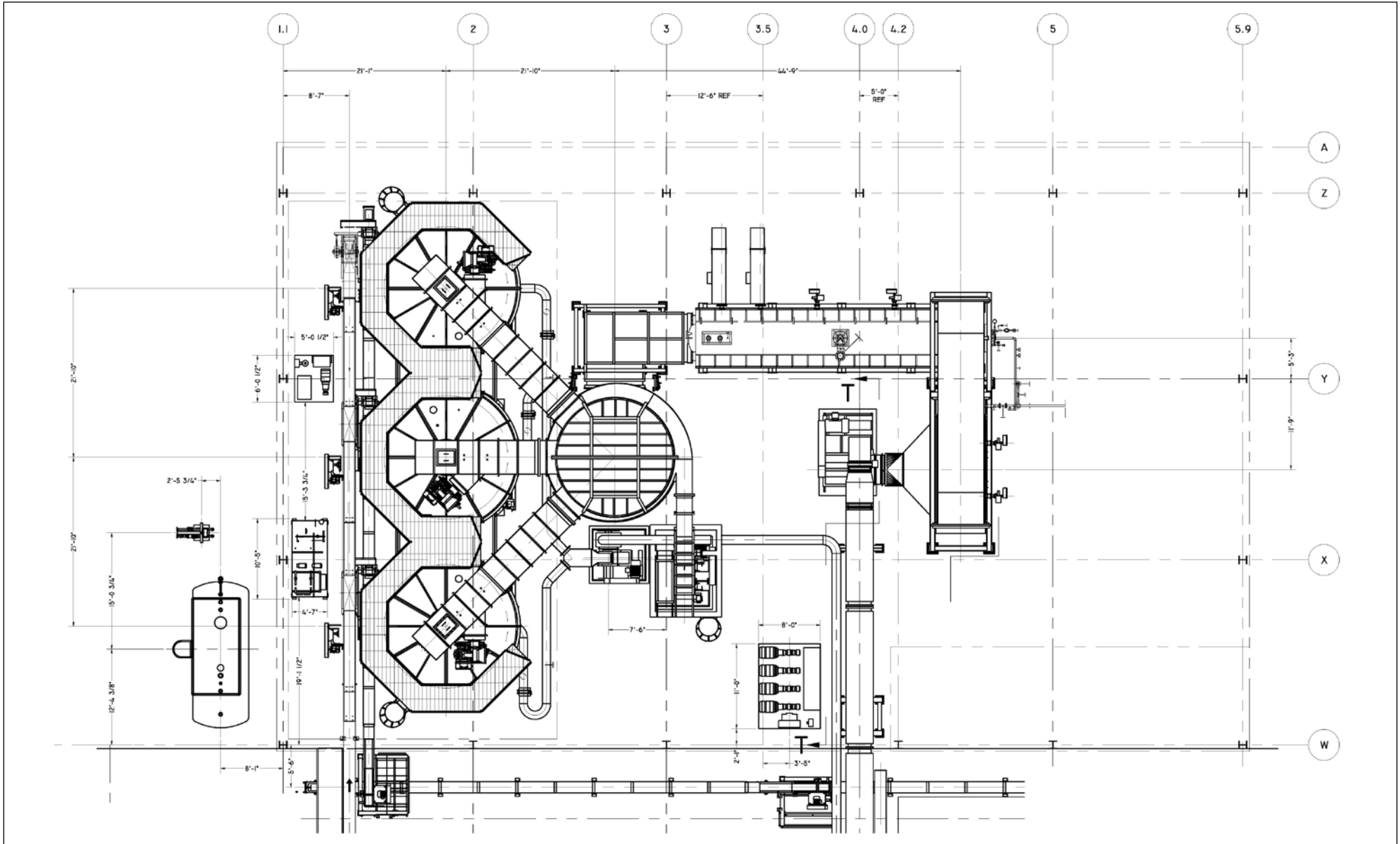
Boiler

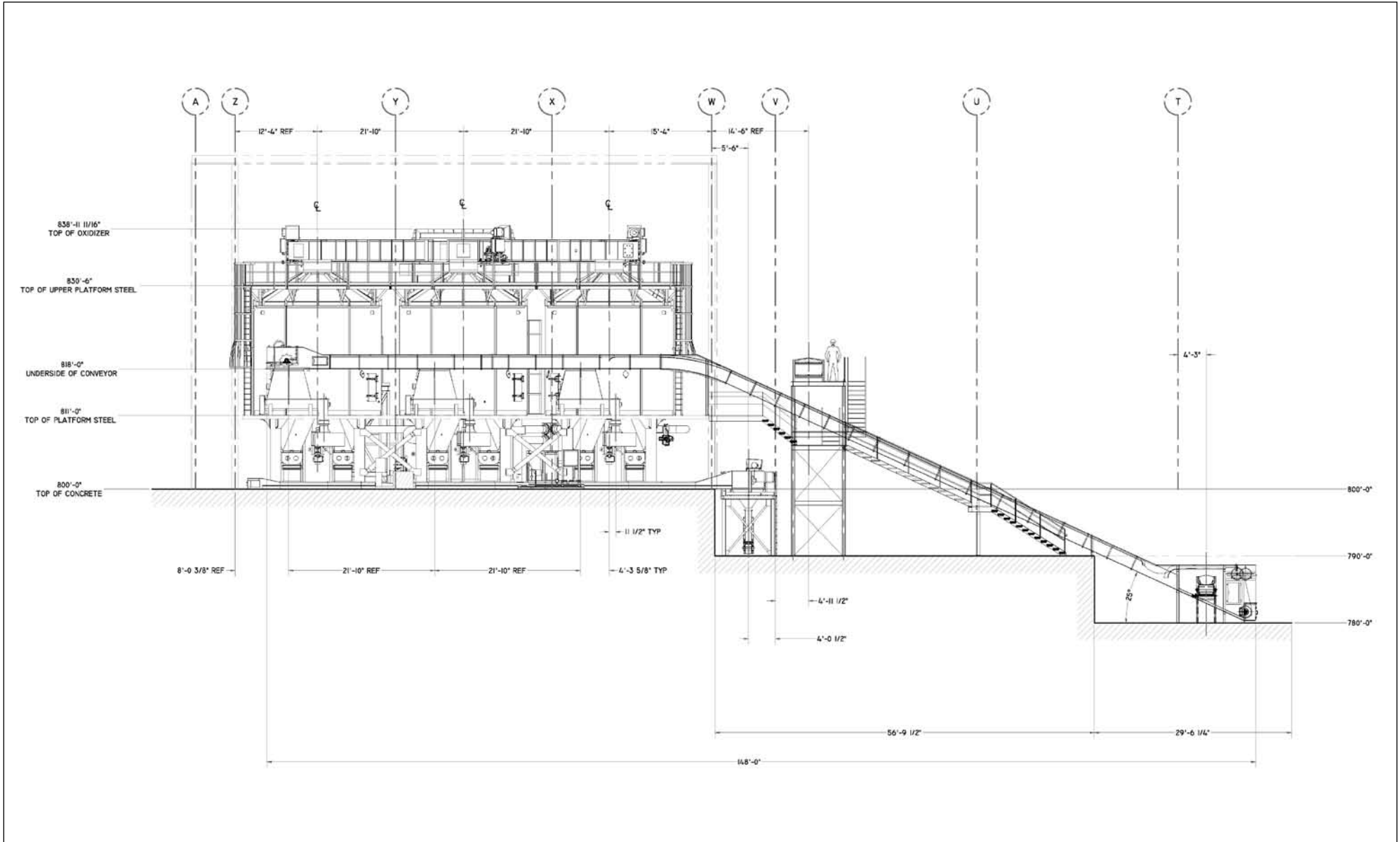


ESP



Building and ESP







About Department of Energy's Oak Ridge National Laboratory

Oak Ridge National Laboratory (ORNL) is the Department of Energy's (DOE) largest science and energy laboratory. Nexterra's biomass gasification system is the cornerstone of an \$94 million dollar contract for Johnson Controls received from the DOE's Transformational Energy Action Management (TEAM) Initiative to undertake a range of energy conservation measures at ORNL. TEAM aims to reduce energy waste and greenhouse gases at DOE facilities nationwide by 30 per cent by 2020.

Nexterra's system will provide 60,000 lbs/hr of steam and will replace ORNL's existing natural gas steam plant, allowing ORNL to shut down four fossil fuel boilers. Nexterra is supplying the complete energy-from-renewable-waste system from fuel handling and storage through to the exhaust stack.

Plant construction began in the fall of 2009 with concrete foundations being formed for the fuel receiving area. Nexterra began installing its gasification equipment in 2010. The plant began operation in October 2011. Emissions performance testing in January 2012 confirmed ultra-low air emissions. Commissioning continued until June, followed by full DOE approval of the project, which was officially opened July 19, 2012.

For more information:
www.ornl.gov



About Nexterra Systems Corp. Vancouver, British Columbia

Nexterra is a leading developer and supplier of energy-from-renewable-waste systems that enable customers to self-generate heat and/or power inside-the-fence at institutional and industrial facilities using low cost biomass fuels. Nexterra's strategic relationships include GE Energy, Johnson Controls, UBC and Fortis BC.

Projects include:

- U.S. Department of Energy (DOE), Oak Ridge National Laboratory, Oak Ridge, TN
- University of British Columbia, Vancouver, BC
- U.S. Department of Veterans Affairs (DVA), Medical Center, Battle Creek, MI
- University of Northern British Columbia, Prince George, BC
- Dockside Green Development, Victoria, BC
- Kruger Products Limited, New Westminster, BC
- Tolko Industries Ltd., Heffley Creek Division, Kamloops, BC
- Nexterra Product Development Centre (PDC), Kamloops, BC

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