

**VA**



U.S. Department  
of Veterans Affairs



**hga.**  
Architecture | Engineering | Planning



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**US DEPARTMENT OF VETERANS AFFAIRS  
MEDICAL CENTER – BATTLE CREEK, MICHIGAN**



Nexterra's VP Projects, Goran Sparica, tests the state-of-the-art graphical user interface (GUI) control system at VAMC.



Nexterra's renewable energy from waste gasification system (seen here under construction) will provide heat and power to the US Department of Veterans Affairs Medical Center in Battle Creek, Michigan.

**Project Description**

- Customer: US Department of Veterans Affairs
- Location: Battle Creek, Michigan
- Facility Type: Medical Center for US Veterans
- Application: Combined Heat and Power (CHP) using a steam turbine and generator
- Nexterra Scope of Work: Supply of biomass gasification and steam generation systems from fuel handling to stack (excluding turbine)
- General Contractor: DeMaria Building Company
- Architect/Engineer: HGA

**System Highlights**

- Start-up: Q3 2013
- Capacity 24,000 lbs/hr superheated steam
- Fuel: Locally sourced waste wood
- Fuel Moisture Content: 15% to 50%
- Urban project targeting natural gas level emissions (CO, VOC and PM)

**Expected System Performance**

Electricity Production	2 MWe
Annual Gas Displacement	117,000 MMBtu
Avoided CO <sub>2</sub> Emissions	14,000 tonnes/yr
Avoided CO <sub>2</sub> Emissions (Car Equivalent)	3,500 cars/yr
Wood Fuel Required	19,000 bone dry tons/yr

**US Department of Veterans Affairs Medical Center, Battle Creek MI**

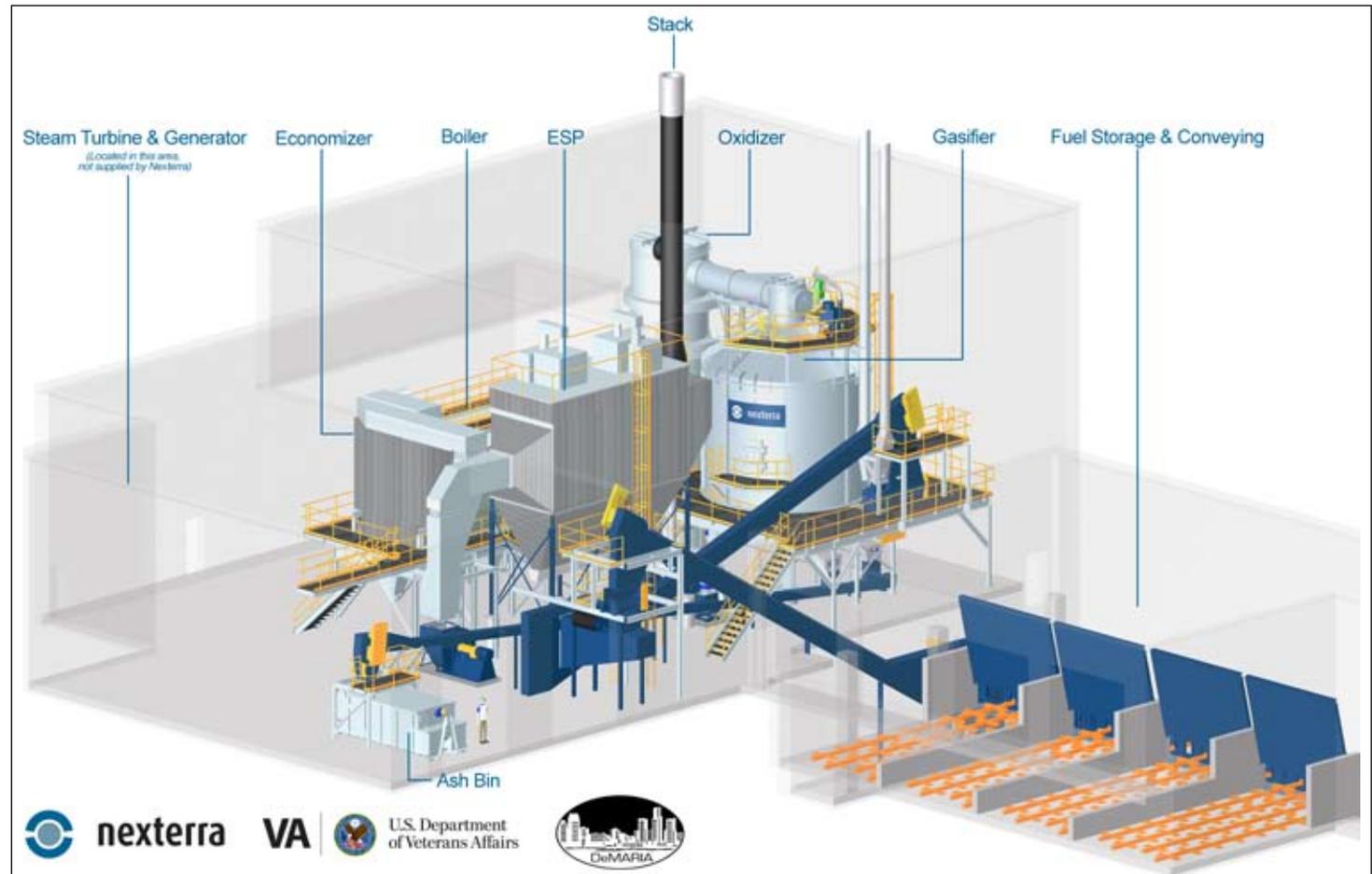
Switching from fossil fuels to carbon neutral biomass will allow the VAMC to cut its GHG emissions by approximately 14,000 tons per year, reducing its carbon footprint by approximately 80 percent. This would be the equivalent of removing 3,500 cars from the road annually. The move also enables the facility to meet the requirements of the Obama Administration's Executive Order 13514, which declared the U.S. Federal government's commitment to reducing its GHGs by 28 percent by 2020.

■ **Process**

- Fuel delivered to fuel storage and conveying system.
- Gasifier converts woody biomass to combustible syngas.
- Clean syngas is combusted in the oxidizer.
- The hot flue gas is directed through a steam boiler to produce high pressure steam.
- Steam is then distributed to a steam turbine to produce electricity.
- Medical Center heating loads are met as a priority and excess energy is used to generate electricity.
- The electrostatic precipitator (ESP) cleans flue gas before exhausting it out the stack.

■ **Benefits**

- Reduced dependence on fossil fuel
- Alternative fuel source capability
- Independence from natural gas grid
- Significant greenhouse gas reduction
- Ultra low air emissions
- Supports local business by using locally sourced wood waste



3D Illustration of the Nexterra Biomass Gasification Combined Heat and Power (CHP) System at the US Department of Veterans Affairs Medical Center in Battle Creek, Michigan.

“Nexterra’s planning and coordination through the design process on this VA biomass project has been exceptional. Although we have not yet tested the system, I’m certain that with Nexterra’s oversight and quality control during the installation process, this system will meet and possibly exceed the VA’s expectations. Nexterra has been very professional during the entire process.”

- Mark Brimmeier, Vice President, Healthcare & University Groups, DeMaria Building Company



Foundations



Fuel Storage and Handling



Gasifier Fabrication



Gasifier Factory Pre-Assembly



Gasifier Installation



Gasifier Installation



Electrostatic Precipitator (ESP)



Oxidizer Construction



Oxidizer Installation



Gasifier Installed



Fuel Conveyor



Boiler Installation



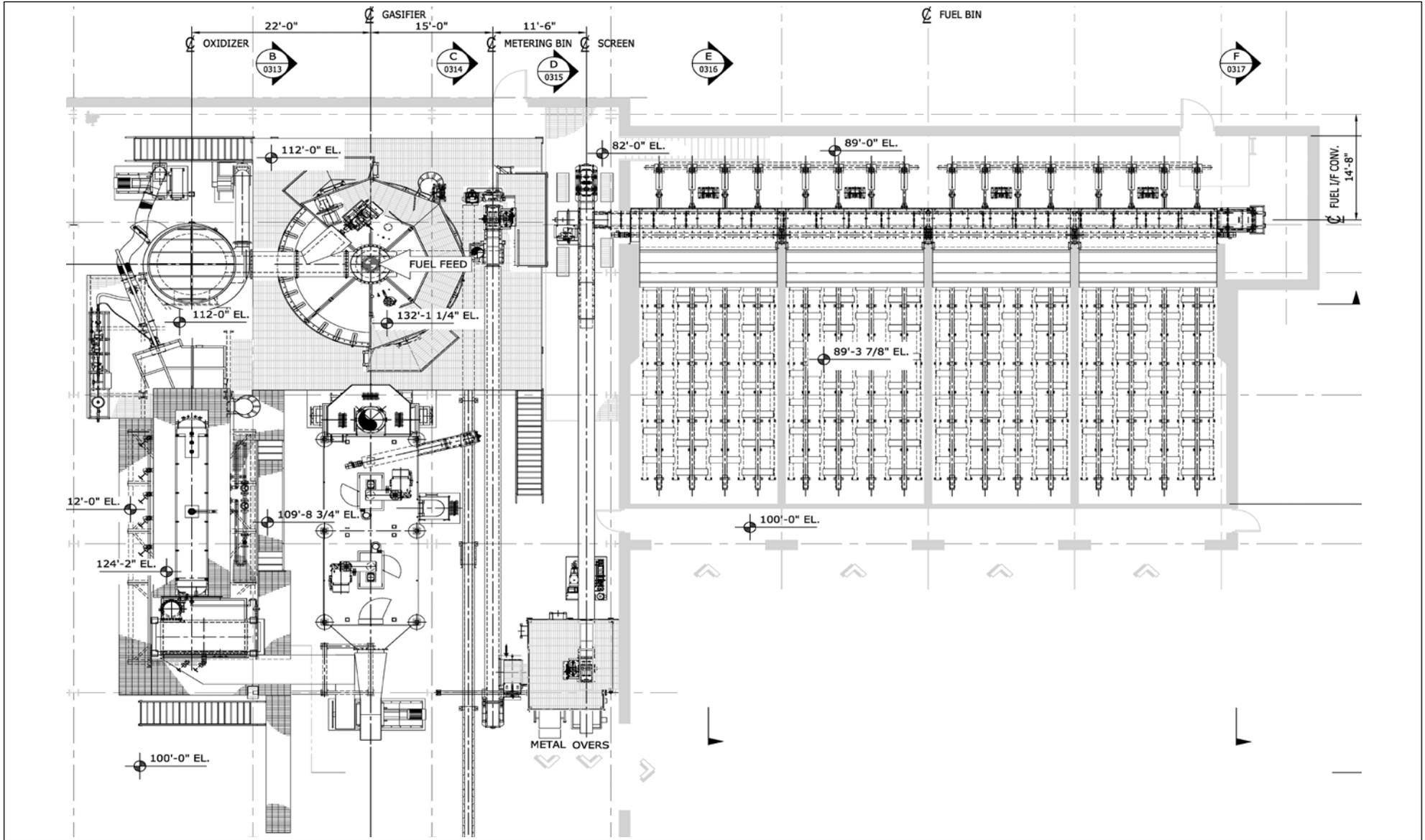
Boiler Installation

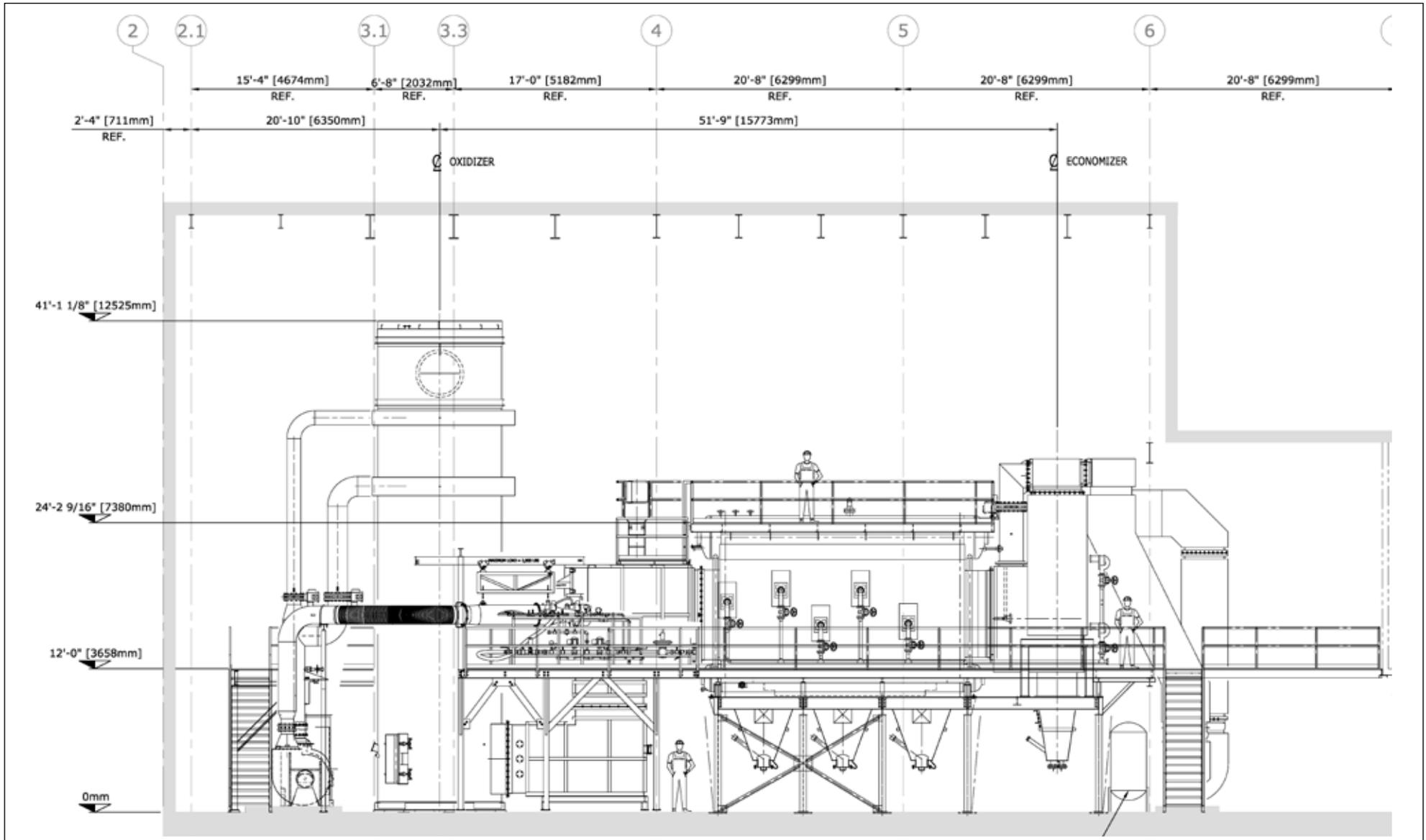


Building Under Construction



Building Nearing Completion







U.S. Department  
of Veterans Affairs



## About US Department of Veterans Affairs Medical Center – Battle Creek, Michigan

Since 1924, the US Department of Veterans Affairs Medical Center in Battle Creek, Michigan has been improving the health of the men and women who have proudly served in all branches of the US Armed Forces.

A wide variety of inpatient and outpatient health care services are available to more than 217,000 veterans living in a 20-county area of western Michigan. The VA Medical Center consists of 104 medical and psychiatric beds, 32 residential rehabilitation beds, and 103 nursing home care unit beds.

Switching from fossil fuel to biomass supports the Department of Veterans Affairs' objectives of achieving a 30 percent reduction in greenhouse gas emissions (GHG) by 2020 and producing a minimum of 7.5 percent of electricity from renewable sources.

The carbon neutral biomass system will allow the VAMC to cut its GHG emissions by approximately 14,000 tonnes per year, reducing its carbon footprint by approximately 80 percent. This would be the equivalent of removing 3,500 cars from the road annually. Switching from fossil fuels to biomass also enables the facility to meet the requirements of the Obama Administration's Executive Order 13514, which declared the U.S. Federal government's commitment to reducing its GHGs by 28 percent by 2020.

**For more information:**  
[www.battlecreek.va.gov/about/](http://www.battlecreek.va.gov/about/)



## DeMaria Building Company

DeMaria was founded in 1969 by Joseph A. DeMaria, Sr. and Richard DeMaria. Beginning as a general contracting company in Detroit with less than 10 employees, DeMaria is now a leading construction management corporation employing over 125 professionals, building projects all over the United States. DeMaria's steady growth over the years has enabled the construction of sophisticated buildings in the health care, university, commercial, industrial and government markets. DeMaria prides itself on being voted one of the "101 Best and Brightest Companies to Work For" for the past ten years in a row.

**For more information:**  
[www.demariabuild.com](http://www.demariabuild.com)

## About Nexterra Systems Corp. Vancouver, British Columbia

Nexterra is a leading provider of plant-scale, energy-from-renewable-waste gasification systems that generate energy and fuels for a range of customers, including district energy providers, industrial process plant operators and independent power producers. Nexterra systems integrate seamlessly with customer operations, providing both environmental and operational advantages, including high reliability and class-leading emissions performance.

### Projects include:

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

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