

Woolgar Avenue Biomass District Heating



312 Woolgar Ave.
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J&R MECHANICAL
Plumbing and Heating Contractors



- Incorporated in 1977
- 25-30 Employees
- Biomass Wood Pellet Boilers Since 2008
- Operating and maintaining heating systems – selling heat to client
- Supply Wood Pellets Bulk and Bagged (Enterprise Pellets)
- Enterprise Pellets owned and Operated by J&R Mechanical Ltd.



LOCATION / DISTRIBUTION

- 312 Woolgar Avenue
- Distribution to 312, 310, 308, 304 Woolgar Avenue, 415 Byrne Road
- 100mm dia Sch. 40 insulated supply and return lines
- Approx. 185m from Energy Centre to GNWT Warehouse
- Designed to meet 100% of GNWT Central Warehouse heating requirements while offsetting 200 tones of GHG emissions



HEATING PLANT

- 3.5m Wide x 3.6m High x 10m Long modular boiler house
- PYRTEC 390 kw boiler
- 4000L Buffer Tank
- 14" dia. Steel chimney c/w Atmospheric Line
- 15' dia. Silo



Controls Display in Building



Underground distribution lines



PYRTEC Boiler



Buffer Tank





PELLET SUPPLY

- 60 tons capacity with option to convert to wood chips
- 1 month supply of pellets
- Approximately 2 tons per day during peak heating season

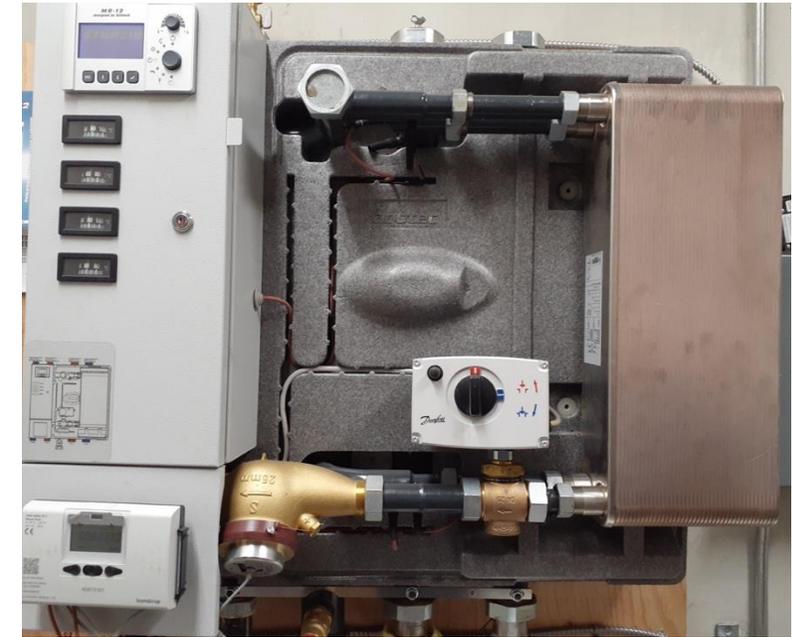


12,000kg and 7,500kg capacity delivery truck



HEAT MONITORING

- Installed in clients building
- 60kW Heat Transfer Station
- Minimum space requirement
- Contain Necessary Components to Connect to the DHS
- Insulated pex supply/return lines from main distribution to the heat transfer station



Transfer Station with Control and Heat Exchanger



Distribution Lines Entering Building from Underground



STAGES OF DEVELOPMENT

Stage 1 - Feasibility

- Meet with GNWT to discuss opportunity to connect the Warehouse on Byrne Road to the DHS (Anchor Client)
- Opportunity to access GHG Grant Program
- Meet with City of Yellowknife to discuss development / requirements of the project
- Discuss with property owners an opportunity to connect to the DHS
- Discuss funding opportunities with property owners (AEA Rebates on Renewable Energy Products)
- Opportunity to develop land at 312 Woolgar Avenue
- Distribution lines to follow parallel with road backing on Lots
- J&R Mechanical has resources to develop and maintain the system
- Location allows opportunity for connections to future customers in the area
- Develop budget



STAGES OF DEVELOPMENT

Stage 2 – Design / Build

- Teamed up with local mechanical engineer to aid in design of the system, and provide documentation required by AHJ
- Develop easement access on owners properties for the distribution lines
- Road crossing agreement required to connect to GNWT Warehouse
- Mou's / Legal Survey / Building permits
- Finalize loads required by all customers and size the system to meet demands
- Refine budget
- Procurement of equipment and scheduling
- Design / develop structure of customer contracts
- Access funding opportunities
- Keep everyone involved informed and engaged with the project



310 Woolgar Avenue



308 Woolgar Avenue



312 Woolgar Avenue



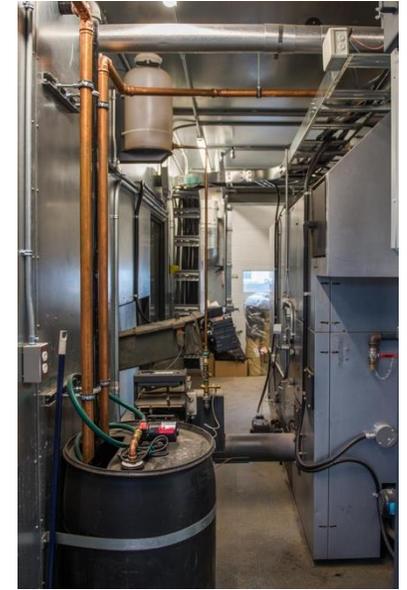
415 Byrne Road



STAGES OF DEVELOPMENT

Stage 3 – Operation and Maintenance

- Optimize to be lean, reliable, safe
- Manage wood pellet deliveries
- Manage the Energy Centre, monitoring of equipment
- Manage distribution network
- Customer billing and support



BENEFITS

- The System contributes to real and measureable reductions to particulate emissions in the community which, in turn, improves community health.
- The System improves air quality at the same time while reducing greenhouse gas emissions with consequent positive impacts on our local air.
- The System reduces reliability on fossil fuels.
- Air quality improvements realized by the System will reduce negative aesthetics associated with particulates in the air shed and thus contributes to civic pride.
- With combustion only occurring in a single point within a group of several buildings, the occupants in each building are given a safe environment in which to live or work, with minimum maintenance and servicing.

DRAWBACKS

- A lot of work during planning including permitting, MOU's with owners, applications, variances.



Savings

Year (March-Feb)	Pellet Consumption (Tonnes)	Offset (Litres of Fuel Equivalent)	CO2 offset (Tonnes)	YK Fuel Price (\$/L)	YK Pellet Price (\$/T)	Annual Savings
2021/22	223	113,278	297	\$ 1.20	284	\$ 72,720
2022/23	176	89,395	234	\$ 1.80	284	\$ 111,025
2023/24	121	61,744	162	\$ 1.80	325	\$ 71,710
2024/2025	172	87,611	230	\$ 1.61	375	\$ 76,498
2025-present	74	37,634	99	\$ 1.49	325	\$ 32,041

- The System has delivered over 3,565 MWH of renewable heat to customers and
- offset over **1,000 Tonnes** of GHG and saved over **\$400,000** since installation.

*noted shown savings are based on market pellet costs – and are increased for J&R based on reduced bulk internal costs for Pellets





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Thank you!

