



Mile 108 Elementary School Mechanical System Upgrade - Geothermal

1. Introduction
 1. SD 27
 2. Mile 108 Elementary
 3. Falcon Engineering
2. Technical Discussion
 1. Brief History of the Geothermal upgrade
 2. Current Mechanical System Upgrade
3. General Positives and Challenges





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School District 27

- Located on the Cariboo Plateau
- Temperatures average -12 in the winter & + 18 in the summer
- Elevation ranges between 900-1500 meters
- One of the larger geographic districts in the Province
- 4600 students
- 22 schools

Mile 108 Elementary

- Original building date: 1975 - Additions were constructed in 1981 and 1995.
- Student Capacity – 240
- 2895 sqm
- 11 Classrooms – 1 Gymnasium (529 sqm)
- The building is for the most part single storey and is considered non-combustible construction.



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General Timeline

- Original Geothermal Plant constructed in 2010
- Partnered with Falcon Engineering in 2019
- Completed Mechanical Systems Assessment Report
- Went to Tender in Spring of 2022
- Began Construction in Summer of 2022



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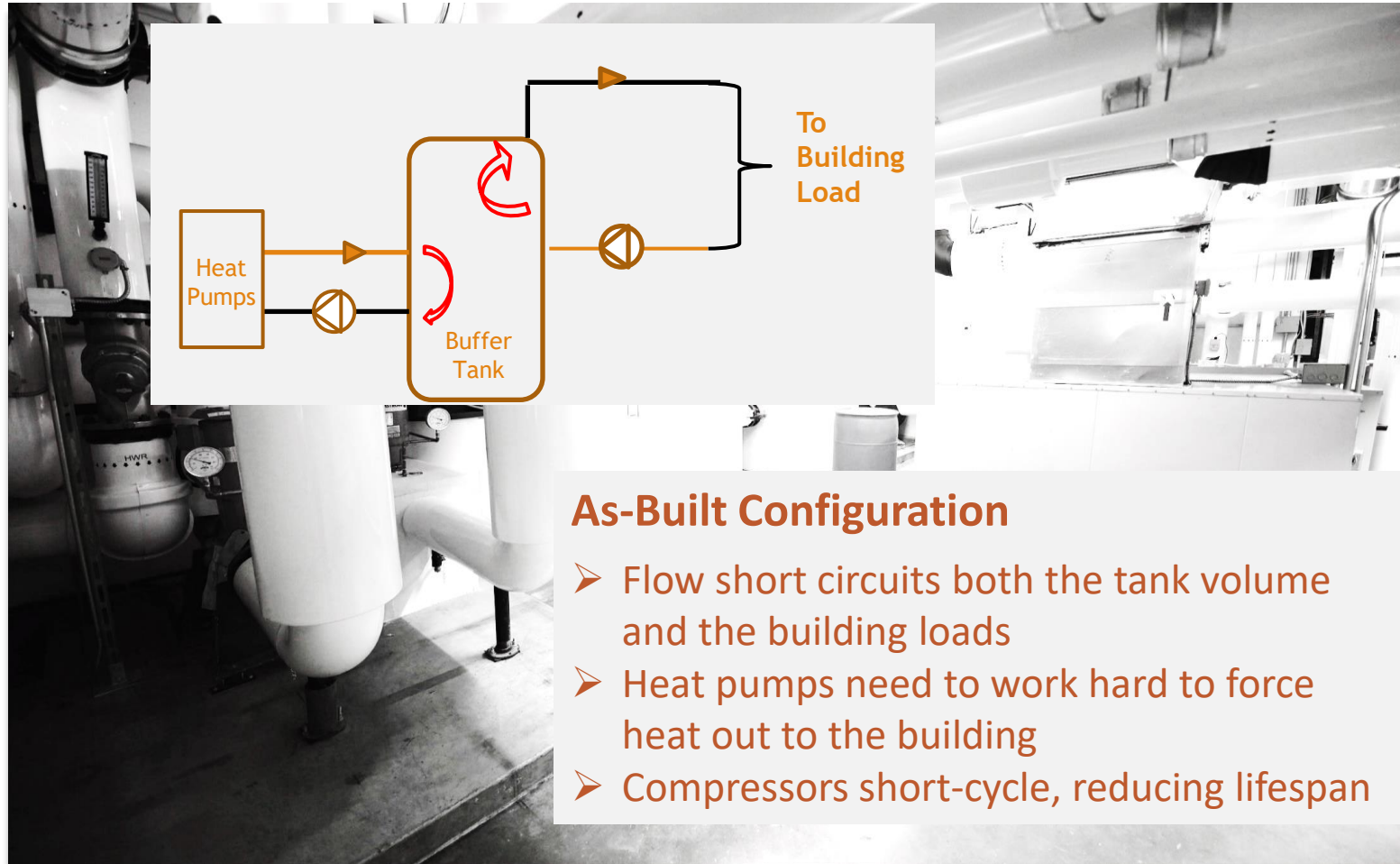
ENERGY TARGETS

108 Mile Elementary										
2,894 sq m										15-Apr-19
Consumption for Existing Configuration Based on 2017/2018 Data										
		GJ	kWhr	Tonne CO2	GJ/ sq.m.	kWhr/ sq.m	\$	\$/ GJ	\$/ kWhr	\$/ sq.m
Natural Gas		340	94,452	16.9	0.12	33	\$3,400	\$10.00	\$0.036	\$1.17
Electricity		966	268,320	5.9	0.33	93	\$32,198	\$33.34	\$0.120	\$11.13
TOTAL		1,306	362,772	22.8	0.45	125	\$35,598	\$27.26	\$0.098	\$12.30
Anticipated Consumption after Piping Reconfiguration										
		GJ	kWhr	Tonne CO2	GJ/ sq.m.	kWhr/ sq.m	\$	\$/ GJ	\$/ kWhr	\$/ sq.m
Natural Gas		34	9,445	1.7	0.01	3	\$340	\$10.00	\$0.036	\$0.12
Electricity		773	214,656	4.8	0.27	74	\$25,759	\$33.34	\$0.120	\$8.90
TOTAL		807	224,101	6.4	0.28	77	\$26,099	\$32.35	\$0.116	\$9.02
Savings										
		GJ	kWhr	Tonne CO2	GJ/ sq.m.	kWhr/ sq.m	\$	\$/ GJ	\$/ kWhr	\$/ sq.m
Natural Gas	90%	306	85,007	15.2	0.11	29	\$3,060	\$10.00	\$0.036	\$1.06
Electricity	20%	193	53,664	1.2	0.07	19	\$6,440	\$33.34	\$0.120	\$2.23
TOTAL	38%	499	138,671	16.4	0.17	48	\$9,500	\$19.03	\$0.069	\$3.28



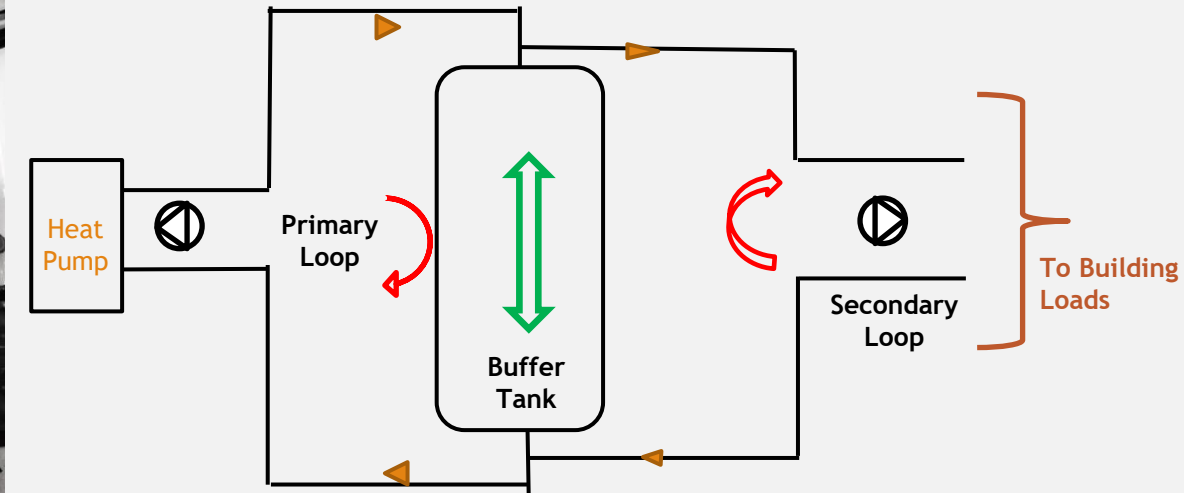
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**BUFFER TANKS -
CONFIGURATION
MATTERS**



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BUFFER TANKS - CONFIGURATION MATTERS



Modified Configuration

- Only the difference in flow passes through the tank
- The tank buffers the difference between heat pump capacity and building load only
- Allows for some flow and temperature mismatch





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General Positives and Challenges

Challenges

- Supply Chain
 - Pumps
 - Buffer Tanks
- Tendering process
 - Revealed reality of the market

Positives

- Governance mechanisms
 - Discussion with the Ministry
 - Discussion internally
 - Discussions with vendors/contractors

Thank you for Listening

Q&A

