



CASE STUDY

Water loss in an apartment building in Sarnia, which is a high-rise rental property.

A Heating Hot Water Boiler system provides heat to the building and heat to a dedicated Domestic Hot Water tank. The boilers failed on occasion and the hot water tank stopped working often too. A test of the hot water in the boilers and heating pipes found a large amount of sludge and other debris in the water. A corrosion prevention program was installed for this property. A side-stream water meter was installed on the Heating Hot Water Cold water make-up, auto-fill station, to determine if there were operational problems within the Boilers or pipes. A chemical treatment and filtration system was installed on the Auto-fill system for the Boilers to clean the water within the pipes. By-monthly water chemistry tests and 'water volume lost' records started to be recorded in October 2020.

Heating Water chemistry tests were conducted on Oct. 21, 2020. Test results showed that the necessary inhibitor level was extremely low and a large volume of inhibitor was required to bring the concentration up to an acceptable level. It is also noted that the newly installed filters were already very dirty. Excessive debris in the heating system indicates that significant corrosion of the pipes and/or boilers was present. It

was determined that the pipes should be cleaned and flushed; this was completed immediately.

The next system test was conducted on Dec.16, 2020. It was again noted that the chemical inhibitor was lost. The side-stream filter was again dirty and replaced. Notably the cold water auto-fill meter indicated that the system consumed a large amount of cold water since the end of October. (Water lost Meter reading 246.003 m3.)

The system was flushed and cleaned again on December 23, since the filter was clogged with dirt, again. The cold water lost since December 16, 2020 was recorded. The amount of lost water revealed that the heating system must have a very significant leak; heating hot water at temperatures of up to 180 DegF (82 DegC) was continuously being lost at recorded rate of 1,140 L/day (~50 Liters/Hr).

A Plumbing contractor was assigned to find this leak immediately. The leak was found in a heating pipe buried under a concrete floor; this pipe was supplying heating water to the main building entrance foyer hot water radiator and adjacent Lounge hot water radiator. The Heating Hot Water supply and return piping was completely shut off and the leak was stopped on December 24, 2020.

Conserve

Protect

SUMMARY:

Water losses of up to 50 liters per hour from the Heating system was stopped by disconnecting the broken pipe from the Heating system. In addition, the ongoing cost to heat the cold water up to 180 DegF from 50 DegF (10 DegC) and ongoing damage to the heating hot water pipes due to corrosion, have also been stopped.

1. The continual addition of raw water to the heating system contributes oxygen to the water in the heating system. The additional oxygen contributes to the corrosion and subsequent deterioration of ferrous metal system components. Much of the system is constructed of iron pipe, fittings and circulator pumps, the rusting these components would contribute to the dirt in the heating system and deterioration over time.
2. The calculated heat loss from the hot water amounts to ~12,000 BTU of energy per hour. The loss of heat was continuous throughout the year, as the heating system operates to heat up the domestic hot water in addition to space heating. The cost of lost energy is calculated to be approximately \$2,000.00 per year.

PROSHIELD is happy to have contributed to this resolution.