

HVAC ASSESSMENT

Salmond School

BOILER ROOM:

- ?? The boiler room is provided with a single H.B. Smith 44 mils cast iron sectional water tube boiler. The boiler generates low-pressure steam and distributes out to an overhead header which distributes to various heating zones throughout the building. The boiler is provided with a natural gas burner which appears to be less than 10 years old however the entire boiler appears to be well in excess of 50 years old. The boiler is covered with what appears to be asbestos insulation with a trowel finish however before an exact determination can be made samples of the material should be taken and tested. It was noted that there was surface contamination on and around the mud drums and nipples of the cast iron sections and it does appear that many of the nipples between the cast iron sections and the mud drums have been replaced recently probably due to leaking. This is an indication that the boiler may be reaching its maximum serviceable life. The boiler is provided with dual low water cut offs and all operating and safety controls and an emergency shut off switch is located at the entrance to the boiler room. The overall condition of the entire boiler considering its age is very good however, with the boiler being in excess of 50 years old this boiler has certainly reached its maximum serviceable life and consideration should be given to a generalized upgrade at this time. The breeching is of the galvanized steel single wall design and is not insulated. The breeching was not provided with a barometric damper nor was it provided with a clean out. The breeching was noted to be in good condition considering its 50 year age and it was noted that there were no water stains or gas stains on or around the breeching. The chimney is of the masonry type and appears to be of adequate height and size to maintain proper draft. It was noted that there were slight water leaks and slight structural crack on the face of the chimney and it is recommended that the masonry chimney be surveyed by a structural engineer. Also based on its age it does not appear that a chimney liner is installed, and this condition as it presently exists is non-code compliant. Based purely on age consideration should be given to an overall upgrade at this time.
- ?? Located at the rear of the boiler is a steel un-insulated condensate return system. The storage tank is provided with a single boiler feed pump at the base of the storage tank. It was noted that the tank and pump contains extensive surface contamination around the base as well as surface contamination on the feedwater pump. The overall condition of the entire system is very poor and should be replaced. The condensate return piping and feed water piping around this condensate receiver appears to be schedule 80 black steel and is un-insulated. It was noted that there was extensive surface contamination around this piping system as well. Based purely on age consideration should be given to an overall upgrade at this time.

- ?? Combustion air for the boiler room is through a single wall mounted louver. The louver is not provided with any motor operated damper and the galvanized sheet metal duct travels to within 12" above the floor from this wall-mounted louver. The present building code requires that two individual openings one high and one low located within the boiler room of equal size are required for complete combustion and therefore this installation is considered non-code compliant and should be upgraded.
- ?? Steam is generated within the boiler room at approximately 10 lbs of steam pressure and distributes to various zones throughout the building. The steam distribution piping is covered with what appears to be calcium silicate insulation with a canvas jacket however before an exact determination can be made samples should be tested for the presents of asbestos. From an outward position the steam piping and the valves do appear to be in good condition considering their age however, various sections should be removed and examined internally corrosion. All steam piping appears to be schedule 40 black steel and the condensate piping appears to be schedule 80 black steel. Condensate piping is generally of the gravity return design and is located in a combination of trenches and low at the floor line. All condensate piping was noted to be extremely contaminated on the surface and various sections should be removed and examined internally for corrosion. Considering the general age of all piping within the building it would appear that both the steam and condensate piping have reached their maximum serviceable life and should be replaced.
- ?? The automatic temperature controls appear to be limited to the use of electric line voltage thermostats which appear to start and stop the boiler on a demand for heat. There does not appear to be any operating automatic temperature controls located throughout the building. This condition should be upgraded.

LOWER LEVEL:

- ?? The south side of the lower level is made up of various occupied reading rooms. The south side area is served through a continuous length of fin tube radiation which is located along the exterior wall. This fin tube radiation feeds from room to room through a common steam distribution piping. At the completion of its run ties into a condensate pipe at the floor, which returns condensate back to the boiler room. It does not appear that this fin tube radiation is operating under any means of temperature control. It was noted that there was a very antiquated line voltage electric thermostat on an interior wall; however it does not appear to be controlling this fin tube radiation. The fin tube radiation was noted to be dirty and slightly damaged. With the lack of control the spaces could tend to over heat. There was no mechanical ventilation provided for these perimeter spaces; however all these spaces were provided with operable windows and natural ventilation does meet the code requirement. Considering the use of the spaces consideration should be given to providing a mechanical ventilation system and based purely on age and condition the fin tube radiation should be replaced.

- ?? The north side of the lower level is also provided with various reading rooms and these spaces were provided with individual ceiling mounted fan coil units. These fan coil units free blow into the individual spaces and it was noted that these fan coil units do operate and maintain reasonable space temperature control. It appears that these units are provided with a source of outside ventilation air as well as return air and overall conditions within the space were noted to be adequate. We could not determine if there were any temperature controls associated with this equipment, as nothing was apparent. The units were noted to be slightly dirty however they were not damaged and do appear to operate in a satisfactory manor. Considering the use of the space these fan coil units are providing satisfactory results; however, consideration should be given to providing a central ventilation and heating system for all lower level areas.

KITCHEN:

- ?? Also located within the lower level is a small kitchen area for the use of the building occupants. The kitchen area was heated through various cast iron radiation located horizontally at the ceiling of the space. This cast iron radiation was noted to be extremely antiquated and slightly dirty and was noted provided with any means of automatic control. All heating control appears to be through the use of hand valves on the steam supply. Based on its antiquated nature consideration should be given to an upgrade at this time.
- ?? Also located within this kitchen area was a dishwasher and this unit was not vented. This condition should be upgraded.
- ?? The kitchen area is also provided with a single wall mounted axial exhaust fan located in an exterior wall. This exhaust fan is not associated with any ductwork and it was brought to our attention that the unit is very noisy when it does operate. This entire system is extremely antiquated and should generally be upgraded at this time.
- ?? Also located within this kitchen area is a central exhaust register which appears to communicate through a central ventilation shaft. It appears that these ventilation shafts throughout the building have been abandoned in place and therefore as it presently exists no mechanical or natural ventilation is presently occurring. This condition is non-code compliant and should be improved upon.

STAIRWAYS, VESTIBULES, AND CORRIDORS:

- ?? These areas were provided with cast iron radiators located throughout the individual spaces each of which are provided with a decorative wood and sheet metal cover. This cover allows for convective air flow to enter to face of the radiator, however no

discharge grill was provided at the top of the radiation closure to allow heat to release. This condition is extremely inefficient; but as we understand it, adequate heating is being maintained. It was noted that the radiators under these covers were extremely antiquated and dirty; however they do appear to operate. The cast iron radiators were provided with hand valves and thermostatic traps and the steam and condensate piping ties into the recirculating system located throughout the building. It does appear that all systems are original condition to the building and are generally old and in poor condition and generally in need of replacement at this time.

- ?? The main communicating corridor in the upper level and also lower level were not provided with any means of either exhaust or supply ventilation air. This condition is non-code compliant and should be improved upon.

UPPER LEVEL READING AREAS:

- ?? The upper level reading areas at one time appear to have been classroom spaces. These areas are provided with wall mounted classroom unit ventilators located on the exterior wall. The unit ventilators appear to be of the two position automatic control type and are provided with an outside air intake louver for ventilation air, filters, a supply fan which distributes the heated and ventilated air to each space all of which is controlled through a wall mounted electric line voltage thermostat. The thermostat was noted to be extremely antiquated and does not appear to operate. In each case the unit ventilators were noted to be slightly dirty however they were not damaged and do appear capable of maintaining reasonable space temperature and ventilation control. It does appear that these unit ventilators were installed approximately 20 years ago as noted by their overall appearance however no record of their actual installation was available. Generally all units should be cleaned and should be upgraded.
- ?? The spaces were also provided with window mounted air-conditioning units all of which were noted to be slightly dirty and slightly contaminated and as we understand it are very noisy when they do operate. Consideration should be given to providing a central air-conditioning system for all occupied areas.
- ?? The spaces were also provided with varying amounts of cast iron radiation located along interior walls. Much of this radiation was covered by a wooden and sheet metal decorative enclosure which is provided with an inlet grille at the face of the radiation. There was no discharge grille located on this decorative cover and this condition will prevent adequate and efficient flow of heat. The enclosures were noted to be slightly damaged and dirty and the cast iron radiation under the enclosures was also noted to be slightly dirty and extremely antiquated. This radiation is controlled by the use of hand valves and thermostatic traps which tie into the existing steam system. Based purely on age and overall condition consideration should be given to a replacement at this time.

- ?? Also located within each of these reading rooms was a wall opening located at the floor which is intended for the use of natural ventilation through convective air currents flowing through building shafts. It does appear that these ventilation openings have been abandoned in place and are no longer used. Considering this lack of exhaust ventilation it does not appear that the code required amounts of ventilation are presently being provided to these spaces. Consideration should be given to upgrading all exhaust systems at this time.

PUBLIC TOILET AREAS:

- ?? The public toilet areas were heated through individual cast iron radiation which is located under decorative grilles. These decorative enclosures were of the combination wood and sheet metal type and were provided with inlet and discharge grilles allowing efficient flow of heat from the radiation. It was noted that the discharge grilles were slightly damaged and slightly dirty and the radiation under the grilles was also slightly damaged and dirty as well as antiquated. Control of the heat from the radiation appears to be through hand valves and thermostat traps which ties directly into the steam and condensate system. With the lack of temperature control spaces do tend to overheat. Considering the extreme antiquated nature of all heating systems consideration should be given to an overall upgrade at this time.
- ?? Ventilation of the individual toilet areas is through a single wall mounted grille located in each toilet space. The exhaust grille appears to communicate to a roof mounted exhaust fan through a galvanized sheet metal exhaust system. The exhaust grille was noted to be extremely antiquated and dirty and at the time of our visit does not appear to be operating. There was no mechanical ventilation air to these toilet spaces however each space was provided with operable windows. Considering the extreme antiquated and limited nature of all ventilation of the toilet spaces consideration should be given to a complete upgrade at this time.