1.0 GENERAL

1.1 Related UBC Guidelines & Documents

.1 Section 20 00 05 Mechanical - General Requirements
.2 Section 22 00 00 Plumbing (and all subsections)
.3 Section 23 21 05 District Hot Water Heating System
.4 All other Tech Guidelines as may be applicable to a given project.

1.2 Related Documents External to UBC

.1 BC Plumbing Code and all references contained there within
.2 BC Building Code and all references contained there within
.3 Work Safe BC Occupational Health and Safety Regulation

1.3 Description

.1 The Guidelines apply to all work completed within buildings on both UBC Vancouver and UBC Okanagan campuses unless stated otherwise.

.2 In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify UBC Mechanical Engineer.

.3 These guidelines are intended to be read by designers and their content integrated into construction drawings and specifications. Construction documents are not to reference the technical guidelines directly.

.4 It is the requirement of the mechanical designer to coordinate these requirements with other disciplines.

2.0 MATERIAL AND DESIGN REQUIREMENTS

These are requirements specific to UBC that may not exist in code or other jurisdictions. Any deviation from these guidelines requires a variance be granted.

2.1 Design Requirements

.1 Sump Pumps
  .1 All sump pumps are to be selected as duty/standby. Design is not to be for parallel operation in normal operating conditions.
  .2 Controller is to rotate runtime between the two pumps.
  .3 Pumps are to be controlled by three floats. The configuration of the floats at UBC is specific because we want to ensure that we receive an alarm to BMS when one pump has failed. A four-float configuration will not send an alarm until both pumps have failed and the water level overcomes the highest float.
    .1 Stop pumps
    .2 Start lead pump
    .3 Start lag pump and sound alarm
    .4 If a four-float configuration is supplied by accident then adjust the top two floats so that the alarm float is slightly below the lag pump start float.

.2 Water heaters
  .1 This bullet and all sub-bullets apply to UBC-Vancouver only: All new and renewed buildings are to be connected to the district energy system. This system is to be the

primary source of heat for hot water systems. Refer to section 23 21 05 and 33 61 00 for more details including energy transfer station piping arrangement.

.1 If a project is not going to connect to DES, they must have a variance in place from UBC Energy and Water Services (Section 33 of the TGs)

.2 Water heaters with storage capacity of 120 L or less and heating capacities of 3.0 kW or less may be electric.

.2 Where central thermostatic mixing valves are used (common in designs of instantaneous DHW from DES), they shall be purpose built thermostatic mixing valves which comply to ASSE 1017.

.1 A BMS controlled 3-way mixing valve shall not be acceptable.

.2 The TMV shall NOT be digital and shall not require a BMS or electrical connection of any kind.

.3 It shall be of the bi-metallic strip or wax element type at the discretion of the designer.

.4 Provide temperature sensors in the domestic hot water return and domestic hot water supply line and connect to BMS for monitoring and generating alarms.

.3 UBC's Climate Action Plan (CAP) has set a target of 100% reduction in GHG emissions below 2007 levels by 2050. In support of this plan, natural gas shall not be used as the primary heating source in domestic water heating.

.1 This bullet applies to UBC-Vancouver only: Natural gas shall also not be used as the backup heating source in domestic water heating.

.4 Where on demand domestic hot water heaters are specified, make provisions for water expansion without relying on pressure relief valve for control of water pressure.

.3 Expansion tanks shall be installed on all domestic hot water systems.

.1 Specify expansion tanks with the "bladder monitor" feature where available. This is offered by several major manufacturers and provides a pressure gauge and a bladder leak indicator which changes colour from white to red when a leak occurs.

.2 *All expansion tanks shall have an isolation valve from the system. Between the isolation valve and the expansion tank there shall be a drain valve.*

.1 *This is necessary to accommodate maintenance of expansion tanks which requires to first isolate, then drain the expansion tank before proceeding with maintenance such as checking the bladder pre-charge.*

2.2 Construction and Material Requirements

.1 Housekeeping pads are to be installed under all equipment.

.2 This bullet and all sub-bullets apply to UBC-Vancouver only: All tanks containing hazardous materials must be registered with UBC Risk Management Services. This includes but is not limited to chemical feed tanks, acid neutralization tanks, oil water separators, grease traps, etc. https://srs.ubc.ca/environment/pollution-prevention/storage-tanks/

3.0 LESSONS LEARNED & COMMON MISSES ON UBC PROJECTS

Items in this section are not specific requirements of UBC but are code or industry best practices which have been missed on past jobs. These items should be considered in mechanical designs at UBC. However, if they're not applicable then a variance is not required.

.1 All sanitary sumps shall be vented and have sealed lids as per BC Plumbing Code 2.4.6.3.2.

*****END OF SECTION*****