1.1 **GENERAL**

1.2 **Related SFU Technical Requirements**

   .1 *Section 23 21 05 District Hot Water Heating System*

1.3 **Coordination Requirements**

   .1 Coordinate with SFU Facilities.
   .2 Coordinate with other design disciplines.

1.4 **Description**

   .1 This section amends the NMS specification for Tanks to suit SFU requirements.

2.1 **MATERIALS AND DESIGN REQUIREMENTS**

   .1 Tank Registration:

      .1 All pressurized storage tanks must be preapproved and registered in the SFU storage tank database in addition with the BC Safety Authority. This is under the responsibility of the project of which the tank is part of.

      .2 All tanks attached to heating, cooling, domestic hot water systems, pressure piping shall be ASME rated tanks.

      .3 An ASME label shall be affixed to the tank and remain visible after tank is insulated.

      .4 All ASME rated tanks shall be inspected the Ministry of Municipal Affairs, Recreation and Culture, Safety Engineering, and Service’s Division.

      .5 Above and underground fuel oil storage tanks shall meet the latest standards of the Canadian Council of Ministers of the Environment “Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products” and the latest provincial and federal regulations governing the installation of above and underground fuel storage tanks, including the Environment Canada - Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/SOR/2008-197)

      .6 Underground Fuel oil tank installations including piping shall be double wall with electronic monitoring systems designed to report on the integrity of the installation.

      .7 Floor mounted tanks shall be on housekeeping pads or otherwise be raised off the floor.

      .8 Tanks shall be seismically braced.

      .9 Underground storage tanks shall be constructed of approved non-corrosive materials.

      .10 Adequate hold down measures shall be taken to prevent groundwater uplift of the tanks when empty.

      .11 All above and underground storage tanks containing flammable and combustible liquids and their piping systems shall meet the latest BC Fire Code (Sections 4.3 and 4.4) requirement
.12 All hazardous waste storage tanks shall meet the latest BC Hazardous Waste Regulations 3.4.2.16

.13 Some of the following Genset Fuel Tank Specifications are covered by one or more applicable codes, but this checklist should assist everyone to ensure best design practice reflecting SFU’s expectations will be carried out:

- Double wall vacuum tanks are preferred, (safer, more reliable, no open containment).
- Use only black pipe, unless the project has an engineered underground installation.
- A labelled hand shut-off is required on the exterior of the building, between the main tank and the day tank.
- A labeled hand shut-off is also required at the day tank, between the day tank and the engine.
- Provide for changing the height of the day tank fuel return down pipe, (a removable or non-welded pipe is acceptable), or provide 2 return pipes, one above and one below the fuel level, as different engine systems have different requirements.
- Install baffles internally which will reduce entrained air and promote delivery of cool fuel to the genset.
- Ensure design accommodates an easy tank drain access.
- Provide a manual fuel port.
- Provide for two access points to permit easy fuel polishing.
- The fuel level gauge must be sealed.
- The mounting must be seismically designed and braced.
- The internal and external finishes must be coordinated to minimize rust corrosion through electrolytic action for long tank life.
- Install a filter/water trap between the main and the day tank upstream of (to protect) the transfer pump.

Regarding Fuel Control:

- Use low voltage fuel sensors.
- Specify and install generic non-proprietary components.
- Equipment must allow in-house staff to diagnose, repair and re-program the controllers.
- Spare parts must be maintained on campus.
- Consider redundancy and the use of duplex systems in some applications.
- Install a terminal board to allow the connection of a monitor system of SFU’s choice (BMS, Fire Alarm, genset). Further discussions should take place regarding genset, fuel and transfer switch monitoring.

.14 The requirements for acid neutralization and hazardous waste disposal should be reviewed on a case-by-case basis with SFU Facilities and Safety & Risk Services – Environmental Health & Research Safety. Separate procedures are required for handling low pH and other hazardous waste materials other than disposing down drains.

***END OF SECTION***