1.1 **GENERAL**

1.2 **Related SFU Technical Requirements**

   .1 *Section 22 10 00 Plumbing Piping*
   .2 *Section 22 40 00 Plumbing Fixtures*
   .3 *Section 20 00 05 Mechanical - General Requirements*

1.3 **Coordination Requirements**

   .1 Coordinate with SFU Facilities.

1.4 **Description**

   .1 These Design Guidelines apply to all Division 22 sections and all mechanical sections of Division 33 including plumbing, fire protection, steam etc.

   .2 Specific requirements of applicable sections are considered in addition to requirements herein. Where conflicts exist, the specific requirement in other section shall govern.

2.1 **MATERIAL AND DESIGN REQUIREMENTS**

2.2 **Submission of Design Philosophy**

   .1 The Mechanical Consultant shall submit to SFU Facilities a design philosophy for the proposed building mechanical and plumbing systems.

   .2 Submit to SFU Facilities a design philosophy for the proposed building plumbing systems. Major components of the philosophy must be accepted in principle by SFU Facilities before the project can proceed to Construction. Consultants are expected to produce designs that meet user needs and allow SFU Facilities to continue to meet those needs in the future in a safe efficient manner.

2.3 **Performance Standards**

   .1 All plumbing installations shall comply with the following:

      .1 BC Plumbing Code.
      .2 SFU Owners’ Technical Requirements.

2.4 **Site Services – Special Requirements for Plumbing**

   .1 Avoid the use of storm pumps and sanitary sewer system pumps if possible.

   .2 Where standby/emergency power is available, storm and sanitary pumps shall be tied into it. Sump levels shall be monitored by Building Management System (BMS).

   .3 Backflow prevention is required on all primary water supplies into the buildings. Refer to SFU Owners’ Technical Requirements, *Section 22 11 18 Backflow/Cross Connection Control* for details.

   .4 Frost proof hose bibs shall be installed at reasonable intervals around building perimeter. At least one on each major building face.
2.5 Building Plumbing - General Requirements

.1 SFU operates under our own Water Operating Permit under the authority of Fraser Health Authority and the Provincial Government. As such, SFU is subject to all the Laws and Regulations specified under the most up to date BC Drinking Water Protection Act.

.2 No alteration or work is to be done on any of SFU's Water Systems without the knowledge and approval of the Mechanical Superintendent. Work is to be carried out by qualified personnel including all permits, water treatment and testing as required.

.3 All domestic hot water systems will have recirculation lines unless otherwise specified by SFU Facilities Mechanical Department.

.4 Potable water plumbing system installations must have adequate flushing of lines to provide assurance that no contaminations are present. This is applicable to renovations and repairs as well.

.5 All drainage piping has a typical slope of 2% (1/4 in 12).

.6 Do not use floor drains in private washrooms, specify only in public washrooms and where automatic flushing devices are used.

.7 All sanitary sumps within buildings must have gas tight covers and be vented to outdoors.

.8 Floor drains connected to sump pumps must have backflow valves.

.9 For underground parkade drainage refer to Section 33 49 00 Storm Water Distribution Structures sentence 2.5.13.

.10 Review acid waste treatment with SFU Facilities and SFU's Safety and Risk Services

.11 Plumbing equipment requiring frequent maintenance (once a year) shall be readily accessible.

.12 Specify, where required by WorkSafe BC tempered, piped in Eye Wash stations required.

.13 All isolation valves shall be operational, and contain fluid without leaks at 1.5 times the working pressure with one side of piping disconnected from the valve.

2.6 Tests

.1 Specify tests to be conducted in presence of SFU Facilities.

.2 Piping Tests
   .1 Maintain test pressure without loss for 48hr unless otherwise specified.
   .2 Test drainage, waste and vent piping to B.C. Building Code.
   .3 Specify piping inspections and testing for gas, fuel systems, medical gases, compressed air systems based on applicable codes and local Authorities Having Jurisdiction such as BC Safety Authority.

2.7 Mechanical Seals

.1 Specify Mechanical seals on all pump applications.

.2 Insure seals are compatible with intended service.
2.8 Dielectric Couplings

.1 Specify dielectric couplings where pipes of dissimilar metals are joined.
.2 Shall be compatible with and to suit pressure rating of piping system.
.3 For pipes NPS 2" 50 mm and under specify isolating unions.
.4 For Pipes NPS 2-1/2" 65 mm and over specify isolating flanges.

2.9 Drain Valves

.1 Specify at low points and at section isolating valves.
.2 Minimum NPS 3/4" 18 mm unless otherwise specified.
   .1 Shall be bronze, with hose end male thread and complete with cap and chain.
   .2 Shall be ball valves.

2.8 Sleeves

.1 Specify pipe sleeves at points where pipes pass through masonry, concrete or fire rated assemblies and at Mechanical Room floor penetrations to stories below.
.2 Where pipes penetrate through floor slabs they must be sleeved with a pipe that protrudes a minimum of 2" (50 mm) proud of the floor level to prevent flooding penetrating the floor below.
.3 Sleeves shall be Schedule 40 steel pipes.
.4 Sleeves shall have an annular fin continuously welded at midpoint, embedded in concrete or sealed to floor finish.
   .1 Provide sleeves through foundation walls.
.5 Size minimum 1/4" (6 mm) clearance all around, between sleeve and un-insulated pipe or between sleeve and insulation.
.6 Terminate sleeves flush with surface of concrete and masonry walls.
.7 Specify fill for voids around pipes.
   .1 Caulk between sleeve and pipe in foundation walls and below grade floors with waterproof fire retardant non-hardening mastic.
   .2 Ensure there is no contact between copper tube or pipe and ferrous sleeve.
   .3 Fill future-use sleeves with lime plaster light weight concrete or other easily removable filler.
   .4 Coat exposed exterior surfaces of ferrous sleeves with heavy application of zinc rich paint to latest edition of CGSB 1-GP-181M.

2.9 Preparation for Fire Stopping

.1 Un-insulated unheated pipes not subject to movement shall have no special preparation.
.2 Un-insulated heated pipes subject to movement: wrap with non-combustible smooth material to permit pipe to move without damaging fire stopping material.
.3 Insulated pipes and ducts shall ensure integrity of insulation and vapor barrier at fire separation.
2.10 Escutcheons

.1 Specify escutcheons on pipes passing through walls, partitions, floors and ceilings in finished areas.
.2 Chrome or nickel plated brass or Type 302 stainless steel, one piece type with set screws.
.3 Outside diameter to cover opening or sleeve.
.4 Inside diameter to fit around finished pipe.

2.11 Painting

.1 Refer to Section 09 90 00 Painting and Coating.
.2 Specify at least one coat of corrosion resistant primer paint to ferrous supports and site fabricated work.

***END OF SECTION***