22 01 01 GENERAL REQUIREMENTS

General

1. All plumbing shall comply with the B.C. Plumbing Code.
2. Avoid the use of storm pumps and sanitary sewer system pumps. Refer to 22 13 29 for details.
3. All necessary storm and sanitary pumps shall be tied into emergency power, and sump levels shall be monitored electronically through the B.A.S.
4. All sanitary sumps within buildings must have gas tight covers and be vented to outdoors.
5. Floor drains connected to sumps must have backwater valves.
6. Specify floor drains only in public washrooms and where automatic flushing devices are used. Do not use floor drains in private washrooms.
7. Review acid waste requirements with Facilities Management.
8. All plumbing equipment requiring annual or more frequent maintenance must be readily accessible. Provide minimum 900mm clearance around equipment. Do not install piping in such a way as to interfere with the removal of equipment.
9. Install curbs and housekeeping pads under equipment and around pipe penetrations in mechanical rooms.
10. Where solar collectors are planned and contemplated, consult with Facilities Management for approval of concept. Panel locations shall be readily accessible for maintenance.
11. Backflow prevention is required on all primary water supplies into buildings, for zone isolation in labs, and for point-of-use on equipment (refer to CRD requirements). Consult with FMPL for approval of locations and discuss with CRD.
12. Provide cleanouts as per the BC Plumbing Code. All cleanouts must be accessible.
13. Provide self-adhesive color coded dots 6mm in diameter to delineate ceiling access.
14. As built drawings must accurately reflect the installation of the piping and all appurtenances and not be regurgitated IFT drawings.
15. Where domestic water and fire sprinkler systems are supplied from a common main, each system will have its own shutoff valve.
16. Re-use of fixtures is not allowed.
17. All equipment must be shown to be accessible and functional.

22 10 01 GENERAL

Plumbing Piping Type

1. Domestic water piping shall be type L hard drawn copper tubing to ASTM B88 or type L copper pipe to ASTM B42.

2. Fittings shall be copper to ASTM B16.18, brass to ASTM B16.22, press type, or solder joint.

3. Do not specify flexible drainage pipe.

4. Do not specify PVC pipe under traffic areas with less than 30 in. of cover.

Piping Tests

1. Provide a hydrostatic test on all new piping at 1380 kPa (200 psig) for 3 hours.

2. Provide written proof of hydrostatic tests.

Non-Potable Water

Determine with Facilities Management whether the treated water, or piping for future use, should be included in the project.

Note: Wastewater from the Outdoor Aquatic Facility is cleaned and chlorinated and piped to a portion of the campus, where it is available for non-potable use. Facilities Management has a set of guidelines for its use and the design of the system.
If a building is designed for use with treated waste water, the design must include the ability to convert to municipal water.

If treated water is not being extended to a new building, consideration should be given to piping the water supply to the water closets and urinals, separately from the rest of the building domestic water piping, so that implementing treated water in the future does not require re-piping the building domestic water. The best use is for central heavily used washrooms

22 11 19 DOMESTIC WATER PIPING SPECIALTIES

Cross Connection Control

1. Cross connection control shall be carried out in accordance with the Capital Regional District Bylaw No. 3516.

2. Following installation, a test report completed by a certified tester shall be submitted to the Owner, and the Capital Regional District indicating satisfactory operation of each device.

3. Tests are to be conducted well in advance of date of the date of substantial completion.

4. Provide one repair kit for every cross connection control device installed.

5. Dual premise backflow preventers are required on primary water supplies into the building. This is to facilitate annual testing without shutting down the building water supply. Equipment shall be installed in accessible locations. Isolation valves are required for backflow preventers.

6. Specify strainers with blowout valve, for all domestic water systems upstream of the premise backflow preventers.

7. The Standard of Acceptance is Watts. Epoxy coated cast iron is not acceptable.

Trap Primers

1. Provide trap priming for all floor drains and for hub drains

2. Proceeding from most preferred to least preferred:
    i. Consider a DDC controlled control valve system of trap priming with backflow prevention for a single trap. The standard of acceptance is Zurn Z-1020.
    ii. With backflow prevention for a single trap where a regularly used plumbing fixture is close by, a trap primer with a fixed air-gap accessory is required. The standard of acceptance is Zurn Z-1022.
    iii. For a single trap where a regularly used plumbing fixture is not close by, a trap primer that adjusts for a continuous slow drip is required. The standard of acceptance is a Precision Plumbing Products Model PO-500.

3. Locate Trap primers must be easily accessible for service. Unions and isolating valves must be used to facilitate replacement. **DO NOT** install in walls.

Cold Water Pressure Booster Systems

1. If any project requires a booster system, consult Facilities Management for water supply details.

Isolation Valves

1. Provide isolation valves as close as practical to each fixture for each group of plumbing fixtures:
    i. At each main branch supply point.
    ii. At each piece of equipment.
    iii. As required by the applicable codes and bylaws.
    iv. Hose bibs
2. As built drawings must show all actual valve locations.

Drain Valves

1. Shall be specified at low points and at section isolating valves.

2. Shall be ball type, bronze, NPS 3/4 in. minimum, with male hose end, complete with cap and chain.

22 13 00 FACILITY SANITARY SEWERAGE

1. Due to the use of low/ultra low flow fixtures, the slope on all drain pipe 4 inches in diameter and under, will be 2%.

When finished, all sanitary lines will be inspected with a camera to ensure that they are free of debris and flowing water in the right direction. This information will be recorded and stored on a memory stick/zip drive.

Cleanouts must be present at the end of all branch lines.

22 13 29 SANITARY SEWERAGE PUMPS

Pumping of Sewage

1. Sewage pumping systems are undesirable and every reasonable effort must be made to design a building project that incorporates gravity sewerage systems. If, however, gravity systems are not possible then do the following:
    i. All portions of the building that can be gravity drained shall be gravity drained.
    ii. Provide a high water alarm through the BMS.
    iii. Where a source of emergency power is available, pumps and controls shall be connected to emergency power.
    iv. All floor drains at or below the flood level of sewer sump pump shall have backwater valves.

Pumps Seals

1. Specify mechanical seals compatible with intended service on all pumps.

Centrifugal Pumps

1. If centrifugal pumps are used their installation shall comply with section 23 21 23.

22 14 26 ROOF DRAINS

1. Consider possible roof deflections when positioning roof drains. Do not locate drains near beams and columns which tend to become high spots on flat roofs with minimum slopes.

2. Provide minimum of 2 roof drains to all major roof areas as insurance against clogging and flooding (e.g. two at 75m diameter preferred even if 1 at 100mm diameter will do).

3. Where roof areas are enclosed by parapet walls, coordinate with Architect for provision of scuppers for relief in emergency flooding situations as per the B.C. Plumbing Code.

4. Roof drains must be located 2m from the edge of the roof. If not, then the roof design must include fall restraint in accordance with OH&S guidelines.

22 35 00 DOMESTIC WATER HEAT EXCHANGERS

1. Water heaters with storage capacity of 180L or less and heating capacities of 4.5 kW or less may be electric and shall have a drain pan piped to drain.

2. For larger tanks and heating capacity, the heat source shall be the campus heating mains. The maximum required domestic hot water temperature shall be 60°C (140°F). Where hotter domestic water is required it shall be boosted from 60°C (140°F) using a heating source other than the campus heating mains. Natural gas or other service over electric is preferred. Temporary hot water source (140°F) for low occupancy periods (i.e. summer break) should be installed to accommodate central heating plan shutdowns for maintenance service.

3. For tanks heated by campus heating mains and where interruption of domestic hot water service is particularly problematic (e.g. food services, laboratories), provide two brazed-plate, double-wall heat exchangers in parallel with isolating valves so one can be removed for cleaning while the other remains in service. Otherwise provide a single brazed-plate, double-wall heat exchanger. Consider multiple 450L glass-lined, insulated storage tanks or single stainless steel tank.

DHW Recirculation Automatic Flow Valves

1. Domestic hot water recirculation valves shall be pressure independent constant flow, factory set, stainless steel. Standard of acceptance: Griswold standard flow cartridge.

2. Select valves flow settings for minimum flow required to maintain warm water throughout the system and size the recirculation piping and pump accordingly.

DHW Recirculation

1. Provide sufficient balancing valves to ensure adequate flow through each domestic hot water recirculation branch to maintain hot water.

2. DHW recirculation pump controls on the DDC with return water temperature sensor point.

22 40 00 PLUMBING FIXTURES

22 41 00 RESIDENTIAL PLUMBING FIXTURES

Plumbing Fixtures – Private

1. Water Closets:
    i. Tank type: Floor mounted.
    ii. Capacity: 4.5 – 6 lpf, processing minimum 500g of solids.
    iii. Colour: White
    iv. Seat: Closed front; white.
    v. Trims: Chromed Brass.
    vi. Standard of Acceptance is American Standard.

2. Lavatories:
    i. Vitreous china. Standard of Acceptance is American Standard or Gerber.
    ii. Trims: Single lever, brass body. Standard of Acceptance is Moen.

3. Showers:
    i. Solid surface shall be acrylic or fibre glass.
    ii. All accessible showers and all showers in lockable rooms shall be grouted under the base to prevent deflection.
    iii. Accessible shower trim shall be compliant with CSA B651.

4. Accessible Water Closet
    i. Accessible water closets shall provide suitable back support for the user.
    ii. Water closet with tank: provide bolted connection for lid to tank and ensure tank design is suitable to act as a support.
    iii. Water closet without tank: provide a toilet seat with adequately positioned wall support to provide support to the user.
    iv. Standard of Acceptance is A.S. Madera.
    v. Where treated waste water or reclaimed water is used, select flush valves designed specifically for treated waste water. Standard of Acceptance is Sloan.

Janitorial Plumbing Fixtures

1. Sinks: moulded stone, floor mounted type, 600mm x 900mm.

2. UVic will provide an automatic cleaning solution dispenser. Provide a separate 1/2” RPBA water connection with backflow prevention for chemical soap connection.

3. The faucet shall be reinforced and be complete with a pain hook. The mixing of hot and cold water shall be manual.

4. Standard of acceptance for the sink is Fiat MSB 3624. Acceptable manufacturer: Williams.

5. Standard of acceptance for the faucet is Delta 28T-2383.

Food Services

1. Standard of acceptance for trims: T&S Brass.

Laboratory Plumbing Fixtures

1. Most existing laboratories constructed or renovated before 2009 have Tech/Cambridge Brass trim with corrosion resistant finish. More recently (when that finish was no longer available) Tech/Cambridge Brass trim with chrome finish has been used or Water Saver. This trim includes water faucets, compressed air and gases outlets both inside fume hoods and wall or counter mounted except that chrome finish has not been used in fume hoods.

2. Where a renovation requires only a very few fixtures and there are others remaining, check with the Plumbing Shop to determine if they have in stock matching trim available to be used for the renovation. If not, evaluate the relative corrosion potential for the installation and select trim to match the existing with chrome finish unless the corrosion potential is high and in that case select Water Saver with suitable finish.

3. Trim for sinks are typically hot and cold gooseneck pull down spring type with type handles, except for ADA trim which shall have blade handles, vacuum breaker and tapered, barbed nozzles except sometimes aerator type outlets for wash-up sinks. Many outlets had aspirators in the past but consideration shall be given to compressed air aspiration (check with Facilities Management). Some sinks require distilled/deionised water outlets. They are typically gooseneck type.

4. Laboratory sinks are typically 316 stainless steel with counter-top flange (although with suitable counter and where coordinated with the Architect, under-counter mount is acceptable), no ledge-back, cross strainer outlet. Standard of acceptance is Aristaline. Acceptable manufacturers are Architectural Metal Industries, Franke, and Steel Queen.

22 42 00 COMMERCIAL PLUMBING FIXTURES

Plumbing Fixtures – Public

1. All plumbing fixtures at UVic are considered “Public” except for those that are in individual residential suites. Fixtures must not be accessible through a wireless connection

2. Water Closets:
    i. Wall Hung.
    ii. Standard of Acceptance is American Standard.
    iii. Standard of Acceptance for seats is Bemis.
    iv. Standard of Acceptance for trim is hands-free, chromed brass by Sloan.
    v. Capacity shall be 4.5 – 6 lpf, processing a minimum of 500g of solids.

3. Urinals:
    i. Standard of Acceptance is American Standard.
    ii. Waterless urinals are not acceptable.
    iii. Standard of Acceptance for trims is hands-free, chromed brass by Sloan.

4. Lavatories:
    i. Vitreous China.
    ii. Standard of Acceptance is American Standard.
    iii. Standard of Acceptance for trims is hands-free, chromed brass by Sloan.

5. Power for the hands free controls shall be building power (on standby power where provided for that building). Battery-powered units are not acceptable even where automatic recharging is included in the fixture.

6. Showers:
    i. Solid surface shall be acrylic or fibre glass.

ii. All accessible showers and all showers in lockable rooms shall be grouted under the base to prevent deflection.
iii. Accessible shower trim shall be compliant with CSA B651.

7. All fixtures shall be white and colour-matched (there is a variety of whites) where within a single room.

8. All washroom fixtures within the building shall be of the same manufacturer.

9. Specify water conserving type of fixtures and trim.

10. Provide chrome plated, hot and cold hose outlet under the lavatory counter (preferably in the male washroom) for each group of public washrooms. Standard of acceptance: Delta 28T8183.

22 45 00 EMERGENCY PLUMBING FIXTURES

1. Water supply at all emergency eyewashes shall be tempered to 22°C +/- 2°C and shall flow at the specified rate (ANSI Z358.1) for a period of > 15 minutes, with temperatures not varying outside of a range between 15°C and 30°C.

2. Stainless steel pipe and fittings only shall be used in emergency eyewash and showers on the UVic campus.

3. Eyewash shall be specified as eyewash only not face and eyewash combination.

4. Emergency showers/eyewash stations:
   i. Shall have “stay open”, hand-controlled valves.
   ii. Shall each have a floor drain plumbed in, complete with trap primers for new construction. Existing construction is exempt.

5. Mixing valves shall be brass.

6. Temperature mixing valves:
   i. Serving individual, sink-mounted eyewashes shall be located under the sink to be accessible for service and with the temperature gauge readily visible.
   ii. Serving showers or multiple devices shall be mounted in a secure location to be accessible for service:
      i. Height 610mm (2’) to 1520mm (5’).
      ii. Recessed flush into a wall.
      iii. Enclosed in an 18 gauge, 304 stainless steel cabinet measuring 18” x 16/5” x 7”.
      iv. Fixed with a piano-type hinge.
      v. See Figure: *22 45 00 – 1 Temperature Mixing Valve Placement.*

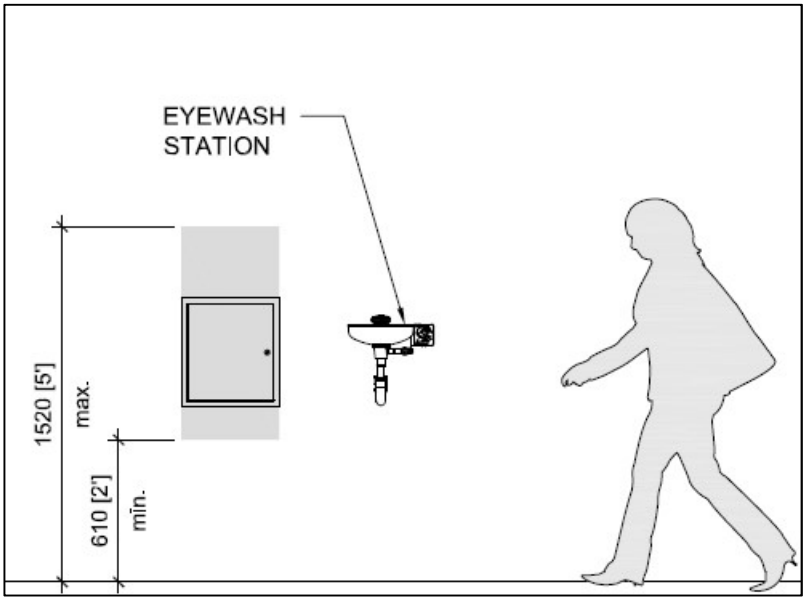

Figure 22 45 00 – 1 Temperature Mixing Valve Placement

22 47 00 DRINKING FOUNTAINS AND WATER COOLERS

1. All buildings over 600 gross square metres shall have at least one accessible drinking water fountain, located in a public area. The drinking fountain should include an appropriate fixture for filling water bottles.

2. Drinking water fountains shall not be cooled.

3. Drinking water fountains shall not have filters (no backflow preventers will be required).

4. Drinking water fountains shall only be located inside buildings at level 1 entrance lobbies and should be visible from the exterior.