

8 HYDRAULIC SYSTEMS

Minimum Standards

- 8.1.00 The minimum requirements for the provision of potable water supply, hot water supply, warm water systems, sanitary plumbing and drainage, stormwater drainage and gas installations in Health Care Facilities shall be those listed in Enclosure E1.
- 8.2.00 In addition to the minimum requirements and depending upon the type of facility and installed services the following Regulations and Australian Standards shall apply:
- Plumbing (Cooling Towers) Regulations
 - Building (Cooling Tower Systems Register) Regulations
 - AS 4343 - Pressure equipment-hazard levels
 - AS 4032 - Thermostatic mixing valves - Materials, design, and performance requirements

All clauses outlined in the following section shall be in addition to statutory requirements.

General

- 8.3.00 Materials shall be selected that are suitable for the specific characteristics of the service being installed. This shall include consideration of parameters such as temperature and concentration of wastes, corrosion, leaching and chemical attack.
- 8.4.00 Where loss of a service can cause unacceptable risk, service shall be monitored, alarmed and provided with a back-up. Critical areas such as Renal Dialysis, Operating Unit, ICU, CSSD, Acute Inpatient Units (one Dirty Utility and one Bathroom), Biochemistry and activities where relevant unacceptable risk can occur, shall be defined in the project brief.
- 8.5.00 Fixed services and maintenance points shall be located in a manner that does not create unacceptable risk or disturbance to patients, staff including maintenance personnel and health care procedures.
- 8.6.00 Service elements such as pipes, isolating valves operating switches and alarms shall be clearly identified.
- 8.7.00 Location and operation of fixtures shall suit to the application and shall not cause health risk.
- 8.8.00 Fixtures shall be easily cleanable. Water discharge devices such as flushing tanks and shower roses, shall be selected to enhance water conservation.

Water Supply

- 8.9.00 Where water quality does not comply with Health - Quality of Drinking Water - Regulations, National Health and Medical Research Council / Australian Water Resources Council 1987 Guidelines or local guidelines, water treatment / filtration plant shall be provided to maintain the integrity of hot water equipment, tapware, specialist health equipment and air-conditioning plant pipework.

Part E- Building Services and Environmental Design

Water Supply

- 8.10.00 Water quality shall not cause risk to patients and shall be suitable for intended medical procedures
- 8.11.00 Where water supply is critical it shall be available all the time.
- 8.12.00 Where the water supply is unreliable, local critical demand shall be satisfied with individual local back-up. Duty and standby pumps shall be designed and installed if the supply system includes pumping.
- 8.13.00 Where possible, locate reticulation pipes in the roof spaces, clear of mechanical equipment with droppers connected to the sanitary fixtures and equipment. Avoid locating pipework over inpatient areas and other areas that could be adversely affected by noise generated in water pipes. Hot and cold water pipes shall be separated by enough distance to avoid heat transfer. Hydraulic services shall not be located above electrical services.
- 8.14.00 Water supply systems shall be adequately zoned and isolated to provide local safety shut downs whilst maintaining maximum availability.
- 8.15.00 If practicable, the water service is recommended to be supplied from an external ring main. The service is recommended to be connected at two locations with a valve midway to maintain a continuity of supply in each section of the building should maintenance be required. Isolation valves shall be located on service lines to individual fixtures or group of fixtures. All valves are recommended to be easily accessible adjacent to/from roof-space access walkway.
- 8.16.00 Pipework shall be identified in accordance with AS 1345 'Identification of the contents of pipes, conduits and ducts'.
- 8.17.00 Single fixture or zone backflow prevention devices shall be designed to comply with AS 3500.1 'Water supply'. Vacuum breakers shall be installed in hose bibs and supply nozzles used for connection of hoses or tubing in laboratories, cleaner's sinks, bedpan-flushing attachments and autopsy tables.
- 8.18.00 To prevent condensation, closed cell foam insulation shall be installed on pipework where the dew point can be reached. Insulation shall have a continuous vapour barrier.
- 8.19.00 All isolation valves for hydraulic services shall have permanently fixed plastic or brass identification discs. Discs shall be clearly permanently engraved to identify the item.
- 8.20.00 When the operational policy includes haemo-dialysis, continuously circulated filtered cold water shall be provided.

Hot Water Supply

- 8 .21.00 System design generally shall comply with AS3500.4 'Hot water supply systems'.

A minimum of two hot water units is recommended to be installed in each main system. Remote point of use type systems may utilise a single unit.

- 8 .22.00 Hot water piping is recommended to be arranged in a ring main or a number of ring mains and incorporate a hot water return pipe.
Branch pipework to individual outlets or groups of outlets shall not exceed three metres for 15 mm diameter pipe in order to minimise deadlegs. Each branch shall be equipped with an isolation valve for maintenance purposes located adjacent to the cold water supply branch isolation valve serving the same outlets.

Hot water supply to areas such as Dirty Utilities is recommended to be separated from the remainder of the hot water system using approved back-flow preventers.

- 8 .23.00 Central hot-water distribution systems serving patient care areas shall have a flow and return to provide continuous hot water at each hot water outlet. The temperature of hot water for showers and bathing shall be appropriate for comfortable use but shall comply with AS 3500.4 'Hot water supply systems'.

When the cold water supply fails, the hot water supply shall be shut down automatically to avoid risk of scalding. Circulation pumping shall be designed and installed with both a duty and stand-by pump. Calorifiers shall be of a failsafe design.

Warm Water Supply

- 8 .24.00 Thermostatic mixing valve (TMV) designs shall comply to AS 4302 'Thermostatic mixing valves - Materials, design and performance requirements', and installation shall comply to AS 3500.4 'Hot water supply systems'. Tempering valves shall not be used. Where concealed TMVs shall be identified with clear signage in a visible location to ensure servicing is carried out.

- 8 .25.00 Warm water systems producing water in the temperature range of 30 to 60 degrees Celsius, shall be designed and installed to achieve compliance with the Health (Legionella) Regulations and DHS Legionella Risk Management, Supplementary Notes for Hospitals, Chapter 'Warm Water Systems'.

Sanitary Plumbing and Drainage

- 8 .26.00 Drain pipes shall be designed and installed to comply with AS 3500.2 'Sanitary plumbing and sanitary drainage' and to suit the waste carried and the temperature of waste. Where possible, pipework is recommended to be concealed. Vents are recommended to be interconnected in roof or ceiling spaces to reduce the number of roof penetrations.
- 8 .27.00 Inspection and cleaning openings shall be positioned external to the building fabric. Where this is not possible, inspection and cleaning openings shall be positioned in ducts or within the wet areas it serves. Inspection and cleaning openings shall not be positioned in ceiling spaces.

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Sanitary Plumbing and Drainage

- 8 .28.00 Access pits suitable for cleaning and pumping out are recommended in service areas rather than cleanout openings within pipes and junctions. Access pits are recommended to be located adjacent to vehicular access.
- 8 .29.00 Gravity drain systems shall be installed wherever possible. If pumping systems for the disposal of sewerage or effluent are installed they shall be installed in duplicate and shall be connected to the hospital standby generator power supply. Alternatively, the systems shall incorporate a minimum of four (4) hour storage in the event of disruption in normal power supply.
- 8 .30.00 Mixing of chemicals wastes that result in fume emissions shall take place within a vented drainage system and not at a common tundish.
- 8 .31.00 Waste water systems access covers, inspection openings and inspection chamber covers shall not be located within High Risk areas.
- 8 .32.00 Waste water systems shall be planned to eliminate access covers, inspection openings and inspection chamber covers being located within functional areas.
- 8 .33.00 Waste pipes are recommended to be located in service areas and not pass through walls and ceiling spaces of patient rooms and treatment rooms.
- 8 .34.00 Floor drainage grates shall not be installed in the clean area of a Sterile Supply Unit or treatment area. Floor drains are recommended to be rationalised to an absolute minimum due to their ability to harbour bacteria.
- 8 .35.00 Floor drains or open tundishes shall not be installed in Operating and Birthing / Delivery Rooms.
- 8 .36.00 Drain liners serving automatic blood-cell counters shall be carefully selected to eliminate the potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, and solder.
- 8 .37.00 Drainage piping is recommended to not be installed within the ceiling or exposed in Operating and Delivery Rooms, Nurseries, food preparation areas, food serving facilities, food storage areas, computer centres and other sensitive areas. Where exposed overhead drain piping in the areas in unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

Trade Waste

- 8 .38.00 The treatment of industrial wastes shall be in accordance with the requirements of the local Water Supplier and other relevant regulations and statutory codes / rules.

Trade Waste

- 8 .39.00 Copper pipes shall not be used to convey trade waste products as photographic wastes corrode copper. UPVC is the preferred material. Fixer and developer shall be collected and stored for off-site treatment and disposal. Fixer and developer shall not be discharged to sewer.
- 8 .40.00 A silver recovery system shall be installed in accordance with the trade waste agreement or provision made for the collection of all spent solution that contains silver (such as bleach fix). All solution shall pass through this system.
- 8 .41.00 In Radiology, close attention shall be given to the discharge of waste from X-ray film processing machines as only rinse water can discharge to sewer. Associated chemicals are not permitted to be discharged to sewer and must be disposed off-site.
- Connect mechanical plant equipment drains to the sewage system, in particular, plant which discharges water containing chemicals. Drains from fan coil and air handling units may discharge to sewer or stormwater.
- 8 .42.00 Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be accessible from outside of the building without need to interrupt any services.
- 8 .43.00 Plaster traps shall have easy access for emptying and cleaning. Plaster traps should be located outside the treatment room or should be accessible from outside the room. Servicing should be able to be carried out with minimum disruption.
- 8 .44.00 All pre-treatment waste systems such as dilution pits, arresters and strainer baskets shall be located in the service / dirty zones of the department if the system cannot be installed externally.

Storm Water Drainage

- 8 .45.00 Storm water system design generally shall comply with AS3500.3 'Stormwater drainage' as referred to in the BCA and local Authorities' by-laws that are applicable.
- Roof drainage systems shall be designed to handle a 1:100 year intensity based on available Bureau of Meteorology statistics and incorporate separate overflow relief discharge to minimise roof gutter overflow and consequent building damage and service interruptions.
- Consideration shall also be given to ways of preventing leaf build up in gutters to prevent building damage and service interruption due to gutter overflow.
- 8 .46.00 Storm water drainage grates shall be cross-webbed in car parks and paths and not be located in wheel chair access areas or trolley areas.
- 8 .47.00 Pumps, if required, shall be as previously specified for sewer pumps.

Part E- Building Services and Environmental Design

Gas Installations

- 8 .48.00 Provision shall be made for the continuity of gas supply where the facility has a post-disaster function or requires gas services for sustaining human life, by duplication of the gas supply provided it is an independent supply or dual fuel firing of critical plant.
- 8 .49.00 Kitchens shall be provided with appropriately labelled gas isolation valve/s at the main entry point for isolation in event of fire.