



0822 Wastewater

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00 Design principles

0.01 Main considerations

It is a requirement to undertake the [00 PLANNING AND DESIGN/0001R - DESIGN REFERENCE](#) and [GLOSSARY OF TERMS](#) information into all aspects of design, detailing and delivery when developing the content here within. Clear demonstration of adherence to these requirements is part of the services and will be called upon at key points in the project and during at the discretion of the Department of Education (DoE).

GUIDE NOTE: Refer to [00 PLANNING AND DESIGN/0001C DESIGN CHECKLIST – HYDRAULIC](#).

0.02 General

GUIDE NOTE: Refer to [02 SITE URBAN AND OPEN SPACES/0244 STORMWATER - SITE](#) for service trenching, existing underground services, discharging from air handling systems & acoustic treatment of piping.

The drainage systems within school facilities includes all the associated pipework and services for the removal and disposal of sanitary drainage and stormwater management in two separated systems.

The design of the drainage system is to meet the relevant Statutory requirements, and address the following issues:

- Fully comply with the requirements of AS3500, Plumbing Code of Australia and the Building Code of Australia and any other relevant statutory requirements.
- Fully comply with the requirements of the local water or supply authority.
- Support sustainable design principles including reducing water consumption and waste production.
- Appropriately treat any trade waste to ensure minimal environmental impact.
- Be accessible and serviceable - easy to maintain with minimal impact on school use when maintenance is being performed.
- Use products with a long life span – many hydraulic services are concealed so durability is essential.
- Use pumps for disposal of effluent where there are no other options.
- Comply with the requirements of the Geotechnical Report.

- Keep branch lines as short as possible.
- All pipe work to be accessible for cleaning with flexible rods. Where located below paved or bitumen areas, clear outs are to be extended to finished surface level and terminate with vandal proof brass cover.
- All underground drainage systems within the site area are to be CCTV inspected after installation and submitted as part of the work as executed submission.
- Avoid running pipework on wall surfaces. When there is no acceptable alternative, run pipes in minor rooms, and boxed in.
- Maximise vandal resistance of all installed pipe work.
- Stacks and vertical pipework to be concealed wherever possible. Ensure unhindered access is available.
- Stacks are to have cleaning access at each level and provide access panels at cleanout points.

0.03 Single Pipe System

GUIDE NOTE: Technical aspects to reflect current legislation & local water or supply authority.

- In sewered areas, design a single pipe system to collect both soil and waste drainage.
- In unsewered areas, design a single pipe system where practical and Council and Health Regulations permit. Otherwise provide a dual-pipe system to collect soil and waste drainage separately.

0.04 Pits and Sumps

GUIDE NOTE: Refer to [02 SITE URBAN AND OPEN SPACES/0244 STORMWATER - SITE](#) for changes of gradient and changes of direction of stormwater drains.

- Access chambers shall be of pre-cast concrete or cast in-situ concrete complete with lid.
- Pit lids shall enable lifting by specialist equipment and be compliant with OH&S requirements.
- Provide an easily removed, square of concrete separated from the main slab, marked to indicate the intersection point of branch lines under pavements etc.

0.04 Trade Waste

Design drawings of trade waste arrestors for acid, grease, plaster and clay, are to show:

- Designed capacity
- Estimated maximum rate of discharge per hour, per day
- Average daily discharge

The following information gives an indication of typical school use of specialist spaces that may create trade waste. The relevant sections should accompany the application to the Water Authority to discharge into the sewer mains.

0.05 Science Laboratories

- All chemicals used in schools must comply with the Chemical Safety in Schools policy which limits chemical quantities used and has strict requirements on how they may be disposed.
- Main acids used in schools are received in the following concentrations:
 - Hydrochloric 32%
 - Sulphuric 98%
 - Nitric 70%
- Dilution: Generally to 5-10% (1 or 2 molar concentrations) for use in laboratory experiments.
- Usage: approximately 500-1000ml per practical period up to 20 times per year for each laboratory (varies from school to school).
- Dilution pits are required by all relevant authorities for all science laboratories.

Waste Disposal from Science Sinks

- Waste Systems shall be acid-resisting
- Position dilution pit between the acid-resisting branch line and main sewer
- Calculate size based on 14 litres per single or double water point throughout

0.06 TAS MAT 1 - Kitchens

- Grease arrestors are required by all relevant authorities.
- Number of students in cooking classes range from 18 to 25.
- Typical year 10 class has 2 periods of cooking and one period for demonstration per week.

0.07 Art

- High school art rooms require a plaster arrestor.
- Primary schools do not require plaster arrestors.
- Clays used in schools:
 - Terra-cotta 80%
 - Stoneware 20%
- Terra-cotta clays contain:
 - Iron (oxides) 6%
 - Aluminium silicates 80%
 - Non-toxic pigments variable

0.08 Canteen Food Service Unit

Determine what food preparation activities will be undertaken within the canteen. Where required by the relevant authority, install appropriate trade waste pre-treatment device for grease and oil removal.

0.09 Dark Room

Where provided activities within the Dark Room involve film processing.

- Used irregularly by art, industrial arts and science classes.
- Waste solutions will have been diluted first for use and again on disposal.

The two most common chemicals will be:

- Fixer Boric acid - diluted for use 1-4
- Developer Bromide developer - diluted for use 1-8
- It is unlikely more than 2-3 litres of diluted chemicals will be disposed of in a week.
- Dilution pit is required.

0.10 On Site Waste Water Treatment

GUIDE NOTE: Refer to [02 SITE URBAN AND OPEN SPACES/0244 STORMWATER - SITE](#) for on-site waste water management & agriculture pipes systems.

Where connection for discharge to an Authority Sewer service is not available:

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- Onsite waste water treatment shall be designed in accordance with local water authority / local council requirements and NSW Health legislation
 - Where appropriate the design of the onsite waste water treatment system is to be accredited with NSW Health

Specification

01 General

As per current NATSPEC.

02 Product

As per current NATSPEC.

03 Execution

As per current NATSPEC.

04 Selections

As per current NATSPEC.