

# Unit of Competency CPCPPS5028

## Design trade waste pre-treatment systems

### Application

This unit specifies the skills and knowledge required to design trade waste pre-treatment systems for commercial and industrial premises, such as commercial kitchens and laundries, mechanical workshops and commercial swimming pools, prior to discharge to authority's point of sewer connection.

The role involves interaction with architects, builders, suppliers, clients and relevant planning authorities and requires a sound understanding of applicable legislation, standards and codes.

The unit requirements are typically undertaken by experienced tradespeople such as hydraulic design consultants or persons in a supervisory capacity in relation to plumbing services on a new or existing site.

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

### Prerequisite Unit

Nil.

### Elements and Performance Criteria

1. Evaluate design parameters.	<ul style="list-style-type: none"><li>1.1 Establish scope of work for trade waste pre-treatment systems prior to discharge to authority's point of sewer connection.</li><li>1.2 Establish performance requirements considering safety of system users or building occupants.</li><li>1.3 Determine design requirements from relevant Australian Standards, codes, plans, specifications, authorities' requirements and client brief.</li><li>1.4 Apply sustainability principles and concepts as part of the design process.</li><li>1.5 Interpret manufacturer requirements and trade and technical manuals.</li><li>1.6 Conduct research to outline design parameters.</li><li>1.7 Analyse trade waste applications and conduct a cost-benefit analysis to compare a range of pipe materials and system designs.</li></ul>
2. Plan and detail system components.	<ul style="list-style-type: none"><li>2.1 Plan layout of pipework systems including type and location of fittings and controls.</li><li>2.2 Plan and detail solid removal systems.</li><li>2.3 Plan and detail grease and oil interceptors, neutralising chambers and wash-down areas incorporating stormwater exclusion.</li><li>2.4 Plan and detail diffused air flotation systems.</li><li>2.5 Detail bacterial treatment processes and combined and specialised treatment processes for a range of commercial and industrial applications.</li><li>2.6 Incorporate general housekeeping procedures to minimise discharge of trade waste.</li><li>2.7 Perform system calculations for a range of applications.</li></ul>

	2.8 Size and detail pump well, pumps, controls and equipment requirements. 2.9 Design pipe supports for a range of applications. 2.10 Specify approved materials, jointing methods and installation requirements for trade waste pre-treatment systems.
3. Design and size systems.	3.1 Design and size trade waste pre-treatment systems for commercial and industrial premises. 3.2 Design and size trade waste pre-treatment systems using calculations and local authorities and regulators' policies and requirements. 3.3 Design flow monitoring systems for trade waste applications. 3.4 Design venting of trade waste systems to comply with local authority requirements.
4. Prepare documentation.	4.1 Produce client brief of the preferred design. 4.2 Prepare plans and specifications for trade waste pre-treatment systems. 4.3 Prepare testing and commissioning schedule. 4.4 Produce operation and maintenance manual including information on how to properly and safely maintain the system.

## Foundation skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Unit Mapping Information

Supersedes and is equivalent to CPCPPS5028A Design trade waste pre-treatment systems.

## Links

Companion Volume Implementation Guide:

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>

# Assessment Requirements for CPCPPS5028 Design trade waste pre-treatment systems

## Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by:

- designing, sizing and documenting the installation and layout details for two trade waste pre-treatment systems from the following:
  - chemical facilities
  - commercial kitchen
  - commercial and industrial facilities that produce a liquid waste stream
  - commercial and industrial laundry
  - food preparation facilities
  - laboratories
  - motor vehicle workshops
  - photography development facilities
  - commercial swimming pool
  - wash-down facilities
- preparing plans and specifications to industry standards for both selections
- documenting the evaluation of design parameters including client, regulatory, manufacturer and relevant Australian Standard requirements for each design.

## Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- hazards associated with devices and systems used in the hydraulic sector
- design of the options for the pre-treatment of trade waste
- approved installation methods for trade waste pre-treatment systems
- key features of work plans and specifications
- nature of materials and effect of their performance in a variety of conditions
- organisational quality procedures and processes
- terminology and definitions used in hydraulic design
- work health and safety (WHS) requirements, including relevant statutory regulations, codes and standards
- scope of work:
  - interpreting plans and specifications
  - sizing and documenting layout of trade waste pre-treatment systems for commercial and industrial applications
- design requirements:
  - architectural plans
  - building specifications

- o cleaning and maintenance procedures
  - o installation requirements
  - o odour control
  - o owner requirements
  - o pipework identification
  - o sizing
  - o trade waste treatment
  - o ventilation
- statutory and regulatory requirements and relevant Australian Standards and codes which may include:
  - o AS/NZS 3500 Plumbing and drainage set
  - o AS 2200 Design charts for water supply and sewerage
  - o Commonwealth, state or territory and local governments requirements
  - o National Construction Code (NCC)
  - o utility provider's trade waste regulations
  - o other relevant Australian Standards and codes
- trade waste applications:
  - o chemical facilities
  - o commercial kitchen
  - o commercial and industrial facilities that produce a liquid waste stream
  - o commercial and industrial laundry
  - o food preparation facilities
  - o laboratories
  - o motor vehicle workshops
  - o photography development facilities
  - o commercial swimming pool
  - o wash-down facilities
- cost-benefit analysis comparisons:
  - o design styles
  - o energy costs
  - o expected design life
  - o labour costs
  - o material costs
  - o safety factors
  - o speed of installation
  - o suitable materials
  - o authorities' requirements
- manufacturer requirements:
  - o containment
  - o design and installation
  - o installation space
  - o material specifications
  - o pipe sizing

- o pump installation
  - o storage systems
  - o technical and trade manuals
  - o ventilation
- information gathered through desk top study to support design purposes:
  - o architectural and building plans
  - o developer plans
  - o manufacturer data
  - o building applications
  - o brochures
  - o forms
  - o policies
  - o reports
- performance requirements to:
  - o establish acceptable discharge standards for the relevant authority
  - o comply with relevant Australian Standards, codes and local authorities' requirements
- layout of pipework systems:
  - o location of pipework (fire rating of enclosure)
  - o trade waste plumbing and drainage
  - o pumped systems
  - o accessibility
  - o designing to not unduly affect building integrity and aesthetic appeal
  - o designing to include principles of economy, serviceability, durability and fit for use
- fittings:
  - o bends
  - o junctions
  - o reflux valves
  - o inspection openings
  - o expansion joints
- solid removal systems which remove:
  - o bone
  - o dirt
  - o grit
  - o metal
  - o paper
  - o plastic
  - o rubbish
  - o sand
  - o silt
  - o wood
  - o other solid contaminants
- grease and oil interceptors:

- o coalescing plate separators (CPS)
  - o vertical gravity separators (VGS)
  - o dissolved air flotation (DAF)
  - o grease arrestors
  - o skimmers
- neutralising chambers which neutralise:
  - o acid
  - o alkaline
  - o chemicals
- wash-down areas:
  - o bin
  - o commercial and industrial wash-down processes that may or may not require stormwater diversion
  - o floor
  - o vehicle
  - o machinery
- bacterial treatment processes:
  - o aerobic
  - o anaerobic
  - o facultative and specialised bacteria for the removal of grease and other contaminants
- combined and specialised treatment processes:
  - o bacterial treatment
  - o cooling pits
  - o diffused air flotation systems
  - o neutralising chambers
  - o solid removal systems
  - o specialised treatment
- system calculations:
  - o calculating gradient
  - o interpreting design charts and tables
  - o calculating pipe sizing
  - o calculating reduced level
  - o determining flow and fixture loadings
  - o sizing treatment system
  - o storage tank capacity
- pump well, pumps, controls and equipment requirements:
  - o access covers
  - o automatic controls
  - o capacity
  - o chains
  - o corrosion-resistant materials
  - o detailing

- o emergency storage
  - o high and low-level water controls and alarms
  - o impeller sizing
  - o inlet and outlet design requirements
  - o installation and mounting requirements
  - o ladder access
  - o odour control
  - o macerator requirements
  - o pump selection
  - o pump sizing
  - o pump well sizing
  - o space requirements
  - o step irons
  - o valve requirements
  - o ventilation
  - o warning system
- pipe supports:
  - o anchors
  - o bedding
  - o bracket spacing
  - o concrete support
  - o corrosion protection
  - o cover
  - o hanging brackets
  - o manufacturer-recommended specific fixings
  - o material requirements
  - o saddles
  - o provision for expansion
  - o wall and ceiling brackets
- materials:
  - o pipes:
    - cast iron or epoxy lined
    - earthenware or vitrified clay pipe (VCP)
    - polyethylene (PE)
    - polypropylene (PP)
    - other approved material
  - o fittings and fixtures, including sound attenuation requirements
- jointing methods:
  - o electrofusion welding
  - o mechanical joints
  - o rubber ring
  - o threading
- installation requirements:

- o bedding
  - o fire rating
  - o level of workmanship
  - o manufacturer-recommended specific fixings
  - o pipe support
  - o provision for expansion
  - o serviceability and access
  - o pipe protection:
    - cover
    - corrosion
    - impact
- computer software packages including:
  - o proprietary design software
  - o manufacturer software
- methods of applying sustainability principles and concepts:
  - o selecting appropriate material to ensure minimal environmental impact
  - o efficient use of material
  - o efficient energy usage/capital outlay comparison
  - o effect on the environment due to overflow or leakage
  - o material selected to convey the type of discharge
  - o water efficiency
- types of plans:
  - o axonometrics
  - o cross-sections
  - o details
  - o elevations
  - o isometrics
  - o sections
  - o schematics produced using:
    - o computer generation
    - o drawing equipment
- specification:
  - o access chambers (manholes)
  - o bedding
  - o commissioning
  - o concrete support and detailing specialised components
  - o jointing
  - o manufacturer requirements
  - o materials
  - o pumps
  - o WHS
  - o support
  - o testing



- o workmanship
- testing for:
  - o air pressure
  - o compliance with authorities' discharge requirements
  - o drainage inspection
  - o hydrostatic
  - o performance
  - o quality assurance (QA) audit
- commissioning schedule information:
  - o checking for foreign material
  - o checking system defects
  - o checking that system functions as per design
  - o containment
  - o leak check
  - o operational commissioning
  - o pump commissioning
  - o system certification
  - o treatment system commissioning
- operation and maintenance manual information:
  - o as installed drawings
  - o certification documentation
  - o results of commissioning test
  - o maintenance schedules
  - o manufacturer brochures and technical information
  - o odour control
  - o regular treatment system maintenance
  - o regular water quality testing
  - o ventilation
  - o water auditing.

## Assessment Conditions

Assessors must satisfy the requirements for assessors listed in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

## Links

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