

National Certificate in Building, Construction, and Allied Trades Skills (BCATS)

**Demonstrate knowledge of the
drainlaying industry within a
BCATS environment**

Unit Standard – 25322

Level 2, Credit 2

Name: _____



What you need to do

By the end of this module, you should be able to demonstrate knowledge of the drainlaying industry covering:

- major industry sectors;
- industry work processes;
- industry clients, supply and inter-trade relationships;
- the impact of regulatory and trade bodies on the industry; and
- industry jobs and their training requirements.

How you will be assessed

Your teacher/tutor will give you a worksheet that you need to complete, which your teacher/tutor will mark.

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Glossary of Terms

Term	Meaning
Drainlayer	A person licensed to carry out drainlaying.
Territorial Authority (TA)	Usually a city council, and who provide sewers and issue building consents.
Building consent	A document issued by the TA approving proposed building, plumbing and drainlaying work.
Building Inspector	An employee of the TA who checks that drainlaying work complies with Building Code regulations.
Drain	Pipes installed below ground which receive discharge from the building and convey it to the property boundary.
Sewer	Underground pipes belonging to the TA which receive discharge from a property's drain.
Storm water sewer	Drainage system that receives rain water only.
Foul water sewer	Drainage system that receives both waste and foul water (sewerage).
Elevated drainage	A discharge system installed above ground within the building which is then connected to the drainage system.
Storm water	Rain water discharged from the roof of a building.
Waste water	Water that has been used for washing or bathing, but does not contain human waste (i.e. urine and/or excrement).
Foul water	Waste water that contains human waste.
Gully trap	The entrance to a drain which is visible and open above ground.
Trap seal	A water seal that prevents foul gases escaping from the drainage system and entering the building.
Loss of trap seal	A problem where trap seals are lost due to compression or siphonage.
Siphonage	Where negative water pressure sucks liquid and waste out of the trap seal.
Compression	Where positive water pressure blows out the trap seal.
Waste pipe	Drainage piping, which conveys waste water only, discharging in the open air above the gully trap.
Discharge pipe	Drainage piping, which conveys waste or foul water, and is either connected to a discharge stack or directly to the drain.
Discharge stack	Receives waste or foul water from discharge pipes and is connected to the drain.
Drain vent	Allows air into and out of drainage system in order to equalise air pressure and prevent siphonage or compression in the drain.
Network supplier	A service provider that provides water mains and sewers - usually the Territorial Authority (Council).
Reticulation	The process of joining pipes together when constructing a supply or drainage network.
Potable water	Clean water that is drinkable.
ITO	Industry Training Organisation A tertiary education organisation which develops qualifications and arranges training for a specific industry.



Introduction to Major Industry Sectors

Drainlaying technically begins at the waste and foul water outlets, collecting discharge from a sanitary plumbing system, and ends at an approved outfall. Only licensed tradespeople can carry out drainlaying.

Drainlaying involves a range of tasks and skills, including:

- excavating, shoring, dewatering and refilling trenches;
- establishing lines, levels and gradients for drains;
- installing foul and storm water drain pipes in trenches (within the property boundary);
- constructing and/or connecting inspection fittings, access chambers, and man-holes in order to provide access to drains;
- installing drain vent pipes above ground, and connecting these to drains;
- testing drains for leaks;
- repairing blocked, broken or leaking drains;
- connecting drains to the TA's sewer connection at the property boundary; and
- installing gully traps and dishes.

Drainlayers may also:

- be asked by the plumber to make connections to discharge pipes and stacks
- install septic tanks and/or soak pits in place of an external sewer connection.

The Drainlaying Industry

Drainlaying is a trade that deals with the pipes and drains used for the removal of water and waste substances from a property.

Only a licensed drainlayer is legally allowed to lay, alter, reconstruct, extend, repair and open up drains and associated traps, as well as connect drains leading up to and away from waste water treatment stations (such as septic tanks).

Drainlayers are licensed by the New Zealand Plumbers, Gasfitters and Drainlayers Board (PGDB).

Drains are underground pipes which carry waste or surface water, and enter either a common drain outside the legal boundary (sewer), or a drain that runs to an onsite waste water disposal system (septic tank). A sewer is part of the Territorial Authorities' (TA) drainage network.

In a residential setting this includes drains which carry waste water from sinks, showers and toilets, as well as rainwater, away from the dwelling.

In a commercial setting (for example factories and shops) drains will carry waste particular to the commercial enterprise which is known as trade waste. This trade waste may require special collection to be taken away; while some trade waste may need special interceptor traps (installed by drainlayers) in order to avoid contamination of the council sewer and treatment plant.

The task of clearing blocked drains is carried out by drainlayers; however they may also open up drains for others to do that work.

Clearing blocked drains may involve simply using a plunger at the appropriate opening, using machines which drive an auger through the blockage, or using sophisticated electronic equipment to locate drain faults. Often a blocked drain indicates a fault with a drain, which will then need to be excavated and replaced by a certified drainlayer.

A common drain outside a house boundary will be one of two systems - either a foul water sewer or a storm water sewer. A storm water sewer carries run off from properties, roads, driveways etc and will carry storm water straight to an outfall, such as a stream or the sea.

Some properties drain their storm water run-off directly to a street kerb near their boundary. Other properties require drains from downpipes and roof gutters to be connected to an underground soak pit; and in some cases will also be required to drain excess water from a section prone to flooding.

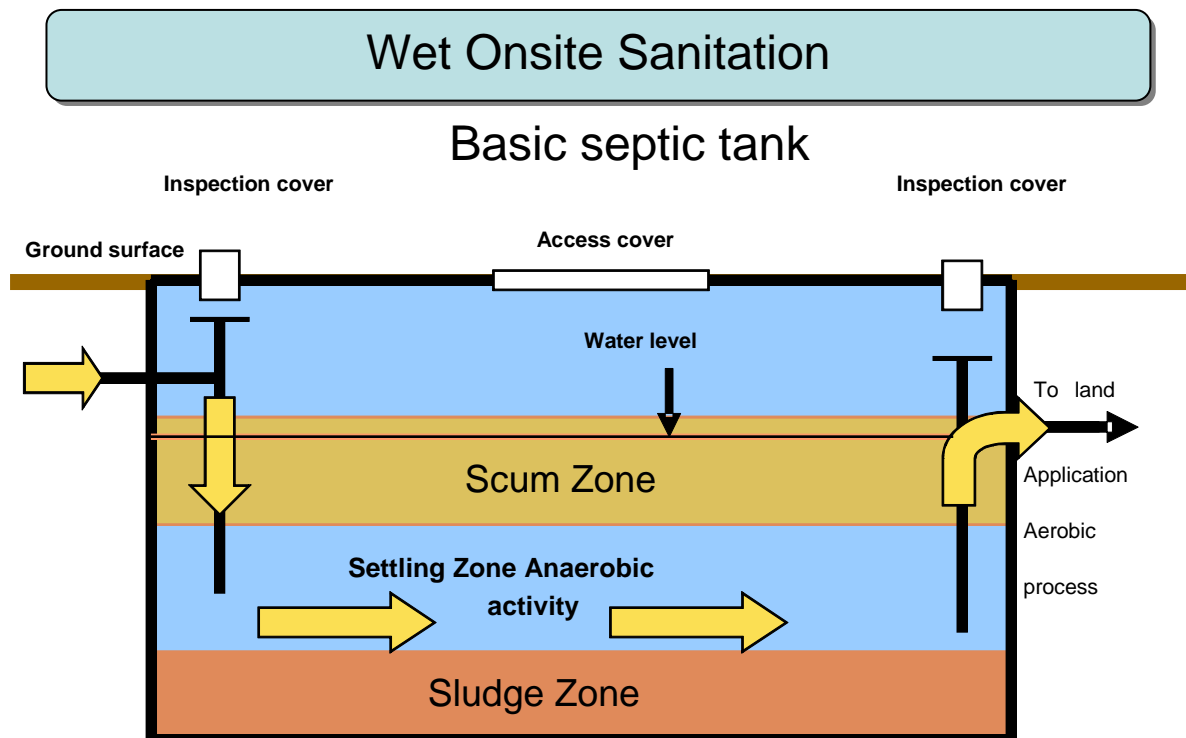
The foul water drains located inside a property's boundary will include pipes and fittings such as gully traps, and toilet and vent connections. In some cases special traps will be needed to be installed by a drainlayer, such as a grease interceptor trap for commercial premises which is required to protect the sewer main from blockages caused by the accumulation of fat in the sewer pipe.

A drainlayer may also need to install a pump if the drain from a property runs too far below the level of the council's foul water sewer to be connected.

The foul water sewer will carry foul water from a property's boundary to a waste water treatment plant. The waste water treatment plant will process the foul water and, once contaminants are treated and removed, the treated water will exit through an outfall into a body of water such as the sea or a river. Foul water from commercial premises can be toxic and may need to be collected from the source. Chemical waste that cannot be treated in New Zealand is sent for treatment overseas.

A property's on-site treatment system treats waste water (sewage) so that it can be safely disposed of within the property's boundaries. It will provide a hygienic environment and protect the public from water-borne diseases.

On-site treatment systems need to control smells and be easily maintainable.



An effective and correctly installed drainage system is essential for protecting public health and maintaining a pollution-free environment.

Common Work Processes

Work commonly carried out by certified drainlayers within the property boundary includes:

- storm water drains;
- soak pits;
- foul water drains; and
- septic tanks.

Storm water drains

Storm water drains receive rainwater run-off, which flows from house roofs via down pipes. The storm water drain is placed below ground level within the property boundary, and is designed so water falls away from the property and into either:

- a kerb channel
- the storm water sewer connection at the property boundary
- an approved outfall such as a soak pit.

Kerb channels

When it is raining you will see rainwater flowing from pipes into the concrete channels alongside the kerb, from where it flows along to a grating, which leads to the storm water sewer.

If there is no kerb, or no available channel outlet pipes, storm water drains may either connect directly to the storm water sewer or to an approved outfall such as a soak pit.

Soak pits

In rural areas, when there is no storm water sewer, a drainlayer will dig a number of soak pits in the ground. These pits are filled with large-sized gravel or aggregate and covered over.

The pits lie away from and downhill of the building, and collect discharge from down-pipes or storm water drains (the rainwater is left to soak into the ground).

Foul water drains

Foul water drains are installed below ground level within the property boundary, and slope until they reach either the foul water sewer connection at the property's boundary or a septic tank.

Septic tank

Septic tanks are installed by drainlayers in rural areas when there are no foul water sewer pipes connecting the property to a waste water treatment station.

Waste water from the property (including human waste) drains into the tank. Septic tanks contain bacteria that turn the sewerage solids into sludge while the liquids soak away into the ground. The

sludge that gathers in the tank is pumped out and correctly disposed of when the tank becomes full.

Work outside the property boundary

In some situations drainlayers will also work outside a property boundary in new subdivisions, for example when:

- laying and connecting a property to storm water and foul water sewers
- reticulating potable water supply mains.

When developing new subdivisions, the same trenches are often used for laying both potable water pipes and sewer pipes.

As the same drainlaying principles involved in on-property work also apply to sewers (just on a larger scale), drainlayers are frequently engaged to carry out off-property work. As such, drainlayers may also be engaged to reticulate the potable water supply as they lay the sewers.

The water mains and sewers are the property and responsibility of the network supplier, which is usually the local Council.

Accredited supply networks

Any company engaged to lay or connect drains to sewers, or to reticulate water mains, must prove to the network supplier their competence carry out the work. The network supplier will then allow that company to do the work by providing them with accreditation.

Work involved in laying drains for sewerage and reticulated water mains requires network supplier accreditation.



Client Base

Drainlaying work is carried out for two types of clients:

- directly; and
- by sub-contract.

Direct clients

The home owner or business owner hires the drainlayer directly and pays them for their work.

By sub-contract

A main contractor hires the drainlayer and pays them for their work. Examples of main contractors include:

- architects;
- builders;
- property management companies; and
- territorial authorities and network suppliers.

Supply Relationships

Drainlayers require a range of supplies, including:

- drain pipe and fittings;
- pre-made man holes, access chambers and surge tanks; and
- tools, equipment and materials.

Drainlayers may either deal with individual suppliers directly or through a merchant.

Manufacturer guarantees

Usually any company that manufactures or supplies fixtures, appliances, equipment, pipe or fittings will guarantee their product against failure under normal conditions for a set period of time.

Certain circumstances will cancel the guarantee, such as where:

- the product has been installed incorrectly;
- the product is misused or subjected to unduly harsh conditions; and
- the guarantee has not been properly registered through the completion and return of documents to the manufacturer.

Product training

Product training is provided to trades people involved in installation work by the supplier of appliances, equipment, pipe or fittings. Installers are trained in:

- how the product works;
- correct installation; and
- how to find and fix faults.

Often a drainlayer will not be allowed access to the product without having first received product training from the supplier. Upon completing this training a drainlayer can be certified as an accredited installer.

Trade accounts

Trade accounts are simply charge accounts that drainlayers open with merchants and suppliers of fixtures, appliances, tapware and equipment.

This allows drainlayers to purchase goods without the upfront payment of cash; instead the merchant sends the drainlayer a bill for “payment due” at the end of the month.

Trade discount

In return for shopping at a particular merchant, a drainlayer often receive a reduced price on some items. This is usually a set percentage less than the retail price of the goods. For example, with a 10% trade discount goods worth \$100 would be reduced to \$90.

Relationships with Other Trades

Drainlaying requires a current practicing license as issued by the PGDB. No unlicensed person is legally allowed to carry out drainlaying within a property boundary.

Like all construction-related trades, drainlayers cooperate with various other trades in the course of their work, including:

- builders and carpenters;
- plumbers; and
- site and housing sub-division developers.

Builders and carpenters

Builders and carpenters build the structures from which drains lead, such as houses and factories. Builders also arrange for the completion of outside surfaces by other contractors after the drainlayer has completed their work, such as the concreting of paths and driveways.

Plumbers

Drainlayers and plumbers must work closely when determining the location and connection of drains on a site.

Civil engineering companies

Civil engineering companies lay roads and streets. Drainlayers installing sewers and water mains must work closely with civil engineers to ensure that when pipes are laid for these services, they are correctly installed into excavations before being back-filled and the road surface laid.

Requirements of Industry Bodies

The drainlaying industry is controlled by various regulatory bodies, including:

- Ministry of Business, Innovation and Employment (MBIE)
- Plumbers, Gasfitters and Drainlayers Board.
- Standards New Zealand.
- Building consent authorities.
- Industry training organisations.
- Trade and professional associations.
- WorkSafe New Zealand (WorkSafe)

Industry bodies

When working in the plumbing, gasfitting or drainlaying trades in New Zealand, there are a number of industry bodies that have an impact on the way trades people work and provide their services. For the plumbing, gasfitting or drainlaying trades these include:

Ministry of Business, Innovation and Employment (MBIE)

The Ministry of Business, Innovation and Employment (MBIE) administers the Building Act and Building Code and also oversees a range of other building and housing related acts and regulations (including occupational licensing in the building trades).

They are also the government body responsible for the Plumbers, Gasfitters and Drainlayers Board.

Plumbers, Gasfitters and Drainlayers Board (PGDB)

The PGDB is a ministerially-appointed board which is tasked with promoting high quality-standards, professional conduct, and public health and safety in the plumbing, gasfitting and drainlaying trades. The PGDB administers a registration and licensing scheme for the certification of competent plumbers, gasfitters and drainlayers.

The PGDB's responsibilities include:

- setting and marking registration exams
- registering gasfitters
- issuing practicing licenses
- prosecuting unlawful drainlaying work.

Standards New Zealand (SNZ)

SNZ is an agency of the Standards Council, a Crown entity operating under the Standards Act 1988.

The majority of quality standards New Zealand are developed in partnership with Standards Australia, and set agreed minimal specifications for products, processes, services or performance in both countries.

New Zealand standards are used by a wide range of organisations to enhance their products and services, improve safety and quality, and meet industry best practices. Quality standards help to keep our homes, buildings, playgrounds and health services safe.

Building consent authorities

Building consent authorities are usually situated within city councils. They are the organisations responsible for issuing building consents, inspecting building work, issuing code compliance certificates and compliance schedules in order to ensure that all building work complies with the Building Act 2004.

Building consent authorities are responsible for:

- issuing building consents (particularly to plumbers and drainlayers)
- inspecting that work
- issuing defect notices if the undertaken work does not comply with regulatory standards
- approving the undertaken work when it does comply
- acting as network suppliers of water mains and sewers.

Trade and professional associations

Trade and professional associations provide industry information and trade upskill sessions to members. A major trade association in New Zealand is Master Plumbers, Gasfitters and Drainlayers New Zealand Incorporated, which was established in 1901 and has 16 regional associations. For more information visit www.masterplumbers.org.nz

Industry Training Organisations (ITOs)

Industry Training Organisations (ITOs) set the skill standards and arrange training for people employed in the industries the ITO is responsible for. Almost all apprentices in New Zealand are enrolled with an ITO.

The ITO for the plumbing, gasfitting and drainlaying trades is the Skills Organisation.

For more information visit skills.org.nz.

Job Roles and Training

Roles

Traditional roles within the drainlaying industry include:

- Trainee drainlayer; and
- Tradesman drainlayer; and
- Certifying drainlayer.

Trainee drainlayers

As they are only learning the trade, apprentice drainlayers must work under the direct supervision of a Certifying drainlayer for one year. They must also apply annually to the PGDB for a Limited Certificate licence.

Tradesman drainlayers

To become a Tradesman drainlayer you need to:

- Secure a placement with a Certifying drainlayer who is willing to train you.
- The employer and trainee must enter into a training agreement with the ITO.
- The ITO will uplift on your behalf a Limited Certificate licence and enrol the trainee into a national certificate approved course.
- Work must be carried out under the direct supervision of a Certifying drainlayer for a period of at least 12 months.
- Gain the National Certificate through completing all theory and practical requirements.
- Sit and pass the PGDB registration exam.
- Gain registration with the PGDB.
- Pay an annual licence fee.

Other roles:

There are other related roles where training and certification as a drainlayer may be an advantage, but is not necessarily a requirement, for example working as a supplier or merchant's sales representative, or for an ITO.

Training Requirements

For information on the licensing, registration and training of drainlayers see the Plumbers, Gasfitters and Drainlayers Board website (www.pgdb.co.nz) and the drainlaying industry's ITO, the Skills Organisation (skills.org.nz).