School of Construction, Electrical, Plumbing and Automotive Trades

NZ2660

New Zealand Certificate in Plumbing, Gasfitting and Drainlaying (Level 3)

Ākonga Handbook

NZ Certificate in Plumbing, Gasfitting and Drainlaying (Level 3)

Available on the Programme Site on Moodle

This document is correct at time of publishing – June 2026

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School Welcome

Neil McDonald (Head of School)

Nau mai, Haere mai. Welcome to the School of Construction, Electrical, Plumbing and Automotive Trades.
The School of Construction, Electrical, Plumbing and Automotive Trades is proud to offer the best range of trades training in the region. Our programmes provide learning opportunities in a comprehensive range of theoretical and practical skills directly related to the workplace and our graduates are in high demand throughout the many industries we support.

The School of Construction, Electrical, Plumbing and Automotive Trades offers you a learning environment that is as close to the real world as we can make it. Your learning will go beyond the classroom, and you will spend much of your time developing the hands-on skills which you will require if you are to succeed in your chosen field.

Learning at WelTec is a two-way partnership. You will learn from an experienced team of highly respected and professional tutors. They will do all they can to help you while you are here, but your success will not just depend on us.

You must bring with you a keen attitude to your studies, a willingness to learn, and respect for those around you who also wish to learn.

When you immerse yourself in your programme of study with energy and enthusiasm you will leave here with a qualification that will enable you to build your future. I wish you all the best for your studies.

Ngā mihi
Neil McDonald
Head of School

Use of Handbook

This handbook provides important information about your programme of study this year. It outlines what you can expect to achieve and regulations that you need to know about.

The Student Guide provides more information about the services that are available at WelTec to help you succeed in your studies. It refers you to policies and procedures that apply to ākonga. The Student Guide is available in a downloadable version on Moodle and the website and in a printed copy at the School Administration office.

Plumbing Team

Stig Brinkley (Programme Manager)

Tutors

Jason Hedley-Stevens
Stephen Dennis
Ron Heywood
Andrew Lyle
Lenard Pasene
Cody Thomas

Resources

Students to Supply/bring:

- Personal PPE equipment: Steel toe capped safety boots, earmuffs, gloves
- Pen
- Warwick 2B8 Exercise Book
- Pencil
- Pencil sharpener
- Eraser
- Compass
- Ruler
- Vivid
- 45° set square
- 60° set square

Programme Aim

The aim of this programme is to:

1. Provide learners/ākonga with a solid foundation to support them to assist qualified Plumbers, Gasfitters and Drainlayers and help meet the demand in the sector.
2. Allow learners/ ākonga to gain real world experience, skills and knowledge and utilise this, to contribute to the learning and achievement of the programme and the qualification.
3. Provide a quality body of learning that meets industry standards and requirements consistently.
4. Allow graduates to gain employment and/or progress to the Level 4 PGD apprenticeship programmes.

Graduate Outcomes

Graduates will be able to:

1. Apply good conduct, ethical, and legal practices to work in a plumbing, gasfitting, and drainlaying environment.
2. Apply safe working procedures and practices, and identify hazards in a plumbing, gasfitting, and drainlaying working environment.
3. Assist with the installation of basic plumbing, gasfitting, and drainlaying systems and components including the following: hot and cold water supply; sanitary plumbing of appliances and fixtures; foul water; drainlaying including associated components; basic sheet metal

Employment Pathways

Graduates *are **not*** qualified to practice as a plumber, gasfitter or drainlayer.

Graduates of this qualification may work as a plumbing apprentice, gasfitting apprentice, or drainlaying apprentice.

Graduates may also be able to work in a related area in the construction industry.

Pathways to Further Study

If Graduates gain an apprenticeship they may progress to:

- New Zealand Certificate in Drainlaying (Level 4)
- New Zealand Certificate in Gasfitting (Level 4)
- New Zealand Certificate in Plumbing (Level 4)

Programme Outline

The programme content includes safe working procedures and practices, the installation of basic plumbing, gasfitting, and drainlaying systems and components, patterns, tools, regulatory and ethical frameworks, excavating and trenching, water basics, water supply pipework, basic sanitary plumbing systems.

Course Code	Course title	Level	Credit	Compulsory or Elective
BD3144	Essential Safety Skills for PGD	3	14	C
BD3145	Drawings, Tools and Regulations	2	18	C
BD3146	Introduction to Drainlaying	3	13	C
BD3147	Introduction to Plumbing and Sanitary	3	17	C

Essential Safety Skills for PGD

This course provides learners with working knowledge of essential safety responses, and how to apply them in given situations.

Drawings, Tools and Regulations

This course provides learners with working knowledge of the regulatory and personal ethical framework, how to work alongside other trades in a worksite and obligations as an employee.

Introduction to Drainlaying

This course provides learners with an overview of drainlaying as a career and develops the knowledge and skills for excavation and trenching.

Introduction to Plumbing and Sanitary

This course provides learners with an overview of plumbing as a career, and the knowledge and skills related to water basics, water supply pipework and basic sanitary plumbing systems

This is a 60-credit programme, divided into four compulsory courses. There are sixty-two (62) unit standard credits embedded across the four courses.

Timetable

This programme is taught over 4 days 8.30am-3.00pm face to face each day.

Progress Through the Programme

This programme is completed in 17 weeks of study, full time, with an additional 2 x 1 week holiday break during the duration.

Award of Qualification

Learners/ākonga must successfully complete all four compulsory courses to be awarded NZ2660 New Zealand Certificate in Plumbing, Gasfitting, and Drainlaying (Level 3).
Our student guide contains more information about support during your study including information on financial support, careers advice, difficulties, disabilities and wellbeing, facilities, student spaces and services.

Teaching and Learning Methods

A variety of learning and teaching activities are planned throughout the programme to meet the learning outcomes of courses. These activities are allocated time within the overall programme hours and more specifically identified within each course.
Learning activities in the programme include:

Activity	**Description**
Classroom activities	Lectures, tutorials, individual and group work, role plays, simulated workplace learning, presentations
Online learning activities	Synchronous and asynchronous. Learner/ākonga participates in online discussion groups, engage in online exercises and formative assessment activities
Practical demonstrations	Learner/ākonga observes a range of practical skills demonstrated by the tutor to underpin practical components in courses
Guest speakers	Industry professionals or graduates share experiences with learners/ākonga of working in the relevant area/s of study
Simulated workplace	Learner/ākonga has opportunities to apply knowledge and skills in a controlled simulated industry setting
Assessment preparation	Learner/ākonga completes assignment/s on time, and is prepared for supervised assessments
Workshop	Learner/ākonga practices skills or develops outputs to meet assessment task requirements
Group study	Learner/ākonga works in groups to meet assessment task requirements
Independent study	Learner/ākonga engages in a variety of tutor recommended or self-selected materials to meet assessment outcomes
Information gathering, readings	Learner/ākonga discusses gathered information in tutor-directed activities, and in assessment (including evidence for portfolio)
Project work	Learner/ākonga works on projects to progressively achieve outcomes

Tutors advise students/ākonga of the activities relevant to each course in course outlines.

Assessment

The Plumbing, Gasfitting and Drainlaying Level 3 programme will be assessed using competency-based assessments. Theory and practical assessments will be assessed against course learning outcomes and assessment criteria and aligned with the graduate outcome practical competencies and knowledge requirements. Where there are associated unit standards the assessment will ensure that all unit standard outcomes are met.

Portfolios will be used extensively in this programme as a record of learning. A portfolio is a compilation of evidence presented by the student in a way that demonstrate their acquired knowledge, competencies and capabilities. Each course's portfolio will consist of several components/project outcomes and students will be required to complete and submit each component in order to pass the course.

The portfolio will demonstrate achievement of the learning outcomes and include, but not be limited to, evidence of:

- Successful project completion
- Teamwork and communication
- Industry standards (timekeeping, attendance, appropriate clothing)
- Health and safety practices

Learners/ākonga will meet all competency requirements in order to pass the course and can resit each component once. Each portfolio will be completed progressively, and key components summatively assessed throughout the course. The final product will be submitted at the completion of the course.

As indicated by the focus of the learning outcomes and assessment criteria, application of skills and knowledge is ensured through the use of projects and theory and practical assessment components that simulate plumbing, gasfitting and drainlaying workplace contexts and processes. These may include written assessments, presentations, reports, and group assessment activities that will require integration of knowledge and skills to demonstrate rounded learning in this discipline, and to deliver a quality customer experience.

Knowledge quizzes and other activities are used formatively to assist with knowledge and skill development.

Learners/ākonga will also be expected to demonstrate and maintain the standards required of a plumbing, gasfitting and drainlaying workplace such as teamwork, customer service, time management, decision making, effective communication, honesty, integrity, reliability, respect, and compliance with legal requirements. This will be assessed through tutor and peer observation.

Personal Responsibility

We are committed to providing a safe and positive learning and working environment for all learners/ākonga, so everyone can meet their learning goals. You can expect to be treated with fairness, dignity and respect by staff and other students. For further information on what we will provide and what is expected of you as a learner/ākonga please click here

Course Outlines

Code	Title
BD3144	Essential Safety Skills for PGD
Level	**Credits**
3	14
Learning hours	Total hours 140 (tutor-directed 90, self-directed 50)

Aim

The aim of this course is to provide the learner/ ākonga with a working knowledge of essential safety skills for plumbing, gasfitting, drainlaying and workplace obligations.

Learning outcomes

By the end of this course the learner/ākonga will be able to:

1. Manage first aid and basic life support in an emergency situation
2. Describe risks and safety measures for asbestos-related work in plumbing, gasfitting, or drainlaying contexts
3. Describe the properties, hazards and mitigations of gas contaminated environments in plumbing, gas-fitting, or drain laying contexts
4. Demonstrate the use of a safety harness system when working at height

Content

LO1

- Assessment and management of people to provide first aid, in an emergency, and to provide basic life support.

LO2

- Friable and non-friable asbestos, ACOP asbestos related terms, respiratory entry, disease risk, risk perception and protection.
- Legal rights and responsibilities, safe working practices.

LO3

- Types of gasses and hazards, main properties of gasses, dangers of working where gas is present, and safe working practices when working with solvents.
- Fire prevention, eliminating sources of ignition, gas fire actions, exposure to toxic gases, notification requirements of gas incursion.

LO4

- Fall hazard terminology, personal equipment faults & non-compliance.
- Safety harness hazards, different safety harness systems, associated equipment & compliance.
    - Checking a safety harness system, using a safety harness system, rescue planning, privacy

Assessments

Assessment Method	Learning Outcome/s
Portfolio of evidence	1 - 4

Successful completion of course

Learners/ākonga must pass all assessments to be competent in this course including carrying out all tasks in a safe manner and to industry standard

Resources

Stationery

Assessment Standards

Learners/ākonga will be assessed against the evidence requirements for the following standards:

Std #	Title	Level	Credit
6400	Manage first aid in an emergency situation	3	2
6401	Provide first aid	2	1
6402	Provide basic life support	2	2
21883	Demonstrate knowledge of working in gas contaminated environments in plumbing, gasfitting, or drainlaying	2	3
30596	Demonstrate knowledge of asbestos and safety measures for asbestos-related work	3	2
23229	Use safety harness system when working at height	3	4

Code	Title
BD3145	Drawings, Tools and Regulations
Level	**Credits**
2	18
Learning hours	Total hours 180 (tutor-directed 100, self-directed 80)

Aim

To provide learners with working knowledge of the regulatory and personal ethical framework, obligations as an employee, correct use and maintaining tools, draw and form simple patterns for sheet metal components and knowledge of confined spaces.

Learning outcomes

By the end of this course the learner/ākonga will be able to:

1. Describe ethical and legal considerations for plumbing, gasfitting, and drainlaying services.
2. Describe the regulatory framework for plumbing, gasfitting, and drainlaying.
3. Identify hazards and control measures in confined spaces when carrying out plumbing, gasfitting, and drainlaying tasks.
4. Draw and form simple patterns for plumbing or gasfitting sheet metal components.
5. Demonstrate the selection, use and maintenance of hand and power tools for work on plumbing or drainlaying jobs.

Content

LO1

- The ethical and legal responsibilities in relation to plumbing, gasfitting, or drainlaying services.
- Ethics and ethical behaviour in and around customers' properties, and on-site customer communication and interaction.
- Personal presentation, and behaviours that may lead to disciplinary action, health and safety obligations, and workplace practice in terms of workplace requirements.
- The roles and inter relationships of key stakeholders in the regulatory environment for the plumbing, gasfitting, and drainlaying sector.

LO2

- Key stakeholders in the regulatory environment, Acts, Regulations, Codes.
- Plumbers, Gasfitters and Drainlayers Board, classes of licenses.

LO3

- Description of confined space, permits, notification of associated work, supporting documents and system supports.
- Atmospheric hazards, other hazards, hazard identification and risk assessment.
- Communication channels, continuous visual monitoring, audio monitoring, testing requirements.
- Responsibilities and duties, record keeping and document control.

LO4

- Component dimensions, geometric information.
- Parallel line development, radial development, angled cut patterns.
- True shape pattern of an angled cut to a square component.
- Three-dimensional sheet metal components

LO5

- Hand tools (selecting, describing, using, maintaining).
- Portable power tools (selecting, describing, using, maintaining).

Assessments

Assessment Method	Learning Outcome/s
Portfolio of evidence	1 -5

Successful completion of course

Learners/ākonga must pass all assessments to be competent in this course including carrying out all tasks in a safe manner and to industry standard.

Resources

Stationery, Drawing Equipment (pencil, eraser, sharpener, compass, protractor).

Assessment Standards

Learners/ākonga will be assessed against the evidence requirements for the following standards:

Std #	Title	Level	Credit
21881	Describe ethical and legal considerations for plumbing, gasfitting, or drainlaying services	2	2
33431	Demonstrate basic knowledge of the regulatory framework for plumbing, gasfitting, and drainlaying	3	4
18426	Demonstrate knowledge of hazards associated with confined spaces	3	4
25413	Draw and form simple patterns for plumbing and gasfitting sheet metal components	2	3
30557	Select, describe, use, and maintain tools for plumbing or drainlaying jobs	2	4

Code	Title
BD3146	Introduction to Drainlaying
Level	**Credits**
3	13
Learning hours	Total hours 130 (tutor-directed 100, self-directed 30)

Aim

To provide learners with an overview of drainlaying as a career and to gain the knowledge and skills for excavation and trenching and inspection chambers.

Learning outcomes

By the end of this course the learner/ākonga will be able to:

1. Explain the concepts and principles underpinning excavation, trenching, and backfilling for plumbing and drainlaying, including notification requirements and collapse control.
2. Describe wet and dry inspection chambers
3. Demonstrate installation of inspection chambers for drainlaying work.

Content

LO1

- Explain
    - how to determine the position of the excavation or trench and allow for other services,
    - collapse control in respect of excavations,
    - excavation dewatering,
    - notification requirements and procedures for excavation and trenching,
    - the concepts and principles underpinning excavation, trenching, and backfilling for plumbing and drainlaying.
- Excavate and trench for plumbing, gasfitting or drainlaying:
    - determine the lines and levels
    - determine the position of the excavation or trench,
    - excavate to a stable sub-base,
    - carry out backfilling and clear the site.

LO2

- Drain access chambers, jointing pipework.
- Wet and dry inspection chambers, soundness tests, protection

LO3

- Inspection chambers, installation of channel, invert level, jointing pipework, lid and adjustment rings

Assessments

Assessment Method	Learning Outcome/s
Portfolio of evidence	1 - 3

Successful completion of course

Learners/ākonga must pass all assessments to be competent in this course including carrying out all tasks in a safe manner and to industry standard.

Resources

Calculator, Stationery, PPE (boots), earmuffs, gloves

Assessment Standards

Learners/ākonga will be assessed against the evidence requirements for the following standards:

Std #	Title	Level	Credit
30532	Demonstrate knowledge of excavating and trenching for plumbing, gasfitting, or drainlaying	3	5
30533	Position, excavate, and backfill excavations and trenches for plumbing, gasfitting, or drainlaying	3	4
30534	Demonstrate knowledge of wet and dry inspection chambers	3	2
30535	Install inspection chambers	3	2

Code	Title
BD3147	Introduction to Plumbing and Sanitary
Level	**Credits**
3	17
Learning hours	Total hours 170 (tutor-directed 120, self-directed 50)

Aim

To provide learners with an overview of plumbing as a career and the knowledge and skills related to water basics, water and gas supply pipework and basic sanitary plumbing systems.

Learning outcomes

By the end of this course the learner/ākonga will be able to:

1. Describe the properties of water, material properties and considerations, including less frequently used materials in plumbing and drainlaying
2. Identify objectives, fixtures, appliances and components used within foul water sanitary plumbing systems.
3. Demonstrate ability to prepare and install basic sanitary plumbing systems
4. Demonstrate ability to mark, cut, join, and test pipework for plumbing, gasfitting and drainlaying

Content

LO1

- The properties of water including:
  - density,
  - energy transfer,
  - qualities of potable, grey, recycled, and foul water.

- Less frequently used materials in plumbing and drainlaying and:
  - when less frequently used materials should and should not be used in plumbing or drainlaying projects,
  - the compatibility and protection considerations of materials.

- The application of less frequently used materials used in plumbing and drainlaying
  - The situations in which the materials are appropriate for use in a plumbing and/or drainlaying project.
  - The situations in which the materials should not be used in a plumbing and/or drainlaying project.

LO2

- Plumbers, Gasfitters and Drainlayers Act 2006, New Zealand Building Code Clause G13 Foul water.
- Sanitary fixtures and appliance types, functions of components, positions of fixtures, appliances and components.

LO3

- Sanitary plumbing system - layout drawings, component functions, schedule of quantities.
- Foul water system - pipework dimension information, marking and cutting pipes, pipe joints, soundness tests.
- Water supply pipework systems - layout drawings, component functions, schedule of quantities.
- Water supply pipework system - pipework dimension information, marking and cutting pipes, pipe joints, soundness tests.
- Installing sanitary fixtures – determining & recording position, securing and connecting fixtures, installation and commissioning tests.

LO4

- Water supply pipework - pipework dimension information, marking and cutting pipes, pipe joints, soundness tests.
- Gas supply pipework - pipework dimension information, marking and cutting pipes, pipe joints, gastight tests.
- Drainlaying pipework – excavation, sub-base, base material, marking and cutting pipes, positioning, installing, connecting pipework, soundness tests.

Assessments

Assessment Method	**Learning Outcome/s**
Portfolio of evidence	1 -4

Successful completion of course

Learners/ākonga must pass all assessments to be competent in this course including carrying out all tasks in a safe manner and to industry standard.

Resources

PPE (boots), earmuffs, gloves and stationery.

Assessment Standards

Learners/ākonga will be assessed against the evidence requirements for the following standards:

Std #	**Title**	**Level**	**Credit**
30616	Demonstrate knowledge of water, material properties, and of less frequently used materials in plumbing and drainlaying.	3	3
25419	Demonstrate knowledge of sanitary plumbing systems and components	3	3
30555	Install basic sanitary plumbing systems	3	5
25421	Mark, cut, join, and test pipework for plumbing, gasfitting and drainlaying	2	6