

## Programme of Industry Training Details

<p>NZQA has approved the programme of industry training in line with NZA requirements.</p>			
<b>Provider name</b>	Apprentice Training New Zealand (ATNZ)		<b>MoE number</b> 7741
<b>Programme of Industry Training Title</b>	New Zealand Apprenticeship in Refrigeration and Air Conditioning (Trade) (Level 4)		<b>Programme ID</b> 118389-4
<b>Level</b>	4	<b>Credits</b>	282
<b>NZSCED code and classification</b>			
031315	Engineering and Related Technologies>Electrical and Electronic Engineering and Technology>Refrigeration, Heating and Air Conditioning		
<b>Qualification to which the programme leads</b>			
New Zealand Certificate in Refrigeration and Air Conditioning (Trade) (Level 4) [Ref: 2366-2]			
<b>Aim of Programme of Industry Training</b>			
<p>The purpose of this apprenticeship is to provide the Refrigeration and Air Conditioning (RAC) industry with skilled tradespeople that are able to independently install, maintain, service, and commission plant and equipment to industry standards.</p> <p>This programme will be delivered in a workplace environment as a New Zealand Apprenticeship.</p>			
<b>Entry Requirements</b>			
<p>Entry to this programme is open, however it builds on the New Zealand Certificate in Refrigeration and Air Conditioning (Trade Assistant) (Level 3) [Ref: 2365]. It is recommended candidates enrolling in programmes leading to this qualification hold the National Certificate of Educational Achievement (Level 2) [Ref: 0973].</p>			

Apprentices must be engaged in a work environment in a role which provides the opportunity for them to meet the graduate outcomes of the qualification, in an industry under the gazette coverage of Te Pūkenga Work Based Learning Limited.

Applicants must be employed by an organisation in the Refrigeration and Air Conditioning industry.

## Learning outcomes and programme outline

This apprenticeship has been developed to meet the qualification graduate outcomes.

The learning outcomes will develop on the job, in response to the apprentice journey. This programme will enable apprentices to gain advanced technical knowledge and skills relevant to their role in the Refrigeration and Air Conditioning industry and will be reinforced through application in a commercial environment.

The relevant skills and knowledge are defined by the requirements of the graduate outcomes in the qualification. Each graduate outcome has been assigned unit standards which meet those requirements.

- This apprenticeship includes lower level standards below Level 4 in the core graduate profile outcomes.
- The requirements of the qualification will be met through the integration of the graduate profile outcomes across the delivery to ensure all graduate profile outcomes are met at the level of the qualification, this will be achieved through a structured apprenticeship training plan.
- Graduate profile outcome 8 has no specific unit standard(s) to meet its requirements. Instead the relevant skills and knowledge required to meet this outcome have been identified in certain performance criteria of unit standards that are contained within the programme. These unit standards and their performance criteria are listed against outcome 8.

There is no particular order in which apprentices are required to achieve unit standards; however it is recommended that unit standards relating to safety are completed prior to any practical assessments. Training towards and assessment of unit standards are completed based on operational and training requirements of the employer.

Learning and assessment takes place on and off-job. Off-job includes block courses offered through training providers including certification in areas such as first aid, and eLearning.

Assessments of unit standards are achieved by completing theory questions, providing evidence such as drawings, job cards, photos and/or the apprentice being observed by an assessor or verifier completing a task(s). These assessments are captured either through assessment guides or via on-line portal as part of eLearning.

The programme in which the apprentice enrolls in is identified in consultation with the apprentice's employer, and a training plan for each apprentice is created between the employer, apprentice and a Te Pūkenga Work Based Learning Limited Training Advisor. The training plan details the agreed unit standards and duration of the training which meet

the requirements of the programme and the needs of the employer and apprentice. Te Pūkenga Work Based Learning Limited Training Advisors actively manage the progress of apprentices. This is supported by at least 4 visits annually to the workplace and quarterly reporting to ensure that apprentices are steadily progressing through the programme to meet the training plan milestones. Each visit is followed by a 'Visit Summary Report' (captured in our customer relation management tool Smart TMS) which outlines how the apprentice is progressing, any observations, when the next visit will take place and any goals and targets which need to be achieved. A copy of the report is provided to the employer and apprentice.

It is expected that fundamental health and safety awareness will be a focus at the start of the programme, and further embedded in all on-job and off-job learning throughout the duration of the programme.

It is also expected that employers comply with all relevant employment, health and safety, privacy and human rights legislation. This is achieved through provision of an adequate induction into the job, appropriate supervision and a safe working environment for the Apprentice.

Graduates must hold both a WorkSafe Approved Filler Test Certificate and an Electrical Workers Registration Board's Electrical Service Technician (EST) Practising Licence to be awarded the qualification this apprenticeship leads to.

RAC plant and equipment may include: Basic installations such as domestic refrigerators; heat/energy recovery units. Complex installations such as; Commercial air conditioning plant found in multi-story buildings; Commercial refrigeration equipment similar to that found in a supermarket; Domestic refrigerators; Heat/energy recovery units; Temperature controlled transport systems; industrial single or multi-staged refrigeration and air conditioning systems; or temperature and environmental control equipment in the food processing industry.

### Assessment standards aligned with qualification outcomes

Core Outcomes	Assessment standards	Level	Credit	
The following unit standards are common to graduate profile outcomes 1, 2 and 3. Additional unit standards specific to each graduate profile outcome are listed below.				
1. Plan, troubleshoot, recondition, and test when maintaining and servicing a range of RAC plant and equipment. Credits 90	2395	Demonstrate and apply knowledge of the selection, use, and care of engineering hand tools	2	4
	2396	Demonstrate and apply knowledge of the selection, use, and care of portable hand held engineering power tools	2	4
2. Apply engineering trade skills and knowledge to plan, install, and test a	29655	Manually produce engineering sketches	2	3

range of RAC equipment in accordance with industry and statutory standards. Credits 55 3. Commission basic installations, and work with specialists to commission a full range of complex RAC plant and equipment. Credits 40	30080	Join ferrous and non-ferrous metal components by torch brazing	3	6
	29550	Demonstrate basic knowledge of common engineering metals	3	3
	29549	Demonstrate basic knowledge of the mechanical properties and selection of engineering materials	2	3
	29397	Demonstrate knowledge of basic trade calculations and units of measure for mechanical engineering trades	2	4
	29674	Demonstrate knowledge of mechanical fasteners used in mechanical engineering	2	3
	28970	Demonstrate the knowledge of the principles of refrigeration and air conditioning	3	15
	31809	Fabricate and assemble components for refrigeration or air conditioning systems under supervision	2	8
	31810	Install refrigeration and/or air conditioning system components under supervision	2	6
	23959	Prepare and purge braze piping for refrigeration and air conditioning	3	4
	28960	Demonstrate the knowledge of the principles of commercial RAC system maintenance and servicing.	3	8
The following unit standards are explicit to the GPOs identified				
1. Plan, troubleshoot, recondition, and test when maintaining and	28955	Diagnose and rectify faults in commercial RAC systems and equipment under supervision	3	8

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servicing a range of RAC plant and equipment. Credits 90	28965	Maintain and service commercial RAC systems and equipment under supervision	3	12
	Select a minimum of 40 credits from the following:			
	3847	Maintain industrial refrigeration systems	4	20
	3851	Service commercial refrigeration and/or air conditioning systems	4	20
	3852	Service industrial refrigeration systems	4	25
	3846	Maintain commercial refrigeration and/or air conditioning systems	3	20
	28956	Maintain and service RAC systems and equipment in controlled temperature transport applications	4	20
2. Apply engineering trade skills and knowledge to plan, install, and test a range of RAC equipment in accordance with industry and statutory standards. Credits 55	28963	Install commercial RAC equipment under supervision	3	8
	21913	Lift loads in engineering installation, maintenance, and fabrication work	2	2
	Select a minimum of one unit standard from the following:			
	22707	Install commercial refrigeration and/or air conditioning systems	4	20
	3837	Modify industrial refrigeration systems	4	20
	28957	Install commercial RAC equipment and systems in controlled temperature transport applications	4	20
3. Commission basic installations, and work with specialists to commission a full range of complex RAC plant and equipment. Credits 40	28959	Demonstrate knowledge of installation and commissioning procedures for commercial RAC equipment	3	8
	29100	Commission commercial RAC equipment under supervision	3	8
	Select a minimum of 20 credits from the following:			
	3841	Commission commercial refrigeration and/or air conditioning systems rated below 50 kilowatts	4	20

	3842	Commission industrial refrigeration systems	5	25
	28958	Commission RAC systems for controlled temperature transport applications	4	20
	28969	Commission commercial RAC systems rated above 50 kilowatts	5	25
4. Apply knowledge of RAC system design and applications to daily tasks, and to meet job and organisation requirements.  Credits 10	28962	Demonstrate knowledge of design principles for commercial RAC systems	4	5
	28966	Apply design principles to the design of basic commercial RAC systems	4	5
	28954	Interpret drawings and produce sketches for refrigeration and air conditioning systems and components	3	3
5. Apply knowledge of the use and management of refrigerants in the RAC industry to safely meet all relevant environmental, legislation, and regulation requirements, when recovering refrigerant into a cylinder, or charging a refrigeration system.  Credits 20	19666	Demonstrate knowledge of refrigerants and their effect on the environment	3	4
	28952	Demonstrate knowledge of refrigerants and their management	3	5
	28953	Demonstrate advanced knowledge of refrigerants and their management	4	5
	28950	Meet requirements for Approved Filler Test Certificate for refrigerants	3	3
6. Carry out electrical work associated with the installation, maintenance, servicing and commissioning of refrigeration plant and equipment.  Credits 50	750	Demonstrate knowledge of electrical test instruments and take measurements	2	2
	15852	Isolate and test low-voltage electrical subcircuits	2	2
	30658	Demonstrate knowledge of fundamental electrical safety in the workplace	2	2
	25070	Explain the properties of conductors, insulators, and semiconductors and their effect on electrical circuits	2	7
	25071	Demonstrate knowledge of electromotive force (e.m.f.) production	2	3
	25072	Apply electromagnetic theory to a range of problems	2	5



	28964	Apply knowledge of electrics and electronics to the installation and maintenance of RAC systems under supervision	3	6
	28961	Demonstrate knowledge of electrical and electronic components used in commercial RAC systems	3	6
	27351	Demonstrate knowledge of theory and legislation for registration of electrical appliance servicepersons	3	3
	27349	Demonstrate knowledge of theory and legislation for registration of electrical service technicians	3	3
7. Apply knowledge of the relevant Health and Safety legislation and workplace safety culture in order to work safely and responsibly in a commercial environment.  Credits 10	29675	Demonstrate knowledge of safety when lifting loads in engineering installation, maintenance, and fabrication work	2	2
	29652	Demonstrate knowledge of safety, health, risk assessment, and hazard ID and control on an engineering worksite	3	3
	21911	Demonstrate knowledge of safety on engineering worksites	2	2
	21912	Apply safe working practices on an engineering worksite	2	2
	6401	Provide first aid	2	1
	6402	Provide basic life support	1	1
	28968	Demonstrate knowledge of legislation and codes of practice that apply to RAC, and mechanical building services	3	5
8. Self-manage on-going learning, and maintain the professional standards required for the RAC industry.  Credits 5	There are no specific unit standards aligned to this graduate profile outcome, however the following unit standards have been identified as contributing to this outcome:  30080 (PC4.1, 4.2, 4.3), 28970 (PC4.2, 5.1, 5.2, 5.3), 23959 (PC3.2, 3.3, 3.4), 28960 (PC1.1, 1.2, 2.1, 2.2), 3841 (PC1.1, 1.4, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6,), 3847 (PC1.3, 2.5, 3.8, 4.4, 5.6, 6.7, 7.3, 8.4, 9.4), 3837 (PC1.2, 1.5, 2.7, 2.8,3.4) 3851 (PC3.2, 4.4, 6.2), 3852 (PC1.3, 3.1, 4.2),			

	<p>3846 (PC1.3, 2.5, 3.8, 4.4, 5.8, 6.7, 7.3, 8.4, 9.4), 22707 (PC1.2, 1.5, 2.6, 2.7, 2.8) 28956 (PC1.5, 2.3, 6.2, 6.4.), 28957 (PC1.2, 1.6, 2.4), 30472 (PC1.2, 2.2, 2.5) 28958 (PC1.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8), 28969 (PC1.1, 1.4, 2.2, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6)</p> <p>The relevant evidence requirements or performance criteria are noted next to the unit standards identified above.</p> <p>As a Level 4 programme of industry training a learner is responsible for self-management of learning and performance, as per NZQF Level Descriptors.</p>
<p><b>Training arrangements and support</b></p>	
<p>This programme is recognised as a New Zealand Apprenticeship, and as such Te Pūkenga Work Based Learning Limited carries out an assessment of the company and apprentice to ensure the right skills and knowledge are learnt in a supportive environment by an apprentice.</p> <p>Apprentice compatibility and requirements:</p> <ul style="list-style-type: none"> <li>- A Te Pūkenga Work Based Learning Limited Training Advisor will engage in a conversation with the apprentice to ensure they understand their responsibilities, where to go for help and the importance of progressing at a steady rate to complete within the timeframe required.</li> <li>- The apprentice will be required to complete a 15 -20 minute test with a Te Pūkenga Work Based Learning Limited Account Manager which assesses the apprentices reading, writing and comprehension ability. This test includes mechanical aptitude, reasoning and number skills. It identifies areas of weaknesses so that extra support can be offered where it is required. Extra support may include advising the employee and employer of Literacy and Numeracy Providers that can offer specialist support.</li> </ul> <p>Company compatibility and requirements:</p> <ul style="list-style-type: none"> <li>- Employers will need to provide access to the equipment required to allow on-the-job learning and assessment to take place. If the employer does not have the required equipment on site, an agreement can be put in place for the apprentice to complete the unit standards elsewhere.</li> <li>- The apprentice will need to have access to eLearning via use of a personal computer or laptop within their workplace or their home environment.</li> <li>- Employers are required to support their apprentice’s learning throughout the training programme through allocation of suitable workplace tasks, on-job training by a designated trainer and supervision. The level of supervision will be adjusted as apprentices develop their skills, knowledge and confidence through the programme.</li> </ul> <p>Te Pūkenga Work Based Learning Limited support to the apprentice and employer:</p>	



- Access to progress reports.  
Employers have access to real-time data on their apprentice’s progress through the programme via an Employer Portal.
- Organisation of block courses and distance learning.
- Active management of apprentice progress by Te Pūkenga Work Based Learning Limited Training Advisors.  
This is supported by visits to the workplace to ensure that apprentices are steadily progressing through the programme to meet the training plan milestones. The frequency of visits is dependent on the apprentice’s capability and the employer’s ability to support their apprentice’s progression, and is adjusted as appropriate throughout the apprenticeship.
- Provision of assessment material for all on-job components

### Transition Arrangements

The following exemptions are available for those who need to transfer to version 2 of the qualification to which this programme leads. The table includes exemptions arising from earlier replacement of standards.

Credit For	Exempt From
15843	25070, 25071, and 25072
15851	30658
22701	28952, 28970
22702	28959, 28963, 29100
22703	28961 and 28964
22704	28960 and 28965
22705	28962 and 28966
20917	29549
20799	29550
21909	29674
21905 and 21908	29397
2430	29655

It is not intended that anyone be disadvantaged by transitioning to this programme, and the above arrangements have been designed for a smooth transition. However, anyone who feels that they have been disadvantaged may appeal to Te Pūkenga Work Based Learning Limited.

## Learning and Assessment methods

The following learning and assessment methods apply to this programme.

### Learning Methods

Learning will take place on-job by completing day to day tasks under supervision, by attending off-job training with a training provider, the use of workbooks or a combination of all three methods.

- On-job training enables apprentices to develop job-related skills by watching colleagues, emulating their behaviours and practicing under supervision. It also involves mentoring from supervisors, workplace trainers, or other personnel delegated by the employer.
- Training Providers with structured and approved courses give learners the opportunity to develop new skills they can take back into the workplace. Courses provide all apprentices with the same skill set regardless of their workplace experience and ensures all learners have relevant and transferable skills. The courses may be a combination of classroom tuition and workshop practice with the emphasis on development of technical skills and the embedding of learning.
- Workbooks provide the apprentice with information and practice activities to assist them to prepare for both theory and practical assessments.

### Assessment Methods

Assessments can be written (theory), observation (practical) or a combination of both. Assessment workbooks outline which unit standard the assessment leads to, under what conditions the learner will be assessed, and methods used to assess the apprentice.

- Theory assessments are comprised of questions linked to unit standard evidence requirements. The answers to the questions can be written in the assessment workbook by the apprentice, or the questions can be asked verbally and the answers recorded by the assessor.
- Practical assessments are guided by checklists that identify the tasks the apprentice must perform and the expected standards. The assessment workbook defines whether the apprentice's supervisor, manager or an assessor must complete the checklist to attest that the apprentice has met the required standards and conditions. Most practical assessments are carried out on-the-job.

All assessment workbooks are accompanied by a schedule containing model answers for use by assessors. These contain exemplars for answers to guide assessors' judgements with regard to the type of answer, length, and the level of detail expected.

## Consistency of Graduate Outcomes

Te Pūkenga Work Based Learning Limited will monitor the performance of graduates in the real world to demonstrate the consistency of graduate outcomes by:

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- ensuring programmes continue to meet current industry needs through ongoing consultation at the Sector and Technical Advisory group levels.
- utilising Industry Subject Matter Experts in our Product development and review processes
- operating systematic and robust quality assured assessment practices
- collecting workplace evidence including both graduate and employer feedback, using surveys demonstrating that graduates meet the graduate profile outcomes
- any other relevant evidence as appropriate.

### Indicative duration of Programme of Industry Training

Number of months	36 – 48 months
Total learning hours	2800