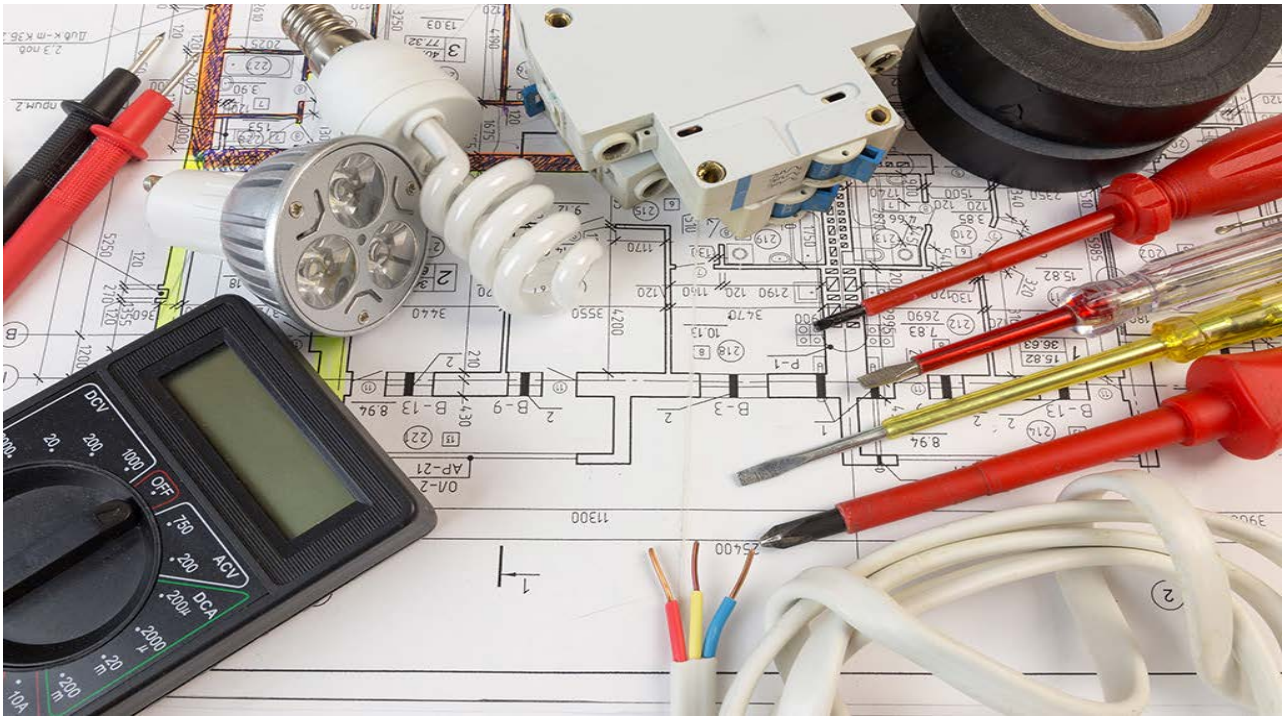
10809NAT - Course in Electrician – Minimum Australian Context Gap

Guide to program and structure of delivery at the

Australian Trade Training College

Banyo Australia



Contents

Contact details

Hello all,

The Australian Trade Training College welcomes your interest in the 10809NAT – Course in Electrician – Minimum Australian Context Gap program.

The NAT10809 Course is delivered by the Australian Trade Training College under licence from EnergySpace the course owner from instructions by Trades Recognition Australia.

Congratulations on successfully completing a skills assessment conducted by a Trades Recognition Australia (TRA) approved Registered Training Organisation (RTO) for the technical component for the *UEE30820 - Certificate III in Electrotechnology Electrician* qualification or its successor. On being issued with an Offshore Technical Skills Record (OTSR) you meet the eligibility for entry into this course.

For further details please contact;

Australian Locations

Australian Trade Training College Ltd
294 Scarborough Rd
Scarborough QLD 4020

17 Armada Place
Banyo, QLD 4740

Contact details

Phone: +61 7 3414 5999

Email: training@attc.org.au

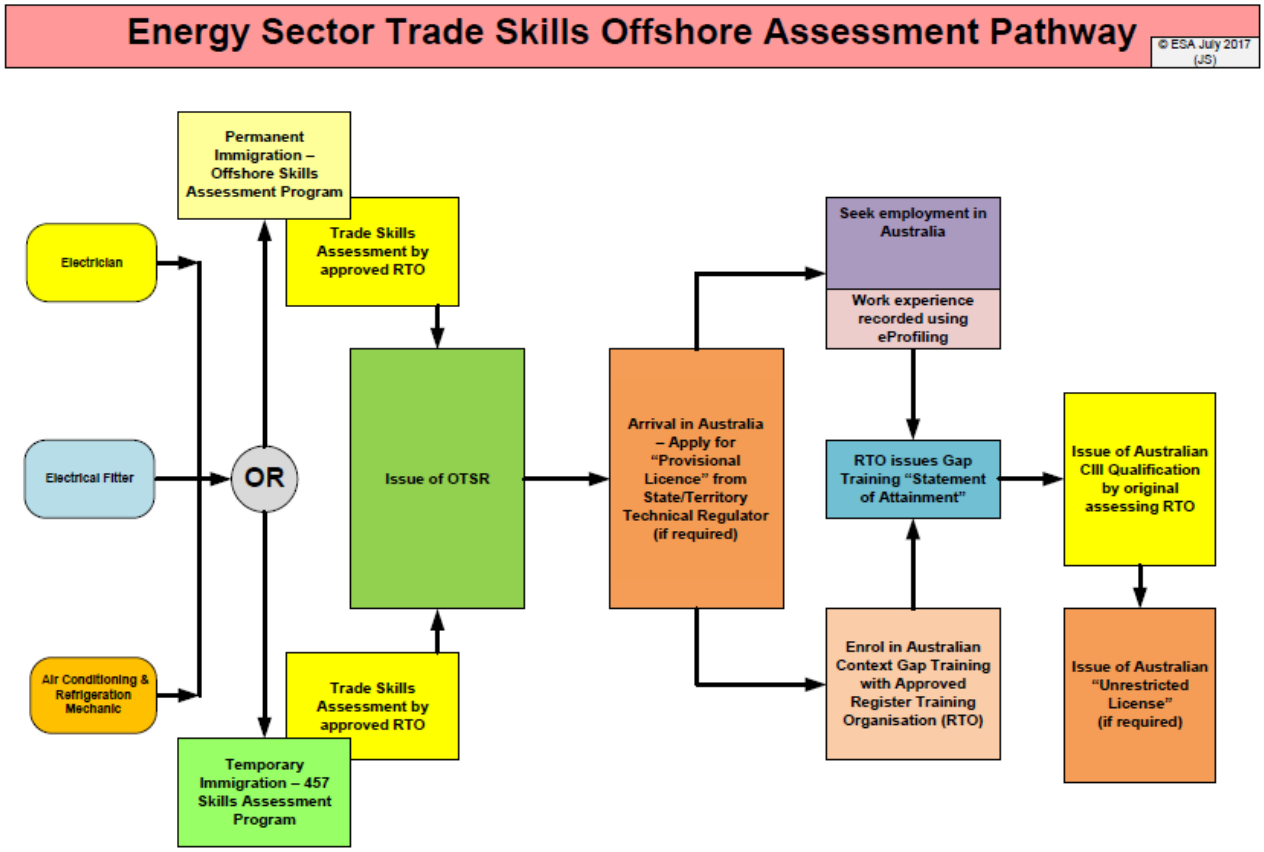
UK office

48 Haven Green
Ealing Broadway, United Kingdom W5 2NX

Local: 020 3780 2437
International: +44 (0) 20 3780 2437

(Note: No training is undertaken in the UK for this program)

Trade Skills Offshore Pathway



Information on the Minimum Australian Context Gap Training course

This document provides guidance and relevant information regarding how to progress towards completion of the Certificate III qualification and issuance of the occupational licence, as well as other useful information you may need to know about the Australian Electrotechnology Industry and training

A licence is required to work in all states and territories and an OTSR statement entitles the holder a provisional or temporary licence as an Electrician, subject to meeting other licencing requirements in the local state or territory. This is covered in the following section of this document.

The licensing of electricians follows a relatively uniform format across all States & Territories of Australia. This means that all training is done to a similar standard and aligns to the agreed 55 Essential Capabilities for electrician workers as set down by the Australian ***ELECTRICAL REGULATORY AUTHORITIES COUNCIL (ERAC).***

'The RTO must deliver the necessary training and assessment services and the candidate must achieve the 55 specified Essential Performance Capabilities prescribed for Licensed Electricians".

This necessity permits the movement of licence holders both geographically and from industry sector to sector (e.g. from mining electrical maintenance to electrical contracting in the construction industry) from time to time.

To achieve the full qualification for the Certificate III in Electrotechnology Electrician, Australian context training, which focuses on the relevant Australian content and standards, can only be finalised in Australia.

A period of supervised work experience in Australia is also needed before you meet the qualification requirements and can apply for a full licence. This will be covered in depth in following sections.

The Minimum Australian Context Gap (MACG) training program will include*:*

- Gaining required skills and knowledge from a RTO.
- Completing work experience under appropriate supervision and recorded using an approved workplace recording system.
- Passing a compliance assessment that covers verifying the safety and compliance of electrical installation wiring and equipment including all the relevant and mandatory tests, in accordance with the relevant standards of the states and territories.

When an candidate completes his/her training and applies to the local Licensing Authority for an electrician licence, the key issue that has to be considered in each case is whether or not the applicant has attained sufficient knowledge, comprehension and practical skills to be able to work safely and competently in an Australian industrial environment, with minimal to no supervision.

As part of the process in obtaining a competent outcome in the program, an agreement between the employer and the candidate is required by the registered training organisation to show that competency has been achieved. This is done through the online log book system known as Exemplar Profiling or through use of a form called a *third party verification* document which is simply asking that you the supervisor / employer agrees that the candidate can do a particular skill to acceptable industry and organisation standards.

Overview of the process

STEP 1 - Provisional occupational licence/permit

The Onshore/Offshore Technical Skills Record (OTSR) lists the technical skills that have been demonstrated against the UEE30820 - Certificate III in Electrotechnology Electrician qualification or its successor. However, there is an 'Australian knowledge' gap that needs to be bridged to meet all the competency standard units comprising the qualification and to meet the full requirements of the UEE30820 qualification or its successor.
Australian Electrical Industry regulators have agreed to issue a provisional (restricted) licence upon presentation of an OTSR. This permit allows candidates to work in Australia under the

supervision of an employer, while the 'Australian knowledge' component of each competency standard unit is completed.
The contact details for each Australian state and territory Electrical Industry licensing regulator is included in Table 1
Regulators will be able to advise you about any specific licensing requirements for that state or territory.

Step 2 – Find an employer

Once you have arrived in Australia you must find an employer. An employer can be found via a number of ways:

- Check the jobs sections of local newspapers
- Check employment websites
- Contact your local Employer/Employee Association
- Centrelink Job search

Table 2 lists the contact details for Electrical Industry Employer and Employee representative associations.

STEP 3-Enrol at an RTO

Registered Training Organisations (RTOs) such as the Australian Trade Training College will view the OTSR as evidence of your prior learning contributing to the Certificate III qualification.

The Australian Trade Training College will deliver the identified MACG training to meet the qualification and, licensing requirements. This training is provided for a fee that is listed in a following chapter.

Step 4 – Gap Training Course

The RTO will deliver the identified MACG training and collect evidence of your on-the-job experiences with an employer via the Exemplar Profiling system.

The MACG training will cover:

a) Required skills and knowledge for Australian standards

b) Completing the work experience/performance requirements

c) A final compliance assessment

a) Required skills and knowledge – The Australian Trade Training College will deliver training for;

- Workplace Health and Safety (WHS)/ Occupational Health and Safety (OHS) in Australia
- Responsibilities in working in an Australian Competency Based Training (CBT) context
- Meet the reading, writing and numeracy indicators of skills/competencies in each competency standard unit
- Electrical Safe Working Practice inclusive of applicable local regulatory tests
- Multiple Earth Neutral (MEN) system
- Electrical Equipment and Systems – Protection Methods and Devices
- Electrical Equipment and Systems – Testing and Verification

b) Work experience/performance

To be undertaken, holding a 'provisional licence' with an employer in the workplace, with appropriate supervision and recorded in Exemplar Profiling.

Aspects to be addressed include:

- Meeting the language, literacy, and numeracy requirements of each competency standard unit.
- Responsibilities of working in an Australian Competency Based Training (CBT) context.
- Repair, maintenance and alteration of existing wiring and equipment installation in accordance with AS/NZS 3000_Australia/New Zealand Wiring Standards and related standards
- Multiple Earth Neutral (MEN) system
- Standards and codes of practice for working with electrical systems and equipment.
- Verification and testing of systems wiring and equipment.
- Local service and installation rules
- Workplace Health and Safety (WHS) / Occupational Health and Safety (OHS) and environmental requirements.

c) Final Compliance Assessment

Undertaking a final compliance assessment that is in accordance with the relevant regulatory and industry policy to cover:

- Verification of the safety and compliance of existing electrical installation wiring and equipment, including the relevant and mandatory tests in Australia and in accordance with the relevant requirements of the jurisdiction.

STEP 5 - Workplace Evidence

Australian regulators require evidence that broad experience has been gained on-the-job and require this evidence to be formally gathered and documented. The industry endorsed method of gathering this evidence is the Exemplar Profiling system.

Exemplar Profiling ® is an innovative electronic workplace skill development tracking system that records and reports on the work experiences of the learner. Exemplar Profiling ® works by regularly measuring the progress of a learner against industry agreed predetermined advisory targets directly linked to national competency standard units.

As part of this gap training process, you are required to register on the Exemplar Profiling ® (e-Log Book) system. Please talk to your RTO delivering the gap training to register for Exemplar Profiling or alternatively you can contact the Exemplar Profiling National Office on 02 6100 2147 or visit www.energyspace.com.au for more information. Once you have registered, you will be issued an e-Log Book registration code and password to allow you to record your workplace experience

Provisional occupational license/permit

The Offshore Technical Skills Record (OTSR) lists the technical skills that have been demonstrated against the UEE30820 - Certificate III in Electrotechnology Electrician qualification or its successor.

However, there is an 'Australian knowledge' gap that needs to be bridged to meet all the competency standard units comprising the qualification and to meet the full requirements of the UEE30820 qualification or its successor. This is the content that is delivered within this program.

Australian Electrical Industry regulators have agreed to issue a provisional (restricted) licence upon presentation of an OTSR. This permit allows candidates to work in Australia under the supervision of an employer, while the 'Australian knowledge' component of each competency standard unit is completed. Regulators will be able to advise you about any specific licensing requirements for that state or territory.

Without a current valid occupational licence/permit you cannot start or finish the MACG program, and in most states and territories and more importantly you **cannot be employed to do electrical work.**

The contact details for each Australian Electrical Industry licensing regulator is included in the table below, listed by state / territory.

Note that the Australian Trade Training College does not deliver this program to students located in Western Australia as that state has specific requirements which are delivered only by RTO's located in that State.

You should be aware that these occupational licence/permits have set durations in which you are expected to have completed your program. That duration is commonly set at 12 months (check your local regulator information). The regulators may issue extensions for a period of time, but we advise, to not expect further extensions being automatically granted.

Your entire migration program can be put into turmoil by failure to have extension granted.

State Territory	Licensing authority	Mailing address	Phone / Email	Website
NSW	NSW Government – Fair Trading	PO Box 972 Parramatta 2124	(02) 9895 0111 Go to website for online email enquiry form	https://www.fairtrading.nsw.gov.au/trades-and-businesses/licensing-and-qualifications/overseas-trained-applicants
VIC	Energy Safe Victoria	PO Box 262, Collins St West, VIC 8007	(03) 9203 9700 licensing@energysafe.vic.gov.au	https://esv.vic.gov.au/licensing-coes/interstate-international-electrical-workers/overseas-qualifications/
QLD	Electrical Safety Office	GPO Box 69, Brisbane Qld 4001	Int +617 3006 6714 Local 1300 362 128 Go to website for online email enquiry form	https://www.worksafe.qld.gov.au/licensing-and-registrations/electrical-licences

			https://www.worksafe.qld.gov.au/contact-us/general-enquiries-selection	
SA	Consumer & Business Service	GPO Box 1719 Adelaide SA 5001	International: +61 8 8204 8532 Local 13 18 82 Pge.bos@ags.sa.gov.au	https://www.sa.gov.au/topics/business-and-trade/licensing/building-and-trades/licensing
WA	Energy Safety Department of Commerce	Locked Bag 100 East Perth WA 6892	(+618) 6251 2000 energylicensing@dmirs.wa.gov.au	http://www.commerce.wa.gov.au/building-and-energy/electrical-licensing-forms
TAS	Building Standards and Occupational Licensing Department	Consumer, Building and Occupational Services PO Box 56 Rosny Park TAS 7018	Local 1300 654 499 https://www.cbos.tas.gov.au/contact-us/online-enquiry	https://www.cbos.tas.gov.au/topics/licensing-and-registration
ACT	ACT Government Build, Buy Renovate	Access Canberra Chief Minister, Treasury and Economic Development Directorate GPO Box 158 Canberra ACT 2601	(02) 6207 7775 electrical.inspections@act.gov.au	https://www.planning.act.gov.au/build-buy-renovate/for-industry/construction-licences/apply-for-a-construction-licence/electrician-licence
NT	Electrical Workers and Contractors Licensing Board	Electrical Workers and Contractors Licensing Board GPO Box 1154, Darwin NT 0801	Ph: (08) 8936 4079 electrical.licensing@nt.gov.au	https://electricallicensing.nt.gov.au/

Employment Evidence Required

Once you have arrived in Australia, you must find an employer. An employer can be found in many of the normal ways such as:

- Check the jobs sections of local newspapers.
- Check employment websites such as Seek.com.au.
- Contact your local Employer/Employee Association.
- Centrelink Job search.

Table below lists the contact details for Electrical Industry Employer and Employee representative associations.

State/Territory	Employer Associations	
	National Electrical Contracting Association (NECA)	
	Phone	Email
ACT, NSW, TAS	1300 361 099	member.services@neca.asn.au
NT, SA	(08) 8272 2966	neca@necasa.asn.au
QLD	(07) 3276 7950	necaq@neca.asn.au
WA	(08) 6241 6100	necawa@necawa.asn.au
VIC	(03) 9645 5533	necavic@neca.asn.au
	Electrical Trades Union (ETU)	
ACT	(02) 4968 2488	etunsw@etunsw.asn.au
NSW	(02) 4968 2488	etunsw@etunsw.asn.au
TAS	(03 6228 0098	info@ceputas.com.au
NT	(08) 8941 2300	darwin@etu.org.au
SA	(08) 8234 2130	Go to website for email. www.cepusa.com.au
QLD	1800 388 937	info@etu.org.au
WA	(08) 9440 3522	Go to website for email. www.etuwa.com.au
VIC	(03) 8329 0000	Go to website for email. www.etuvic.com.au
	Master Electricians Australia	
QLD	1300 889 198	Go to website for email. www.masterelectricians.com.au

Workplace Evidence

Australian regulators require evidence that broad experience has been gained on-the-job and require this evidence to be formally gathered and documented. The industry endorsed method of gathering this evidence is the Exemplar Profiling system.

'Exemplar Profiling' ® is an innovative electronic workplace skill development tracking system, that records and reports on the work experiences of the learner. 'Exemplar Profiling' ® works by regularly measuring the progress of a student against industry agreed predetermined advisory targets directly linked to national competency standard units.
Once you have enrolled with the Australian Trade Training College you can self-register on the Exemplar Profiling (e-Log Book) system. Please review Appendix 2 at the end of this document. Once you have registered, you will be issued an e-Log Book registration code and password to allow you to record the details of your work experiences on a weekly basis via the internet.

The MACG program aligns closely to the Certificate III in Electrotechnology Electrician, a qualification that is the basis of all electrical trade training across Australia. To meet this requirement the student must remain logging workplace experience for the entire time they are in this program, regardless of any time values which may be stated by state or territory regulators.

A core component of this process is wherever practical, the use of summative (or final) assessment is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment.

This is particularly important as students are being asked to provide evidence that they have met the following criteria electrical based workplace experience.

- **Installation of cable support and cable mechanical protection methods**. - Must include metallic conduit, non-metallic conduit, supporting cable clips/ties, cable trays/trunking and underground systems.
- **Design, installation and termination of low voltage power lighting and control circuit wiring**. - Must include consumer mains, sub-mains, and final sub-circuits
- **Design, installation and termination of low voltage power lighting and control circuit wiring**. Must include protective earth systems including MEN wiring systems.
- **Installation of electrical apparatus and equipment.** Must include switchboards and circuit protection devices, heating, cooling, lighting and power apparatus, electric motors and/or transformers and controls.
- **Fault finding, maintenance and repair of LV wiring systems and electrical equipment**. Must include LV power and control circuit wiring and electrical apparatus and equipment.
- **Test and verify compliance of LV electrical wiring systems and electrical equipment**. Must include mandatory testing of insulation resistance, earth continuity/resistance, polarity, and earth fault - loop impedance as well as load and leakage current tests.

The volume of experience will be easily met when nearing the 10th - 11th month of workplace logging has occurred.

The Australian Trade Training College through its industry contacts has undertaken to use the knowledge and experience of the person responsible for the candidate in the workplace to verify that the skill necessary for the individual competencies has been verified (seen) in a work environment and that it meets the standards required by industry.

The Australian Trade Training College has also undertaken to recognise that, in some circumstances, assessment in part or full may be necessary outside the workplace. If this is the case, then it will only occur in accordance with approved industry and regulatory policies.

The Australian Trade Training College as the Registered Training Organisation (RTO) is responsible for all aspects of the assessment process. The assessment must cover a list of critical aspects of evidence (assessment) detailed in each unit of competency of the qualification.

This manual is designed to assist you by suppling what are the skills that the candidate needs observed in the workplace, in a simple plain language description. It is important that together the Australian Trade Training College and you as the student and your employer (or representative), ensure that you satisfy the requirements in terms of underpinning/essential knowledge and associated skills. This ensures your ability to transfer the competency to differing circumstances may reasonably be inferred and importantly that the individual is competent to safely perform all the practical applications required.

The supervisor or referee may be asked to verify your experiences logged within Exemplar Profiling ®. These referees are only required to answer a few questions about the skills observed. Please remember, they are not assessing you, only verifying that the required skills have been used and observed by them in a work environment. A sample of this form displays later in this Guide.

This manual will assist you by giving you some insight into what each competency covers in plain language.

Gap Training Entry Requirements

The entry requirements now state:
Entrants to the 10809NAT Course in Electrician - Minimum Australian Context Gap must

- *hold an Offshore Technical Skills Record (OTSR) for a UEE30820 Certificate III in Electrotechnology Electrician (or successor)*
- *hold a provisional/restricted licence issued by the regulatory authority responsible for regulating electrical work and licensing of workers in the jurisdiction where the training will take place.*
- *be engaged (employed) as an electrical worker or have access to a workplace environment that replicates workplace conditions.*
- *hold a certificate of currency for resuscitation (CPR) within the last twelve months and can provide a certificate of currency.*

These requirements now preclude candidates commencing the program while still overseas. The candidates need to be employed in Australia and will need to complete a weekly log.

Gap Training Course

Language

In Queensland it is a requirement under Clause 42 of the Electrical Safety Regulations 2013 that *'the applicant is adequately able to understand and read and write in the English language without the aid of an interpreter'.*

42 General requirements

(1) This section states requirements that apply generally for the issue of an electrical work licence, other than an electrical work training permit, to an applicant for the licence.

(2) The regulator must be satisfied that—

(a) the applicant satisfies the eligibility requirements for the licence; and

(b) the applicant is adequately able to understand, and read and write in, the English language without the aid of an interpreter.

Learning Literacy and Numeracy (LLN)

When you commence the program, you will be asked to undertake a short assessment of your Learning, Literacy and Numeracy skills as part of the Australian Trade Training College's compliance process.

This information is primarily to assist the Australian Trade Training College to help all candidates in meeting the reading, writing and numeracy indicators for the skills/knowledge in each competency unit.

The Australian Trade Training College determines the level of possible support needs for candidates in this program and will provide access to the educational and support services necessary for the candidate to meet the requirements of the training product as specified for VET accredited courses.

The Australian Trade Training College will deliver the identified MACG training and collect evidence of your on-the-job experiences with an employer via the e-Profiling system. The MACG training will cover:

- Required skills and knowledge for Australian standards.
- Completing the work experience/performance requirements
- A final compliance assessment

Required skills and knowledge.

To be delivered by the RTO and includes:

Workplace Health and Safety (WHS)/ Occupational Health and Safety (OHS) in Australia

- Responsibilities in working in an Australian Competency Based Training (CBT) context.
- Electrical Safe Working Practice inclusive of applicable local regulatory tests
- Multiple Earth Neutral (MEN) system
- Electrical Installation – Protection Methods and Devices
- Electrical Installation – Design and Equipment Selection
- Electrical Installation – Testing and Verification

Work experience/performance
To be undertaken, holding a 'provisional licence' with an employer in the workplace, with appropriate supervision and recorded in e-Profiling. Aspects to be addressed include:

- Meeting the language, literacy and numeracy requirements of each competency standard unit.
- Responsibilities of working in an Australian Competency Based Training (CBT) context.
- Wiring and equipment installation in accordance with AS/NZS 3000_Australia/New Zealand Wiring Standards and related standards
- Multiple Earth Neutral (MEN) system
- Standards and codes of practice for working with electrical installations and equipment.
- Verification and testing of installation wiring and equipment
- Local service and installation rules
- Workplace Health and Safety (WHS)/ Occupational Health and Safety (OHS) and environmental requirements.

Final Compliance Assessment
undertaking a final compliance assessment that is in accordance with the relevant regulatory and industry policy to cover:

- Verification of the safety and compliance of electrical installation wiring and equipment, including the relevant and mandatory tests in Australia and in accordance with the relevant requirements of the jurisdiction.

Delivery schedule for OTSR electrician training at the Australian Trade Training College

- **Training Duration 'off the job** – This is the amount in days that the candidate is required to undertake training away from the workplace. This time will occur at the Australian Trade Training College Campus at Banyo in Brisbane Queensland, following completion of the mandated local workplace experience.
    - This final assessment may occur at a different location on agreement with student and if availability of resources is available at our partnering organisation.
- **Allocated Time to complete unit** – Based upon the temporary occupational licence/ permit duration in Australia of 12 months, the allowance to complete the units of the program is listed in the following table as a guide. The time logged is 12 months and not a few hours as some incorrect websites and social media indicate. The table shows what we have setup as a reasonable progression speed for this program against the field evidence experience being logged and is listed in the days allocated to the candidate to complete each unit over that 12-month period. It is based upon the average time students have taken to date, to complete the units.
    - It is a guide to the candidate and employer as to when the unit completes for progression monitoring.
    - The time indicates candidates need to allocate 4.5 hours each week for 48 weeks.
    - The minimum time needed to fully complete is 169 hours of work. Historically the time required is more than this value due to 'life events' getting in the way.
- **OBS** — Demonstration of tasks with observation checklists.
- **Q&A** — Questions and answers/written reports.
- **TPR or TPV** — Workplace supervisor/s acknowledgement of competency – evidenced through Exemplar Profiling or possibly a paper based report.

			Nom Hrs	Duration of 'Off job' training (Days)	Allocated time to complete unit (in Days)	OBS	Q&A	TPR/Exemplar Profiling
1.	NAT10809001	Apply Australian Work Health and Safety practices in the workplace	9	**0.5**	30		**X**	**X**
2.	NAT10809002	Document and apply control measures for Australian electrical workplace hazards and risks	7	**0.5**	30		**X**	**X**
3.	NAT10809003	Apply Australian standards and requirements to solve LV a.c. circuits/systems problems	20	**0.5**	30		**X**	**X**
4.	NAT10809004	Select protection devices and systems for low voltage circuits and apparatus	35	**0.5**	60		**X**	**X**
5.	NAT10809005	Select wiring systems and cables for low voltage electrical installations	60	**1**	60	**X**	**X**	**X**
6.	NAT10809006	Verify compliance, functionality and aspects critical to the safety of electrical installations	24	**1**	60	**X**	**X**	**X**
7.	NAT10809007	Use computer applications for electrical work in Australia	2	**0.5**	15		**X**	**X**
8.	NAT10809013	Lay and connect Australian telecommunication services for multiple access	12	**0.5**	30	**X**	**X**	**X**
				Total	**315 days**	**169 Hours**		

The *'allocated time to complete'* column indicates the actual time required to complete by considering the incidental learning that is required for this program.

Australian Standards required for course program

The contents of this program will review the relevant Australian Acts, Regulations, Codes and Standards, Workplace Health and Safety and States Occupational Health and Safety Legislation and Regulations.
The following Australian Standards and codes will be used throughout this gap training. It is recommended that you obtain (at minimum) the standards in bold type.

AS/NZS 3000:2018	Electrical installations (known as the Australia/New Zealand Wiring Rules
AS/NZS 3008.1.1	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions
AS/NZS 3012	Electrical installations - Construction and demolition sites
AS/NZS 3017	Electrical installations—Testing and inspection guidelines
AS/NZS 3018	Electrical installations—Domestic installations
AS/NZS 3760	In-service safety inspection and testing of electrical equipment
AS/NZS 4836	Safe working on low-voltage electrical installation

The following pages provide a little basic information on all units delivered by the Australian Trade Training College in this program.

A simple description of what the unit entails along with the observable skills required demonstrated by candidates.

NAT10809001 - Apply Australian Work Health and Safety practices in the electrical workplace.

This unit specifies the mandatory requirements of workplace health and safety and how they apply to the various work functions in the electrical workplace. It requires the ability to identify relevant health and safety and risk management processes at all operative levels, adhering to safety practices as part of the normal way of doing work in Australia.

The student must be able to demonstrate essential knowledge required to effectively do the tasks outlined in the elements and performance criteria of this unit, manage the tasks and manage contingencies in the context of the work role. This includes knowledge of the following **Australian Work, Health and Safety Principles:**

- Legal requirements covering Workplace Health and Safety (WHS) in the workplace encompassing:
    - Underlying principles of workplace health and safety
    - General aims and objectives of the relevant state or territory legislation relating to workplace health and safety
    - Employer and employee responsibilities, rights and obligations
    - Major functions of safety committees and representatives
    - Powers given to workplace health and safety inspectors
- The work environment encompassing:
    - Safety signs commonly used in electrotechnology workplaces
    - Types and requirements of work permits (access, hot work, etc.)
    - Workplace emergencies that require emergency evacuation workplace procedures
    - Importance of safe premises, buildings and security in an industrial setting and the consequences of non-compliance
    - Concept of a ‘standard work procedure’
    - Need for standard work procedures in electrotechnology work
    - Types of fire extinguishers used in Australia
    - Basic process of fighting a fire
- Working safely with electricity encompassing:
    - Precautions that can minimise the chance of electric shock including earthing, extra low voltage, fuses, circuit breakers and residual current devices (RCDs)
    - Protection offered by a residual current device (RCD)
    - Need for ensuring the (safe) isolation of an electrical supply
    - Process to safely remove an electric shock victim from a live electrical situation
    - Life support - CPR in the workplace encompassing:
    - Responsibilities of a First Aider
    - Priorities of first aid management for accident or injury

- Procedures required at an accident scene
- Legal and ethical issues of providing first aid
- The concept of ‘Duty of Care’
- Effect of cardio pulmonary arrest on the body
- Signs and symptoms of shock

Observable skills the candidate is required to show is the ability to, on at least two occasions, the following Australian Work Health and Safety tasks:

- Attends to on-going workplace housekeeping tasks
- Uses the correct personal protective equipment and tools for all given tasks
- Accepts and follows safe work methods for:
- Working at heights
- Manually handling items with a weight up to 10 kg
- Identifying and dealing with asbestos
- De-energising and safely isolating electrical circuits including applying own personal lock-out device
- Follows safe work methods to select a fire extinguisher and uses it correctly on a simulated fire in a switchboard
- Follows procedures in a simulated workplace emergency to rescue a person in contact with live electrical conductors or equipment including the demonstration of Cardiopulmonary Resuscitation (CPR)
- Identifies and reports hazards in the workplace
- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809002 - Document and apply control measures for Australian electrical workplace hazards and risks

This unit specifies the essential outcomes for safely and effectively documenting and applying measures to control Work Health and Safety (WHS) risks associated with electrical work.

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of **Australian workplace hazards and risks principles:**

- Risk management and assessment of risk encompassing:
  - Risk management principles and purpose of risk management
  - Processes for conducting a risk assessment
  - Hazard identification using a job analysis and work site inspection
  - Risk Assessment Record Keeping
- Degree of the risk encompassing:
  - Determining the degree of the risk –
    - Recognised levels of risk: extreme (imminent threat of death or permanent disability); high (potential to kill or cause permanent disability); medium (potential to cause an injury or illness of a permanent nature); and low (potential to cause a minor injury requiring first aid)
    - Difference between a hazard and a risk
    - Concept of a risk matrix
  - Control Measures –
    - Steps of the hierarchy of control measures to control risk (Eliminate the risk by discontinuing the activity, control the risk by redesigning the equipment, adopt administrative procedures, and use of personal protective equipment)
    - Control measures documentation in Job Safety Analysis (JSAs) and Safe Work Methods (SWMs)
  - Monitoring and reviewing risk assessment processes –
    - Purpose of monitoring and reviewing the control measures
    - Purpose of communicating the control measures to the work team
    - Continuous improvement process to achieve best practice
  - Hazards, risks and control measures in working on construction sites encompassing:
    - Construction sites hazards and risks –
      - Hazards that will be encountered on a construction site including manual and mechanical handling, working at heights, working in confined spaces, noise, dusts, gases and chemicals

        - Risks that may be encountered in a construction site environment
    - Construction site risk assessment –
        - Standards and codes of practice relevant to construction sites
        - Examples of risk assessment documents used to complete Job Safety Analysis (JSAs) or Safe Work Methods (SWMs)
- Hazards associated with high-current extra-low voltage/low voltage installations encompassing:
    - Extra-low voltage installations risks –
        - Parts of a low voltage electrical system and equipment where high currents are likely and the associated hazards
        - Arrangement of power distribution and circuits in electrical installations operating at low voltage
    - Low voltage installations risks –
        - Parts of a low voltage electrical system and equipment where high currents are likely and the associated hazards
        - Arrangement of power distribution and circuits in electrical installations operating at low voltage
- Hazards, risks and control measures associated with high-voltage encompassing:
    - High voltage installations - parts of an electrical system and equipment that operate at high-voltage and the associated hazards and risks
    - High voltage terminology - touch voltage, step voltage, induced voltage and creepage and the associated hazards and risks
    - High voltage risks and control measures used for dealing with hazards of high-voltage
- Hazards, risks and control measures in working with low voltage equipment encompassing: Working with low voltage equipment risks and associated hazards that are present before, during and after modification, fault finding, maintenance and repair of low voltage equipment
    - Working with low voltage equipment –
        - Control Measures for work before, while, and after working on low voltage electrical installations, circuits or equipment
        - Steps for safe isolation “lock out and tag out” (LOTO) procedures
    - Working on ‘LIVE” low voltage equipment:
        - Hazards, risks and restrictions for working on “live” low voltage equipment
        - Control measures for working on “live” low voltage equipment
- Hazards, risks and control measures associated with harmful devices, materials, gases, dusts and airborne contaminant encompassing:
    - Harmful devices hazards, risks and control measures including gas torches, welding equipment, laser equipped devices and the like
    - Harmful materials hazards, risks and control measures including gases (refrigerants), some industrial cleaning agents, fibres of optical cable, fibres of thermal insulation, fibrous cement materials, and asbestos

Observable skills the candidate is required to show is the ability to, on at least two occasions, the following Australian workplace hazards and risks practice tasks:

- Identify potential workplace hazards and effective control measures including:
    - Identifying potential workplace hazards
    - Identifying the effectiveness of adopted hazard control measures
    - Modifying hazard control measures to improve effectiveness where necessary
    - Assigning the level of risk to newly identified hazards
    - Developing safe work methods for risk control of newly identified hazards that cannot be eliminated
    - Documenting modified and/or developed safe work methods
- Carry out effective isolation in accordance with safe work methods for work on or near low-voltage electrical installations and equipment (AS/NZS 4836) including:
    - Prepared a safe work method statement (SWMS) or job safety analysis (JSA) for effective isolation that requires:
- Identifying all sources of electric shock including electrically charged equipment
- Using safe methods for identifying source of supply to be isolated
- Consulting with authorised personnel regarding safety in de-energising a circuit or equipment Applying switching-off, lock-out and tagging procedures in accordance with AS/NZS 4836
- Using safe methods for confirming effective and safe isolation
- Followed a prepared safe work method statement (SWMS) or job safety analysis (JSA) to monitor its effectiveness
- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809003 – Apply Australian standards and requirements to solve LV a.c. circuits/systems problems

This unit specifies the essential outcomes for safely and effectively applying Australian standards and requirements to evaluate the behavior and solve problems in LV single and three phase circuits/systems

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of LV a.c. circuits/systems problems principles:

- Impedance in a.c. circuits encompassing:
    - AS/NZS 3000 Wiring Rules requirements for the installation of capacitors
    - Determining voltage drop for cables using the values for reactance and a.c. resistance from AS/NZS 3008.1.1
- Power factor improvement encompassing:
    - Effect of load power factor on the voltage drop of the supply cables (refer to AS/NZS 3008.1.1)
    - Local supply authority and AS/NZS 3000 Wiring Rules requirements regarding the power factor of an installation and power factor improvement equipment
- Three phase four wire systems encompassing:
    - Functions of Neutral Conductors –
        - Functions of the neutral conductor in a three-phase four-wire system
        - Effects of high impedance in the neutral conductor of a three phase four wire systems supplying an unbalanced load where MEN Earthing is employed
        - Effect in a unbalanced load on cable voltage drop determination (AS/NZS 3008.1.1)
    - Neutral Conductors - effects of broken/disconnected neutral conductors in balanced and unbalanced load conditions
    - Australian Standards Requirements –
        - AS/NZS 3000 Wiring Rules requirements regarding neutral conductors
        - Factors that must be considered when determining the size of the neutral conductor
- Harmonics and resonance effects in a.c. circuits encompassing:
    - Harmonic effects –
        - AS/NZS 3000 and the local supply authority requirements concerning harmonics in a.c. power systems
        - Effects of harmonics on cables current carrying capacity (refer to AS/NZS 3008.1.1)

    - Resonance effects –
        - Dangers created by a series resonance circuit
        - Effects of resonance in a.c. series circuits/power systems
        - Dangers of parallel resonance circuits
        - Effects resonance in a.c. parallel circuits/power systems
- Earth Fault Loop Impedance encompassing:
    - Importance of the earth fault loop impedance in a MEN system
    - Factors to be considered in calculating earth fault loop impedance of a circuit
    - Relevant clauses in AS/NSZ 3000 Wiring Rules associated with earth fault-loop impedance
    - Determining earth fault loop impedance using resistance and reactance values from AS/NZS 3008.1.1
- MEN Earthing System
    - Earthing Concepts and terms: Earthed; Earthed situation; Earth electrode; Equipotential bonding; Multiple earthed neutral (MEN) systems; Protective earth neutral (PEN) conductor; Main earthing conductor; Protective earthing (PE) conductor; Functional earthing; MEN link
    - MEN Earthing Systems:
        - Selection process to determine the minimum size earthing conductor for a range of active conductor sizes and materials
        - Parts of an earthing system and the purpose of each
        - Typical arrangement for a MEN earthing system
        - Arrangements of protective earthing conductors that comply with the Wiring Rules
        - Requirements for equipotential bonding in a range of installations situations

Observable skills the candidate must evidence, is that the student has completed on at least two occasions the following LV a.c. circuits/systems problems tasks:

- Evaluate the behavior of a three phase system supplying an unbalance star connected load including:
    - Accepting and following safe work methods for working with electrical circuits
    - Drawing a diagram of the specified circuit using Australian standard symbols, showing all component values
    - Calculating line and phase voltages and line and phase and neutral currents for the given unbalanced load
    - Selecting sufficiently rated components and connecting the load in star
    - Energising the circuit, measuring and documenting voltages and currents, and evaluating load behavior
    - Comparing calculated and measured values of voltages and currents and explaining their relationship by phasor diagram

- Energising the circuit with supply neutral disconnected taking and documenting line and phase voltages and currents readings
- Examining the effect of the loss (disconnection) of the supply neutral including its protective role in an Multiple Earthed Neutral (MEN) earthing system using measured values and a phasor diagram Examining the effect of the loss (disconnection) of the supply neutral including its protective role in an MEN earthing system using the measures values and an equivalent circuit of a fault loop current path
- Using safe work methods to de-energise the circuit, switching off powered testing devices and storing equipment safely

- Improve the power factor of <0.5 of a given single phase load to reduce the line current by 50% including:
  - Accepting and following safe work methods for working with electrical circuits
  - Drawing a diagram of the specified circuit using Australian standard symbols, showing all component values
  - Selecting and connecting sufficiently rated components of which the inductive reactance of the load is greater than the load resistance. (Xc > R)
  - Energising the circuit, and taking and documenting voltage and current readings
  - Determining the required value of capacitive reactive volt ampere (VArs) to be added into the circuit from voltage and current readings, to reduce the current by ≈50%
  - Energising the circuit with the appropriated capacitor connected, taking and documenting the voltage and current readings to confirm the required reducing of current for the same power dissipation
  - Using safe work methods to de-energise the circuit, switching off powered testing devices and storing equipment safely
- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809004 - Select Australian protection devices and systems for low voltage circuits and apparatus

This unit specifies the essential outcomes for arranging and selecting protection devices and systems for general electrical installations to ensure they are compliant

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of LV protection devices and systems principles:

- Safety principles - Electrical systems in building and premises encompassing:
    - Safety principles given in Part 1 (Section 1) of the Wiring Rules AS/NZS 3000 with deemed-to-comply requirements given in Sections 2 to 8
    - Methods of compliance for providing protection against: direct contact; indirect contact; thermal effects; unwanted voltages; over current; fault currents; overload; overvoltage and injury from mechanical movements
    - Installation design and equipment selection requirements including: compliant protection arrangements; functioning, compatibility with supply; estimation of maximum demand and voltage drop and arrangement of circuits
- Circuit and control arrangements encompassing:
    - Electrical Installation Circuits - reasons for dividing electrical installations into specific circuits and factors that shall be considered when determining the number and type of circuits in an installation
    - Electrical Circuit Design - daily and seasonal requirements of lighting, power, heating and other loads in a given installation; methods used to determine the number and type of circuits required for a particular installation; use of diagrams and schedules for circuits in a given installation
    - Special circuit arrangements for separated extra low voltage (SELV) circuits, protected extra low voltage (PELV) circuits and an isolated supply
- Hazards and risks in an electrical installation encompassing:
    - Electric current effects on the human body at various levels of a.c. and d.c. current and the duration of current flow for the various current paths
    - Ignition risk of flammable materials due to the thermal effects from the current from electric arcs
    - Risk of injury from mechanical movement of electrically actuated equipment
- Protection Against Direct Contact - acceptable methods of providing protection against direct contact with live parts of an electrical installation and the use of extra-low voltage (ELV) as a method of providing protection
- Protection against indirect contact encompassing:
    - Indirect protection - the term “indirect” contact with live parts of an electrical installation, touch voltage and touch current; current path when a short circuit fault occurs to exposed conductive parts of an appliance

- Indirect protection methods - automatic disconnection of supply method of providing protection, use of Class II equipment, “electrical separation”, uses of a Residual Current Device (RCDs) and the use of extra-low voltage and electrical separation
- Damp situations - requirements for providing protection in damp situations

- Protection against overload and short circuit current encompassing:
  - Overload and Short-Circuit Protection
    - Terms: overload current or fault currents with regard to an electrical installation
    - Equivalent circuit of an earth fault-loop
    - Level of fault current possible at a given point in an installation from the fault-loop impedance and data from the electricity distributor
    - Methods and devices that comply with the Wiring Rules AS/NZS 3000 for providing protection against the damaging effects of overload and fault current
- Protection methods requirements:
  - Coordination between protective devices and conductors
  - Coordination of protective devices for discrimination and back up protection
- Devices for automatic disconnection of supply encompassing:
  - Circuit Breakers - operating principles of thermal/magnetic circuit breakers and time/current tripping curves characteristics of various types of circuit breakers that comply with the requirements of the Wiring Rules
  - Fuses - operating principles of common types of fuses and time/current curves fusing characteristics of various types of fuses that comply with the requirements of the Wiring Rules, also use of fuses as fault current limiting protection
  - Residual Current Devices (RCDs) - operating principles of residual current devices (RCDs) and time/current curves tripping characteristics of various types of RCDs that comply with the requirements of the Wiring Rules
- Fault Loop Impedance:
  - Factor in a fault loop that will affect the impedance of the circuit
  - Maximum impedance of an earth fault-loop to ensure the operation of the protection device
- Protection against over voltage and under voltage encompassing:
  - Overvoltage Protection:
    - Overvoltage conditions
    - Causes of overvoltage and how this may affect the electrical system
    - Methods for protection against overvoltage
  - Under voltage Protection:
    - Under voltage condition
    - Causes of under voltage and how this may affect the electrical system
    - Methods of protection against under voltage
- Control of an electrical installation and circuits encompassing:

- Switch types - current, voltage and IP ratings, and their application
- Switching requirements for isolation, emergency, mechanical maintenance and functional control
- Control Arrangements for complete installations without safety services and an alternative supply and with safety services and an alternative supply

- Switchboards / distribution boards encompassing:
  - Switchboards and Distribution Boards - purpose, types and applications of switchboards and distribution boards
  - Metering - physical and circuit arrangements for whole current metering and Current Transformer (CT) metering
  - Switchboards/Distribution Boards Arrangements:
    - Physical and circuit arrangements of main switches, circuit protection devices, fault-current limiters, metering equipment and other distributor equipment
    - Compliance requirements including location and access, arc fault protection, identification, construction suitability, equipment marking and wiring and fire protection

The student must show observable evidence of the ability to complete tasks; manage tasks and manage contingencies in the context of the job role. There must be demonstrated evidence that the student has completed on at least two occasions the following LV protection devices and systems tasks:

- Arrange and select control and protection equipment for an electrical installation with a maximum demand of ≤80 A from a given design brief including:
  - Arranging the installation into circuits
  - Obtaining the maximum demand for the consumer's mains and any submain and for each final sub-circuit
  - Determining the prospective fault current at the main switchboard
  - Selecting protective devices for each circuit and control and isolation arrangement
  - Determining the earthing arrangement
  - Arranging the main switchboard equipment including preparation for metering and service protection
  - Documenting the arrangement of the installation including:
    - an equipment schedule giving the type and ratings of devices and evidence of compliance
    - single line diagram of the installation including earthing arrangement
    - layout diagram of the main switchboard and any additional distribution board
- Arrange and select control and protection equipment for an electrical installation with a maximum demand of ≥100 A ≤ 200 A, that has at least one distribution board and three phase induction motor from a given design brief including:
  - Arranging the installation into circuits
  - Obtaining the maximum demand for the consumer's mains, submains and for each final sub-circuit

- Determining the prospective fault current at the main switchboard and at distribution boards
- Selecting protective devices for each circuit and control and isolation arrangement for the installation
- Selecting control and overload protection arrangement for induction motors
- Determining the earthing arrangement
- Arranging the main switchboard equipment including preparation for metering and service protection
- Arranging the distribution board equipment
- Documenting the arrangement of the installation including:
    - an equipment schedule giving the type and ratings of devices and evidence of compliance
    - single line diagram of the installation and including earthing arrangement
    - layout diagram of the main switchboard and additional distribution boards

- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809005 - Select wiring systems and cables for low voltage electrical installations

This unit specifies the essential outcomes for selecting wiring systems and cables for low voltage electrical installations to ensure they are compliant and performance criteria by which competency is to be assessed.

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of:

Electrical installations requirement for selecting cables and wiring systems

- Design and safety requirements to meet installation performance encompassing:
    - External design factors (harmful effects, performance standards, external factors, protection against mechanical movement and fire ratings)
    - Electrical design features (electrical supply, maximum demand, voltage drop, circuit arrangements)
    - Electrical protection design requirement (unwanted voltages, acceptable methods, direct and indirect contact, faults)
    - Final sub-circuit requirements and arrangements (factors, daily and seasonal demands, configurations)
    - Factors affecting the suitability of wiring systems (mechanical damage, environmental and external influences, cable conductor size, voltage drop and earth-fault impedance limitations, cable insulation/sheathing limiting temperature, characteristics of cable insulation)
    - Types of wiring system and components (enclosures, support systems and underground wiring systems)
- Maximum demand encompassing:
    - Methods of determining maximum demand in consumers mains, submains and final sub-circuits including by:
        - Calculation
        - Assessment
        - Measurement
        - Limitation
    - Determining maximum demand in consumers main and submains
    - Determining maximum demand of final sub-circuits by:
        - Assessment of connected load where a circuit supplies a single item of equipment
        - Limitation where here the circuit supplies a number of items of equipment
- Application of AS/NZS 3008 to select cables based on current carrying capacity requirements encompassing:
    - Consideration in the process including:
        - type of conductor material to be used
        - insulation material operating temperature,

        - cable operating temperature
        - installation conditions
        - group or spacing
        - external influences, including harmonic content in the line currents of a balance three-phase system
    - Using current-carrying capacity tables to select cable conductor size
    - Conditions where short-circuit performance may be a factor in selecting a cable
    - Requirement for coordination between conductors and protective devices
- Application of AS/NZS 3008 to select cables based on voltage drop limitations encompassing:
    - Consideration in the process including:
        - maximum demand for the circuit
        - size of the cable conductors
        - route length of the conductors
        - maximum permissible voltage drop for the circuit
    - Using millivolts per Ampere metre (mV/A.m) tables
    - Simplified method for determining voltage drop given in the Wiring Rules (AS/NZS 3000)
- Method for selecting cables based on earth fault-loop impedance limitations encompassing:
    - Factors that regulate the fault loop impedance of a circuit
    - AS/NZS 3000 requirements for maximum fault loop impedance
    - Comparison of maximum circuit length between voltage drop and earth fault-loop limitations
- Selecting devices for isolation and switching encompassing:
    - Circuit isolation (requirements, need for protection against mechanical movement)
    - Circuit switching requirements
- Switchboards encompassing:
    - Local supply authority requirements main switchboard equipment
    - Switchboard configurations (single phase-single tariff, single phase-multiple tariff, multiphase-single tariff, multiphase multiple tariff, multiple tenancy and three phase CT metering

The student must show evidence of the ability to complete tasks outlined in the elements and performance criteria of this unit, manage tasks and manage contingencies in the context of the job role. There must be demonstrated evidence that the student has completed on at least two occasions for the following electrical installations –selecting cables and wiring systems tasks:

- Selects cables and wiring systems for a single phase domestic installation with a maximum demand of ≤ 80 A, including at least two circuits for lighting, two circuits for socket outlets and circuits, for fixed cooking appliances, hot water and air conditioning encompassing:
    - Listing all electrical items in the installation into load groups
    - Calculating the maximum demand in the consumer mains

- Determining the maximum demand for each final sub circuit
- Determining the route and route length of each circuit from scaled location drawings
- Selecting cable type to suit the installation conditions and external influences and conductor size based on required current-carrying capacity
- Checking that the rated tripping currents of the proposed circuit protective devices are correctly coordinated with the current-carrying capacity of the cables selected
- Determining the voltage drops in the series run of circuits for the conductor sizes selected
- Deciding on the need to increase the conductor size for a circuit to reduce voltage drop to ensure compliance with the Wiring Rules (AS/NZS 3000 and AS/NZS 3008)
- Deciding on the need to increase the circuit conductor and/or protective earthing conductor size for circuits not to be protected by a residual current device to reduce the earth fault-loop impedance to ensure operation of the circuit protection device
- Determining the size of the protective earthing conductor main earth conductor, type and location of earth electrode and equipotential bonding arrangements in compliance with the Wiring Rules (AS/NZS 3000)
- Deciding the wiring system components needed to satisfy installation conditions and protect against external influences
- Documenting the cable and wiring system component select in a cable schedule showing cable types, conductor sizes route and route length, wiring system components and reasons for the selections made including any calculations

- Selects cables and wiring systems for a non-domestic installation with a maximum demand of ≥200 A ≤400 A, including an adequate number of lighting and general power circuits and circuits for fixed cooking appliances, hot water, at least one distribution board and an air conditioning plant encompassing:
  - Listing all electrical items in the installation into load groups
  - Calculating the maximum demand in the consumer mains
  - Listing electrical items supply from each distribution board into load groups
  - Calculating the maximum demand in all submains
  - Determining the maximum demand for each final sub circuit
  - Determining the route and route length of each circuit from scaled location drawings
  - Selecting cable type to suit the installation conditions and external influences and conductor size based on required current-carrying capacity
  - Checking that the rated tripping currents of the proposed circuit protective devices are correctly coordinated with the current-carrying capacity of the cables selected
  - Determining the voltage drops in the series run of circuits for the conductor sizes selected
  - Deciding on the need to increase the conductor size for a circuit to reduce voltage drop to ensure compliance with the Wiring Rules (AS/NZS 3000 and AS/NZS 3008)
  - Deciding on the need to increase the conductor and/or protective earthing conductor size for circuits not to be protected by a residual current device to reduce the earth fault-loop impedance to ensure operation of the circuit protection device
  - Determining the size of the protective earthing conductor main earth conductor, type and location of earth electrode and equipotential bonding arrangements in compliance with the Wiring Rules (AS/NZS 3000)

- Deciding the wiring system components needed to satisfy installation conditions and protect against external influences
- Documenting the cable and wiring system component select in a cable schedule showing cable types, conductor sizes route and route length, wiring system components and reasons for the selections made including any calculations

- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809006 - Verify compliance, functionality and aspects critical to the safety of electrical installations

This unit specifies the essential outcomes to safely and effectively verify compliance, functionality and aspects that are critical to the safety of low voltage electrical installations and performance criteria by which competency is to be assessed.

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of verification of Australian electrical installations principles:

- Work, Health and Electrical Safety encompassing:
  - Occupational safety and health:
    - Work Health and Safety (WHS) / Occupational Safety and Health (OHS) regulations
    - legal responsibilities for employers and employees and “duty of care” requirements
    - workplace safety committees and their role
  - Personal safety in the workplace:
    - purpose and use of Safe Work Method Statements (SWMS) or Job Safety Analysis (JSA)
    - purpose and process of reporting WHS/OHS incidents
    - safety procedures for working with electrical systems, circuits and equipment
    - regulations for the supervision of apprentices and trainees
  - Workplace hazards, control measures and safe work methods
  - Live panel rescue - Process in rescuing a person in contact with live electrical conductors or equipment and the primary importance of the safety of the rescuer
  - Electric shock victim first aid - Application of emergency first aid requirements for an electric shock victim: calling for help, applying cardiopulmonary resuscitation (CPR), fire extinguishers to control electrical fire at accident site
  - Electrical isolation - Effective safe isolation of any equipment: ‘safe work method statement’ (SWMS) or Job Safety Analysis (JSA) for effective safe isolation, identifying source of supply to be isolated, switching-off, lock-out and tagging procedures, safe methods for confirming effective and safe isolation

- Electrical circuit principles and diagrams encompassing:
    - Effects of electric current:
        - physiological effects of current
        - basic principles by which an electric current can produce heat, light, motion and a chemical reaction
    - Single source multiple path d.c. circuits including:
        - circuit configurations and connection of energy source, protection device, control device and load for single source multiple path d.c. circuits
        - purpose of each component in the practical circuit
        - relationship between the parameters of voltage, current, resistance and power dissipation in the whole or any part of multiple path circuit
        - safely measures and the parameters for the whole or any part of the multiple path circuit
        - consequences of an open-circuit, closed-circuit and short-circuit in a practical circuit
    - Electrical diagrams:
        - purpose and characteristics of schematic, block and wiring diagrams, plans and schedules
        - reading and interpreting schematic, block and wiring diagrams, plans and schedules
        - sketching electrical diagrams using conventional symbols
- Alternating current principles encompassing:
    - Single phase a.c.:
        - principles of generating a single-phase sinusoidal voltage waveform and resulting current flow
        - terms: period; maximum value; peak-to-peak value; instantaneous value; average value; root-mean square (r.m.s.) value; and frequency of a single-phase sinusoidal waveform
    - Three-phase a.c.:
        - principles of generating a three-phase sinusoidal waveforms
        - relationship between the phase voltages generated in a three-phase alternator and the conventions for identifying each
        - method for determining the phase sequence or phase rotation of a three-phase supply
        - methods for determining power and energy supplied by three phase circuits
- a.c. machines and controls encompassing:
    - Motor starting, connections and protection:
        - selecting motor starters and overload protection types and connection arrangements for direct-on-line and reduced voltage starters
        - thermal, magnetic and thermistor overload protection methods
    - Applications of transformer types:
        - requirements and restriction on the installation and use of transformers

        - safe working procedures when connecting and testing transformers
        - risks and safety control measures associated with connection and disconnection of instrument transformers
- Electrical installation and operational safety encompassing:
    - Fundamental safety principles:
        - terms used in AS/NZS 3000 Part 1 (Section 1) and deemed to comply solution given in Part 2 for the fundamental safety principles
        - fundamental safety principles of protection against direct and indirect contact with live parts; thermal effects; overcurrent; earth faults; abnormal voltages; spread of fire; mechanical injury and external influences
        - fundamental principles of installation design; selection and installation of equipment; means of compliance (including alterations, additions and repairs) and verification of compliance
    - Hazards of high voltage (HV) equipment and systems:
        - dangers of high voltage equipment and distribution systems
        - step, touch and induced voltages
        - sources of induced voltage and stored energy
        - creepage and clearance requirements
        - safe working procedures in the vicinity of HV equipment
- Electrical installation earthing, control and protection encompassing:
    - Protective and functional earthing:
        - purpose of protective and functional earthing
        - parts of the protective earthing systems earthing arrangements, earthing of equipment and equipotential bonding
        - methods of determining the maximum fault loop impedance for a circuit
    - Multiple Earthed Neutral (MEN) earthing system:
        - roles of the protective earthing (PE) and neutral (N) conductors in an a consumer's installation and their relationship to the protective earth neutral (PEN) conductor in the electricity distributor's system or sub main to an outbuilding using a MEN system
        - importance of the MEN link when a fault occurs
        - likely consequences of the absence of the MEN link or high impendence in the PEN conductor when a fault occurs
        - requirements for installation of an MEN link in an installation and an outbuilding
    - Separated Extra Low Voltage (SELV) circuits, Protected Extra Low Voltage (PELV)systems:
        - purpose and configuration of SELV and PELV systems
        - earthing requirements and testing of SELV and PELV circuits
    - Control and Protection installations and equipment:

        - minimum fault levels specified by electricity network operator methods and arrangement for protection against short-circuit currents and overload currents
        - coordination of overload and short-circuit protection devices
        - coordination between conductors and overload protection devices
        - causes of over and undervoltage
        - device/s and requirements for protection against over and undervoltage
    - Location of switchboards, arrangement of equipment:
        - accessibility and restricted locations of switchboards
        - identification of main switchboards
        - construction requirements of switchboards arrangement and identification of switchboard equipment
        - arrangement and installation of metering equipment
        - switchboard wiring and fire –protective measures
        - protection against switchboard internal arc faults
- Cable selection and coordination encompassing:
    - Maximum Demand - determining maximum demand of mains, submains and final sub-circuits
    - Cables and installation methods:
        - types of cables typically used for mains, submains and final sub-circuits
        - installation methods and external influences affecting cable current-carrying capacity
        - selection of cables for mains, submains and final sub circuits
    - Voltage drop:
        - voltage drop limitation and the effect of voltage drop limitations on circuit route length
        - selection of cables to satisfy voltage drop limitations
    - Earth fault loop impedance:
        - effect of earth-fault loop impedance on circuit route length
        - Selection of cables to satisfy earth fault loop impedance limitations
    - Short circuit performance – selection of cables to satisfy short-circuit performance requirements
- Special installations and situations encompassing:
    - Damp Situation Installations:
        - areas specified as damp situation limitation of installation of equipment in classified zones
        - selection and location of equipment suitable for installation in given classified zones
        - use of RCD, SELV and PELV for damp situation
        - equipotential bonding in showers and bathrooms and swimming and spa pools

- Construction and demolition sites:
    - requirements for the installation, modification and testing of electrical equipment for construction and demolition sites, complying with AS/NZS 3012 and applicable workplace safety legislation
    - supply requirements for construction and demolition sites
    - protection of and control of circuits on construction and demolition sites
    - initial and periodic inspection and testing (inspection and testing methods and instrument calibration)
- Hazardous area installation requirements:
    - nature of areas classified as a “hazardous area”
    - standards to which the selection, installation and maintenance of electrical equipment shall comply additional training required to work competently with electrical equipment for hazardous areas

- Cable installation encompassing:
    - Cable termination and installation:
        - typical cable routes through buildings, structures and premised
        - application of wiring accessories drawing-in, placing and fixing of cables
        - cables and conductor terminations
        - maintaining fire rating integrity
        - application of flat thermoplastic sheathed (TPS), circular thermoplastic sheathed (TPS), steel-wired armoured (SWA), fire rated and flexible cables
    - Final sub-circuit wiring and connection requirements:
        - interconnection between switchgear, protection devices and links
        - preparation for fitting and connection of electricity
        - network operator equipment
        - use of adequately sized cables
        - marking of equipment
        - identification of circuit neutral conductors – correct polarity
    - Aerial and underground wiring systems
        - types and application of aerial conductors
        - aerial span limitations and required clearances
        - selection of aerial supporting poles/post and struts for a given application
        - use and requirements of catenary support systems acceptable cable types and protection for underground wiring categories
        - underground wiring depth layer and protection
        - underground wiring clearances from other services
    - Consumer’s mains installation requirements:
        - installing of underground and overhead consumers mains
        - terminating consumers mains at pillars, pits, main connection boxes and consumers switchboard

        - installing unprotected consumers mains to minimize short-circuit fault currents
        - installing bonding conductors where necessary
        - ensuring correct polarity
    - Verification of electrical installations encompassing:
    - Visual inspection of electrical installations requirements to determine whether the installation complies with the Wiring Rules and applicable specific installation standards
    - Mandatory testing:
        - mandatory tests required to verify compliance and functionality of an electrical installation in accordance with AS/NZS 3000
        - sequence for mandatory testing in accordance with AS/NZS 3000
    - Earth resistance/continuity testing
    - Insulation resistance testing
    - Polarity and correct circuit connections
    - Earth fault loop impedance and RCD operation
    - Optional test - apparatus calibration, load current of appliance/apparatus, and appliance/apparatus performance characteristics tests
    - Rectification of non-compliance defects
    - Legislated regulations and documentation Legislated regulation:
        - relevant commonwealth, state/territory legislation and regulations that require installations and equipment to be inspected and tested to ensure they are safe
        - person/bodies responsible for the various aspects of ensuring electrical installations are safe
        - testing documentation:
    - Commissioning/decommissioning procedures:
        - reasons to carryout commissioning/decommissioning of electrical equipment and installations commissioning/decommissioning safety procedures
        - phase and polarity checking prior to energization
        - removal of equipment and termination of unused cables
        - dangers of mechanical damage to cables and equipment
- Electrical equipment and fault diagnosis and repair encompassing:
    - Types of faults - open-circuit; short-circuit; incorrect connections; insulation failure; unsafe condition; apparatus/component failure; related mechanical failure
    - Electrical equipment/apparatus and circuits testing and repair:
        - methods and tests to identify faults in circuits and/or equipment
        - fault rectification/repair (fixed appliances; lighting; socket outlets; motors and controls circuits; transformers; electronic or computer based equipment)

The student must show evidence of the ability to complete tasks, manage tasks and manage contingencies in the context of the job role. There must be demonstrated evidence that the student

has completed on at least two occasions the following compliance verification inspection and testing practices tasks:

- Conducts a visual inspection and installation testing of a single phase domestic installation with a maximum demand of 80 A, and including at least two circuits for lighting, two circuits for socket outlets and circuits for fixed cooking appliances, hot water and air conditioning encompassing:
    - Strictly following safe work methods for the site and work activities
    - Visual inspection of the installation following the checklist provided in the Wiring Rules (AS/NZS 3000)
    - Testing earth resistance of the main earthing conductor protective earthing conductors and bonding conductors to confirm continuity
    - Testing insulation resistance to confirm that it is sufficiently high and compliant
    - Testing that the polarity of consumer main, submains equipment socket outlets, switches and lamp holders are correct
    - Testing that circuit connections are correct
    - Testing that the impedance of the earth fault-loop (active and protective earth) for each circuit is sufficiently low for automatic disconnection of supply
    - Testing the operation of Residual Current Devices (RCDs) (with supply connected)
    - Documenting the results of inspection and testing activities as required under local electrical safety regulations
    - Distributing copies of inspection, test results and verification outcomes as required under local electrical safety regulations
- Conducts a visual inspection and installation testing of a three phase installation with a maximum demand of >80 A, and including at least two circuits for lighting, two circuits for socket outlets and circuits, for fixed cooking appliances, hot water, air conditioning and at least one safety service circuit encompassing:
    - Strictly following safe work methods for the site and work activities
    - Visual inspection of the installation following the checklist provided in the Wiring Rules (AS/NZS 3000)
    - Testing earth resistance of the main earthing conductor protective earthing conductors and bonding conductors to confirm continuity
    - Testing insulation resistance to confirm that it is sufficiently high and compliant
    - Testing that the polarity of consumer main, submains, equipment socket outlets, switches and lamp holders are correct
    - Testing that circuit connections are correct
    - Verifying that the impedance of the earth fault-loop (active and protective earth) for each circuit is sufficiently low for automatic disconnection of supply
    - Testing the operation of RCDs (with supply connected)
    - Documenting the results of inspection and testing as required under local electrical safety regulations
    - Distributing copies of inspection, test results and verification outcomes as required under local electrical safety regulation
- Carry out decommissioning/commissioning of a three phase electrical circuit supplying a three phase induction motor encompassing:

- Strictly following safe work methods for the site and work activities
- Safely identifying, isolating and tagging the electrical circuit
- Removing electrical equipment and terminating unused conductors safely
- Re-instating electrical equipment safely
- Checking functionality of electrical equipment including testing for supply voltage, load current, phase rotation and correct operation
- Documenting the decommissioning/commissioning procedures and outcomes

- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809007 - Use computer applications for electrical work in Australia

This unit specifies the basic use of personal computer applications relevant to a work function as part of the normal way of performing electrical work in Australia

The student must be able to demonstrate essential knowledge required to effectively do the task, manage the task and manage contingencies in the context of the work role. This includes knowledge of:

- WHS requirements and safe control measures including the details in safe work method statements for the use of computers in the workplace
- Applications (software) relevant to the work being undertaken
- Australian standard electrical terminology and symbols
- Common document formats used in Australian Electrical work
- Printer configuration

The student must show evidence of the ability to complete tasks, manage tasks and contingencies in the context of the job role. There must be demonstrated evidence that the student has completed on at least two occasions the following computer applications relevant to the Australian workplace practice tasks:

- Used WHS procedures and followed safe work methods
- Used personal computer (desk top), lap top or tablet for the following operations:
    - Start up and basic configuration
    - Selecting workplace applications relevant to the work being undertaken
    - Entering information using Australian standard electrical terminology and symbols
    - Saving documents and information
    - Printing documents and information
- Performed the activities outlined in the performance criteria of this unit during work experience, recorded in a logbook and verified by a person or persons qualified (licensed) to supervise electrical work

NAT10809013 - Lay and connect for multiple access to Australian telecommunication services

This unit specifies the installation and maintenance of telecommunications cabling in buildings and premises to meet Australian Communications and Media Authority's (ACMA) ‘Open’ Cabling Provider Rule requirements

It encompasses working safely and to Australian Communications and Media Authority's ‘Open’ Cabling Provider Rule, installing multiple telephone line, multi-pair cables, backbone cabling, terminating in socket outlets, termination modules and distributors, testing and compliance checks and completing cabling documentation.

The student must show evidence of the ability to complete tasks, manage tasks and contingencies in the context of the job role. There must be demonstrated evidence that the student has completed on at least two occasions for to laying and connecting Australian telecommunication services tasks:

- Use WHS procedures and follow safe work methods
- Carry out the cable laying and connecting applicable to larger commercial and industry installations involving multiple lines, multi pair cables, backbone cabling, multi-story buildings and complex termination modules and distributors including the following activities encompassing:
- Terminating systems at both distributor and outlet locations and at least one 50 pair copper cable, with accurate completion of installation records, drawing alterations and compliance forms
- Placing of cables on support structures and building faces for both internal and external location
- Securing cables correctly for above locations.
- Avoiding cable damage such as crushing, burning, kinking, sheath twist, cutting and nicking, bending radius
- Reading and interpreting drawings related to cable layouts, outlet location, cable coding system and identifiers, distributor locations.
- Conducting and interpreting cable test results
- Correctly interpreting and applying standards and regulations
- Completing the required documentation
- Sufficient performance evidence to meet the Australian Communications and Media Authority (the ACMA) requirements for the Open Cabling registration must be at least 360 hours of actual on-the-job cabling experience. The 360 hours is additional to any experience that was gained during the training to acquire the competencies for registration. Sufficient evidence of on the job cabling experience can include any of the following:
    - suitable recognised industry qualifications involving cabling practices (for example, licensed electrician, Telstra technician/linesman, Foxtel pay TV installer or similar)
    - a statutory declaration signed by the candidate in the presence of an authorized witness setting out the details of the candidate’s experience
    - a detailed log book of cabling experience showing dates and types of work

- a signed statement by an employer, a registered cabler or a supervisor (who does not have to be a registered cabler) who has directly supervised the candidate, detailing the candidates cabling experience

The student must be able to demonstrate essential knowledge required to effectively do the task outlined in the elements and performance criteria of this unit, manage the task and manage contingencies in the context of the work role. This includes knowledge of telecommunications Open CPR regulations relevant to the Australian workplace:

- Cabling Provider Rules encompassing:
  - Cabling registrars, auditors and inspectors:
    - responsibilities of the industry regulator for customer premises cabling and cabling providers for WHS and network integrity
    - role of cabling registrars, cabling auditors and inspectors
  - Mandatory and voluntary requirements:
    - role of the cabling provider rules
    - mandatory and voluntary registration requirements for cabling work
    - role of the wiring rules, labelling notice and cabling record maintenance under the cabling provider rules
    - role of supervisors in implementing cabling provider rules
  - Registration:
    - method of registration and the prerequisites for registration
    - security, data and fire alarm cabling provider rules
- General installation requirements encompassing:
  - General installation requirements:
    - general installation requirements laid down by AS/CA S009
    - importance of maintaining segregation between cables of different systems
    - requirements for joints in customer cables
    - general requirements for ensuring safety and integrity of the telecommunications network
    - requirements for protection against the effects of low frequency induction
  - Earth potential rise:
    - effect of Earth Potential Rise
    - practical considerations for the installation of customer cabling and equipment within the earth potential rise zone
    - requirements for power/earth feeding
    - Catenary cabling systems
    - general requirements for catenary cabling systems
    - minimum separation required between the terminations of customer cabling and other services in internal locations
  - Optical fibre and coaxial cabling systems:
    - requirements for optical fibre cabling systems

        - requirements for coaxial cabling systems
    - Conduits - general requirements for conduits
    - Surge suppression devices requirements
- Cable Distribution Devices encompassing:
    - Cable distribution devices:
        - physical properties of common cable distribution devices
        - regulatory requirements for cable distribution devices
        - carrier's and licensed cable installer's responsibilities for the installation of the network boundary cable distribution device
    - Clearances:
        - minimum permissible clearances between power cable terminations and telecommunications terminations in shared and adjacent cable distribution devices minimum permissible clearances from enclosed telecommunication terminations to other terminations and the enclosure
        - requirements for location and conditions of installation for the network boundary cable distribution device
        - minimum permissible clearance distances that apply to the installation of the network boundary cable distribution device
    - General requirement - prohibited locations for installation of the network boundary cable distribution device
- Indoor cabling encompassing:
    - General requirements for indoor cabling:
        - conditions that apply to cable installation work
        - regulatory requirements for the installation of indoor grade customer cables
    - Minimum clearances:
        - minimum separation required between customer cabling and other services in internal locations
        - minimum separation required between the terminations of customer cabling and other services in internal locations
    - Damp situations:
        - delineate restricted zones within damp situations
        - customer equipment for installation within damp situation restricted zones
    - Cables in lift and hoist shafts - restrictions placed on cables installed in lift and hoist shafts
- Underground cabling encompassing:
    - Requirements for underground cabling:
        - regulatory requirements for installation of underground customer cabling
        - delineate restricted zones and nominate suitable equipment for installation in these areas
    - Protection of underground cabling:
        - precautions to protect underground customer cabling

        - minimum installation depths for underground customer cabling
    - Segregation from other services - minimum segregation between customer cabling and other underground services
- Aerial cabling encompassing:
    - Requirements for aerial cabling:
        - regulatory requirements for the installation of aerial customer cabling
        - precautions to protect aerial customer cabling
        - conditions that apply to aerial cabling
    - Minimum ground clearances for aerial customer cabling
    - Segregation requirements - minimum required segregation between aerial customer cabling and electrical aerial services
- Earthing encompassing:
    - Earthing systems:
        - basic telecommunications earthing systems
        - methods of installing a communications earth system
        - function of the telecommunications functional earth electrode
    - Earthing of equipment:
        - regulatory requirements for earthing of metallic frames, backmounts, enclosures, trays, conduits and ducts
        - regulatory requirements for earthing of cable shields and drain wires
        - regulatory requirements for connecting surge suppression devices to the protective earth
    - Equipotential bonding - regulatory requirements for equipotential bonding
- Miscellaneous regulations encompassing:
    - Cabling in heritage buildings - approvals process and cabling techniques appropriate for heritage building
    - Cabling in public places - approvals required and procedures involved in road and pavement openings for underground and aerial cable erection in a public place
    - Cabling in hazardous areas:
        - hazardous areas in relation to cabling installations and procedures and techniques required for cabling in such areas
        - requirements for installing customer cabling in explosive atmospheres

Frequently asked Questions

Q1. How long will the process take from the time I start the course with you?

The theory component has some considerable content to get through, but it is up to you how long it will take, remembering it is at your pace. We do give you some guidelines as to the expected duration of each unit. If you work at it every day, then you will get the program completed quicker.

The program gathers evidence across two key areas over 12 months when you are in an Australian workplace. Firstly, the Australian content theory is completed using the Energy Space learning systems. Secondly, during the time doing the theory you will be also logging field work experience into the 'Exemplar Profiling' online work experience logging system.

The 12-month timeline reflects the length of the training permit or state regulations in most regulatory areas of Australia. The online component of the program can be done in a shorter time. (See Question 2 for more detail) The observed practical will take a total of 5-7 days,

Once you get out with an employer, the time taken to gain enough work experience relies on what you are doing with that employer. Ideally, the electrical licensing regulators in most states like to see around 400 hours of Australian experience logged in each specialisation areas of;

(a) fault finding of electrical installations,

(b)Installing and terminating low voltage cables,

(c) Installing apparatus

(d) Test apparatus and circuits

Note: that 12 calendar months' work is the primary requirement, not just hours.

Q2. How long does each unit take to complete?

An analysis of actual candidate's completion times for each unit over the last few years, has shown the average time taken to complete modules is listed in the table below.

Units	Nominated duration hrs	Allocated time to complete unit. (in Days)
NAT10809001	9	30
NAT10809002	7	30
NAT10809003	20	30
NAT10809004	35	60
NAT10809005	60	60
NAT10809006	24	60
NAT10809007	2	15
NAT10809013	12	30
The durations are based upon individual allocating 4.5 hours per week against the program. A minimum of 169 hours is required to fully address the online components.		

Q3. Is there a time limit to complete the course?

Yes, you have 12 months from the date of commencement to complete the theory and practical components, however if you need extra time to complete past the anniversary date of 1 year, then let us know and we can negotiate extending your completion date. This will occur once payment of the extension fee is completed.

It is important to warn you that the regulators have begun to close down on training permit extensions, as they believe that 12 months is minimum sufficient to get the Gap Training completed. So do not think you have a long and unending amount of time to complete programs.

To avoid the need to pay extension fees, it is required to commence the MACG program only when you are resident in Australia and are employed. The program cannot be started while outside of Australia.

Q4. When are the practical sessions held?

The observed practical will take place by either attendance at our Brisbane Campus or through an agreed external video methodology with the trainer. Contact us directly for further information.

Q5. What is the theory component?

The theory delivery is 100% online. It consists of a series of 'Unit Knowledge Tests', Topic Quizzes and are which are self-marking questions (Multiple Choice, etc.) or written questions where you need to write a response or provide a drawing.

The program units are;

NAT10809001	Apply Australian Work Health and Safety practices in the workplace
NAT10809002	Document and apply control measures for Australian electrical workplace hazards and risks
NAT10809003	Apply Australian standards and requirements to solve LV a.c. circuits/systems problems
NAT10809004	Select protection devices and systems for low voltage circuits and apparatus
NAT10809005	Select wiring systems and cables for low voltage electrical installations
NAT10809006	Verify compliance, functionality and aspects critical to the safety of electrical installations
NAT10809007	Use computer applications for electrical work in Australia
NAT10809013	Lay and connect Australian telecommunication services for multiple access

These units are specifically designed by course owner EnergySpace in consultation with industry and the state / territory regulators.

Each unit of competency contains assessment tasks which consist of a series of questions along with a series of Observed practical assessments relating to the topic of the unit.

As you progress through the units, the written questions will start to involve mathematical calculations based on selected scenarios to provide industry relevance to what you would be expected to see in your occupation as an 'Unrestricted' electrical worker in Australia.

The program will be nearly impossible without you having a copy of the following Australian Standards:

- AS/NZS 3000:2018 Electrical installations
- AS/NZS 3017:2001 Electrical installations - Testing and inspection guidelines
- AS/NZS 3008.1.1:2017 Electrical installations – Selection of Cables Part 1, Part 1.1: Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions.
- AS/NZS 3012 Electrical Installations – Construction and Demolition Sites

The assigned textbooks are highly recommended to assist in the completion of your course. The details of our recommended textbooks are available online in the course material.

Q6. When are the fees due?

There are three (3) payments to be made.

- **First payment of $1500 upon enrolment into the program.**
- **Second payment of $1500 will occur after;**
    - **upon completion of any three modules within the program or three months from start date, whichever comes first.**
- **Final payment of $1500 is due prior upon release of the final Units NAT10809005 and NAT10809006.**
- An extension fee of $400 applies if the program is not completed by the 12-month anniversary date by the candidate, and they wish to continue in program.

Our accounts team will send you an invoice for each of these payments. You can pay by credit card or by bank transfer. The invoice will have all these details on it.

Q7. How do I review my feedback from the assessor in EnergySpace?

To review this feedback, you simply go into the start of the assessment page and click on '*Review Previous Attempt*' or '*Review'.* This will display what feedback has been provided and any additional; support that the assessor feels is needed.

Q8. What is the pass mark on each task?

85% "Pass Mark" must be achieved to demonstrate competency in each of the Unit Knowledge Tests (UKT) throughout the program. It is important when working through

Completion of the entire course occurs once the final practical is completed successfully. From the perspective of Australian Electrical Regulators, *it is not the 80% you know but the 20% that you don't know, that could kill you.*

Q9. What if I have already completed my Communications Registration previously?

That's awesome. You may be given credit standing towards your course only if the ACMA registration units are recent. You will need to supply us copies of formal documents (Statement of Attainment) from the issuing RTO.

Q10. What do I need to do to get my Australian Communications and Media Authority (ACMA) Registration?

Once you have successfully completed the course and have been issued your UEE30820 Certificate and transcript (which is on the back of your certificate), you can then approach one of the ACMA Registrars for your telecommunications registration. ***This cost is not included in the course costings.***

We recommend TITAB (www.titab.com.au) as they are great at keeping you up to date with industry happenings and potential work coming up. You will need to include your UEE30820 certificate and transcript to them (NOT your 10809NAT statement of attainment) and the enrolment form, which we can provide to you upon completion. You then need to send to registrar along with your payment. This will provide you with your telecommunications ACMA Open Registration.

Q11. I heard that I need '*endorsements*' for my ACMA Registration.

Yes, that is correct. There are three (3) main specialisation competencies (known as endorsements) that you should have. It is best to have at least 1 (one) endorsement within 12 months of you obtaining your ACMA Open Registration. Most often, this is the Structured Cabling specialisation. We offer all 3 of the main specialisation competencies at additional expense to the MACG program:

- Structured Cabling
- Coaxial Cabling

- Fibre Optical

Note these competencies are not a part of the electrical licencing program so are fully voluntary to undertake. So please ask the Support Team at the Australian Trade Training College for more information.

Q12. How much '*Exemplar Profiling'* do I have to complete?

If you are in Queensland, you must achieve an equivalent of 12 months Exemplar Profiling. This will calculate to approx. 1600 hours of work. Ideally, the electrical licensing regulators in most states like to see around 400 hours of Australian experience logged in each specialisation areas of;

(a) fault finding of electrical installations,

(b)Installing and terminating low voltage cables,

(c) Installing apparatus

(d) Test apparatus and circuits

The other electives such as Air Conditioning etc. are not part of your course hours so don't select them, however the only elective that you should be putting hours against is Telecommunications Cabling.

If you are outside of Queensland, then you must do 12 months (52 weeks) worth of 'cards'. A card equals one week.

These hours must be distributed equally between Fault Finding, Testing, Installation and Install apparatus. By equally I mean 400 hours between all 4 components.

If your work in Australia does not allow you to reach the anticipated levels, then you may need to amass some evidence from your former employers in your country of origin to verify you undertook such tasks back there.

Q13. Is Australian Trade Training College able to offer this course nationally?

Yes, is registered under Australian Skills Quality Authority (ASQA) to deliver the 10809NAT nationally.

Q14. Is Australian Trade Training College able to issue me the UEE30820 Certificate at the completion of the 10809NAT course?

If the Australian Trade Training College was **NOT** your OSAP provider (the one that issued the OTSR) then you will need to take our 10809NAT certificate back to the issuing OTSR provider and have them issue your final UEE30820 certificate. They will also complete your paperwork for the relevant licensing authority if applicable.

Q15. What processes is there for NSW?

Once we have issued you the final certificate, we will also provide you a form from VTT for you to apply for a "Proficiency Certificate". It is needed in applying for your electrical licence with Fair Trading NSW.

Q16. What processes is there for Victoria?

Once we have issued you the final certificate, you are then eligible to sit the **Licensed Electrician's Assessment (LEA)**, which is mandatory to earn an Electrician's Licence. We can assist you in finding the provider for you in Victoria.

Q17. What processes is there for South Australia?

Once the program is complete, you will need to contact the SA Government department of business and trade licensing to apply for your license. Further information at https://www.sa.gov.au/topics/business-and-trade/licensing/building-and-trade/licensing

Q18. What processes is there for Northern Territory?

Once the program is complete, you will need to contact the Electrical Workers and Contractors Licensing Board to apply for your license. Further information at https://electricallicensing.nt.gov.au/home

Q19. What processes is there for Western Australia?

Once the program is complete, you will need to contact the SA Government department of business and trade licensing to apply for your license. Further information at,

energylicensing@dmirs.wa.gov.au

Q18. It is difficult to get a complete one-year employment at the one employer; can I have employment at different employers to complete one year experience of Exemplar Profiling?

You sure can. If you change your employer, you can advise Exemplar Profiling of your new employer or supervisor. Alternatively advise our Support Team and we will action the change it for you.

Q20 What do I have to do in Exemplar Profiling once I am registered?

Exemplar Profiling is a field workplace experience logging tool that is provided by industry and forms part of your registration with Australian Trade Training College. You must log all your hours you complete during the 12 months of actual workplace experience.

The Australian Trade Training College will create your Profiling account with Exemplar Profiling. There are four (4) parts that Exemplar Profiling requires you to complete for you to obtain your unrestricted licence:

- Testing (Testing of installations as per AS 3000)
- Fault Finding (Any fault finding you undertake)
- Installation of Cabling (Sub Mains, Consumers Mains, Final Sub Circuits)
- Installation of Apparatus (Equipment, Switchboards, GPO's Lights etc.)

Q21. I have been employed in Australia for the past 5 months, what to do, to add my experience in Exemplar Profiling?

A. This is a tricky situation. Your Exemplar Profiling can only apply to time that you hold a Provisional Licence (Training Permit) from the State / Territory Electrical Regulator. It is illegal in Australia for you to work without a permit or licence. You can back date your start date on Exemplar Profiling to the date of issue of your Provisional Licence.

Discuss this with one of the College trainers directly

Q22. How many unit clusters are there in profiling?

A. There are no units clustered, they are all laid out in a logical order for you to log your hours against the tasks that you are undertaking.

Q23. How much duration is there to complete 12months/1year work experience? Is that within 3-5 years?

A. Interesting question. You can take as long as you like to gain the workplace experience, it all depends on your State / Territory Electrical Regulator if they will continue to issue you a Provisional Licence. This is totally out of our hands.

Q24. What if my employer does not have sufficient range of work and can't offer the full range of services required for me to carry out all of the relevant Exemplar Profiling tasks?

A. If you are unable to complete the specific tasks required for Exemplar Profiling, then you need to seek alternative employment or engage with another contractor (through agreed arrangements) who can provide you that specific range of tasks.

If you are unable to get the experience required, then as an alternative, you can use evidence of you having done the required work back in your country of origin. Discus this option with your Australian Trade Training College trainer who will guide you on the necessary documentary evidence that will need to be provided. No RTO will be able to provide you with the hours required for specific tasks in simulated form.

Q25. What if I have to move interstate for new employment, what happens with the course and Exemplar Profiling?

A. If you have to move interstate, that's no problem. Australian Trade Training College is registered Australia wide, so the course is all good and online. You just need to come back to Australian Trade Training College f or the practical. Your Exemplar Profiling is transferrable to another employer, all you need s to advise us of the new details such as home address, employer's details and any other relevant information to update our systems. You will require a new provisional licence for that new state / territory however and will need to cancel the old state / territory provisional licence.

Q26 When will I be issued my Certificate III in Electrotechnology? Is that after completion of theory and practical?

A. That's correct. You must complete your 12 months' workplace of experience before you can come in for the practical and upon completion of the practical, we will work with you to get your licence by providing you all the required documentation or the links to the docs and organisations to complete the applications required. You will receive your 10809NAT Statement of Attainment first, then once your Exemplar Profiling is completed and all documents completed, the UEE30820 Certificate will be issued to you by the organisation that you undertook the OTSR program with.

Q27. Wide range of experience does it mean maintenance, fault finding & installation of control panel, switchgear panels, industrial control panels?

A. This relates back to what you are required to log in Exemplar Profiling. There are 4 parts that Exemplar Profiling requires you to complete for you to obtain your mechanic licence:

- Testing (Predominately within the context of install work not maintenance and repairs);
- Fault Finding (Predominately within the context of install work not maintenance and repairs); Installation of Cabling (Sub Mains, Consumers Mains, Final Sub Circuits);
- Installation of Apparatus (Equipment, Switchboards, GPO's Lights etc.).

Q28. What does the practical component comprise of?

A. The practical will be conducted either by face-to-face basis with an experienced Australian trainer who will assist you on your learning pathway. The alternative method is through the use of Video evidence collection which must show candidates working and testing a single-phase installation, a three-phase installation over 100 Amps and the de-commissioning and commissioning test for a three-phase motor. This will be your chance to demonstrate what you have learnt in the workplace and online during the course. Your time will be divided into three categories.

- DESIGN: You will be required to calculate the requirements of a typical Australian installation. Subjects will include but not limited to AS3000 circuit compliance, Max–demand, Conductor current carrying capacity, Overload co-ordination, Volt-drop, Fault loop impedance, and short circuit considerations.

- INSTALLATION: You will build the switchboard and associated circuits that you designed. Emphasis will be placed on your understanding of Australian installation arrangements and quality of work.
- VERIFICATION (testing): Verification is both a legislative and standards requirement. This area of the practical is where most overseas workers come a little unstuck as the Australian method of testing is strictly controlled and documented. It is listed in the Standards so must be done in a specific order. Your testing skills during your logged months in the Australian workplace become very important. All participants need to note that our testing may not be the same as your country of origin, so it is your task to become familiar with the Australian methods. Some key areas are Earth continuity, Insulation resistance, Polarity of consumer mains and circuits, correct circuit connections, Fault loop impedance and RCD testing. You can only attend the practical week after your work experience is deemed sufficient which is generally after at least 9 months on the job.

The practical can be undertaken at any time after your workplace hours and theory has been deemed completed by the Assessor.

You must provide a copy of your training permit and pay the remaining fees prior to attending (If you have already provided the permit, that's excellent).

Q29. What is the procedure if a candidate fails in practical?

A. You will be given two (2) chances to get through the final practical. If after 2 attempts, you will be asked to undertake further tutorial programs. When you and your trainer have agreed that it's time to come back in, you will be booked back in for a retest. Retest is strictly at the discretion of the college. There is a **Retest Fee of $600** and you will retest the practical.

Q30. I'm coming from interstate; do you have accommodation nearby?

A. We sure do. We are located on the north of Brisbane at Banyo. The Brisbane airport is close by and accommodation is readily available in the surrounding area. The area has many accommodation facilities available to suit all budgets.

Q31. How easy is it to get to the Campus?

- 17 Armada Place Banyo QLD 4020.
- By Car: We are 10 minutes from Brisbane International Airport and 30 minutes from Brisbane CBD.

Q32. Is the practical available anywhere else in Australia, Brisbane is a long way to go?

A. The alternative method to face to face attendance in Brisbane is through the use of Video evidence collection which must show candidates working and testing a single-phase installation, a three-phase installation over 100 Amps and the de-commissioning and commissioning test for a three-phase motor. If you can ensure you have access to these installations, then video evidence collection maybe available. Specific requirements will need to be adhered to so call us before you commence collecting evidence from you home.

Q33. I heard that there are new requirements in QLD for me to be able to get my licence. I work as a Fire System Installer; will I be able to get my Mechanic's Licence?

A. You are right there might be some issues arising from this type of work. Contact us here at the college to discuss your specific concerns. There are new requirements that apply to anyone completing UEE30820 Certificate III in Electrotechnology Electrician, and this includes overseas students doing the 10809NAT Minimum Australian Context Gap Course, because your outcome is a Certificate III (UEE30820).

There are 3 categories of a worker.

CATEGORY 1 – WIDE RANGE OF INSTALLATION WORK

The employer will carry out a wide range of electrical installation work that includes at least a variety of multi- phase commercial or industrial installations. The work will provide significant and repeated exposure to the installation of consumer mains, sub mains and final sub-circuit wiring as well as the installation of main switchboards, distribution switchboards and final sub-circuit equipment. Students will gain significant exposure to verification and testing of electrical installation wiring in accordance with the Wiring Rules and other applicable standards. This scope of work will comfortably support the issuance of a UEE30820 qualification and subsequent electrical mechanic licence.

Typical employers who are generally able to provide this variety of work are electrical contractors engaged in the full range of electrical contracting work. Students employed by these employers are likely to be eligible for an electrical mechanic licence upon completion of the training.

CATEGORY 2 – NO INSTALLATION WORK

The employer does not carry out electrical installation work. The electrical work may, for example, focus on maintenance and servicing of electrical equipment and existing electrical installations. In such cases, electrical workers do not need to be the holders of an electrical mechanic licence. Such businesses would not normally be able to provide sufficient electrical installation wiring experience to support a UEE30820 qualification. Their work, however, may support a qualification such as UEE33020 Certificate III in Electrical Fitting that can lead to an electrical fitter licence or another qualification that leads to a restricted electrical work licence outcome, such as a refrigeration and air- conditioning or an instrumentation and process control tradesperson.

Typical employers that may fall within Category 2 include:

- switchboard manufacturers
- appliance servicing businesses
- machine repairers/armature winders
- refrigeration and air-conditioning businesses

Students employed by these employers are unlikely to be eligible for a QLD electrical mechanic licence (Fitter outcome may be possible) or to complete the 10809NAT course.

It is important that students and employers understand that an electrical fitter licence outcome does not prevent them from later gaining an electrical mechanic licence through additional on and off-the-job training after the completion of their training.

CATEGORY 3 – LIMITED SCOPE/RANGE OF INSTALLATION WORK

The employer will carry out a range of electrical installation work that falls within the scope of work of an electrical mechanic licence. However, the scope of electrical installation work is narrow and is insufficient to provide a student with the range of experience needed for the UEE30820 qualification, as described for Category 1.

Typical employers that may fall within Category 3 include:

- Lift companies
- Energy providers/distribution and transmission entities
- Solar PV system installers
- Industrial workshops operators
- Mine operators

- Rail entities

Alternative arrangements through a temporary transfer to another employer would be required to obtain the required skills to be eligible for an electrical mechanic licence.

Q34. What if I am unsure of what Category I fall under?

A. By all means give us a call and we will discuss with your employer and have them complete an Employer Resource Assessment (ERA) which is the employers guide into what they need to expose you to.

Q35. In the past friends have been able to start the program while still overseas. Is this still possible?

A: No, that avenue is no longer possible with the 10809NAT qualification. The new program has now strict entry requirements for commencement of the program.

The entry requirements now state:
Entrants to the 10809NAT Course in Electrician - Minimum Australian Context Gap must

- *hold an Offshore Technical Skills Record (OTSR) for a UEE30820 Certificate III in Electrotechnology Electrician (or successor)*
- *hold a provisional/restricted licence issued by the regulatory authority responsible for regulating electrical work and licensing of workers in the jurisdiction where the training will take place.*
- *be engaged (employed) as an electrical worker or have access to a workplace environment that replicates workplace conditions*
- *hold a certificate of currency for resuscitation (CPR) within the last twelve months and can provide a certificate of currency.*

Q36. What do we have to revise to be prepared for the final assessments?

The following items are the core components that you must be comfortable in doing when you attend the final practical assessments. Discuss with the trainer if you are experiencing any difficulty.

Minimum electrical course knowledge expectations

- Australian Workplace Health and Safety.
- Knowledge of how to use and locate clauses and sub-clauses in AS/NZS 3000.
- Knowledge of cable selection using AS/NZS 3008.
- Knowledge of AS/NZS3017 and required testing procedures.
- Cable selection.
- Cable installation.
- Cable de-rating.
- Voltage drop calculations.
- Cable temperature ratings and why they are applied.

- Common circuit breaker sizes.
- Cable co-ordination for Ib < In < Iz.
- ‘Maximum length of a cable’ calculation.
- *Fault loop impedance* calculation.
- Actual *fault loop impedance* calculation.
- *Prospective fault current*.
- Earthing systems, functions, parts of an Australian earth system, equipment and earthing arrangements.
- Reverse polarity.
- Full knowledge and understanding of the Australian MEN system.
- Ability to wiring of a simulated house and switchboard including meters, off peak relay, fuses, Socket outlets, lights stove, switching, HWS, air conditioner (electrical power only) etc.
- Switch board testing - visual.
- Switch board testing - earth resistance.
- Switch board testing - insulation resistance.
- Switch board testing - Polarity testing.
- RCD testing process.
- Safe isolation of electrical equipment process.

Appendix One –Registration form into Exemplar Profiling

AUSTRALIAN TRADE TRAINING COLLEGE

·DIGITAL·LOGBOOK·REGISTRATION·FORM¶

COURSE·DETAILS·¤			
QUALIFICATION·CODE·&·TITLE¤	☐·UEE30820·Certificate·III·in·Electrotechnology·Electrician¶ ☐·UEE33020·Certificate·III·in·Electrical·Fitting¶ ☐·10809NAT·Minimum·Australian·Context·Gap·Course¤		
ELECTIVE·STREAM¤	☐·Telecommunications¤	☐·Solar¤	¤
CONTRACT·MODE¤	☐·Full-time¤	☐·Part-time¤	☐·School-based¤
START·DATE¤	¤		

APPRENTICE·DETAILS¤			
FIRST·NAME¤	¤	SURNAME¤	¤
DATE·OF·BIRTH·(DD/MM/YYYY)¤	¤	PARENT/·GUARDIAN·NAME·(if·under·18)¤	¤
EMAIL¤	¤	MOBILE¤	¤

EMPLOYER·DETAILS¤			
COMPANY·NAME¤	¤	ABN¤	¤
STREET·¤	¤	POSTCODE¤	¤
SUBURB¤	¤	STATE¤	¤
EMAIL¤	¤	PHONE·NO.¤	¤

SIGN-OFF¤			
STUDENT·SIGNATURE¤	¤	DATE¤	¤
PARENT/GUARDIAN·SIGNATURE¤	¤	DATE¤	¤
EMPLOYER·SIGNATURE¤	¤	DATE¤	¤

SUPERVISOR·DETAILS¤			
SUPERVISOR·1¤			
NAME¤	¤	EMAIL¤	¤
TRADE·LICENCE·NUMBER¤	¤	MOBILE¤	¤
SIGNATURE¤	¤		
SUPERVISOR·2¤			
NAME¤	¤	EMAIL¤	¤
TRADE·LICENCE·NUMBER¤	¤	MOBILE¤	¤

Document·Name¤	FORM087·Digital·Logbook·Registration·Form¤			Page·1·of·2¤
Date·Created:·08/2022¤	Review·Date:·04/2023¤	Next·Review·Date:·05/2024¤	Version·1.1¤	
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SUPERVISOR·DETAILS¤			
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SIGNATURE¤	¤		

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Form is to be returned to ATTC when enrolment occurs