

# **Industrial Electrician Workplace Assessor Guide**

**Version 1.1**

# Introduction

Congratulations becoming an assessor in an industry best practice qualification.

Take time to read through the introduction section. It has been designed to tell you about the Industrial Electrician Apprenticeship, how apprentices work through it, and your role as an assessor.

## Purpose of the Industrial Electrician Apprenticeship

The qualification is designed to meet the specific electrical competence required by industry in automated production, process and control environments.

The qualification uses competency based assessment and an integrated workplace and theory assessment approach to demonstrate competence as an industrial electrician, and typically will be gained during a four year apprenticeship.

The qualification is made up of one section of compulsory standards and two elective sections of advanced standards. The elective sections provide choice within the qualification and allow application in a variety of electrical industry contexts.

**Compulsory standards** – there are 59 compulsory standards that an apprentice must achieve, totalling 241 credits.

37 (134 credits) are theory competency standards which are delivered and assessed by a training provider.

23 (107 credits) are workplace competency standards. Workplace training and assessment consists of a range of practical skills essential to become an industrial electrician. You will assess competency in these skills using the assessment guides in the Apprentice's Workplace Logbook.

**Advanced standards** – apprentices, with their employer, choose 35 credits from the Advanced Competency Standards list. 25 credits are required from section A and 10 are required from section B. These 35 credits are a requirement of the qualification. When discussing these standards with the apprentice, be sure to check any prerequisite requirements.

If limited options within the workplace mean an apprentice is unable to complete the 35 advanced credits or all of the compulsory competency standards, the employer will need to look for alternative arrangements to enable the apprentice to access the necessary training and assessment. If difficulties still remain, contact the Resource Training Organization.

## Assessors

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To be an assessor you must be registered with the Resource Training Organization. To do this you must meet the assessor registration criteria as set out in the next section.

As an assessor you will:

- Plan the assessment with the apprentice
- Evaluate the evidence supplied by the apprentice using the assessment guides
- Make an assessment decision – judge competence – and give feedback to the apprentice
- Complete assessment documentation as required by the Resource Training Organization

Assessors are required by the Resource Training Organization to respect client and company confidentiality.

## Assessor Registration Criteria

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### Electrical Workplace Competency Standards

To be registered as a workplace assessor and assess against any electrical competency standard – that being any competency standard in this program that is not itemized in the non-electrical competency standard section below – assessors must meet the following criteria:

- Be a qualified electrician with Red Seal endorsement
- Have a minimum of five years industrial experience
- Passed the assessor exam.
- Complete one assessment with the apprentice and send to RTO for review.

## Judging Competence

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As the assessor, you have to be confident that the apprentice has met the standards set out in the assessment guides. You evaluate the evidence supplied by the apprentice, and using your knowledge and expertise in the industry, assess the evidence against the standards set by the competency standards. You need to be able to show clearly how the evidence supports your assessment decision. Are you satisfied the apprentice can complete the task:

- safely
- repeatedly
- without assistance
- according to regulatory requirements
- according to the assessment guide
- to best industry practice
- within acceptable industry timeframes.

As part of assessment, you will be looking for:

- Consistency in the evidence – are all the pieces together saying the same thing?
- Authenticity – is the evidence produced the apprentice's?
- Relevant – is the evidence produced, current/up-to-date to industry needs?
- Sufficiency – is the evidence enough to meet the requirements of the competency standards?

## Evidence of Competency

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Workplace learning and assessment is an ongoing process and an apprentice may not be competent in the more complex unit standards until near the end of their apprenticeship. The apprentice needs to provide you with sufficient evidence that they have the required experience in each aspect described in the assessment guide.

Evidence is obtained using a mix of the following methods.

- Direct Observation – watching the apprentice carry out the work
- Inspection of Work – inspection of the apprentice's finished work
- Questioning and Discussion – apprentice's answers to questions relating to the competency standard to check they understand what they are doing. All questions and answers need to be written down – this may be notes from a verbal discussion – and signed by both the apprentice and assessor.
- Daily written record – the logbook contains diary pages integrated into the assessment guides.

These should be completed daily, in the relevant part. I.e. the apprentice may be using hydraulic tools – they record the information in the diary pages for competency standard IE115-1WC, as well as the pages regarding the electrical equipment they have been working on.

The apprentice will soon become very familiar with the contents and layout of the logbook and the assessment guides, it will be helpful for you to understand this too. Refer to your notes from the Assessor Registration Competency and your own use of the assessment tools.

- Workplace records – these may include job sheets, specifications, schedules, reports, notes, sketches, photos.
- Task Verification – assessors will use the testimony of another tradesperson or supervisor as evidence or to confirm that your records are correct and that you can be assessed as competent. This may be a person with knowledge and skills for a particular task within a competency standard, to support the assessor in the assessment of a task.
- Theory Training Records – theory training records will show the apprentice's competence in the underpinning knowledge of Electrical Theory related to each unit.

### **Assessment Appeals**

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What can happen if an apprentice disagrees with a 'not yet competent' decision you have made?

- The apprentice can appeal your decision to the employer. Discussion will generally resolve differences
- If the differences are unable to be resolved contact the RTO.

### **Moderation**

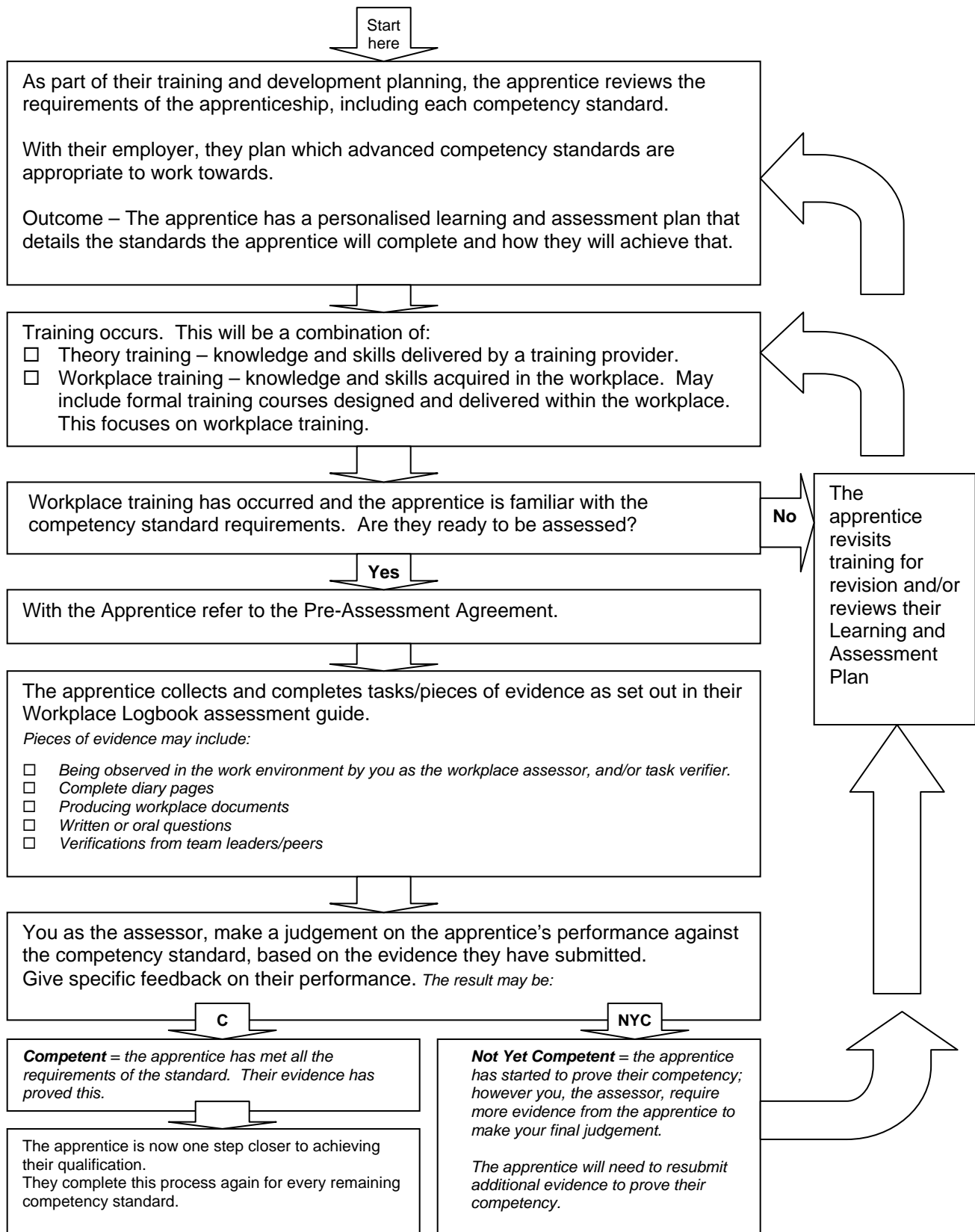
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The Resource Training Organization operates a moderation system where a moderator will periodically evaluate assessor decisions in order to:

- Support assessment that is fair, valid and consistent
- Support 'best practice' in assessment which includes using an integrated method of assessment based around a collection of evidence model
- Detect assessment variance from the provincial and national [Red Seal] standard and keep the variance to a minimum – so all involved can be sure of the knowledge and skills held by those with the qualification
- Protect the integrity of the Industrial Electrician qualification.

You will be required to retain records of your assessment decisions for a period of time, to enable them to be moderated. Contact RTO for more information.

## How the Apprentice works through their Apprenticeship



**REMEMBER:**

- The training consists of two parts – theory and workplace
- The Resource Training Organization Workplace Logbook covers all the requirements for the workplace part of the qualification
- All the tools the apprentice needs for gathering evidence for assessment are provided in the Logbook
- Assessment should be part of the apprentice's everyday work – it should not be saved up until the end of the apprenticeship
- Assessment can begin as soon as the apprentice feels able to do a standard competently and prerequisites have been achieved
- The apprentice is responsible for completing their qualification
- Your judgement as an assessor is a critical component of assessment.

# QUALIFICATION STRUCTURE AND CONTENT

## Competency Standard Coding

The code consists of two parts

The front a unique identifier – IE for industrial electrician and a unique number for each competency standard.

The tail a number and a two letter code showing how this relates to the qualification.

1 at level 1 in the qualification

2 at level 2 in the qualification

3 at level 3 in the qualification

4 at level 4 in the qualification

9 can be done at any stage in the qualification as long as any prerequisites are fulfilled

T Theory

W Workplace

C Compulsory

A Advanced competency standards within the Industrial Electrician Apprenticeship

Examples

IE110-1TC This is a level 1 compulsory theory competency standard.

IE127-3WC This is a level 3 Compulsory workplace competency standard.

IE183-9WA This is an advanced workplace competency standard that can be done at any stage in the qualification as long as any prerequisites are fulfilled.

## Level One

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Compulsory Theory Competency Standards delivered and assessed by a training provider Classroom and Lab Delivery		
Code	Title	Credit
IE110-1TC	Demonstrate knowledge of electricity and magnetism	15
IE112-1TC	Perform electrical math calculations	4
IE113-1TC	Describe and access the Canadian Electrical Code and wiring standards	2
IE117-1TC	Demonstrate knowledge of electrical and electronic drawings	3
IE118-1TC	Demonstrate knowledge of manuals and manufacturer specifications	1
IE126-1TC	Demonstrate knowledge of analytical troubleshooting techniques	1
IE128-1TC	Demonstrate and apply knowledge of basic test equipment	3
IE131-1TC	Demonstrate knowledge of installing electrical equipment	2

Compulsory Workplace Competency Standards assessed using the assessment guides in the Workplace Logbook		
Code	Title	Credit
IE102-1WC	Comply with health and safety regulations	2
IE103-1WC	Follow safe working practices in an electrical workplace	2
IE106-1WC	Respond to fire emergencies	1
IE108-1WC	Apply basic knowledge of electrical safety	2
IE114-1WC	Use hand and power tools	4
IE115-1WC	Demonstrate safe and proper use of pneumatic and hydraulic tools	2
IE116-1WC	Demonstrate and apply knowledge of PC hardware and software	4
IE120-1WC	Demonstrate knowledge of workplace communications standards	1
IE121-1WC	Demonstrate knowledge of professional behaviour	1

### Note

While it is generally expected that competency standards will be completed in the level they are assigned to; completion and reporting of credit may be delayed due to use of naturally occurring evidence. This does not affect entry into the next level of the qualifications, but any prerequisite competency standards must be completed before assessment of subsequent competency standards.

## Level Two

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Compulsory Theory Competency Standards delivered and assessed by a training provider Classroom and Lab Delivery		
Code	Title	Credit
IE133-2TC	Demonstrate knowledge of alternating current (AC) and direct current (DC) theory	7
IE141-2TC	Demonstrate knowledge of the installation and maintenance of low voltage circuits	3
IE145-2TC	Demonstrate knowledge of lighting systems and design	3

Compulsory Workplace Competency Standards assessed using the assessment guides in this Workplace Logbook		
Code	Title	Credit
IE122-2WC	Communicate technical information clearly and check for understanding	2
IE132-2WC	Install electrical equipment	20
IE146-2WC	Install lighting controls and equipment	5

## Level Three

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Compulsory Theory Competency Standards delivered and assessed by a training provider Classroom and Lab Delivery		
Code	Title	Credit
IE111-3TC	Demonstrate knowledge of electronics	6
IE129-3TC	Demonstrate knowledge of three-phase theory	6
IE134-3TC	Demonstrate and apply knowledge of PLC operation, installation and maintenance	2
IE135-3TC	Demonstrate and apply knowledge of communication buses and PLC interfaces	2
IE138-3TC	Demonstrate knowledge of programming language and of installing and maintaining PLC software	3
IE143-3TC	Demonstrate knowledge of installation and maintenance of transformers	6
IE144-3TC	Calculate power factor correction	4
IE150-3TC	Demonstrate knowledge of AC motors	7
IE192-3TC	Demonstrate knowledge of DC motors	3
IE227-3TC	Demonstrate knowledge of AC motor controls	6
IE228-3TC	Demonstrate knowledge of semiconductor power devices	4

Compulsory Workplace Competency Standards assessed using the assessment guides in the Workplace Logbook		
Code	Title	Credit
IE123-3WC	Write technical documents	3
IE124-3WC	Demonstrate Knowledge of leading teams	2
IE127-3WC	Apply knowledge of analytical troubleshooting techniques	4
IE130-3WC	Use phase rotation meter	1
IE136-3WC	Install and maintain PLC hardware	7
IE137-3WC	Install and maintain PLC networks	7
IE142-3WC	Install and maintain low voltage circuits	12
IE151-3WC	Install and maintain AC motors	9

## Level Four

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Compulsory Theory Competency Standards delivered and assessed by a training provider Classroom and Lab Delivery		
Code	Title	Credit
IE147-4TC	Demonstrate and apply knowledge of network diagnostic tools	2
IE148-4TC	Demonstrate and apply knowledge of communications protocols	2
IE152-4TC	Demonstrate knowledge of the installation and maintenance of high voltage circuits	3
IE156-4TC	Demonstrate knowledge of installing and maintaining HVAC equipment	3
IE158-4TC	Demonstrate knowledge of pumps	2
IE160-4TC	Demonstrate knowledge of power generation equipment	2
IE164-4TC	Describe co-generation principles and operations	2
IE165-4TC	Demonstrate knowledge of portable generator and portable electric welding equipment	1
IE168-4TC	Demonstrate knowledge of control systems	6
IE176-4TC	Demonstrate knowledge of the installation and maintenance of Robotic Control Systems	3
IE178-4TC	Demonstrate knowledge of variable speed drive (VSD) and starting systems	3
IE181-4TC	Demonstrate knowledge of back up power equipment, UPS, battery banks and battery charging systems	3
IE194-4TC	Demonstrate knowledge of installing and terminating fibre optic cables	
IE210-4TC	Demonstrate knowledge of electrolytic cell technology and safety considerations as used in mining and smelting	2
IE225-4TC	Demonstrate knowledge of measurement and calibration test equipment	2
IE226-4TC	Design and demonstrate knowledge of motor controls and motor control programs	3

Compulsory Workplace Competency Standards assessed using the assessment guides in this Workplace Logbook		
Code	Title	Credit
IE119-4WC	Design and draw electrical and electronic drawings including schematics, maintain documentation and produce as-built drawings	4
IE155-4WC	Install and maintain motor control, voltage control and power distribution centres	5
IE179-4WC	Install and maintain variable frequency drives (VFD)	7

## Advanced Competency Standards

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A minimum of 35 credits is required from advanced competency standards: Theory or Workplace

A minimum of 25 credits is required from Section A and a minimum of 10 credits are required from Section B.

### Section A

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A minimum of 25 credits required from the following competency standards, which are broadly applicable to most industrial electrical workplaces.

Advanced Workplace Competency Standards assessed using the assessment guides in this Workplace Logbook		
Code	Title	Credit
IE104-9WA	Use safe lifting and rigging techniques	1
IE105-9WA	Follow safe procedures for working in confined spaces	1
IE109-9WA	Use jumpers and forces safely	3
IE125-9WA	Lead teams and manage electrical installation and maintenance projects	3
IE139-9WA	Read and write programming language and install and maintain PLC software	5
IE149-9WA	Install and maintain computer networks	3
IE153-9WA	Install and maintain high voltage circuits	12
IE157-9WA	Install and maintain HVAC equipment	3
IE159-9WA	Install and maintain pumps	2
IE161-9WA	Troubleshoot and maintain power generation prime movers	5
IE166-9WA	Maintain portable generators	3
IE167-9WA	Maintain portable electric welding equipment	3
IE169-9WA	Install and maintain servo and proportional valve control loops	3
IE172-9WA	Install and maintain process control hardware	3
IE174-9WA	Install and maintain hydraulic or pneumatic controls	3
IE182-9WA	Install and maintain power supplies	9
IE183-9WA	Install and maintain a UPS system	4
IE184-9WA	Install and maintain batteries	3
IE186-9WA	Install and maintain detection and alarm systems	9
IE196-9WA	Use a computerized maintenance management system	2

## Section B

A minimum of 10 credits required from the following competency standards, which tend to be for sector specific industrial electrical workplaces.

Advanced Endorsement Workplace Competency Standards assessed using the assessment guides in the Workplace Logbook		
Code	Title	Credit
IE162-9WA	Install and maintain power generation controls	9
IE163-9WA	Install and maintain power generator protective relays	9
IE170-9WA	Install and maintain encoders	3
IE171-9WA	Install and maintain numeric controllers	3
IE173-9WA	Install and maintain data and process monitoring systems	3
IE177-9WA	Install and maintain Robotic Control Systems	3
IE180-9WA	Install and maintain DC drive systems	9
IE185-9WA	Demonstrate knowledge of safety and security systems	3
IE187-9WA	Install and maintain video monitoring systems	4
IE189-9WA	Maintain crane control systems	4
IE191-9WA	Install and maintain boiler furnace system monitors and controls	6
IE193-9WA	Install and maintain DC electric motors	9
IE195-9WA	Maintain electronic precipitators	5
IE197-9WA	Use powder actuated tools	1
IE198-9WA	Operate personnel lifting devices	1
IE199-9WA	Use liquid-fuel powered tools	1
IE200-9WA	Install and maintain wound rotor drives	7
IE201-9WA	Install and maintain wireless radio controllers	4
IE202-9WA	Maintain portable switch houses	4
IE203-9WA	Demonstrate knowledge of line installation, maintenance, and repair procedures	3
IE204-9WA	Install and maintain wheel motors	9
IE205-9WA	Make-up and repair trailing cable (4160 – 13.8kV) (2300 – 600V)	3
IE206-9WA	Install and maintain a Global Positioning System (GPS)	3
IE208-9WA	Maintain electric arc furnace	3
IE209-9WA	Maintain induction furnace	3
IE211-9WA	Access and comply with mining electrical regulations	2
IE212-9WA	Install and maintain gas detection equipment	4
IE213-9WA	Install and maintain controls for liquid separation and refractionation	4
IE215-9WA	Install and maintain gas metering equipment	4
IE217-9WA	Install and maintain analytical measurement equipment	4
IE218-9WA	Demonstrate and apply knowledge of onshore pipeline regulations	2
IE219-9WA	Describe principles of pulp and paper technology maintenance and production	1
IE220-9WA	Maintain recovery boiler control systems	3
IE221-9WA	Describe basic operation of mill machinery and processes	1
IE223-9WA	Install and maintain scanning and optimization equipment	4
IE224-9WA	Describe principles of oil and gas processing	1
IE229-9WA	Describe principles of mining and smelting	1

# Pre-Assessment Agreement

## List of Competency Standards in Industrial Electrical Apprenticeship

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This agreement is to be completed by the assessor and apprentice, when the apprentice enrolls into the Industrial Electrician Apprenticeship. This is an agreement of roles and responsibilities between the assessor and the apprentice. If a new assessor is assigned to this apprentice, a new Pre-Assessment Agreement must be discussed and signed between the new assessor and the apprentice.

Apprentice Name	_____	Apprentice Number Please ensure apprentice has this number	_____
Assessor Name	_____	Assessor Contact Details Phone or email to contact you for support	_____

Date apprentice enrolled into this qualification: \_\_\_\_\_

The following roles and responsibilities for the assessor and apprentice, apply to each instance of workplace assessment towards this qualification.

## Assessment Planning Stage

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### The apprentice:

- Ensures they have an understanding the requirements of each competency standard they have chosen. This includes the tasks they are to complete and collect within their workplace, as well as any tasks to be carried out with the assessor (eg observations).
- If applicable, requests and carries out a planning meeting with their assessor, prior to being assessed for a particular competency standard. The purpose of this meeting may include getting clarification from the assessor on the competency standard and task requirements.
- Will identify to the assessor, prior to assessment, any special needs/circumstances that may affect their performance.

### The assessor:

- Ensures the apprentice has a clear understanding of the competency standard task requirements, prior to assessment.
- Has provided for any equipment, resources, preparation required as part of the assessment set-up.

- Has explained the internal and external appeals processes that are in place to assist apprentices.

### **Assessment Stage**

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Both the assessor and apprentice will use Resource Training Organization documents as part of the recording and completion of the workplace tasks/assessments. These are available in each apprentice logbook for this qualification. This includes full completion of the logbook, assessor observations, and task verifiers including signatures, dates, etc.

All evidence produced and collected in assessment for any competency standard, will be the work of the apprentice. This will either be observed or verified, to ensure authenticity.

Agreed dates for observations and any other assessment tasks carried out with the apprentice and assessor/task verifier, will be met. If not, a new date will be planned and met.

Throughout the assessment process for each competency standard, the apprentice will know which element/performance criteria the task has been designed for.

### **Assessment Completion Stage**

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The assessor will ensure all completed tasks by the apprentice have been verified and documented prior to making an assessment judgement.

The assessor will provide verbal and written feedback to the apprentice on their overall performance for each competency standard assessed. If applicable, any Not Yet Competent judgements will have an Action Plan included.

### **Special Requirements**

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After reviewing the chosen competency standards for this qualification, the following special requirements have been identified from the apprentice, in relation to completing the requirements of this qualification: If none, write 'None' in space provided

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If appropriate, list how these special needs will be cared for during the assessment process. Who will be responsible for ensuring these have been met each time? If no special needs were identified above, leave blank.

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Signing of this Pre-Assessment Agreement notifies the apprentice, assessor, the apprentice's workplace, and Resource Training Organization that the above roles and responsibilities will be carried out appropriately during the assessment of the apprentice against the requirements of this qualification.

This agreement forms an important part of the assessment process. Any changes made during the assessment process, by way of a new assessor, newly identified special needs, etc will initiate a new completion of this agreement.

Apprentice Signature	_____	Date this Pre-Assessment Agreement was discussed and signed	_____
Assessor Signature	_____		

If an additional assessor is involved:

Apprentice Signature	_____	Date this Pre-Assessment Agreement was discussed and signed	_____
Assessor Signature	_____		

If another additional assessor is involved:

Apprentice Signature	_____	Date this Pre-Assessment Agreement was discussed and signed	_____
Assessor Signature	_____		