Qualification Specification

ECITB Level 3 Diploma in Pipe Welding in Engineering

Qualification number: 610/6443/9

Regulated by Ofqual
Qualification start date: 20/10/2025
Issue RV1-0 valid from 20/10/2025

Issue

This specification is Issue RV1.0. We will inform Approved Centres of any changes to this issue. The latest issue can be found on our website.

Changes to this document

The table below sets out all revisions made to this document since it was first issued, and the dates on which the revisions were effective from.

New Issue number	Summary of changes made between the previous issue and this current issue	Page number	Date of change

Accessibility

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You can email us at Qualifications@ecitb.org.uk

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1. Overview

1.1 ECITB

The Engineering Construction Industry Training Board (ECITB) is the employer-led skills, standards and qualifications body for the development of the engineering construction workforce of Great Britain. An arms-length body of the UK Government, the ECITB reports to the Department for Education.

The ECITB awarding organisation for regulated engineering construction qualifications is part of the training board. Our qualifications certify knowledge and competence across craft and technical disciplines. They improve quality and standards for the industry, helping engineering construction companies to maintain occupational competence.

This document is for use by approved centres to ensure that their candidates gain the relevant Knowledge, Skills and Behaviours (KSBs) for their role specific activities. It is also used by ECITB's External Quality Assurers and employers may be interested in this document if they have employees or applicants who hold this qualification.

1.2 Regulation

This qualification is regulated by Ofqual and is listed on Ofqual's Register of Regulated Qualifications.

This qualification has an operational start date of 01/10/2025. This is the date centres may start registering candidates and delivering courses leading to the qualification.

1.3 Objective

The objective of this qualification is to equip the candidate with knowledge, skills and behaviours to become occupationally competent as a pipe welder.

1.4 Candidates

This qualification is suitable for candidates currently working as pipe welders, those wishing to become pipe welders and those undertaking an Apprenticeship such as ST0851 Pipe Welder.

The individual working in these roles will conduct welding activities in engineering and is responsible for the safety, quality, productivity and accuracy of their own work whilst ensuring it conforms to a relevant pipe welding specification. They are responsible for selecting, setting up, preparing the welding equipment and conducting welding activities to high standards for a wide range of engineering materials and components. They are also responsible for dismantling welding equipment and the welding environment whilst reinstating the work area. They are able to interpret documents, welding specifications, engineering drawings and diagrams and work safely in accordance with health, safety and environmental requirements whilst managing on-site hazards.

A candidate must register for this qualification via an ECITB approved centre. If you are a candidate looking for a centre, visit www.ecitb.org.uk

1.5 Language

This qualification is available in English only.

For candidates who use English as a second language, an approved centre must satisfy itself prior to registering a candidate that the candidate's level of English is sufficient to be able to access the learning and undertake the assessment at the appropriate level, and to be able to interact with others and work safely.

1.6 Entry requirements

There are no mandatory entry requirements. The qualification is open to any candidate who the approved centre believes has the ability to reach the assessment requirements set out

within this document. A candidate must have a sound grasp of the English language and mathematics to be able to follow instructions as well as complete the learning and assessment required within this qualification. The approved centre will work with the prospective candidate and, where appropriate, employer, to determine the candidate's suitability for the qualification.

1.7 Progression

Candidates who achieve this qualification can progress to a range of further career options including welding supervisor, welding coordinator, welding inspector and welding examiner (NDT).

This qualification aligns with the apprenticeship standard ST0851 Pipe Welder.

You can find information about career progression in Engineering Construction at Careers in engineering construction - ECITB.

1.8 Standards

Each unit in this qualification has been mapped to Apprenticeship standards and National Occupational Standards (NOS). The assessment criteria within this qualification have been developed by the ECITB in consultation with stakeholders, including employers in the industry, Assessment Associates, who are subject experts, and approved centres.

1.9 Units and grades

This qualification consists of 7 mandatory units. The qualification grades available are pass or fail. Candidates must attain all the learning outcomes in each unit to achieve this qualification. Candidates achieve a unit by meeting all of its assessment criteria linked to the learning outcome(s) at the appropriate standard. The units in section 2 detail the assessment criteria.

We issue a qualification certificate but do not issue unit certificates.

The qualification contains the following units:

ECITB unit ref no.	RQF unit ref no.	Unit title	RQF level	Mandatory or optional
SAF3WL	K/651/7850	Work safely and sustainably in welding	3	M
REL3	L/651/7851	Effective working relationships, communication, and inclusion	3	M
DOC3WL	M/651/7852	Use documentation, procedures and digital technology in welding	3	M
PRE3PIWL	R/651/7853	Prepare for using manual arc pipe welding processes	3	M
CAW3PIWL	T/651/7854	Conduct manual arc pipe welding processes	3	M
MQC3PIWL	A/651/7856	Maintain pipe welding quality control	3	M
RWA3WL	D/651/7857	Reinstate the work area after welding	3	M

1.10 Guided Learning Hours (GLH) and Total Qualification Time (TQT)

Values for Total Qualification Time (TQT), including Guided Learning Hours (GLH), are calculated by considering how much time it would take the typical candidate to complete the learning and assessment activities to achieve the learning outcomes of a qualification.

TQT is an estimate of the total amount of time, on average, that the candidate will take to complete the supervised and unsupervised learning and assessment for the qualification.

GLH is a subset of the TQT and only refers to the supervised time that the candidate will spend with a tutor/ trainer/ assessor/ invigilator.

Individual candidates' requirements and different programme delivery methods at approved centres, mean there will be variation in the actual time taken to complete a qualification. Values for TQT, including guided learning, are estimates.

There are **846 GLH** for this qualification.

Some examples of activities which can contribute to guided learning include:

- classroom or workshop-based learning supervised by a tutor/trainer
- work-based learning supervised by a tutor/trainer
- live webinar or phone tutorial with a tutor/trainer in real time
- e-learning supervised by a tutor/trainer in real time
- all forms of assessment which take place under the immediate guidance or supervision of a tutor/trainer.

The TQT for this qualification is **1440 hours**. Some examples of activities which can contribute to TQT include:

- independent and unsupervised research/learning
- unsupervised compilation of a portfolio of work
- unsupervised e-learning
- unsupervised e-assessment
- watching a pre-recorded podcast or webinar
- unsupervised work-based learning
- all guided learning.

The GLH and TQT for each unit are in this table:

ECITB unit ref no.	RQF unit ref no.	Unit title	RQF level	GLH	TQT
SAF3WL	K/651/7850	Work safely and sustainably in welding	3	106	176
REL3	L/651/7851	Effective working relationships, communication, and inclusion	3	31	38
DOC3WL	M/651/7852	Use documentation, procedures and digital technology in welding	3	109	194
PRE3PIWL	R/651/7853	Prepare for using manual arc pipe welding processes	3	77	117
CAW3PIWL	T/651/7854	Conduct manual arc pipe welding processes	3	336	633
MQC3PIWL	A/651/7856	Maintain pipe welding quality control	3	142	202
RWA3WL	D/651/7857	Reinstate the work area after welding	3	45	80
Total				846	1440

1.11 RQF level

This qualification is at RQF level 2. The RQF level descriptor is:

Knowledge descriptor (the holder…)	**Skills descriptor (the holder can…)**
Has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine.	Identify, select and use appropriate cognitive and practical skills, methods and procedures to address problems that while well-defined, may be complex and non-routine.

Can interpret and evaluate relevant information and ideas. Is aware of the nature of the area of study or work. Is aware of different perspectives or approaches within the area of study or work.	Use appropriate investigation to inform actions. Review how effective methods and actions have been.

1.12 Equity, diversity and inclusion

We have designed this qualification and its assessments to enable fair access to all candidates as far as reasonably possible, while taking industry requirements into consideration e.g. health and safety.

You may wish to refer to our *Equal Opportunities Policy* and the *Reasonable Adjustments and Special Considerations Policy and Procedure* at The ECITB Awarding Organisation - ECITB. If you would like to discuss arrangements for reasonable adjustments, please contact us at qualifications@ecitb.org.uk.

This qualification is designed to promote equity, diversity, and inclusion (EDI) through the learning outcomes (LOs) and assessment criteria (ACs) within it. This qualification ensures that learners understand the importance of creating inclusive environments and are equipped with the skills to do so. The scope of the qualification covers maintaining and communicating effectively to promote good working relationships with all individuals within the workplace. It aligns with the National Occupational Standard (NOS) ECI CO1: Maintain working relationships, communicate effectively and support diversity and inclusion.

1.13 Sustainability

This qualification is designed to promote environmental sustainability and work practices, integrating them through learning outcomes (LOs) and assessment criteria (ACs). This qualification ensures that learners are equipped with the knowledge and skills to implement sustainable practices in their role. The scope of the qualification includes subjects such as resource management, environmental protection, and correct disposal of materials, and equipment. Additionally, it aligns with the National Occupational Standard (NOS) ECI C04: Work with environmental sustainability in mind.

1.14 Digital skills

This qualification assesses the candidate's competence to interact with and utilise digital technology and digital information and ensure the security of digital information through its learning outcomes (LOs) and assessment criteria (ACs). The qualification assesses that learners can use digital tools and technologies essential for their workplace. It aligns to National Occupational Standard (NOS) ECISAEC15: Interacting and utilising digital technology, digital information and security.

2. Units

2.1 Unit features

The qualification units are all presented in a standard layout, providing information for candidates, tutors/trainers, assessors, IQAs and EQAs as well as those who may wish to know about the units for progression purposes, such as training providers, colleges and employers. Each unit has the following sections in it:

ECITB unit number

The unique unit code that identifies the unit on ECITB systems.

RQF unit number

The unique unit code that identifies the unit on the Register of Regulated Qualifications.

Unit title

The name of the unit, which reflects the content of the unit.

RQF level

The level measures the degree of challenge posed by the qualification compared to other qualifications. The level is determined by using the Regulated Qualifications Framework (RQF) level descriptors.

Unit aim

A summary of what the unit enables the candidate to do.

Learning outcomes

What a candidate will know, understand and/or be able to do upon attainment of the unit. Each learning outcome starts with the letters LO.

Assessment criteria

The requirements a candidate is expected to meet in order to demonstrate the attainment of the related learning outcome. Each assessment criterion starts with the letter K if it relates to Knowledge or understanding, with S if it relates to Skills or with B if it relates to Behaviours. Each assessment criterion starts with a command verb which instructs the candidate in what to do.

Additional information

This section provides further information related to those learning outcomes and assessment criteria where clarification is required to support delivery and assessment, to ensure the range of teaching, learning and content of the unit can be met. The text highlighted in bold within the assessment criteria indicates that additional information is provided at the end of the unit. This additional information outlines specific content that approved centres and candidates are encouraged to explore and include within their evidence as appropriate to their role and workplace. The information should be used by candidates to prepare for the qualification, by tutors/trainers to deliver a programme of learning, by assessors to assess candidate evidence, and by IQAs and EQAs for quality assurance. This may also be used to write questions for knowledge tests.

Assessment

This section outlines the ways the unit will be assessed.

Standards

The Apprenticeship/Occupational Standards and the National Occupational Standards (NOS) that the unit is aligned to, builds on or selectively covers.

2.2 Units

ECITB Unit number: SAF3WL
RQF Unit number: K/651/7850
Unit title: Work safely and sustainably in welding

RQF level: 3

Unit aim: This unit is designed to enable the candidate to gain an understanding of relevant health and safety legislation, safe working practices, emergency procedures and environmental sustainability in welding. It will equip the candidate with skills and behaviours to minimise risk of injury, prevent damage to equipment, follow shutdown and evacuation procedures and deal safely with dangers in accordance with organisational policy and procedures. It will also equip the candidate with skills and behaviours to reduce waste and follow environmentally safe working practices.

Learning outcome:

1. The candidate will understand relevant health, safety and environmental legislation and regulations, safe working practices and personal site safety responsibilities and be able to work safely in welding.

Knowledge assessment criteria The candidate can, within the context of their role:	**Skills assessment criteria** The candidate can, within the context of their role:
K1.1 Describe the statutory requirements of the main **health, safety and environmental legislation and regulations.** K1.2 Explain the consequences for employers and employees of not fulfilling their legal health and safety responsibilities. K1.3 Explain the purpose and nature of risk assessments, safe working practices and safe systems of work and the relevance of local procedures and guidance notes. K1.4 Describe the importance of personal behaviour in maintaining workplace standards. K1.5 Explain what sources of information are available to use equipment safely and correctly. K1.6 Describe how to select and correctly use personal protective equipment for the work to be undertaken. K1.7 Explain the potential for different types of injury and how they can be prevented.	S1.1 Work safely at all times, complying with statutory health, safety environmental legislation, regulations and other relevant guidelines and procedures. S1.2 Select the correct personal protective equipment for the work to be undertaken and the work location.

K1.8 Describe the checks which are needed to make sure that portable appliances are safe to use. K1.9 Outline first aid procedures and where information and competent assistance can be obtained and the location of first aid facilities.	

Learning outcome:

2. The candidate will understand risk and hazard management and emergency procedures and be able to deal with risks, hazards and emergencies in welding.

Knowledge assessment criteria The candidate can, within the context of their role:	**Skills assessment criteria** The candidate can, within the context of their role:
K2.1 Describe common types of **hazards** and risks in the workplace. K2.2 Explain how to manage hazards and risks and their own responsibility in relation to minimising these. K2.3 Explain the consequences of poor hazard and risk management in their own workplace. K2.4 Describe emergency, shutdown and evacuation procedures at their own place of work and their related responsibilities.	S2.1 Safely check for potential hazards and risks in accordance with approved procedures. S2.2 Take the correct action to minimise the risk when a hazard has been identified by applying appropriate control measures. S2.3 Follow procedures to contain the hazard, if possible, using appropriate equipment and materials. S2.4 Report the hazard or risk in accordance with procedures and risk control strategy. S2.5 Follow emergency, shutdown and evacuation procedures promptly and correctly.

Learning outcome:

3. The candidate will understand how their work activities impact on the environment and will be able to take positive actions to support environmental sustainability and the move towards a net zero future.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K3.1 Explain their own **responsibility in relation to environmental sustainability** at their own workplace. K3.2 Describe what actions they can take to **reduce the impact of their own work activities on the environment.** K3.3 Describe **potential environmental incidents** within their own work role and the **implications on their own organisation**.	S3.1 Follow environmentally safe working practices and take precautions to minimise environmental damage. S3.2 Report any environmental incidents, concerns or improvements that they identify. S3.3 Deal effectively with **resources** taking environmental considerations into account to reduce use of resources, where possible. S3.4 Minimise the production of waste wherever and however possible.

K3.4 Describe the procedures to follow in relation to communicating incidents, concerns and improvements. K3.5 Explain the importance of using resources efficiently and effectively.	S3.5 Correctly **dispose of waste materials.** S3.6 Store re-usable materials and equipment in accordance with procedures.

Behaviours assessment criteria:

B1.1 Safety conscious – work safely at all times.
B1.2 Risk aware – identify hazards and risks minimising impact and consequences.
B1.3 Takes initiative – deal with routine hazards and risks effectively and report those that cannot be resolved.
B1.4 Environmentally responsible - uses resources sustainably and correctly disposing of waste.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

Assessment of this unit will be by occupationally competent assessors approved by the ECTIB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851, the Plate Welder Apprenticeship Standard ST0852 and the following National Occupational Standards (NOS):

Work safely and manage risks and hazards in engineering construction ECICO2

Join materials by TIG welding Legacy ECIW01L

Join materials by flux cored welding Legacy ECIW02L

Join materials by MMA welding Legacy ECIW04L

Join materials by MIG/MAG welding Legacy ECIW05L

Interpret welding procedures, specifications and standards Legacy ECIW07L

ECITB Unit number: REL3

RQF Unit number: L/651/7851

Unit title: Effective working relationships, communication, and inclusion

RQF level: 3

Unit aim: This unit is designed to enable the candidate to understand the importance of fairness and respect in the workplace, how to develop effective and inclusive working relationships, and the roles, responsibilities, and reporting lines in organisations. It will also provide the skills needed to communicate clearly, deal with issues appropriately, and follow workplace codes of conduct.

Learning outcome:

1. The candidate will understand the importance of developing effective and inclusive working relationships in a diverse workplace and will be able to identify and resolve common workplace problems while following relevant work-based and professional codes of conduct.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Discuss the importance of treating all people **fairly, respectfully, and inclusively** in the workplace, providing detailed examples of how this supports positive working relationships. K1.2 Evaluate the importance of honesty and integrity at work, considering the effect on teamwork, safety, and professional reputation. K1.3 Explain in detail the work-based and professional codes of conduct relevant in their role and how they influence workplace behaviour and decision-making. K1.4 Discuss the importance of developing and maintaining **effective working relationships** in the workplace, including their impact on teamwork and project outcomes. K1.5 Evaluate common problems that can affect working relationships and the effectiveness of different actions to resolve these issues.	S1.1 Consistently demonstrate fair, respectful, and inclusive behaviour towards others, contributing to a positive, welcoming and diverse workplace environment. S1.2 Respond promptly and positively when colleagues request help or information, adapting **communication** style where necessary to maintain effective working relationships. S1.3 Apply and follow relevant work-based and professional codes of conduct accurately within their role, showing commitment to professional standards and responsibilities. S1.4 Develop and sustain effective working relationships with a diverse range of colleagues and stakeholders. S1.5 Proactively maintain effective relationships by clearly communicating and keeping others informed about work activities that impact them. S1.6 Initiate requests for assistance from others in a polite, respectful, and professional manner. S1.7 Apply appropriate negotiation and problem-solving strategies to

	address and resolve **disagreements** constructively and objectively. S1.8 Evaluate the impact of their own work and responsibilities on others, adapting their approach to support collaborative outcomes.
Learning outcome: 2. The candidate will understand responsibilities and reporting lines within their role and will be able to communicate effectively related to these and appropriately resolve or report issues.	
Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K2.1 Explain the responsibilities of their role and others within the workplace, assessing how these support **effective working relationships and communication**. K2.2 Evaluate the importance of **lines of communication and reporting lines** and how they ensure accountability and clarity in workplace communication. K2.3 Explain the procedures and documentation that must be used to communicate in the workplace. K2.4 Assess the potential consequences of failing to follow established communication procedures and systems in the workplace. K2.5 Evaluate the limits of their own responsibility and justify who should be referred to for clarification or escalation of issues. K2.6 Explain why it is important to deal **with problems promptly and effectively in the workplace** K2.7 Describe how to report issues that have been resolved as well as those that cannot be resolved.	S2.1 Effectively resolve problems within the limits of their own authority as they arise, applying appropriate judgement and communication skills. S2.2 Identify when **escalation** is necessary and promptly escalate problems to the appropriate person in accordance with workplace protocols. S2.3 Accurately report problems following established procedures, ensuring clear and timely communication. S2.4 Demonstrate integrity and attention to detail by completing all records accurately and thoroughly in line with workplace procedures.
Behaviours assessment criteria: B1.1 Accountable - takes accountability of their tasks and acts professionally. B1.2 Professional -acts with integrity, treating everyone with fairness and respect.	
Assessment This section outlines the ways the unit will be assessed. The candidate must pass a knowledge test for this specific unit.	

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the National Occupational Standard (NOS):

Maintain working relationships, communicate effectively and support diversity and inclusion ECI C01.

ECITB Unit number: DOC3WL

RQF Unit number: M/651/7852

Unit title: Use documentation, procedures and digital technology in welding

RQF level: 3

Unit aim: This unit will enable the candidate to develop both understanding and skills to accurately interpret and follow work-related specifications, documentation, procedures, and handover requirements. It will also enable the candidate to understand digital and security policies and apply these effectively, using a range of digital devices, information, and technologies in line with workplace requirements. The unit is limited to general documentation and procedures rather than quality control documentation and procedures.

Learning outcome:

1. The candidate will be able to interpret complex engineering documentation, specifications, and procedures, applying this information accurately to complete work tasks to the required standard.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Explain how the principles, conventions, and applications of engineering documentation ensure accurate communication. K1.2 Explain how the detailed information in engineering drawings and related specifications corresponds to the physical components involved. K1.3 Explain the purpose and use of relevant plans and schedules within engineering projects. K1.4 Explain the **procedures** and typical authorisation processes related to tasks undertaken, including the implications of adherence and non-adherence. K1.5 Assess the importance of verifying that **procedures** have been followed and documentation correctly completed at all stages of the work, including pre-, during, and post-process checks. K1.6 Explain the significance of signing **documentation**, including associated legal responsibilities and accountabilities. K1.7 Describe the tasks performed, the reporting lines, and the timing and	S1.1 Verify the validity and currency of documentation before use to ensure accuracy and compliance. S1.2 Interpret and apply relevant **documentation** accurately to support task completion. S1.3 Adhere to authorisation **procedures** for client and site requirements, ensuring all approvals are secured prior to commencing work. S1.4 Accurately complete all relevant permits, briefs, and site documentation at every stage of the work process. S1.5 Identify and report any instances where work cannot be completed, or where deviations from specifications, procedures, or work plans occur. S1.6 Confirm that all necessary actions and reports are completed thoroughly before concluding activities and prior to any **handover**. S1.7 Execute appropriate handover procedures to ensure clear communication and continuity.

nature of required reports within their role. K1.8 Evaluate appropriate actions when variations from specifications or work plans are identified, considering the impact on quality and compliance.	S1.8 Follow all relevant safety **procedures**, risk assessments, and methods of work when preparing and reinstating work areas, materials, tools, and equipment.
Learning outcome: 2. The candidate will understand digital and security policies and be able to effectively use a range of digital devices, information, and technologies relevant to their role.	
Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K2.1 Explain how **digital and security policies and procedures** apply specifically to their role. K2.2 Analyse the impact that **misuse** of digital information can have on the employer. K2.3 Describe how personal digital information must be stored to comply with relevant legislation and regulations. K2.4 Explain what complying with intellectual property rights means within their role, including copyright, commercial sensitivities, and trademarks. K2.5 Evaluate why different data **permission levels** exist and their importance within their role. K2.6 Explain the purpose and function of digital access security systems. K2.7 Describe the procedures required when using **digital devices to access buildings and sites.** K2.8 Explain the reasons for **restrictions on employer-provided and personal digital equipment**. K2.9 Explain how work-related digital information is used, interpreted, stored, and destroyed, with specific reference to the welder role. K2.10 Analyse the risks associated with using unverified **digital information** relevant to the job role and tasks.	S2.1 Apply digital and security policies and procedures consistently to maintain data security and confidentiality. S2.2 Check and maintain digital devices and access equipment used within their role, ensuring they are functional, secure, and compliant with workplace procedures. S2.3 Use workplace technology effectively to locate, extract, store, share, and securely dispose of digital information in line with organisational and site procedures. S2.4 Seek and utilise appropriate support and guidance when issues with digital technologies or data access arise, following established reporting protocols. S2.5 Operate within permitted data access levels, respecting intellectual property rights and legal restrictions on digital information usage.

K2.11 Explain the benefits of **digital technology for training** and professional development.	

Behaviours assessment criteria:

B1.1 Responsible - works with integrity accurately completing all documentation.

B1.2 Precise - uses correct versions of documentation, safeguarding the quality and integrity of the welding operations.

B1.3 Accountable - maintains the integrity of the site digitally, adhering to procedures for personal digital items such as mobile phones.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

The candidate's skills and behaviours will be assessed through observed activities in the workplace. Some of the candidate's knowledge, skills and behaviours will be assessed in the technical discussion which is holistic and covers aspects of the whole qualification.

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851, Plate Welder Apprenticeship Standard ST0852 and the following National Occupational Standards (NOS):

Interpret and follow documentation and procedures ECI C05

Interacting and utilising digital technology, digital information and security ECISAEC15

Join materials by TIG welding ECIW01

Join materials by flux cored welding ECIW02

Join materials by MMA welding ECIW04

Join materials by MIG/MAG welding ECIW05

Interpret welding procedures, specifications and standards ECIW07.

ECITB Unit number: PRE3PIWL

RQF Unit number: R/651/7853

Unit title: Prepare for using manual arc pipe welding processes

RQF level: 3

Unit aim: This unit will equip the candidate with knowledge, skills and behaviours to safely and correctly identify and prepare work areas for manual arc welding equipment. It will also enable candidates to set up and assemble the arc welding equipment, conduct checks and test whether the arc welding equipment is operating within specification.

Learning outcome:

1. The candidate will understand how to prepare for manual arc welding processes and be able to safely and correctly select, connect and set-up arc welding equipment to conduct welding activities.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Describe the requirements for the welding work area. K1.2 Explain the impact of **environmental conditions** on the welding activities. K1.3 Describe **calibration and validation** procedures and which equipment must be calibrated. K1.4 Describe **how to identify** the correct **power source**, associated cables, **consumables** and **safety equipment** to conduct arc welding. K1.5 Explain the **pre-use checks** required before and after assembly of the equipment and what defects could be found.	S1.1 Identify a **suitable area to position** the **arc welding equipment** for welding activities. S1.2 Ensure the welding environment is suitable for welding activities and the hazards are mitigated including welding generated hazards. S1.3 Check the arc welding and associated equipment **is calibrated and valid.** S1.4 Select and safely **connect the arc welding equipment** for the selected processes. S1.5 Safely handle arc welding equipment ensuring the equipment is not damaged. S1.6 Conduct pre-use checks before and after assembly to ensure correct operation. S1.7 Identify and report equipment defects if appropriate.

Behaviours assessment criteria:

B1.1 Responsible - makes decisions within the guidelines of the work instruction, to ensure the workplace is set up in accordance with procedures for weld quality and safety.
B1.2 Proactive - seeks guidance to ensure the preparations support weld quality and safety.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

The candidate's skills and behaviours will be assessed through observed activities in the workplace.

Some of the candidate's knowledge, skills and behaviours will be assessed in the technical discussion which is holistic and covers aspects of the whole qualification.

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851 and the following National Occupational Standards (NOS):

Join materials by TIG welding ECIW01

Join materials by flux cored welding ECIW02

Join materials by MMA welding ECIW04

Join materials by MIG/MAG welding ECIW05

Interpret welding procedures, specifications and standards ECIW07.

ECITB Unit number: CAW3PIWL

RQF Unit number: T/651/7854

Unit title: Conduct manual arc pipe welding processes

RQF level: 3

Unit aim: This unit will equip the candidate with knowledge and skills to weld pipe joints using 2 selected manual arc welding processes to the required standard, taking into account the environmental considerations, whilst adhering to health and safety legislation, regulations and safe working practices.

Learning outcome:

1. The candidate will understand the different types of manual arc welding processes used for pipe welding in engineering and be able to prepare and set up the components to be joined to specification for 2 selected processes.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Describe the following arc welding processes: a) 111 Manual Metal Arc MMA b) 131 MIG c) 135 MAG d) 136 FCAW e) 141 Tig f) TIP TIG. K1.2 Describe additional welding processes to include: a) 15 PAW b) 121 Submerged arc. K1.3 Explain **arc welding equipment** used for each process in K1.1, including: a) power source characteristics b) settings c) welding parameters and fault-finding procedures. K1.4 Describe the types of **pipe welding joints.** K1.5 Explain how **joint configurations** impact on welding.	S1.1 Follow the relevant welding procedure specifications and quality standards for the components to be welded. S1.2 Ensure joint preparation and configuration complies with the specification. S1.3 Raise concerns when joint preparation and conditions are not acceptable for quality welds.

Learning outcome:

2. The candidate will understand weldability of materials, joint geometry and temperature control and be able to safely and correctly weld pipe joints in the 2 selected processes in all positions.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K2.1 Explain the fundamentals of **weldability**. K2.2 Describe **how materials and consumables affect welding characteristics** and **variables** for each of the processes. K2.3 Describe pipe **bore contamination** control methods. K2.4 Explain the implications of poor joint alignment and **poor joint geometry.** K2.5 Describe **root contamination prevention methods and equipment** including gas measurement. K2.6 Explain the requirement for pre, and post heat and interpass temperature control. K2.7 Explain methods of **monitoring temperatures**. K2.8 Describe **control of welding consumables** before, during and after the welding task.	S2.1 Confirm the consumables are as specified and fit for purpose. S2.2 Ensure joint alignment and joint geometry complies with the specification. S2.3 Prevent root contamination where required. S2.4 Ensure the material is within the correct temperature range in accordance with the Weld Procedure Specification (WPS). S2.5 Safely make **positional** joints as specified using the appropriate thermal joining technique. S2.6 Shut down the equipment to a safe condition on completion of joining activities.

Learning outcome:

3. The candidate will understand inspection and testing methods, weld defects and causes and be able to repair pipe welded joints in engineering and visually inspect welded joints ensuring they meet specifications.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K3.1 Explain **inspection and testing methods** commonly used on pipe welds. K3.2 Identify the **weld defects** which are: a) common to all processes b) specific to each process. K3.3 Explain the **root causes** and **mitigation of weld defects**.	S3.1 Visually inspect completed welds are to the required quality and specification. S3.2 Prepare the welded joint to specification for inspection and testing by **cleaning** the welded joint(s) as required and **marking the weld** appropriately to ensure accurate recording.

K3.4 Describe how to **repair the weld defects**.	S3.3 Prepare the welded joint for **post weld treatment** where appropriate. S3.4 Confirm compliance with the relevant joining procedure and job instructions. S3.5 Where defects are identified seek guidance for remedial activities from qualified welding inspector.

Behaviours assessment criteria:

B1.1 Responsible - takes responsibility for decision-making, within the guidelines of the work instruction, for their workplace, the application of welding processes, and for their production.
B1.2 Proactive - seeks guidance where necessary to ensure the quality of the weld and safety of the work area.
B1.3 Challenges poor practices in a professional manner when identified within the workplace.
B1.4 Quality focused - delivers quality work in accordance with expectations in safety, production and ethics.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

The candidate's skills and behaviours will be assessed through observed activities in the workplace. Some of the candidate's knowledge, skills and behaviours will be assessed in the technical discussion which is holistic and covers aspects of the whole qualification.

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851 and the following National Occupational Standards (NOS):

Join materials by TIG welding ECIW01

Join materials by flux cored welding ECIW02

Join materials by MMA welding ECIW04

Join materials by MIG/MAG welding ECIW05

Interpret welding procedures, specifications and standards ECIW07

ECITB Unit number: MQC3PIWL

RQF Unit number: A/651/7856

Unit title: Maintain pipe welding quality control

RQF level: 3

Unit aim: The aim of this unit is to ensure the welder understands the purpose of welding procedures, quality assurance and quality controls, and how these impact the welded joint. The unit enables the learner to develop skills and behaviours to evaluate a finished weld against the relevant standards and undertake corrective actions to achieve the required specification.

Learning outcome:

1. The candidate will understand the purpose of welding procedures and standards, how they are created and be able to comply with these when conducting welding activities.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Define the purpose and requirements for welding procedures. K1.2 Explain how Weld Procedure Specifications (WPS) and/or welder instructions are created, tested and used to ensure the competence of welders. K1.3 Define a Welding Procedure. Qualification Record (WPQR). K1.4 Explain what information is contained in the WPS. K1.5 Describe welder qualification range, prolongation and revalidation (ISO 9606). K1.6 Explain how they can **improve their own welding quality**.	S1.1 Follow the relevant WPS and quality standards for the components to be welded, to confirm the joint configuration and preparation requirements are acceptable. S1.2 Follow the relevant WPS and quality standards for the components to be welded, to ensure root contamination protection is in place and sufficient where appropriate. S1.3 Follow the relevant WPS and quality standards for the components to be welded, to monitor pre, post and interpass temperatures. S1.4 Follow the relevant WPS and quality standards for the components to be welded, to select and control the correct consumables. S1.5 Follow the relevant WPS and quality standards for the components to be welded, to conduct welding within the specified welding parameters. S1.6 Reflect upon their own effectiveness as a welder and continuously improve their own performance.

Learning outcome:

2. The candidate will understand welding quality control, quality assurance methods and welding procedures and be able to identify and implement the appropriate quality controls.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K2.1 Define quality assurance and quality control for welding activities. K2.2 Explain welding standards and specific additional requirements and how they are complied with. K2.3 Explain why welding test coupons/test pieces are produced in accordance with procedures. K2.4 Explain the purpose of acceptance criteria. K2.5 Describe the quality assurance plan and Inspection and Test Plans (ITP). K2.6 Describe the reasons for the creation and completion of lifetime quality records.	S2.1 Review welder documentation and standards. S2.2 Produce weld samples and test coupons as required. S2.3 Interpret weld acceptance criteria and assess the weld against them. S2.4 Complete schedules or weld process documentation. S2.5 Conduct weld marking to enable identification of welder.
Learning outcome: 3. The candidate will uunderstand how weld quality is influenced by the welder and will be able to identify quality impacting factors or conditions taking corrective actions to achieve the specification.	
Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K3.1 Describe why welding is defined as a **special process**. K3.2 Describe why a weld must have identification and how this is achieved. K3.3 Explain how compliance with Welding Procedure Specification (WPS) is achieved. K3.4 Analyse temperature readings during monitoring activities and decide what action to take. K3.5 Describe what information is recorded before, during and after welding activities. K3.6 Describe when and what interaction occurs between the welder and the Quality Control/Quality Assurance before, during and after welding. K3.7 Define what 'non-compliance reporting' is and how it is undertaken.	S3.1 Interpret and follow welding procedures and standards. S3.2 Assess conditions to identify whether there are any variations that are detrimental to weld quality before welding. S3.3 Assess conditions to identify whether there are any variations that are detrimental to weld quality during welding. S3.4 Assess conditions to identify whether there are any variations that are detrimental to weld quality after welding. S3.5 Mitigate and resolve detrimental conditions to achieve the specification.
Behaviours assessment criteria:	

B1.1 Quality focused: stops the welding activities when conditions and/or set up is incorrect to ensure a quality weld is produced.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

The candidate's skills and behaviours will be assessed through observed activities in the workplace. Some of the candidate's knowledge, skills and behaviours will be assessed in the technical discussion which is holistic and covers aspects of the whole qualification.

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851 and the following National Occupational Standards (NOS):

Join materials by TIG welding ECIW01

Join materials by flux cored welding ECIW02

Join materials by MMA welding ECIW04

Join materials by MIG/MAG welding ECIW05

Interpret welding procedures, specifications and standards ECIW07.

Welding quality standards may include:

NDT testing requirements:

ISO 17636: Non-destructive testing of welds. Radiographic testing

ISO 10675: Non-destructive testing of welds - Acceptance levels for radiographic testing

ISO 17640: Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment

Weld defect acceptance criteria:

ISO 5817: Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections.

Additional standards:

ASME Boiler and Pressure Vessel Code (BPVC) Sections I-XI

AWS D1.1, D1.9

BS EN 1090-2: Technical requirements for the execution of steel structures

BS EN 1011: Welding. Recommendations for welding of metallic materials

BS 2633: Specification for Class I arc welding of ferritic steel pipework for carrying fluids

BS EN 12952: Water-tube boilers and auxiliary installations

PD 5500: Specification for unfired pressure vessels.

ECITB Unit number: RWA3WL

RQF Unit number: D/651/7857

Unit title: Reinstate the work area after welding

RQF level: 3

Unit aim: This unit enables the candidate to reinstate the work area correctly and store or quarantine welding equipment, consumables and resources correctly whilst adhering to health, safety and environmental legislation, regulations and safe working practices.

Learning outcome:

1. The candidate will understand how to isolate, disconnect and dismantle arc welding equipment and will be able to carry out the processes and hand over the work area in line with procedures.

Knowledge assessment criteria: The candidate can, within the context of their role:	**Skills assessment criteria:** The candidate can, within the context of their role:
K1.1 Describe how to safely isolate, disconnect and dismantle the welding equipment. K1.2 Define the appropriate storage for arc welding equipment, and associated consumables including used consumables. K1.3 Define handover of the weld area and relevant signing off of documentation.	S1.1 Isolate, disconnect and dismantle the welding equipment including removal of consumables where appropriate. S1.2 **Remove arc welding equipment,** associated consumables and resources, and store them. S1.3 Handover the work area and documentation in line with procedures.

Behaviours assessment criteria:

B1.1 Responsible and accountable - follows specified reinstatement and handover procedures and controls.
B1.2 Professionalism - checks arc welding equipment and associated cables and equipment and reports defects and/or quarantines items.

Assessment

This section outlines the ways the unit will be assessed.

The candidate must pass a knowledge test for this specific unit.

The candidate's skills and behaviours will be assessed through observed activities in the workplace. Some of the candidate's knowledge, skills and behaviours will be assessed in

Assessment of this unit will be by occupationally competent assessors approved by the ECITB Awarding Organisation. They will gather sufficient evidence of competence from work-based activities on suitable engineering sites.

Assessment Criteria may be satisfied by observation, questioning, expert witness testimony, professional discussion or any other approved method. Further guidance on assessment can be found in the ECITB Assessment Guidance Manual.

Standards

This unit is aligned to the Pipe Welder Apprenticeship Standard ST0851, Plate Welder Apprenticeship Standard ST0852 and the following National Occupational Standards (NOS):

Join materials by TIG welding ECIW01

Join materials by flux cored welding ECIW02

Join materials by MMA welding ECIW04

Join materials by MIG/MAG welding ECIW05

Interpret welding procedures, specifications and standards ECIW07.

