T-LEVELS | IfATE Institute for Apprenticeships and Technical Education

T Level Technical Qualification in Engineering, Manufacturing, Processing and Control (8713-34)

Fabrication and Welding Technologies (334)

Guide standard exemplification material

Threshold competence – Sample 2022

First teaching from September 2022
Version 2.0

City & Guilds | eal

Contents

Version and date	Change detail	Section
1.1 February 2023	Minor amendments to dimensions in resources and cutting lists	Task 1 evidence
	Alignment of assessor observation evidence	Task 2 Practical Observation forms
2.0 February 2024	Additional assessor observation guidance – Task 2	Task 2 – assessor observation guidance

Introduction

The sample assessment materials within this document refer to the Fabrication and Welding Technologies sample occupational specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to **minimal threshold competence**. The examples provided do not reflect all evidence from the sample assignment as the focus of this material is the quality and standards that need to be achieved rather than the volume of exemplar evidence provided. However, the examples provided are representative of all tasks in the sample assignment. The evidence presented here has been developed to reflect **minimal threshold competence** within each task but is not necessarily intended to reflect the work of a single candidate. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and standard of performance will vary across tasks. **Minimal threshold competence** will be based on a synoptic mark across all tasks.

The materials in this Guide Standard Exemplification Material (GSEM) are separated into the sections as described below. Materials are presented against a number of tasks from the assignment.

Task

This section details the tasks that the candidate has been asked to carry out, what needs to be submitted for marking and any additional evidence required. Also referenced in this section are the assessment themes the candidates will be marked against when completing the tasks within it. In addition, candidate evidence that has been included or not been included in this GSEM has been identified within this section.

In this GSEM there is candidate evidence from:

Task 1 – Planning

Task 2 – Production

Task 3 – Quality review and testing.

Candidate evidence

This section includes exemplars of candidate work, photographs of the work in production (or completed) and practical observation records of the assessment completed by centre assessors. This will be exemplar evidence that was captured as part of the assessment and then internally marked by the centre assessor.

Photographs in this GSEM demonstrate the full process that the candidate has undertaken to complete the anchor. Commentary sections detail where performance is considered to be at a level reflective of a threshold competence grade. Note, due to the nature of this process, not all individual work activities would provide opportunity to demonstrate a defined level of differentiation beyond a pass – but these images are shown in order to show the cohesiveness of the process being undertaken, and to draw out where differentiation is possible.

Commentary

This section includes detailed comments to demonstrate how the candidate evidence attests to the standard of **minimal threshold competence** by directly correlating to the grade descriptors for this occupational area. Centres can compare the evidence against the performance indicators in the marking grid descriptors within the assessor packs, to provide guidance on the knowledge, skills and understanding that need to be met for **minimal threshold competence.**

It is important to note that the commentary section is not part of the evidence or assessment but are evaluative statements on how and why that piece of evidence meets a particular standard.

Grade descriptors

To achieve a pass (threshold competence), a candidate will be able to:

Interpret information, demonstrate planning, assess risk and follow safe working methods when applying practical skills to an acceptable standard as recognised by industry.

Adequately prepare working areas, acknowledging potential risks and applying acceptable housekeeping techniques during tasks.

Demonstrate basic technical practical skills in marking out, cutting, forging, fabricating, welding that is in line with industry standards and meet the requirements of the brief.

Demonstrate basic knowledge and understanding of the principles and processes required for fabrication and welding technologies.

Work safely showing an understanding in the selection and use of relevant tools and equipment and demonstrate a basic awareness of straightforward preparation and application processes within the working environments for marking out, cutting, forging, fabricating and welding activities.

Identify causes of problems or common issues related to fabrication and welding and have some knowledge and skills in how to rectify them.

Demonstrate basic technical skills and understanding in the use of non-destructive testing methods to ensure quality welds are produced to recognised industry standards.

Mostly use general industry and technical terminology accurately across different communication methods with some consideration of technical and non-technical audiences.

Task 1 – Planning

(Assessment themes: Health and safety, Planning and preparation)

For task 1, candidates need to produce the following pieces of evidence:

- a resources list with justifications for the selections and measuring equipment calibration check recorded
- a risk assessment
- a method statement with justifications
- a hot works permit
- a cutting list
- a quality check sheet.

The following task 1 supporting evidence has not been included for this version of the GSEM.

- a hot works permit.

For task 1 candidates will be expected to complete a hot works permit template as part of their preparation. This is supporting evidence for assessors to gauge the candidate's planning skills and safety awareness and will not be marked. *See assessor pack for additional guidance.*

For task 1 candidates will be expected to produce a quality check sheet to use in task 3a during the quality inspection task. This is supporting evidence for assessors to gauge the candidate's planning skills and will not be marked.

Candidate evidence

1. Resources list with justifications for the selections and measuring equipment calibration check recorded

Requirements and resources	Task	Quantity	Justification
Tools/equipment/materials/consumables			
Pencil and paper	1	n/a	To plan the work and to create the quality check sheet.
6mm x 1m x2m mild steel plate, 6mm x 1m x2m mild steel round bar 10mm x 1m x2m mild steel flat bar	2	2	Raw material to make the components.
Chalk	2	1	Needed for marking out.
Engineer's square	2 and 3	1	Used to check for squareness when establishing the datums.
Steel rule	2 and 3	1	Used to mark out the components dimensions for cutting, to check the dimensions.
Centre punch	2	1	Used to create clear cut lines for the oxy fuel cutting.
Forging hammer	2	1	Used for hammering the steel.
Oxy fuel cutting equipment including gas bottle regulators	2	1	Used to cut each component of the anchor out, and for the forging.
Ball pein hammer	2	1	Used for hammering the punch marks with the centre punch.
Anvil	2	1	This will be used in the forging process.
Angle grinder with grinding wheel	2	1	Used to clean up all the cut edges.
MIG Welding plant with 1.2mm Mild steel wire copper coated	2	1	To fully weld the anchor.
MMA Welding plant with 3mm mild steel electrodes	2	1	To fully weld the remainder of the anchor.
Chipping hammer	2	1	Used to remove the welding slag.
Wire brush	2	1	To clean the welds after removing the slag.
Oxygen gas bottle	2	1	Used for the cutting of the components.
Acetylene gas bottle	2	1	Used for the cutting of the components.
Tongs	2	1	Used to hold the stock end during the forging process.
Pillar drill	2	1	To drill the hole for the round bar.
Drill bits 3.2mm and 8mm	2	1	Needed to drill the hole for the round bar.
Yoke magnet	3	1	For MPI NDT testing.
Magnetic ink/fluid	3	1	For MPI NDT testing.
Brush	3	1	To apply the magnetic ink.
Rags	3	1	To clean all weld testing areas.
Computer access	3	n/a	To prepare a report for handover.
PPE			
Gloves	2 and 3	2	To reduce chances of injury to hands.

Overalls/coat	All	1	To protect the body from dirt and hot swarf.
Safety shoes/boots	All	1 pair	To reduce chances of injury to feet.
Safety glasses	2 and 3	1	To protect the eyes from swarf and grinding dust.
Welding helmet	2	1	To protect eyes and face during welding.
Welding gauntlets	2	1	To protect the hands during welding.
Welding screen	2	1	To protect eyes from welding light.
Dark cutting screen	2	1	To protect eyes from bright light and sparks when cutting and forging.
Technical information/documentation			
Assignment brief	All	Needed for technical drawings and tolerances.	
Cutting list	1 and 2	To plan the individual components to be cut from the raw material to be assembled into the anchor. List will show the required sizes and how many to cut.	
Calibration record	2 and 3	To check the measuring equipment calibration is up to date.	
User manuals	2	For the pillar drill, MIG welding plant and MMA welding plant.	
Risk assessment	2 and 3	To be completed before beginning the task to identify risks and hazards that may occur during the activities.	
COSHH data sheets	2	To check user requirements.	
Method statement	2 and 3	This document sets out what I need to do and in the order in which to do things for the tasks.	
Quality check sheet	3	To record the results of the quality review and testing.	
Hot work permit template	2	To complete prior to starting hot works. Permission to work.	
General workshop resources			
Waste disposal bins	All	Waste to be separated into recyclable and non-recyclable.	
First aid kit	2 and 3	In case of any minor injuries.	
Warning signage and notices	2 and 3	In case of a spillage, to warn others of a wet floor.	
Paper towels, brushes, dustpan	2 and 3	To clean up any waste during and after production.	
Mop and bucket	2	To clean up any spills and clean the work area.	
Calibration of measuring equipment			
All measuring equipment checked. Last calibration date was November 2022.			

1. Cutting list

Component	Material	Requirements	Quantity
Shank	Mild steel flat bar	650mm x 50mm x 10mm with 6mm hole in the middle of the width side but in required position for the stock.	1
Flukes	Mild steel plate	340mm x 150mm x 6mm	2
Flukes support	Mild steel plate	340mm x 30mm x 6mm	2
Stock	Mild steel round bar	6mm x 530mm	1

Crown	Mild steel plate	100mm x 100mm x 6mm 2 notches cut to suit the stock piece.	2
Crown (middle)	Mild steel plate	84mm x 100mm x 6mm 8mm hole to be drilled in the centre.	1

Commentary

Note: This commentary covers the resources list and cutting list.

The candidate has interpreted the requirements of the brief and applied their understanding to produce an adequate list of resources required, demonstrating technical knowledge of the requirements required for producing the anchor, carrying out the quality inspection and testing the anchor using non-destructive testing equipment.

The candidate has produced a standard cutting list with the required information needed to aid them with the measuring and marking out of the components.

The candidate has listed amounts of each resource that they have planned to use but their justification is brief and not detailed. The candidate could have given more detailed justifications for their choice, giving more detail of the intended use. For example, the candidate could have explained the purpose of the yoke magnet and magnetic ink in respect of carrying out the Magnetic Particle Inspection (MPI) non-destructive testing (NDT) method. The candidate has indicated the task in which the listed resources will be used. The candidate has also included consideration for other resources that should be available in the workshop, for example, access to a first aid kit. They could have also included an eye wash station. The candidate could also have referred to copies of the welding standards being available, such as BS EN ISO 5817 which the quality of the welds must meet.

The candidate has recognised the need to refer to supporting technical documentation in order to complete the task. This is not detailed. The candidate could have developed their response further if they had given more detail in describing the legislation they have listed and how it will be used.

The candidate has demonstrated planning for safe working by identifying appropriate PPE and stating why each piece should be used, but some areas lack additional detail, for example, the type of gloves to be worn and why they are the preferred type. The candidate could have developed this area further, through listing additional pieces including ear protection and the use of barrier cream.

1. Risk assessment

Work area

Hazard	Risk	Control	Likelihood	Severity
Slips, trips, and falls.	Slipping or tripping.	Floor markings identify where to walk. Use correct PPE. Remove trailing cables or wires. Ensure area is clean and tidy at all times. Dispose of waste correctly.	1	1
Falling or moving objects.	Items falling onto body parts.	Ensure good housekeeping, clean benches. PPE to be worn at all times. Good tool management.	2	1
Hot sparks.	Burns.	Must wear PPE (eye protection, heat-resistant gloves) and close curtains.	3	2
Electrical energy.	Electric shock.	Check all cables, wear PPE. Follow isolation procedures when cleaning and maintaining equipment.	2	2
Manual Handling.	Personal injury to back, sprains.	Ensure training is followed. Use correct techniques to move tools and materials. Use mechanical means of lifting if too large or heavy.	2	1
Faulty equipment or machinery.	Electrical and mechanical breakdowns leading to injuries e.g. cuts or grazes, electric shocks etc.	Carry out pre-use safety checks, check for hazards or problems. Lock off broken or faulty machinery or equipment until it's fixed. Comply with PUWER regulations.	1	1
Liquids and chemicals.	Spillages, eyes, skin, fumes.	Check the COSHH data sheet before using any liquids or chemicals. Wear PPE. Clean up spillages.	2	1

Completing fabrication and welding tasks

Hazard	Risk	Control	Likelihood	Severity
Welding and burning fumes.	Inhalation of fumes causing illness.	Always use extraction. Wear correct PPE.	2	1
Ultra-violet and Infra-red radiation.	Burns, arc-eye.	Correct PPE at all times and close welding curtains to protect others.	2	3

Flammable Gas.	Leakage of harmful gas.	Check equipment before using.	2	1
Hot equipment and parts.	Burns to skin.	Cool in burning area before storing.	1	2
Hot sparks, slag, and chippings.	Burns to skin.	Clean materials and use correct PPE.	3	2
Manual Handling.	Back injuries, sprains	Ensure training is followed. Use correct techniques to move tools and materials. Use mechanical means of lifting if too large or heavy.	2	1

Likelihood		Severity	
1	Very unlikely to happen	1	Minor injury
2	Unlikely to happen	2	Major injury
3	Possible to happen	3	Loss of limb
4	Likely to happen	4	Death of an individual
5	Very likely to happen	5	Multiple death

Commentary

The candidate has demonstrated a good level of knowledge and understanding of the different types of risks and hazards associated with fabrication and welding activities. The candidate has considered and identified most of the major hazards and associated some risks for each of the tasks.

The candidate has demonstrated some understanding of the mitigations required to minimise the risks and hazards; however they lack detail demonstrating that the candidate may have not considered a variety of scenarios and situations that could arise during the fabrication and welding activities. There are references to PPE but the content lacks detail.

The likelihood and severity has been attempted for most of the hazards and risks occurring and is mostly realistic, demonstrating the candidate has a basic understanding and awareness of risk assessment and mitigation and working safely. For example, the candidate rated the likelihood for fault equipment or machinery as 1, very unlikely to happen and rated severity as 1. This shows a lower level of understanding and consideration as equipment could malfunction or breakdown or they could encounter a problem whilst using the equipment therefore the likelihood could be a possibility, therefore a 3 rating would be more appropriate.

The candidate has demonstrated a basic knowledge for the risk assessment process through the full completion of the risk assessment. To develop their response, the candidate

would need to demonstrate a deeper understanding of likelihood and severity by rating them more accurately and that risks may be very unlikely to happen but could be of a higher severity rating if it did occur.

They have demonstrated acceptable knowledge for risk mitigation in order to work safely, however, if the candidate had provided more detail for the mitigation and specified the PPE throughout this would have developed the response.

1. Method statement

Production of the anchor

When I enter the workshop, I will be wearing all the correct workshop PPE required for the fabrication and welding activity. I will check that the work area is clean and will remove anything that should not be on my workstation. I will complete a hot works permit and hand it to the supervisor.

I will use the technical drawing and cutting list to collect the correct materials needed for the task, lifting correctly and place them on the workbench ready to mark-out.

I will accurately produce the markings required for cutting the materials to size. When doing this I will always use a datum edge and check measurements.

Starting with the crown. I will produce the scribe markings required and then mark out the flukes of the anchor and check markings.

I will cut the plates using the oxy-fuel process. I will then check and clean the metal.

I will produce markings for the notches and the correct diameter hole in the crown then produce the notches and hole in the crown side plates and check for accuracy. I will clean the components using an angle grinder. I will measure the angles for the flukes at 30° and join the shortest side to the highest point, I will cut the metal accurately.

Once all materials are cut to size, I will check all measurements. I will get the prefabricated sections and inspect to make sure they are to desired dimensions. I will then set up the welding equipment for the two processes for MMA and MIG welding. I will check all connections and make sure the welding-bay is clean and tidy before working.

I will put the anchor together and will keep an eye on potential distortion of the plates. I will assemble the anchor checking for accuracy throughout.

Once all the components are tacked together and held firmly, I will weld the fluke and support to the shank using the MMA process and clean up all the welds.

Once all welds are completed, I will visually inspect the welds for good quality then remove spatter and use a wire brush to clean the welds for further inspection.

I will then take the completed anchor to the NDT station ready for inspection and make sure the metal is clean.

Following the correct COSHH and safe working practice procedures, I will test the welded sections of the anchor and record the quality of welds.

On completion of the task I will tidy my workspace, return all equipment and tools to the correct areas and complete the associated paperwork for handover.

Commentary

The candidate here has displayed a good understanding of the order in which the activities should take place. This sequence is accurate in terms of the order of activities, but the detail is a little brief in some of the stages in terms of the safety checks, material collection, marking-out of components, checking for dimensions, fabricating, joining, and testing the component.

The method statement produced is logical and gives the sequence to follow to fabricate the component to the required tolerances, prior to, during and after assembling and welding the product. The format is acceptable and attempts to demonstrate a methodical approach to what the candidate has to achieve rather than a basic bullet pointed list which at this level is not appropriate.

The method statement is accurate throughout, and states that correct methods should be used, for example 'When doing this I will always use a datum edge and check measurements'.

The candidate has correctly included reference to the hot works permit but has not provided any detail about this or reasoning for why this is an important step.

Planning does not fully take into account implications of potential issues with the fabrication and welding processes resulting in potential non-conformity with the specification.

If the candidate had provided more detailed justifications for their decisions and considered potential issue, this would have developed their response. For example, if the datum edge was not used, what would be the impact on the fabrication of the final product.

1. Quality check sheet

Check	**Criteria**			**Comments**
Component sizing:	**Dimensions**	**Finished size:**	**Met**	
Stock	530 mm x 6 mm			
Crown	100 mm high x 100 mm wide at widest point			
Shank	650 mm x base width 50 mm to 25 mm at top			
Flukes	340 mm overall height x 150 mm wide x 240 mm at shortest height side x 30-degree angle to meet top			
Fluke supports	340mm x base width 30 mm			
Hole and notches	8 mm			
Finished anchor height:	730 mm			

Welding processes:		
Welding process 1		
Welding process 2		
Welding positions:		
Position 1		
Position 2		
Non-destructive testing		

Test result:	PASS	FAIL
Comments:		

Task 2 – Production

(Assessment themes: Health and safety, Production and assembly (Measuring and marking out, Cutting components, Assembly techniques and methods, Tools and equipment).

For task 2, candidates need to produce the following pieces of evidence:

- fully fabricated and welded anchor consisting of:
    - stock
    - crown
    - shank
    - flukes and support
    - pre-fabricated shackle and chain attached.

For task 2, assessors will need to produce the following pieces of supporting evidence from completing the fabrication activities:

- assessor observation to include:
    - the work area, prior to, during and on completion of fabrication activities
    - preparation of tools and equipment
    - production stages of anchor (marking out, use of cutting list, cutting, welding preparation, welding, finishing and final assembly)
    - the application and use of welding tools, equipment and skills to include,
        - the use of two different welding techniques
        - one continuous 150mm completed weld for each of the two different welding processes selected.

Photographic evidence required:

- Photographic evidence showing the prepared working area – *Illustrated in task 2 photographic evidence section below (photograph 1)*

- Photographic evidence showing marking out and use of measuring equipment - *Illustrated in task 2 photographic evidence section below (photographs 2 - 3)*

- Photographic evidence showing cutting and preparation of cut components - *Illustrated in task 2 photographic evidence section below (photographs 4 - 11)*

- Photographic evidence showing application of welding techniques, showing two different welding processes and two different welding positions - *Illustrated in task 2 photographic evidence section below (photographs 12 - 20)*

- Photographic evidence of the completed anchor (with the pre-fabricated shackle and chain attached) – *Illustrated in task 2 photographic evidence section below (photographs 21 - 23). Note: the shackle and chain have not been attached in this version of the GSEM. Due to material availability and extended procurement process it was not possible to procure these pre-fabricated materials prior to the photographic evidence being created due to time constraints and material availability. For formal assessments it will be expected that the complete anchor has the shackle and chain*

attached.

Note: For the purpose of this GSEM additional photographs have been included, however it is not expected that Providers will capture this level of evidence for each candidate. A sample is recommended to show the key points within a process and to highlight any defects or issues encountered etc.

Photographs in this GSEM demonstrate the full process that the candidate has undertaken to complete the anchor. Commentary sections detail where performance is considered to be at a level reflective of a threshold competence grade.

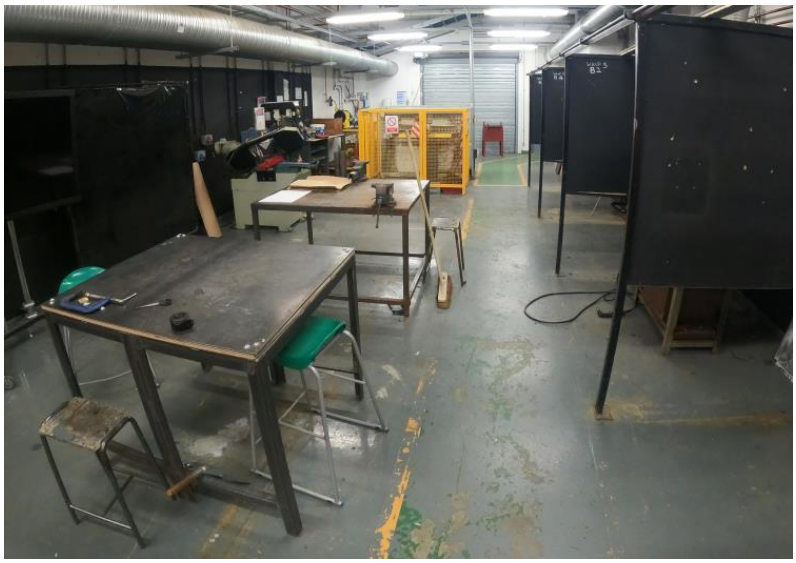
Note, due to the nature of this process, not all individual work activities would provide opportunity to demonstrate a defined level of differentiation beyond a pass – but these images are shown in order to show the cohesiveness of the process being undertaken, and to draw out where differentiation is possible.

*Due to safety considerations it was not possible to fully capture the welding processes being used. Assessors should use both direct observation and photographic evidence at the time of the assessment to ensure the welding processes are correctly applied.

2. Photographic evidence – Production of the anchor

Preparing the work area (Photograph 1)

Photograph 1 – showing the work area prior to activities being started. Photograph shows the area of work has some tools left on bench, with a cable slightly onto the walkway. Stools have not been tucked away or removed completely and the candidate has not stored all tools correctly.



Marking out and use of measuring equipment (Photographs 2 – 3)

Photograph 2 - showing the candidate using a tape measure and chalk to produce marked components. Excess tools, materials are still present on the workbench such as wire brush.

Photograph 3 – showing the markings on the plates, it can be seen there are scribed marks which are inaccurate on the right-hand side. These were eventually corrected by the candidate.

Cutting and preparation of cut components (Photographs 4 - 11)

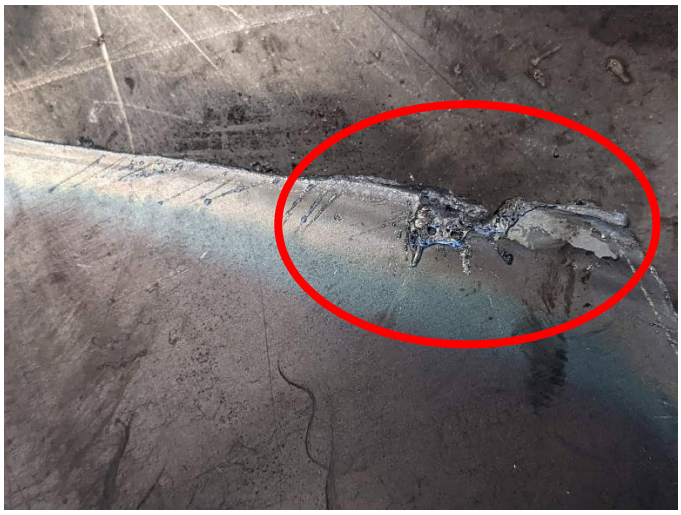
Photograph 4 – showing the cutting of the components using oxy-fuel (acetylene) cutting process.

Photograph 5 – showing inaccurate cutting when cutting the metal using oxyacetylene, the cut extends beyond the scribed marks.

Photograph 6 – showing the cuts before any welding preparation. Cut lines should have been straight to the scribed lines to maintain the dimensions of the component.

Photograph 7– showing an example of uneven cutting. Cut lines should have been straight to the scribed lines to maintain the dimensions of the component. Note the extra cut made to the left of the picture. Note the trailing gas hoses under the work bench which the candidate should have avoided in order to prevent damage to the hoses from falling debris.

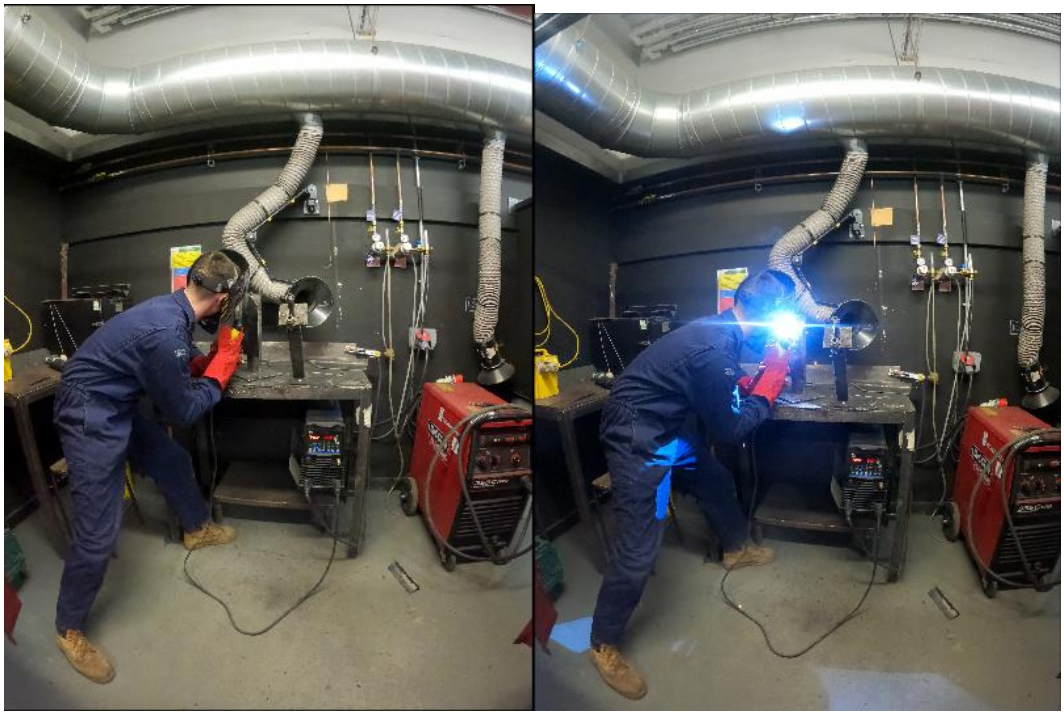
Photographs 8 and 9 – showing an example of uneven cutting and some warping to the bottom left corner. Cut lines should be straight to the scribed lines to maintain the dimensions of the component. Note the defect to the top right of the picture (enlarged).



Photographs 10 and 11 - showing the fluke component after grinding and preparing the component for welding. Note the defect in the cut remains and the warped corner has been rectified.

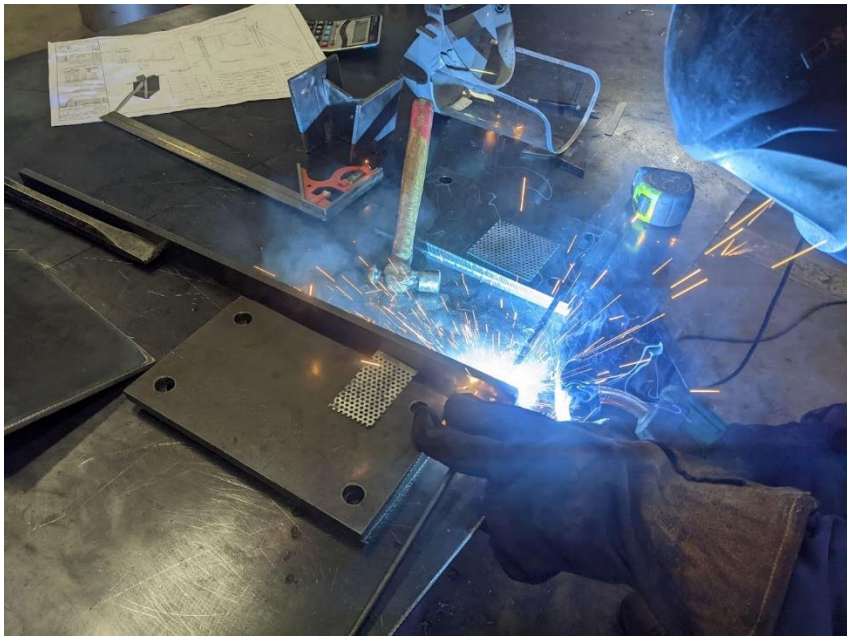
Application of welding techniques, showing two different welding processes and two different welding positions (Photographs 12 - 8)*

Photographs 12 and 13 – showing application of the MMA welding process, using position PF (vertical).

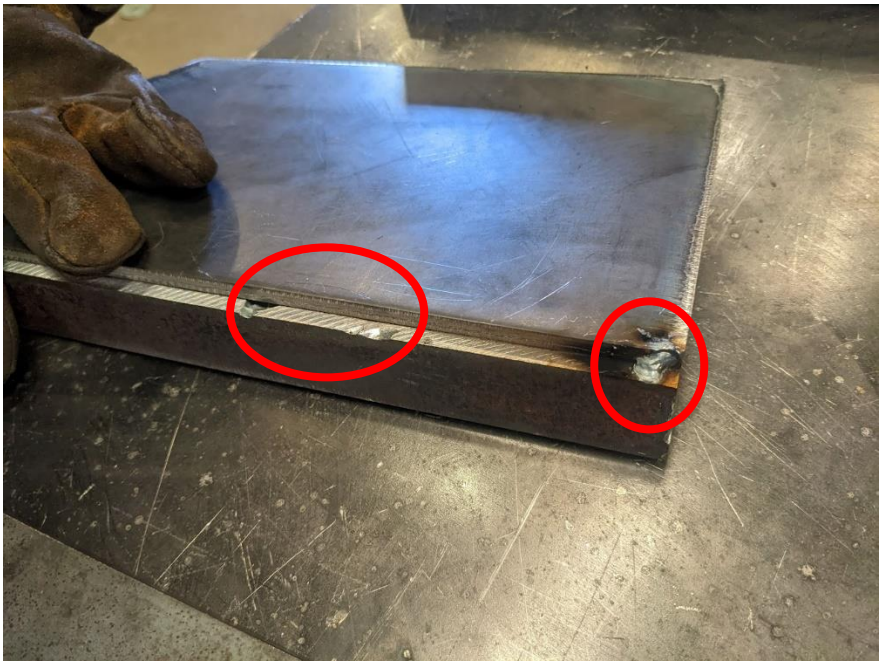


Photograph 14 – showing application of the MIG welding process, using PA position (flat). Note: Tools have not been removed from the area prior to the welding.

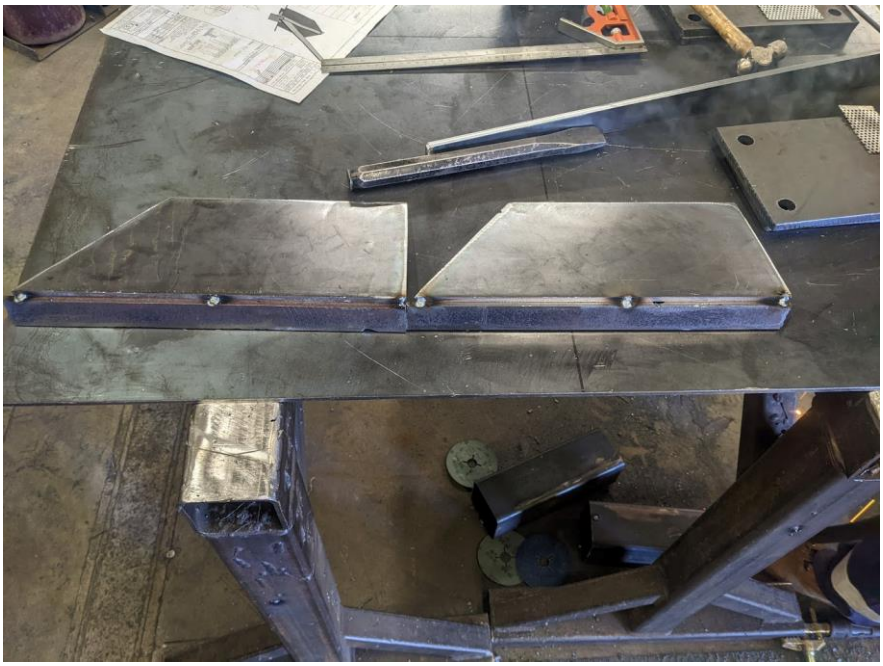
Photograph 15 – showing application of MIG welding the bar through the stock.



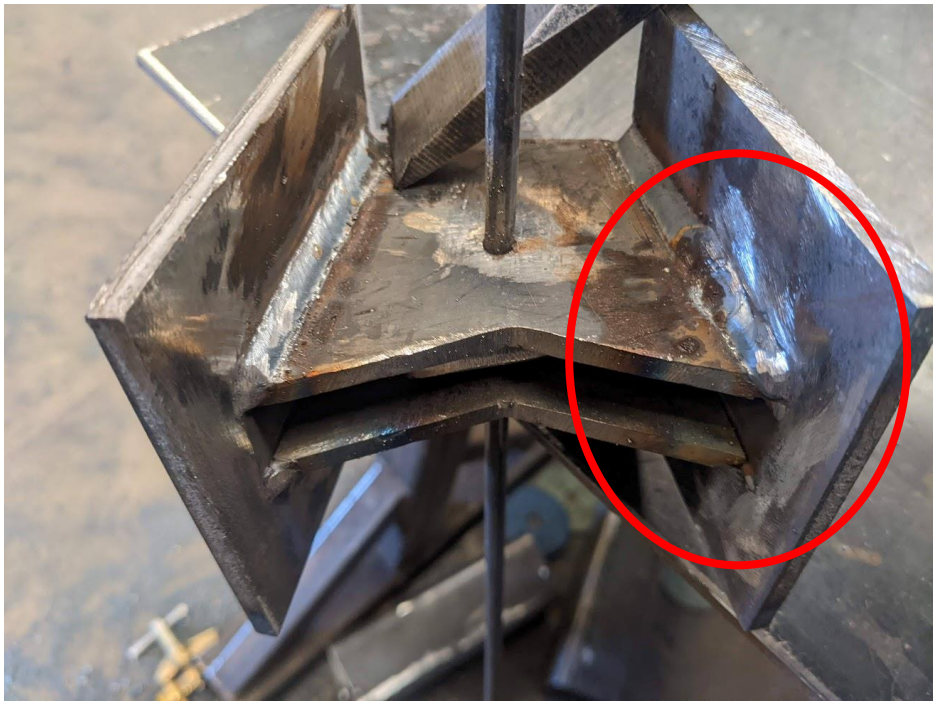
Photograph 16 – showing application of tack welding, note the damage to the component.



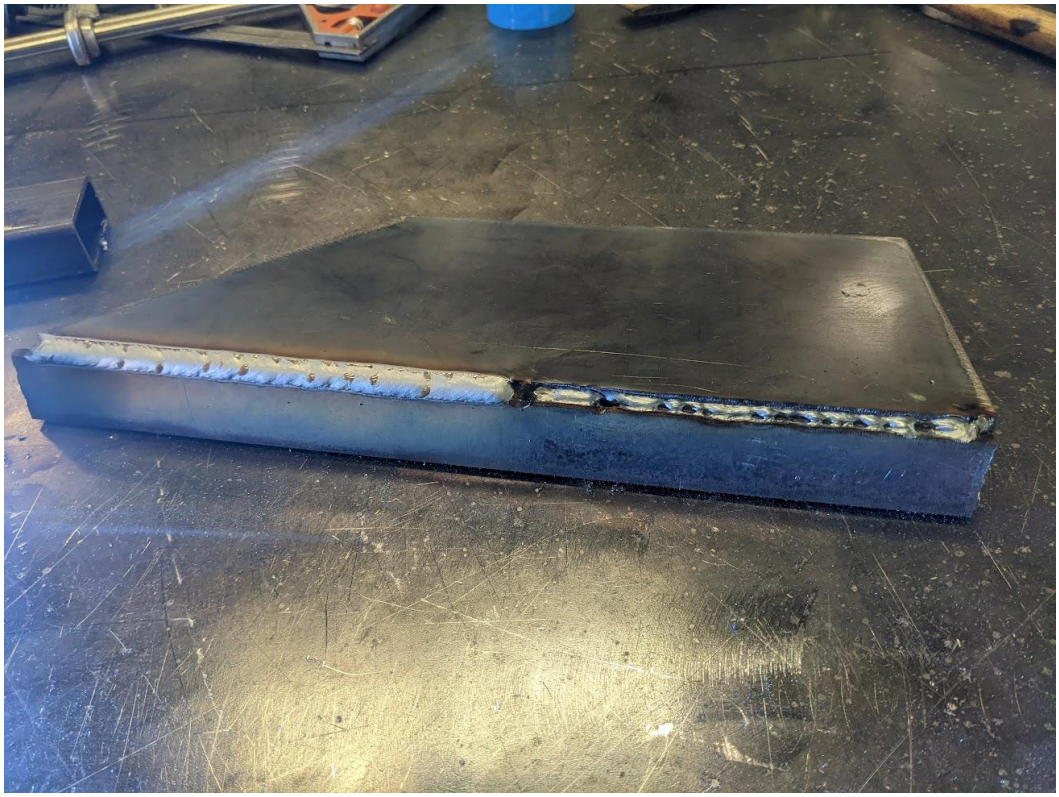
Photograph 17 – showing flukes tack welded to the supports. Note the floor area under the workbench is cluttered with used grinding discs and other waste.



Photograph 18 – showing the crown welds. Note the straight bead on the left and the uneven bead on the right.

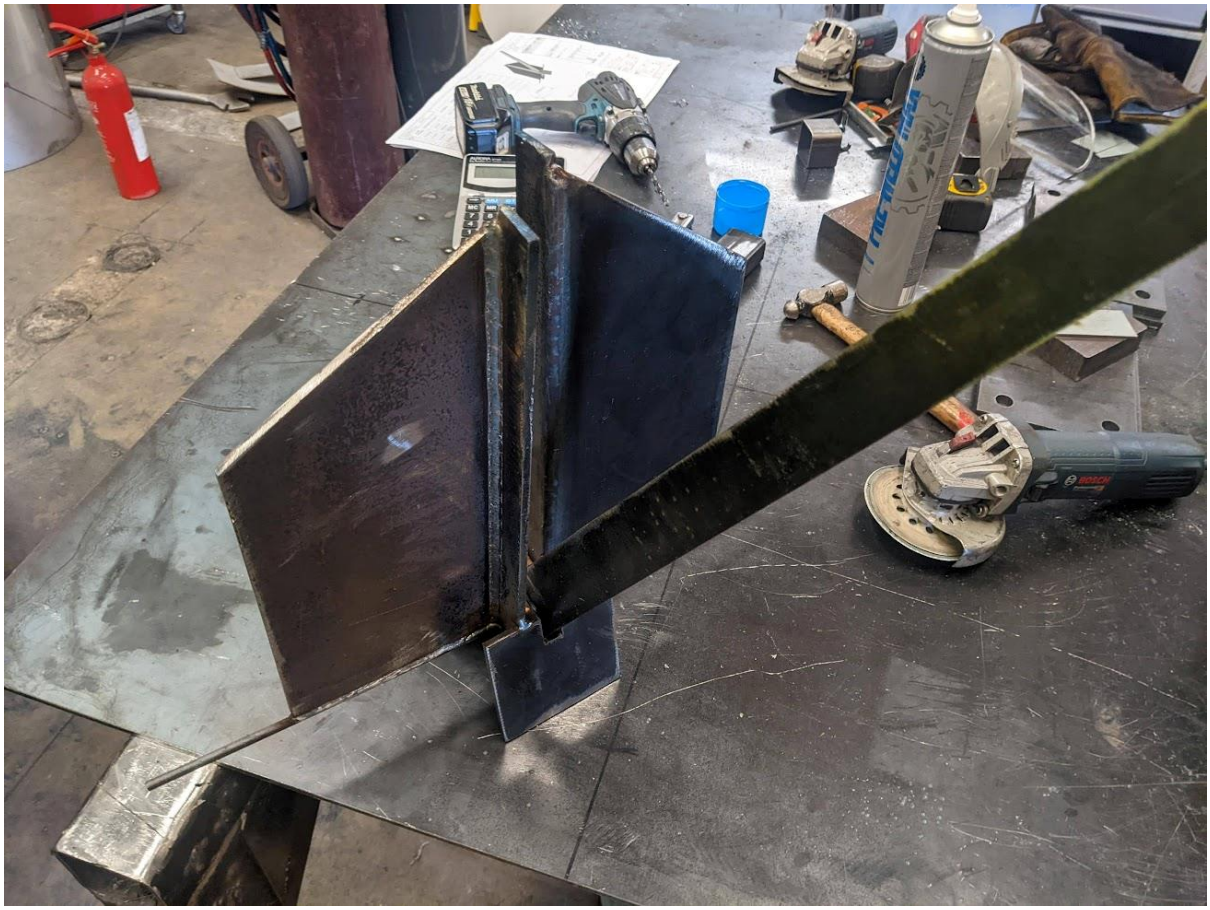


Photographs 19 and 20 – showing the welding of the fluke support to the fluke. The welding application has been unevenly applied and required rectification.



Fabricated anchor (Photographs 21 – 23)

Photographs 21, 22 and 23 – showing the fabricated anchor.



2. Practical observation form – Work area, prior to, during and on completion of fabrication activities

Assessment ID	Qualification number
8713-334	8713-334
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Health and safety Planning and preparation

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Assessor observation to include: • The work area, prior to, during and on completion of fabrication activities	The candidate put on their PPE, completing some basic visual checks. They briefly referred to their risk assessment when checking their immediate workstation. Some debris was brushed off the workstation surface, waste disposed of in designated waste bin. Hot works permit filled out and handed to workshop supervisor for countersigning. The candidate checked with the supervisor that the exhaust system was working. Workstation set up with the tools and equipment required. There did not appear to be any logical sequencing of tools and equipment placement in the working area. All resources collected at once, resources piled up on the workstation. During tasks some excess equipment was left in the work area. Cluttered workstation observed. Some piling up of tools and equipment, not a risk to the candidate or others, but affected efficiency. Hoses and cables kept within the work area most of the time. All welding equipment left to return to room temperature before storage. Work area reinstated. Surrounding floor area swept clean of most debris. All used materials, offcuts and debris disposed of in the correct receptacles as per the disposal requirements with adherence to the waste regulations. Most surfaces cleaned. Some ancillary equipment checked for wear and damage prior to returning to stores. Cables and hoses returned to storage, untidily stored, creating a potential trip hazard for others.
Assessor signature	**Date**

Assessor A	**17.11.2022**

Commentary

The observation evidence shows that the candidate demonstrated a basic level of understanding for setting up their workstation. They showed a basic understanding of health and safety by wearing the correct PPE in the workshop and by allowing the welding equipment to return to room temperature to ensure others did not accidently burn themselves on hot equipment.

The candidate demonstrated an acceptable understanding of waste disposal regulations, using the correct methods of disposal.

The candidate at times demonstrated a lack of understanding by not adopting a more organised approach for arranging and managing their tools and equipment. For example, at times during the production where the candidate had selected all their resources at the start which led to some piling up on the workstation. The candidate could have applied better housekeeping and organisation to enable a more efficient work area. For, example only selecting the measuring and marking out tools they required, then returning them to storage before selecting the cutting equipment.

If the candidate had demonstrated a more methodical approach to the selection and return of used equipment, this would have developed their response.

Reinstatement of the work area on completion of the activities was acceptable for this level. Improvement could have been made on the level of post-use checks and general level of housekeeping, for example, taking better care to store the hoses correctly avoiding any uncoiling and not creating a potential trip hazard to others.

2. Practical observation form – Preparation of tools and equipment

Assessment ID	Qualification number
8713-334	**8713-334**
Candidate name	**Candidate number**
Candidate A	**CG12345**
Centre name	**Assessment theme**
City & Guilds	**Health and safety** **Planning and preparation** **Production and assembly**

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Assessor observation to include: • Preparation of tools and equipment	The candidate completed some visual checks of all the tools and equipment. Some tools and equipment checked for cleanliness, some dirt was removed and disposed of accordingly. The candidate completed some visual checks on the welding equipment. Checks included visual inspection of the cables and hoses. No issues were found. All electrical and gas connections visually checked. An isolation procedure was applied throughout the equipment preparation. Workshop ventilation system was confirmed operational and ready for use. They completed visual checks on the additional PPE (welding hood, filters) needed for the welding tasks. Welding bay area briefly checked. The candidate needed to be reminded to check the function and condition of the welding curtain. The candidate used the manufacturer's user manual to set up the equipment, setting the parameters for the intended task. Some basic checks for safety were completed on the oxy-fuel equipment, including a gas leak test prior to use.

Assessor signature	**Date**
Assessor A	**17.11.2022**

Commentary

The evidence shows the candidate has demonstrated a basic knowledge and understanding of preparing tools and equipment for producing the anchor.

The candidate prepared the equipment with the main safety checks required such as gas and electrical connections, however, was reminded to carry out safety checks of the welding bay. For example, being reminded to check the function and condition of the welding curtain.

The candidate performed visual checks on the equipment, whilst this is acceptable, it would have been more prudent for the candidate to perform some functional checks in addition to the visual checks. A visual check may not pick up on potential equipment hazards.

The candidate did carry out basic checks for safety on the oxy-fuel equipment including performing a gas leak test prior to use, showing some good knowledge of the safety process.

The candidate could have developed their response further if they had demonstrated a more thorough examination of the equipment and the welding bay.

2. Practical observation form – Production stages of anchor

Assessment ID	Qualification number
8713-334	8713-334
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Health and safety Production and assembly

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Assessor observation to include: • production stages of anchor (marking out, cutting/use of cutting list, welding preparation, welding, finishing and final assembly)	The candidate marked out the components on the raw material using a measuring tape, engineer's square and chalk. Brief reference was made to their cutting plan. The candidate was hesitant when marking out, making more than one attempt to mark out the components on the material. Some wasted space observed. Some correct methods used, including checking that the plates were square and adjusting this where necessary, overall level of accuracy was low. Some lines were uneven and not clean. A datum edge was used throughout, centerlines were added. Some measurements were inaccurate and had to be attempted more than once. Centre pop marks were used to highlight the lines to make the cutting marks. Some marks checked prior to cutting materials but as only one method was attempted the accuracy was off for some of the marks, resulting in a re-attempt for one of the components. The candidate completed visual checks on the measuring equipment. Some poor techniques of measuring (using end of tape rather than 100mm from the end) was observed. The measuring tape and chalk is a less accurate method than that of an engineer's steel rule and scribe. The candidate set up their work area and selected the equipment required for oxyacetylene cutting. The candidate correctly prepared the equipment and completed safety checks prior to lighting the cutting torch. Lighting was done with the cutting torch away from the body and not towards

Task	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
	others. The candidate made some additional adjustments to get a neutral flame. The candidate used the cutting torch to heat the metal to its kindling temperature, before applying the oxygen. The candidate proceeded to cut the components from the steel, following the chalk lines. Some of the chalk had been smudged off, this was not corrected before cutting making it difficult for the candidate to maintain accurate cuts. One fluke support had to be re-attempted as was the incorrect size. The candidate kept the cutting torch at the correct distance from the surface of steel, the angle was not consistently maintained. The cuts made were uneven and did require more correction and re-work. Some in-production checks observed, the candidate referred to their cutting list to check the dimensions required. Some components were not cut to the size stated on the cutting list. The candidate selected an angle grinder and appropriate wheel to abrade the cut edges. The candidate checked the grinder and the condition of the selected wheel before use. The candidate clamped the cut piece to the table. The candidate mostly used the appropriate angle, speeds and pressure when applying the grinder to the surface, but this was not consistent resulting in some unevenness. Most edges were prepared to the required standard, some areas were more abraded than others. The candidate did not check the final dimensions of the components. The candidate performed serviceability and condition checks before using the cutting and grinding equipment. The candidate wore the correct PPE (welding jacket, no exposed skin, ear plugs, dry gloves, eye protection) for the task. Fume extraction was used during the activity. The angle grinder was held correctly using two hands at all times.

Assessor signature	Date
Assessor A	**17.11.2022**

Commentary

The candidate has demonstrated a basic understanding of the application and use of relevant technical information to measure and mark out each of the components, for example, referring back to their cutting plan.

Marking out has been completed, the methods used lack efficiency resulting in some inaccuracies and some excessive waste materials created. For example, the candidate opted for using equipment such as a measuring tape and chalk, which is less accurate than that of an engineer's steel rule and scribe as the ends of tapes are prone to damage – therefore becoming less accurate over time. A more developed level of knowledge and understanding would have been demonstrated if the candidate had measured 100 mm from the end of the tape or had chosen the scribing method.

The candidate did adopt the correct marking out process for the majority of time to produce the anchor. Evidence that the candidate could use datum edges was present and was good practice, but the level of accuracy applied was not consistent. The candidate demonstrated a basic understanding of the need for accuracy.

The candidate could have developed their response if they had used a more efficient method to mark out. For example, using an engineer's steel rule and a scribe over the measuring tape and chalk, as the chalk can easily be smudged or removed during handling which could affect the positioning of the line. The candidate could also improve their positioning of the components on the raw material to minimise the amount of waste created.

The candidate has demonstrated a basic understanding and application of the process to cut each of the components from the raw material and then prepare the cut components for fabrication and welding.

The candidate followed health and safety procedures at all times and correctly checked the equipment prior to use showing a good understanding of health and safety and the importance of working safely. For example, demonstrating lighting the cutting torch away from the body and not towards others.

The candidate demonstrated basic cutting skills and techniques which resulted in some re-working of the components, for example, the candidate had to re-attempt the cutting of one of the fluke supports which resulted in additional material being used and some scrap. If the candidate had used a more efficient marking out process the cutting lines would not have smudged and become unclear, causing the incorrect size being cut.

The candidate used basic techniques to prepare the cut pieces for fabrication and welding by abrading the cut edges with an angle grinder. For example, the candidate mostly used the correct angle, speed and pressure needed to make the edges ready for the welding process, although the surface preparation was uneven.

The candidate did carry out some in-production measurement checks, referring back to their cutting list to check the required dimensions which led to the re-attempt of the second fluke support.

The candidate could have developed their response further if they had better accuracy with their cuts and had minimal re-work required to prepare the cut pieces for fabrication and welding. In addition, the candidate could have carried out more frequent in-production checks, for example, when the candidate encountered the problem with the cutting lines, they could have re-marked the correct line prior to cutting which would have improved the accuracy of the cut and avoid necessary re-work.

2. Practical observation form – Application and use of welding tools, equipment and skills

Assessment ID	**Qualification number**
8713-334	**8713-334**
Candidate name	**Candidate number**
Candidate A	**CG12345**
Centre name	**Assessment theme**
City & Guilds	**Health and safety** **Production and assembly**

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Assessor observation to include: • the application and use of welding tools, equipment and skills to include, - the use of two different welding processes - the use of two different welding techniques.	The welding equipment was prepared using the manufacturer's user manual. Candidate wore the correct PPE throughout. The welding process using Metal Inert Gas (MIG) was carried out to an acceptable standard. The correct amperage was selected. Welded in the PB position (flat). The travel speed was correct, candidate weaved the gun resulting in a slight weave in the weld and not the straight bead required. Welding techniques were basic and could be improved. The candidate did not account for the distortion of the weld plate and did not pre-set the materials for this. Some warping of the flukes. Some excessive welding was observed. The welding process using Manual Metal Arc (MMA) was carried out to an acceptable standard. They selected the correct electrode with flux and diameter appropriate for the job. Demonstrated the PF position (vertical). They adopted the correct technique to complete the weld, some visible surface defects noted. Both processes completed with some flaws or defects on the surface. Some excessive welding was observed. Candidate worked safely throughout, with a good level of safety awareness. The welding curtain needed to be adjusted to prevent some sparks from escaping the welding station. This was quickly rectified with no adverse effects.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
	On completion of the welding activities, the candidate used a chipping hammer and a wire brush to remove some of the excessive build up around the welds. Some excess welding material remained on the anchor.

Assessor signature	Date
Assessor A	**17.11.2022**

Commentary

The evidence shows the candidate has demonstrated acceptable joining and bonding techniques and methods to produce the fabrication. The candidate has demonstrated basic technical practical skills using two different welding processes and two different welding positions, for example using MIG and MMA welding processes and demonstrating both PA (flat) and PF (vertical) positioning.

Overall, the candidate demonstrated a basic understanding of the different welding processes and the techniques and positioning needed to produce quality welds. The candidate demonstrated a basic application of the welding techniques and not all welds were to the quality standard. For example, when using the MIG process, the candidate weaved the gun creating a weave to the weld rather than a straight weld, the weaving would produce a weakness in the weld. The candidate did not fully take into account potential distortion of the material during the welding whilst setting the parameters, resulting in some warping of the flukes.

The candidate attempted to remove the excess welding slag by using a chipping hammer and finishing with a wire brush. Overall application of tool skills resulted in an acceptable quality finish but with some noticeable surface defects.

The candidate could have developed their response if their welding skill had been more controlled, for example, when using the MIG equipment, controlling the gun and avoiding weaving when producing a straight weld, as this would reduce the chance of producing internal defects within the weld.

Health and safety was followed during throughout the tasks ensuring the work was completed safely and the candidate was able to identify a risk during the welding task. For example, on one occasion the welding curtain needed to be adjusted, to prevent causing a hazard to others but this was rectified immediately by the candidate and no harm was caused.

Task 3a – Quality review and testing

(Assessment themes: Health and safety, Quality testing, review and evaluation (quality testing, quality review, reporting, recording and handover)

For task 3a, candidates need to produce the following pieces of evidence:

- completed check sheet with NDT results recorded.
- assessor observation:
    - use of measuring equipment
    - application of non-destructive testing method
    - quality checks
    - review of work area (preparation, during and on completion of task).

Photographic evidence required:

- Photographic evidence of the quality review being undertaken – *Illustrated in task 3 photographic evidence section below (photographs 24 - 26).*

- Photographic evidence of the non-destructive testing method used - *Illustrated in task 3 photographic evidence section below (photographs 27 - 28).*

Photographs in this GSEM demonstrate the full process that the candidate has undertaken to complete the anchor. Commentary sections detail where performance is considered to be at a level reflective of a distinction grade.

Note, due to the nature of this process, not all individual work activities would provide opportunity to demonstrate a defined level of differentiation beyond a pass – but these images are shown in order to show the cohesiveness of the process being undertaken, and to draw out where differentiation is possible.

**It was not possible to fully capture the MPI process being used. Assessors should apply direct observation at the time of the assessment to ensure the MPI process is correctly carried out.

3a. Photographic evidence – Quality inspection and testing

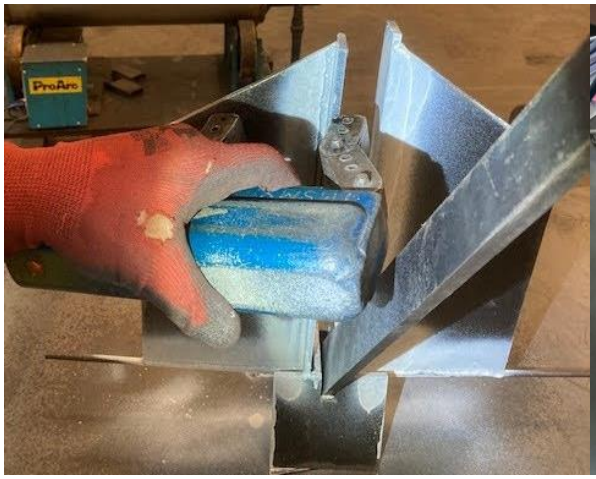
Photographs 24 – 26 show the quality review being undertaken.

Photographs 24 and 25 – showing the quality review process being undertaken. Candidate shown using some poor technique, an incorrect method of using a tape measure (using the end of tape) to check for measurements/tolerance.

Photograph 26 – showing close up of the welding, some uneven weld can be seen.

Photographs 27 – 28 show the application and result of using the magnetic particle inspection (MPI) non-destructive testing method.

Photographs 27 and 28 showing the application of the magnetic particle inspection method process. The MPI test showed small surface defect (crack along weld-toe). This could be rectified by grinding and then re-welding. Incorrect use of the magnet shown, welds need to be sprayed with white magnetic particle powder before applying the magnetic. An even coverage should be applied but care should be taken to not saturate the workpiece or the work area.



Candidate evidence

3a. Completed quality check sheet

Check	**Criteria**			**Comments**
Component sizing:	**Dimensions**	**Finished size:**	**Met**	
Stock	530 mm x 6 mm		✓	
Crown	100 mm high x 100 mm wide at widest point	101 mm x 100.5 mm		within tolerance
Shank	650 mm x base width 50 mm to 25 mm at top		✓	within tolerance
Flukes	340 mm overall height x 150 mm wide x 240 mm at shortest height side x 30-degree angle to meet top		✗	Angle incorrect Some warping
Fluke supports	340mm x base width 30 mm	339 x 30 mm		within tolerance
Hole and notches	8 mm	8 mm	✓	within tolerance
Finished anchor height:	730 mm	732 mm	✓	within tolerance

Welding processes:		
Welding process 1	MMA	
Welding process 2	MIG	
Welding positions:		
Position 1	Vertical	
Position 2	Flat	Some excessive weld visible

Non-destructive testing		
Test result:	PASS	FAIL
1 – fluke support		✓
2 – crown (1)	✓	
3 – crown (2)	✓	

Comments:

Three welds selected and tested using MPI method. Fluke weld failed due to incomplete fusion between the base metal and weld metal. Crown welds passed minimum pass criteria.

One of the welds tested did not pass the quality required due to a defect within the welding process. Rectification would be grinding down and re-welding.

The final appearance was acceptable, some surface markings that were slightly inaccurate, leaving marks on the surface, detracting from the final appearance.

3a. Practical observation form – Quality inspection and testing

Assessment ID	Qualification number
8713-332	8713-332
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Quality testing, review and testing

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Assessor observation to include: • use of measuring equipment • application of non-destructive testing method • quality checks • review of work area (preparation, during and on completion of task).	The candidate selected appropriate measuring equipment, briefly checking the calibration record. A brief visual inspection of the anchor was completed. Some dimensional checks completed. Some appropriate methods used to measure the anchor; accuracy was inconsistent. Some measurements taken more than once. Most dimensions and findings recorded on their quality check sheet. Some tolerances were met. Some surface defects identified and recorded on the quality check sheet. The candidate set up the MPI testing equipment correctly, referring to the manufacturer's information. Three welds were selected for testing (Crown 1, Crown 2 and Fluke). Test completed for each selected weld according to NDT procedures. Candidate encountered an equipment fault during the testing of Crown 2, which resulted in the Crown 2 test being retested. The equipment fault was a result of incorrect technique being used. Crown 1 and Crown 2 showed no sub-surface defects. Fluke weld test showed a small sub-surface defect. Appropriate PPE was put on at the start of the task and worn throughout. No reference to risk assessment. Candidate did not check the COSHH data sheet before handling the MPI solution. Work area was reinstated, all waste disposed of in accordance with workshop procedures. NDT equipment was returned to storage without cleaning.

Assessor signature	Date
Assessor A	18.12.2022

Commentary

This commentary also covers the completion of the quality check sheet.

The observation evidence has captured that the candidate undertook a basic quality inspection of the completed anchor.

The candidate has utilised the quality check sheet template from task 1. The check sheet contains a basic level of information, set out clearly and shows the candidate has recorded most of their findings.

They utilised measuring equipment to complete the checks of the components to record the final dimensions and to check for compliance with tolerances against the brief. Some dimensional checks were completed, and a visual inspection of the surface was made to check for defects with findings recorded on their check sheet. For example, 'the final appearance was acceptable, some surface markings that were slightly inaccurate, leaving marks on the surface, detracting from the final appearance'.

The candidate could have developed their response if the quality check sheet had included more detail within the comments column, for example, provided the measurements for the results of the non-destructive testing.

Most dimensions and components were checked for accuracy against the dimensions and tolerances in the given specification and recorded. Some dimensions were within the given tolerances.

The candidate demonstrated Magnetic Particle Inspection (MPI), a Non-Destructive Testing (NDT) method on three welds to check for sub-surface defects or flaws. Detectable defects were identified, recorded and attributed to a process or procedural deficiency, for example, the NDT process revealed a sub-surface defect in the fluke support. The candidate demonstrated a basic understanding of NDT procedures, for example, as a result of poor technique using the testing equipment during the testing of the Crown weld, an equipment fault was encountered, resulting in the candidate having to do a retest.

Health and safety was adequate for this task, PPE was worn. Not all safety guidance was followed, for example, the candidate did not check the COSHH data sheet for the MPI solution before use which is not best practice.

The candidate could have further developed their response if they had performed more thorough visual inspection of the anchor and if they had demonstrated a better understanding of the testing process and applied the testing equipment more accurately removing the need to perform a re-test and had followed the health and safety guidance when using the MPI solution, as they had indicated in their risk assessment.

Task 3b: Evaluation and recording

(Assessment themes: Quality testing, review and evaluation (quality testing, quality review, reporting, recording and handover)

For task 3b, candidates need to produce the following piece of evidence:

quality inspection report.

Candidate evidence

3b. Quality inspection report

Quality Inspection Report

Introduction

The assignment brief was to produce an anchor for a small boat. To produce the anchor I followed a series of fabrication and welding processes. When the anchor was completed, the anchor would be quality inspected and the integrity of the welds would be tested using a non-destructive testing (NDT) method to check they conformed to industrial welding standard BS EN ISO 5817.

Fabrication and welding processes

The anchor was fabricated out of mild steel. The anchor consisted of a number of individual components including a stock, crown, shank, flukes and fluke supports. These components needed to be fabricated and then welded together using two different welding processes and two welding techniques.

Each component was fabricated following the same process. The process was to first mark out the mild steel with the required dimensions using the cutting list for reference. Each component was cut out from the steel using oxy-acetylene torch. The cut pieces were then prepared for welding. Notches were cut into the crown pieces and the shank was drilled to enable the stock to be fitted. Each cut piece was abraded using an angle grinder, ensuring the edges to receive a weld were prepared thoroughly to enable a good weld to be established.

The components were then assembled to form the anchor using MMA and MIG welding processes. The ends of the stock were forged into a rounded edge using oxy-acetylene equipment and a hammer to prevent the stock from moving. On completion of the welding, the anchor was cleaned of any welding residue.

Inspection and testing

I carried out a quality inspection on the fabricated anchor. This included a visual check; dimensional accuracy check and non-destructive testing (NDT).

I prepared my work area and collected my measurement tools and my quality check sheet to record my findings on.

I completed a visual check of the completed assembly to check the finish and identify any visible surface defects. There were no obvious breaks in the welds and some excess weld material was seen on the flukes. The flukes had some areas of warping.

I selected a steel tape to measure the finished dimensions of the individual components. The final dimensions and findings were recorded on the quality check sheet. Most dimensions were within the given tolerances except the flukes. The flukes were more than the required tolerance which was caused by the component being larger than the required dimension and there was some warping.

I selected the MPI equipment from the stores. I selected three welds to check with the MPI equipment. The MPI works by magnetising the area to be tested with a yoke magnet. Magnetic ink (iron powder particles in a liquid carrier base) is brushed over the weld, the iron particles will group

where a defective weld is detected and give a visible indication. This process is used for all three selected welds. Once tested the anchor is demagnetised and the anchor is cleaned of all MPI fluid and residue.

The MPI test result showed that the two selected welds on the crown had passed and were to BS EN ISO 5817 standard. The weld on the fluke failed the test. The test showed a sub-surface break in the weld. The fluke weld failed due to a defect within the welding process, where the base metal and weld metal had not properly fused. A copy of my quality check sheet is included below:

Check	**Criteria**			**Comments**
Component sizing:	**Dimensions**	**Finished size:**	**Met**	
Stock	530 mm x 6 mm		✓	
Crown	100 mm high x 100 mm wide at widest point	101 mm x 100.5 mm		within tolerance
Shank	650 mm x base width 50 mm to 25 mm at top		✓	within tolerance
Flukes	340 mm overall height x 150 mm wide x 240 mm at shortest height side x 30-degree angle to meet top		x	Angle incorrect Some warping
Fluke supports	340mm x base width 30 mm	339 x 30 mm		within tolerance
Hole and notches	8 mm	8 mm	✓	within tolerance
Finished anchor height:	730 mm	732 mm	✓	within tolerance

Welding processes:		
Welding process 1	MMA	
Welding process 2	MIG	
Welding positions:		
Position 1	Vertical	
Position 2	Flat	Some excessive weld visible
Non-destructive testing		

Test result:	PASS	FAIL
1 – fluke support		✓
2 – crown (1)	✓	
3 – crown (2)	✓	

Comments:

Three welds selected and tested using MPI method. Fluke weld failed due to incomplete fusion between the base metal and weld metal. Crown welds passed minimum pass criteria.
One of the welds tested did not pass the quality required due to a defect within the welding process. Rectification would be grinding down and re-welding.
The final appearance was acceptable, some surface markings that were slightly inaccurate, leaving marks on the surface, detracting from the final appearance.

I confirm the above is a true reflection of my work.

Signature:	**Date:**
Candidate A	*19.11.2021*

Evaluation

During the fabrication of the anchor, I experienced some difficulty with measuring and marking out, as I had chosen to use chalk to mark the measurements which was a mistake as this was not accurate and the measurements tended to rub off easily.

When I was using the MIG equipment to weld in the PB (flat) position, I waved the gun which resulted in a slight weave which wasn't the straight bead I was hoping to achieve.

If I were to repeat this assessment I would improve the following:

- to be more thorough when setting up equipment to avoid faults occuring during the fabrication and the NDT
- my measuring and marking out techniques to achieve more accuaracy to ensure that the dimensions would be to the required sizes and to not use chalk as my marking preference. I would next time use a scribe and a steel rule which is more efficient
- to carry out more in-production checks especially after cutting the compoments and abrading them for welding to avoid removing too much or not enough material
- to improve my welding techniques to hold the gun at the correct angles to create a sound weld
- recording all data accurately, I did not write down all the final dimensions or mark all boxes off whether a component had met the requirements or not.

Conclusion

The design for the anchor is good and would be suitable for the purpose it was intended. My anchor would need to have the defective weld rectified and retested before it could be used. This would delay the delivery to the customer.

The processes are standard procedures for this sector and are fit for purpose. However, I would suggest an improvement to the design team which would be to supply all the required dimensions for the anchor, for instance, the size of the notches on the crown as this was not stated and took extra time to set out to the correct size. If they provided all the dimensions the process could be more time efficient.

Commentary

The candidate has given a brief description of the methods and techniques undertaken to produce the anchor and the process of performing the quality testing and non-destructive testing method. To develop their response further, the candidate could have provided more detail, for example, they could have included reference to in-production checks that were carried out during the production of the components.

Evaluation is basic and the candidate has identified a range of improvements to their own performance but has only provided a list with brief justifications.

The candidate has identified some areas for their improvement in their own performance and has recorded their concessions and some difficulties encountered during the production of the components. They provided a brief reasoning for why the concessions had occurred; this was lacking in detail. They could have provided further reasoning, for example, describing the difficulties they had with setting up for the non-destructive testing (NDT), why it occurred and how it could be prevented in the future.

The candidate could have developed their response further if they had provided more detailed justifications and had given consideration to preventative measures. For example, explaining how they could have prevented the surface defects from occurring and suggested preventative measures.

The candidate has suggested an improvement for the design which is to include all the dimensions for the anchor, specifically the notches required on the crown. The candidate has suggested that to work out the required measurements took additional time and slowed

down the process.

The report is structured appropriately with an introduction, overviews for the processes followed to fabricate the anchor, inspection and testing, evaluation and conclusion.

The completed quality check sheet has been included in the report but the inspection and testing detail has not been recorded consistently, with some final dimensions missing and not all components have been checked off in the ‘met’ column.

A basic level of industry terminology has been used consistently throughout. The report contains reference to the one industrial standard which is given in the specification. The candidate could have identified other standards, for example, ISO 17638 Non-destructive testing of welds (MPI) or ISO 9934-1 Non-destructive testing - Magnetic particle testing - Part 1. (General principles) which they would also be working towards.

Task 3c: Handover meeting

(Assessment themes: Quality testing, review and evaluation (quality review, reporting, recording and handover).

For task 3c, candidates must provide the following materials:

- completed anchor assembly (from task 2)
- quality inspection report (from task 3b).

For task 3c, assessors will need to produce the following pieces of supporting evidence:

- assessor observation:
    - handover meeting.

Video evidence

- video evidence showing the handover meeting.

The following task 3c supporting evidence has not been included for this version of the GSEM:

Video evidence

- video evidence showing the handover meeting.

3c. Practical observation form – Handover meeting

Assessment ID	Qualification number
8713-334	8713-334
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Quality testing, review and testing

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Handover meeting	The candidate provided a brief description of their given brief and was able to justify some of the processes and techniques used to produce the components. They briefly described the benefits of both welding processes used to join the components. They mentioned some but not all inconsistencies and did not elaborate on the areas which were difficult and required further attempt. They described the MPI results and how the NDT process works to identify surface and sub-surface defects or flaws. They shared their results with the supervisor, pointing to the welds on the anchor that were selected and tested. They gave a brief explanation why one of their welds had failed and why it had occurred however this was brief with no future preventative method was offered. No explanation was given for the retest of the Crown 2 weld. They referred back to their report throughout the discussion to confirm or reiterate points made. They gave a basic evaluation and identified some improvements for the marking out process and the testing process however this was not detailed. No reference was made to meeting industry standards. They used basic terminology throughout but was this was generally correct, some minor inaccuracies noted but did not deter from the meaning. They spoke clearly and displayed professionalism throughout the meeting. They presented the completed anchor and the quality inspection report.

Assessor signature	**Date**
Assessor A	**19.11.2022**

Commentary

The observation form details that the candidate conducted the handover meeting and supplied all the required evidence for the supervisor to review. The handover was brief but the candidate did give some explanations for the findings of the report. For example, the candidate briefly explained their brief and the processes used to produce the anchor. They provided some explanation for the problems and issues they encountered but not all were related, for example, the need to retest one of the welds due to an equipment fault within the process.

The candidate used adequate communication skills. A basic level of terminology was used throughout. Terminology used had some inaccuracies, but the meaning was noted as being clear to the targeted audience. The candidate's response would have been developed if they had shown a higher level of understanding of terminology and made reference to working to industry standards.

The candidate could have further developed their response if they have provided more detailed explanations throughout. For example, a more detailed response for why their fluke weld failed and how this could be prevented in a future production and why they needed to retest the Crown 2 weld.