ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Engineering Construction Pipefitter

Supporting Documents

QAN 610/6020/3
ST0162 V1.1 V1.2 V1.3 V1.4

Supporting Documents for

EEA Level 3 End-point Assessment for Engineering Construction Pipefitter

QAN 610/6020/3

Updates to the supporting documents

Since the first publication of Energy & Environment Awards Engineering Construction Pipefitter (ECP) supporting documents, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v4.0	January 2026	Updated to include V1.4 in line with current Skills England assessment plan; no changes to assessment content.	All
v3.0	August 2025	Rebranded	All
v2.1	August 2023	Update to Assessment Plan references v1.2	5, 50, footer
v 2.0	August 2023	Rebranded	All
v1.0	March 2023	First published	All

Appendix A: Glossary

Amplification – provides more detail on how individual knowledge, skills or behaviours statements should be interpreted. Where the KSB statements, themselves are deemed self-explanatory, no amplification is provided. Assessment may include questions on anything identified in the amplification

Behaviours (as part of KSBs) – specific mindsets, attitudes or approaches identified as part of the apprenticeship standard that must be evidenced during end-point assessment

Elements – are the knowledge, skills and behaviours and what is needed to competently undertake the duties required for an occupational standard

Gateway - the stage of the apprenticeship where the apprentice, employer and training provider determine whether the apprentice is ready to undertake end-point assessment

Guidance – is only provided where it is required to support interpretation of the KSB statements

Knowledge (as part of KSBs) – specific information, technical detail, and 'know-how' identified as part of the apprenticeship standard that must be evidenced during end-point assessment

Pathways – a specialist route within an apprenticeship standard that builds on the occupational competence for a new entrant to the occupation

Skills (as part of KSBs) – the practical application of knowledge identified as part of the apprenticeship standard that must be evidenced during end-point assessment

Standard – An occupational standard is a description of an occupation. It contains occupational profile, and describes KSBs needed for someone to be competent in the occupation's duties. Occupational standards are developed by employers for occupations that meet the Institute for Apprenticeships and Technical Education current occupation criteria

Topic - is a collection of elements grouped into a theme e.g. Health and Safety

Appendix B: Gateway Eligibility Form

(Standard Version: ST0162; Assessment Plan Version: ST0162 V1.2-V1.4)

Apprentice's name:	Apprentice's job title:	
Apprentice's ULN:		
Name of Employer:	Name of Training provider:	
Employer representatives present:	Training provider representatives present:	
Apprenticeship start date:	Apprenticeship on-programme end date:	
Was the apprentice aged 19 or over at the start of the programme?	Y / N	
Employer Decision for apprentices aged 19 or over only at the start of the programme**:**	We require the apprentice to attempt English and maths before taking the end-point assessment	Y / N
Gateway meeting date:		
Has the apprentice taken any part of the end-point assessment for this apprenticeship standard with any other End Point Assessment Organisation?	Y / N	
If 'Yes' please give details:		

Apprentice's details

Eligibility requirements:

Where applicable, the apprentice must confirm their achievement of the following

Note: For apprentices aged 19+, if maths and/or English have been attempted but not achieved evidence of the attempt should be submitted.

Eligibility requirement	Achieved by the apprentice? Y/N	Evidence (scans of certificates MUST be included)
Achieved Level 3 Diploma in Installing Engineering Construction Plant and Systems - pipefitting		
Achieved Level 2 English or higher		
Achieved Level 2 Maths or higher		
Completed Evidence Report and mini-portfolio		

Gateway Eligibility Declaration

The apprentice, the employer and the training provider must sign this form to confirm that they understand and agree to the following:

1. The apprentice has completed the required on-programme elements of the apprenticeship and is ready for end-point assessment with Energy & Environment Awards.
2. The apprentice will only submit their own work as part of end-point assessment.
3. All parties agree that end-point assessment evidence may be recorded and stored by Energy & Environment Awards for quality assurance purposes.
4. The apprentice has been on-programme for a minimum duration of 365 days.
5. The apprentice has achieved the 'Level 3 Diploma in Installing Engineering Construction Plant and Systems'
6. The apprentice has achieved English and maths Level 2 as detailed in this document.

7. The apprentice has produced an Evidence Review and mini portfolio which includes a mapping document. The mapping document has been placed at the front of the portfolio and submitted to Energy & Environment Awards. 8. Energy & Environment Awards has been informed about any reasonable adjustment and/or special considerations requests. 9. The apprentice, if successful, gives permission for Energy & Environment Awards to request the apprenticeship certificate from the ESFA who issue the certificate on behalf of the Secretary of State. 10. The apprentice has been directed to Energy & Environment Awards Appeals Policy and Complaints Policy. 11. The employer/training provider has given Energy & Environment Awards at least three months' notice of requesting this EPA for this apprentice. 12. If the Gateway Eligibility Report is not completed in full, meeting all requirements, and submitted to Energy & Environment Awards, the end-point assessment cannot take place.

Signed on behalf of the employer (print name):	Signature:	Date:
Signed on behalf of the training provider (print name):	Signature:	Date:
Apprentice's name (print):	Signature:	Date:

Energy & Environment Awards use only:	
Energy & Environment Awards Sign off:	
Comments/actions:	

Appendix C: Practice Knowledge Test

Level: 3

Engineering Construction Pipefitter

Paper Code: PRACTICE PAPER

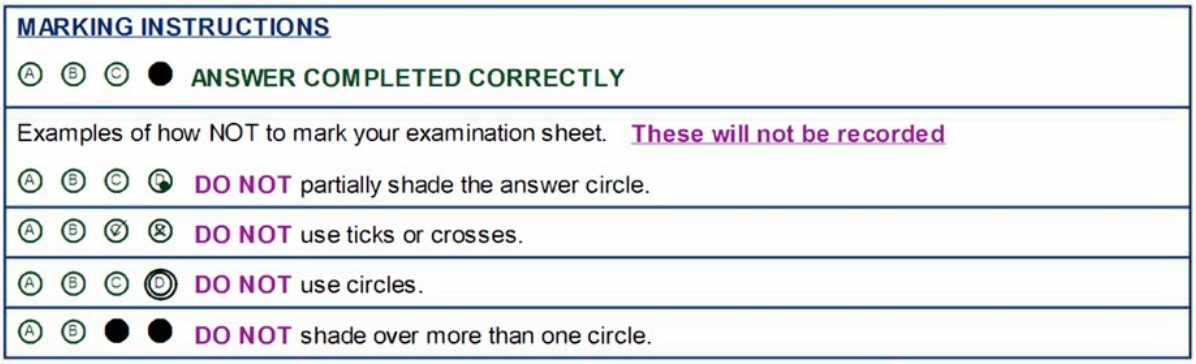
This examination consists of 50 multiple-choice questions.
The Pass mark is 30 correct answers.
The Merit mark is 35 correct answers
The Distinction mark is 43 correct answers
The duration of this examination is 90 minutes.
You must use a pencil to complete the answer sheet - pens must NOT be used.
When completed, please leave the examination answer sheet and question paper on the desk.

For this paper the use of a scientific calculator (non programmable) is permitted.

For each question, fill in ONE answer ONLY.

If you make a mistake, ensure you erase it thoroughly.

You must mark your choice of answer by shading in ONE answer circle only. Please mark each choice like this:



This paper must be returned to Energy & Environment Awards with the apprentice answer sheets.

You may use this page for rough work

Question 1	
Hand-arm vibration syndrome (HAVS) can be caused by operating hand-held grinders. Which of the following symptoms could indicate that a person is suffering with HAVS?	
Possible answers	
a)	Decreased grip strength
b)	Persistent discomfort in the eye
c)	Swollen legs
d)	Ringing in the ears

Question 2	
Identify ONE reason for taking a hydro pressure test up in increments.	
Possible answers	
a)	To allow for the pipe to expand gradually.
b)	To check for leaks at lower pressures
c)	To ensure pump reservoir is kept topped up.
d)	To reduce the likelihood of a test failure

Question 3		
What does this COSHH (Control of Substances Hazardous to Health) symbol mean?		
Possible answers		
a)	The substance is an irritant	
b)	The substance is harmful	
c)	The substance is toxic	
d)	The substance is corrosive	

Question 4	
What is the legislation that covers the handling of bolt lubricants?	
Possible answers	
a)	RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)
b)	LOLER (Lifting Operations and Lifting Equipment Regulations)
c)	PUWER (Provision and Use of Work Equipment Regulations)
d)	COSHH (Control of Substances Hazardous to Health)

Question 5	
Which piece of legislation covers the maintenance of pressure testing equipment?	
Possible answers	
a)	PUWER
b)	RIDDOR
c)	COSHH
d)	LOLER

Question 6	
Which one of the following cards is **NOT** a recognised site safety passport scheme?	
Possible answers	
a)	CCNSG
b)	CSCS
c)	EQUITY
d)	EMMS

Question 7	
A toxic alert siren is heard on a petrochemical site. What action should be taken?	
Possible answers	
a)	Monitor the work area until the emergency services arrive
b)	Make the job safe and go to the nearest toxic refuge. Ensure all windows and doors are securely shut
c)	Go straight to the designated muster point, making sure you are accounted for
d)	Await instructions from the supervisor

Question 8	
What does it mean when a risk is reduced to ALARP?	
Possible answers	
a)	There will be no accidents resulting from the risk
b)	The risk controls in place are better than just good practice
c)	The degree of risk has specified level
d)	The risk controls have been considered alongside the measures needed to control the risk

Question 9	
A disc is being changed on a portable grinder. What is the first safety precaution that should be taken?	
Possible answers	
a)	Make sure the disc is the right speed for the grinder
b)	Make sure the correct spanner is used for the task
c)	Make sure the machine is isolated from the electricity supply
d)	Make sure the guard is correctly connected

Question 10	
Where should waste oil be disposed of?	
Possible answers	
a)	In a special waste tank
b)	Down the drain
c)	With the general wate
d)	In an incinerator

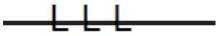
Question 11	
In relation to pipe work, what does the term 'schedule' refer to?	
Possible answers	
a)	Work plans
b)	The drawing
c)	Wall thickness of pipe
d)	Time doing the task

Question 12	
On an isometric drawing what do the initials FW refer to?	
Possible answers	
a)	Field weld
b)	Flange
c)	Floorplan
d)	Water supply

Question 13	
What are the angles used in an isometric drawing?	
Possible answers	
a)	15 degrees and 30 degrees
b)	30 degrees and 60 degrees
c)	45 degrees and 90 degrees
d)	180 degrees and 360 degrees

Question 14	
What is the difference of elevation on a length of pipe on a drawing known as?	
Possible answers	
a)	A drop
b)	A gradient
c)	A height
d)	A fall

Question 15	
Where would the information to determine the specified material for fabrication of a pipe spool be found?	
Possible answers	
a)	General Arrangement
b)	Rams
c)	Toolbox Talk
d)	Isometric drawing

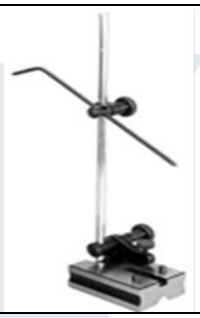
Question 16	
Which of the following P&ID symbols represents a hydraulic line?	
Possible answers	
a)	
b)	
c)	
d)	

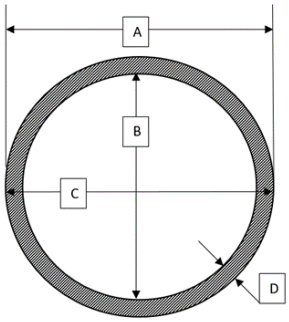
Question 17	
Calculate the area of a right-angled triangle with sides of 3m, 4m and 5m.	
Possible answers	
a)	$3m^2$
b)	$6m^2$
c)	$12m^2$
d)	$15m^2$

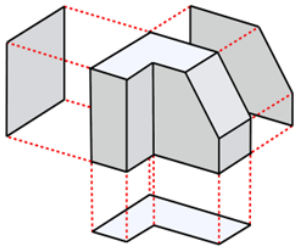
Question 18	
What information is needed to calculate the PCD (Pitch Circle Diameter) for a flange?	
Possible answers	
a)	Number of holes, diameter of holes and distance between adjacent holes
b)	Bolt diameter, coefficient of friction and bolt stress
c)	Flange outside diameter, bolt size and pipe Nominal Bore
d)	Raised face diameter, flange diameter and flange thickness

Question 19	
What is the circumference to the nearest mm for 100mm Nominal Bore pipe?	
Possible answers	
a)	314mm
b)	414mm
c)	514mm
d)	614mm

Question 20	
What is the formula used to determine the measurement from the centre of a 90 degree long radius elbow to the edge of prep?	
Possible answers	
a)	1 x the Nominal Bore (NB)
b)	2 x the NB
c)	1 ½ x the NB
d)	1 ¼ x the NB

Question 21		
What is the marking out tool shown below?		
Possible answers		
a)	Vernier height gauge	
b)	Surface gauge	
c)	Vernier calliper	
d)	Thread gauge	

Question 22	
Refer to the diagram below. Which measurement is the Nominal Bore?	
Possible answers	
a)	A
b)	B
c)	C
d)	D

Question 23	
What type of drawing is shown below?	
Possible answers	
a)	Isometric
b)	Orthographic
c)	PandID (Piping and Instrumentation Diagram)
d)	GA (General Arrangement)

Question 24	
A bend is marked out. The height is 300mm and the length is 400mm. What is the travel?	
Possible answers	
a)	300mm
b)	400mm
c)	500mm
d)	600mm

Question 25	
What is the appropriate tool for cutting and shaping sch80 stainless steel pipe?	
Possible answers	
a)	Handheld angle grinder
b)	Plasma cutter
c)	Air arc cutter
d)	Pipe prep machine

Question 26	
What is the largest sized nominal bore pipe that can be safely bent using a manual hydraulic bender?	
Possible answers	
a)	1”
b)	2”
c)	3”
d)	4”

Question 27	
What is the most appropriate tool for assembling a barrel nipple?	
Possible answers	
a)	Combination spanner
b)	Adjustable spanner
c)	Torque wrench
d)	Pipe wrench

Question 28	
What is the purpose of a check valve?	
Possible answers	
a)	Prevent the back flow of the product
b)	Control the flow of the product
c)	Relieves pressure of the product
d)	Change the direction of the product

Question 29	
What is the torque value of flange bolts measured in?	
Possible answers	
a)	Newton-metres
b)	Kilojoules
c)	Lumens
d)	Decibels

Question 30	
What is used to prevent creasing when bending 15mm copper?	
Possible answers	
a)	Spring
b)	Sand
c)	Blow torch
d)	Hydraulic oil

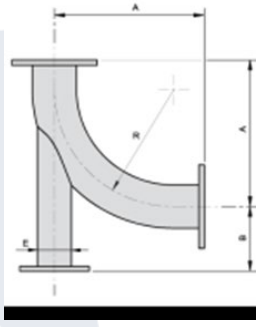
Question 31	
A vessel is being tested with water. What is the purpose of having one gauge at the top and one at the bottom?	
Possible answers	
a)	The pressure will be greater at the bottom than the top
b)	It will ensure entire vessel is pressurised to the correct test pressure
c)	It will ensure that the vessel will fill with water quicker
d)	It will ensure the test will pressurise faster

Question 32	
Which of the following is the most appropriate test medium for stainless steel pipe work?	
Possible answers	
a)	Potted water
b)	De-mineralised water
c)	Hydraulic oil
d)	Nitrogen

Question 33	
What is the name for an alloy of copper, nickel and iron?	
Possible answers	
a)	Chrome Molybdenum
b)	Cunifer
c)	Duplex
d)	Super Duplex

Question 34	
What is an elbolet?	
Possible answers	
a)	A small elbow
b)	A branch from the back of an elbow.
c)	A 45-degree elbow
d)	A 180-degree elbow

Question 35	
What is the most important reason for segregating stainless steel pipe from carbon pipe?	
Possible answers	
a)	Keep the pipes in a safe area
b)	Pipes may get mixed up
c)	Cross contamination
d)	Makes them easier to identify

Question 36		
What is the support in this drawing commonly known as?		
Possible answers		
a)	Crow foot support	
b)	Swan foot support	
c)	Duck foot support	
d)	Hens foot support	

Question 37	
What material is pipe made from if the grade number is 316L?	
Possible answers	
a)	Chrome Molybdenum
b)	Carbon steel
c)	Copper
d)	Stainless steel

Question 38	
What type of component does SORF refer to?	
Possible answers	
a)	Flange
b)	Gasket
c)	Weldolet
d)	Orifice plate

Question 39	
Which one of the following is NOT a form of metal protection?	
Possible answers	
a)	Sacrificial anode
b)	Galvanisation
c)	Paint
d)	Dye penetration

Question 40	
Which ONE of the following materials is most resistant to corrosion/rust?	
Possible answers	
a)	Copper
b)	Iron
c)	Carbon steel
d)	Plastic

Question 41	
What is good practice when breaking a flanged joint?	
Possible answers	
a)	Checking what the medium is
b)	Checking the line is isolated and drained
c)	Completing checklists and records as required
d)	Checking all components are to specification

Question 42	
What is the method normally used to detect external pipe wall laminations in stainless steel pipe work?	
Possible answers	
a)	MPI (Magnetic Particle Inspection)
b)	Ultrasonic
c)	Dye pen
d)	Pressure test

Question 43		
What is the name of the component shown below?		
Possible answers		
a)	Bellows	
b)	Spring flange	
c)	Coiled flange	
d)	Spiralled support	

Question 44	
What is the result of tightening a bolt to its yield point?	
Possible answers	
a)	The bolt breaks in two
b)	The bolt is tightened correctly
c)	The bolt won't return to its original length
d)	The bolt heats up under pressure

Question 45	
What medium is used for pressure testing high-pressure gas lines?	
Possible answers	
a)	Nitrogen helium
b)	Hydraulic oil
c)	De-mineralised water
d)	Potted water

Question 46	
What is the hydrostatic test pressure of a system in relation to its design pressure?	
Possible answers	
a)	1 x the safe working pressure
b)	1 ¼ x the safe working pressure
c)	1 ½ x the safe working pressure
d)	2 x the safe working pressure

Question 47	
A leak is discovered on an under-pressure flanged pipe spool. What is the next step?	
Possible answers	
a)	Wipe up the water and tighten up the bolts whilst the spool is under pressure
b)	Drop the pressure 50% and then retighten the bolts
c)	Drop the pressure to zero then investigate the leak
d)	Drop the pressure to 25% then fix the leak retighten the bolts

Question 48	
When determining materials required for a pipe installation, what does the term spiral wound refer to?	
Possible answers	
a)	Elbow
b)	Gasket
c)	Flange
d)	Pipe support

Question 49	
The ASME/ANSI A13.1 Standard helps identify the type of hazardous materials in a piping system. Which colour is used to indicate that compressed air is being transported in a piping system?	
Possible answers	
a)	Blue
b)	Green
c)	Brown
d)	Orange

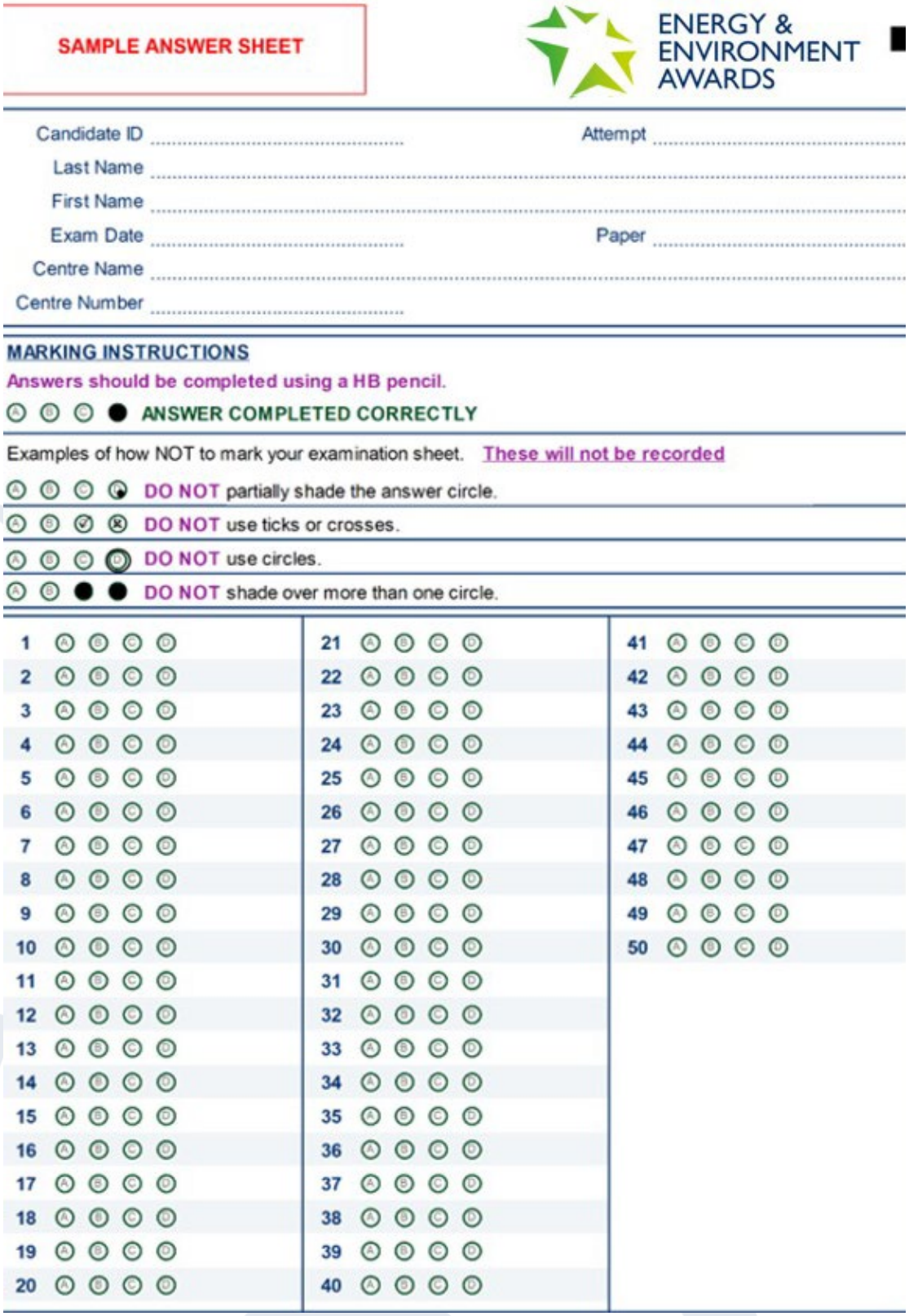
Question 50	
What does British Standard Pipe (BSP) set the standards for?	
Possible answers	
a)	Screw threads
b)	Buttwelding ends
c)	Wall thicknesses for different pressure uses
d)	Pipe flanges

End of Questions

Answers

Question	Answer	Question	Answer	Question	Answer
1	A	18	A	35	C
2	B	19	A	36	C
3	D	20	C	37	D
4	D	21	B	38	A
5	A	22	B	39	D
6	C	23	B	40	D
7	B	24	C	41	B
8	D	25	A	42	C
9	C	26	C	43	A
10	A	27	D	44	C
11	C	28	A	45	A
12	A	29	A	46	C
13	B	30	A	47	C
14	D	31	B	48	B
15	D	32	B	49	A
16	B	33	B	50	A
17	B	34	B		

Energy & Environment Awards MCQ Example answer Sheet



SAMPLE ANSWER SHEET

ENERGY & ENVIRONMENT AWARDS

Candidate ID ..... Attempt .....

Last Name .....

First Name .....

Exam Date ..... Paper .....

Centre Name .....

Centre Number .....

MARKING INSTRUCTIONS

Answers should be completed using a HB pencil.

A B C ● **ANSWER COMPLETED CORRECTLY**

Examples of how NOT to mark your examination sheet. These will not be recorded

DO NOT partially shade the answer circle.

DO NOT use ticks or crosses.

DO NOT use circles.

DO NOT shade over more than one circle.

1	A B C D	21	A B C D	41	A B C D
2	A B C D	22	A B C D	42	A B C D
3	A B C D	23	A B C D	43	A B C D
4	A B C D	24	A B C D	44	A B C D
5	A B C D	25	A B C D	45	A B C D
6	A B C D	26	A B C D	46	A B C D
7	A B C D	27	A B C D	47	A B C D
8	A B C D	28	A B C D	48	A B C D
9	A B C D	29	A B C D	49	A B C D
10	A B C D	30	A B C D	50	A B C D
11	A B C D	31	A B C D		
12	A B C D	32	A B C D		
13	A B C D	33	A B C D		
14	A B C D	34	A B C D		
15	A B C D	35	A B C D		
16	A B C D	36	A B C D		
17	A B C D	37	A B C D		
18	A B C D	38	A B C D		
19	A B C D	39	A B C D		
20	A B C D	40	A B C D		

Appendix D: ECP Sample Brief and Supporting Documentation for Practical Assessment

Instructions

The practical observed assessment will be delivered in a strictly controlled environment. The assessment will be invigilated by an Independent Assessor from Energy & Environment Awards. During the test the Independent Assessor will question the apprentice to ascertain the breadth and depth of their underpinning knowledge. The Independent Assessor will record the answers given.

This assessment has a 55% weighting towards the overall score and grading.

Apprentices have maximum 8 hours to complete the task. The exact duration is like the time expected for a competent pipefitter to complete a similar task.

The test will take the form of one holistic pipefitting task where the apprentice must work to the tolerances and specifications stated in an engineering drawing to fabricate, assemble, install, test and then dismantle a piping assembly.

Health and safety and potential risks are an essential part of this assessment. Safety requirements and codes of practice associated with fabrication engineering must be understood and implemented by the apprentice. In order to pass this assessment all aspects of safety must be demonstrated. Failure to do so will result in the assessment being halted.

You must not modify the requirements of the engineering drawing provided to make it more relevant to local needs.

You must use one of the engineering drawings provided by Energy & Environment Awards. The drawing should be printed on A3 paper.

You will also require

- The dimensions tolerances sheet
- A rig to fit the piping assembly to. Energy & Environment Awards will provide the rig for the period of the assessment.

During the assessment the apprentice pipefitter should demonstrate the following skills:

- Engineering practices and principles including reading engineering drawings and marking out techniques
- Mathematical techniques and formula related to the fabrication, development and installation of pipework systems
- Correct selection and safe use of hand tools, mechanical tools and equipment in for the fabrication, repair, installation and decommissioning of a pipework system
- Application of knowledge of common and specialist pipe materials such as ferrous, non-ferrous and non-metallic including fittings associated with the pipework components and systems
- Pipework preparation, fabrication, installation, testing and decommissioning techniques commonly used throughout the Engineering Construction industry
- Application of appropriate codes, practices and industry standards to ensure quality requirements are met.

During the assessment the apprentice pipefitter should demonstrate the following behaviours:

- Solving problems by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
- Take responsibility as an individual for the quality of the work
- Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
- Maintain a safe, clean and tidy work area
- Check for and identify potential hazards in the workplace and take responsibility to maintain a safe working environment.

Resources used to complete the tasks

Apprentices will need access to the following resources

- A workshop with a range of hand tools, mechanical tools and equipment for the fabrication, installation and decommissioning of a pipework system
- Health and safety equipment
- The raw materials and sundries required to produce the fabricated parts
- The rig to bolt their completed assembly onto. This is provided by Energy & Environment Awards.

Guidance for apprentices

You have responsibility to read the assignment carefully and to understand what you need to do. You may seek clarification from the Independent Assessor if you are unsure of requirements.

Health and safety and potential risks are an essential part of this assessment. In order to pass this assessment all aspects of safety must be demonstrated. Failure to follow safety procedures will result in the assessment being halted.

Task overview

The assessment will involve the fabrication of a pipe spool containing diverse ways of assembling pipework.

The assembled spool will be pressure tested before installation.

The three parts of the spool will be assembled as a joint operation.

The completed fabrication should be lifted into place onto the rig and bolted into position.

After installation the spool will be safely dismantled to its individual component pieces.

Resources

- A workshop with a range of hand tools, mechanical tools and equipment for the fabrication, repair, installation and decommissioning of a pipework system
- Health and safety equipment
- The raw materials and sundries required to produce the fabricated parts
- A rig to bolt their completed assembly onto
- The engineering drawing, provided by Energy & Environment Awards
- Pressure testing template, provided by Energy & Environment Awards
- Access to appropriate supporting documentation such as risk assessments, dimension tolerances.

Conditions

- Duration: maximum 8 hours
- Conditions: Controlled and invigilated by an Independent Assessor
- Materials: as stated in the engineering drawing.

Task detail

Identify health and safety aspects associated with pipework fabrication

a. Extract information from current specifications to indicate legal and site requirements.
b. Determine the actions required to prepare the work area for the fabrication of the pipe spool
c. Determine the arrangements that may need to be made to achieve safe access when installing the spool
d. Complete a personal risk assessment.

Interpret information and marking out pipe work materials

a. Apply safe working practices
b. Interpret the drawing of the spool.

Preparation, joining and erection of pipe work assemblies

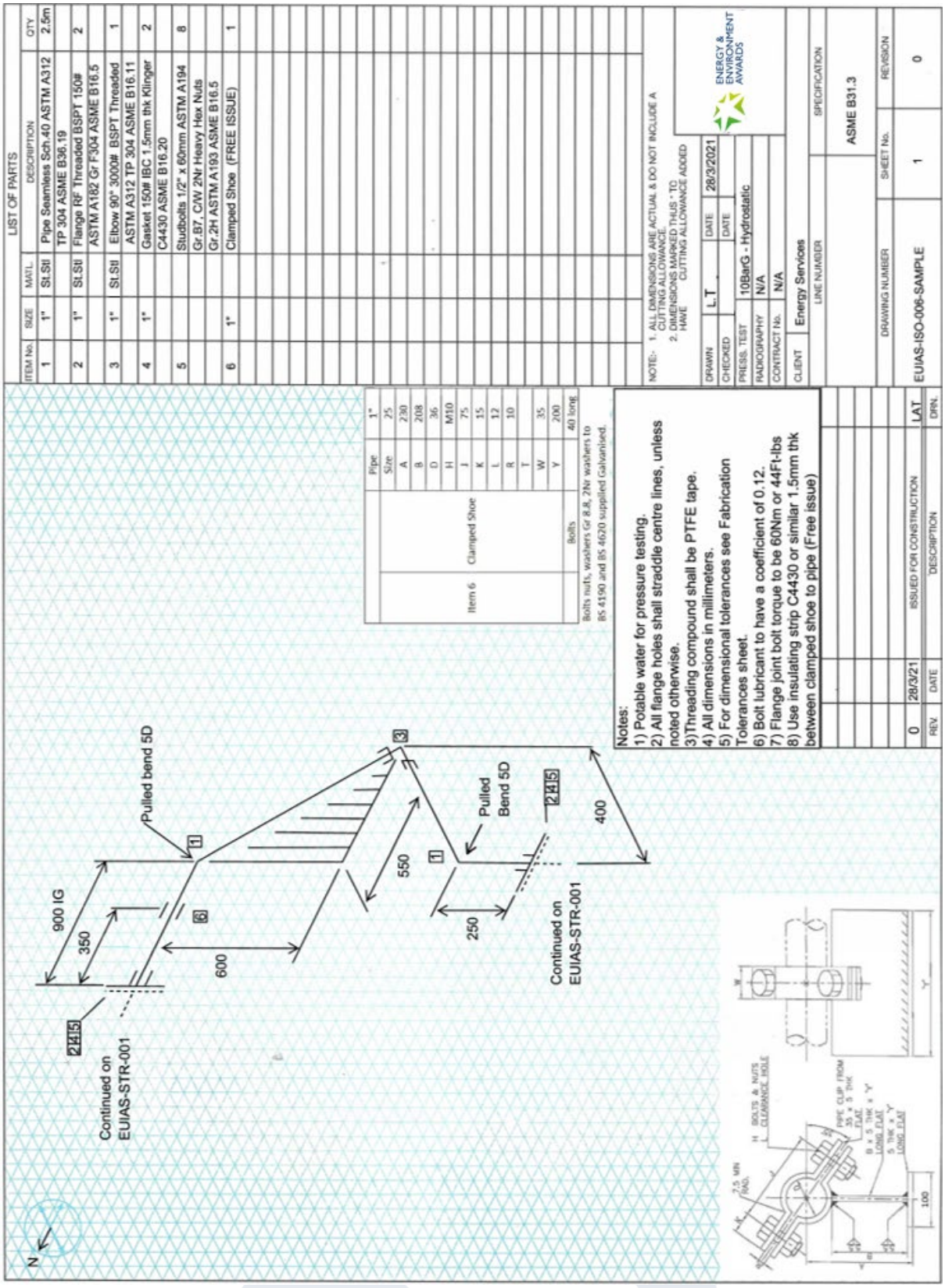
a. Apply safe practices
b. Cut the appropriate pipe sizes after producing a cutting list
c. Prepare and clean pipe and fittings for fabrication
d. Bend pipework safely using hydraulic bender to measurements within specified tolerances specified on the drawing
e. Safely thread pipework ready for the fitting
f. Fabricate spool using the most economic methods ready for installation.

Installation and testing of pipe work systems

a. Apply safe practices
b. Prior to installation the spool is to be pressure tested using the hydrostatic testing method stated. The spool will then be depressurised and drained safely.
c. Using the correct lifting equipment and methods safely lift spool to correct position.
d. Using the correct tightening sequence safely bolt spool into position.

Recover tools, area and equipment

a. Apply safe practices
b. Make all isolations and disconnections in line with approved procedures
c. Remove the required components using the correct techniques and tools
d. Correctly record and store components for reuse
e. Dispose of any waste in line with procedures and regulations.


LIST OF PARTS
ITEM No. | SIZE | MATL. | DESCRIPTION | QTY
1 | 1" | St.Stl | Pipe Seamless Sch.40 ASTM A312 TP 304 ASME B36.19 | 2.5m
2 | 1" | St.Stl | Flange RF Threaded BSPT 150# ASTM A182 Gr F304 ASME B16.5 | 2
3 | 1" | St.Stl | Elbow 90° 3000# BSPT Threaded ASTM A312 TP 304 ASME B16.11 | 1
4 | 1" | | Gasket 150# IBC 1.5mm thk Klinger C4430 ASME B16.20 | 2
5 | | | Studbolts 1/2" x 60mm ASTM A194 Gr.B7, C/W 2Nr Heavy Hex Nuts Gr.2H ASTM A193 ASME B16.5 | 8
6 | 1" | | Clamped Shoe (FREE ISSUE) | 1
Item 6 Clamped Shoe
Pipe 1"
Size 25
A 230
B 208
D 36
H M10
J 75
K 15
L 12
R 10
T
W 35
Y 200
Bolts 40 long
Bolts nuts, washers Gr 8.8, 2Nr washers to BS 4190 and BS 4620 supplied Galvanised.
Notes:
1) Potable water for pressure testing.
2) All flange holes shall straddle centre lines, unless noted otherwise.
3)Threading compound shall be PTFE tape.
4) All dimensions in millimeters.
5) For dimensional tolerances see Fabrication Tolerances sheet.
6) Bolt lubricant to have a coefficient of 0.12.
7) Flange joint bolt torque to be 60Nm or 44Ft-lbs
8) Use insulating strip C4430 or similar 1.5mm thk between clamped shoe to pipe (Free issue)
NOTE:- 1. ALL DIMENSIONS ARE ACTUAL & DO NOT INCLUDE A CUTTING ALLOWANCE
2. DIMENSIONS MARKED THUS * TO HAVE CUTTING ALLOWANCE ADDED
DRAWN L.T. DATE 28/3/2021
CHECKED DATE
PRESS. TEST 10BarG - Hydrostatic
RADIOGRAPHY N/A
CONTRACT No. N/A
CLIENT Energy Services
LINE NUMBER
SPECIFICATION
ASME B31.3
DRAWING NUMBER EUIAS-ISO-006-SAMPLE
SHEET No. 1
REVISION 0
REV 0 DATE 28/3/21 DESCRIPTION ISSUED FOR CONSTRUCTION DRN. LAT
Pulled bend 5D
Pulled Bend 5D
900 IG
350
600
550
250
400
2415
Continued on EUIAS-STR-001
Continued on EUIAS-STR-001
N
H BOLTS & NUTS
L CLEARANCE HOLE
PIPE CLIP FROM 35 x 5 THK FLAT
8 x 5 THK x Y LONG FLAT
5 THK x Y LONG FLAT
2.5 MIN PAD
100

ECP: Practical Assessment – Parts List

The test takes the form of one holistic pipefitting task where the apprentice must work to the tolerances and specifications stated in an engineering drawing to fabricate, assemble, install, test and then dismantle a piping assembly.

List of Parts Covering All ECP Practical Assessments

The following items are the parts that may be required for the assessment. The parts will be specific to the individual engineering drawing that the apprentice is issued with.

To be provided by assessment centre:

Size	MATL	Description	Qty
2”	C/S	Pipe API-5L GrB Sch.40 Seamless ASME B36.10	2.5m
1”	C/S	Pipe API-5L GrB Sch.40 Seamless ASME B36.10	2.5m
1”	St.Stl	Pipe Seamless Sch.40 ASTM A312 TP 304 ASME B36.19	2.5m
2”	C/S	Flange RF Threaded BSPT 150# ASTM A105 ASME B16.5	2
1”	C/S	Flange RF Threaded BSPT 150# ASTM A105N ASME B16.5	2
1”	St.Stl	Flange RF Threaded BSPT 150# ASTM A182 Gr F304 ASME B16.5	2
2”	C/S	Elbow 90° 3000# BSPT Threaded ASTM A105N ASME B16.11	1
1”	C/S	Elbow 90° 3000# BSPT Threaded ASTM A105N ASME B16.11	1
1”	St.Stl	Elbow 90° 3000# BSPT Threaded ASTM A312 TP 304 ASME B16.11	2
2”		Gasket 150# IBC 1.5mm thk Klinger C4430 ASME B16.20	2
1”		Gasket 150# IBC 1.5mm thk Klinger C4430 ASME B16.20	2
		Studbolts 5/8" x 90mm ASTM A194 Gr.B7, C/W 2Nr Heavy Hex Nuts Gr.2H ASTM A193 ASME B16.5	8
		Stud bolts 1 /2" x 60mm ASTM A 194 Gr.B7, C/W 2Nr Heavy Hex Nuts Gr.2H ASTM A193 ASME B16.5	8
		Potable water and drain	
		PTFE tape	
		Bolt lubricant	
		Insulating strip C4430 or similar 1.5mm thick	0.20m

To be provided by Energy & Environment Awards:

- Rig and clamped shoe

ECP: Safety Pressure Test Report

General Information			
Report no.		Test location	
Test Date		Piping Assembly Reference	
Type of Test	☐ Hydrostatic	☐ Pneumatic	
Required Test Pressure		Test Duration	
Test Medium		Test Material	

Testing			
Start Time		End Time	
Test Pressure at Start		Test Pressure at End	
Actual Test Fluid Temperature		Actual Holding Time	
Environmental Controls			
Test Area Controls (e.g. signage, barricades)			

Test Equipment Used (e.g. Gauge, Pressure Recorder, Temperature Recorder)				
Type	Description / Serial Number	Pressure Range	Calibration date	Certificate Number

Test Result			
Results			
Pressure Test	☐ Satisfactory	☐ Unsatisfactory (explain)	
Remarks / Additional Information			
This is to certify that the above item has been tested satisfactorily using the parameters specified			
Apprentice performing test		Signature	Date
Witnessed by IA Inspecting Test		Signature	Date

Appendix E: Checklist and Summary Record for Practice Practical Assessment

Apprentice Name	
Assessor Name	
Date of Assessment	

Marks awarded against PASS criteria		Award 60 ONLY if all PASS criteria achieved
Marks awarded against MERIT criteria		Award 5 marks for each MERIT criterion achieved
Marks awarded against DISTINCTION criteria		Award 5 marks for each DISTINCTION criterion achieved
Total marks		

Grade

Pass: 60 marks
Merit: 75 marks
Distinction: 85 marks

To achieve a Merit for the Practical Assessment, all Pass criteria must be achieved PLUS a minimum of three Merit criteria.

To achieve a Distinction for the Practical Assessment, the apprentice must achieve a Merit PLUS a minimum of two Distinction criteria.

Note. It is possible to score more than 75 and NOT achieve a Merit because a minimum of three Merit criteria have not been achieved. Similarly, it is possible to score more than 85 and not achieve a Distinction because a minimum of three Merit and two Distinction criteria have not been achieved.

The Practical Assessment carries a weighting of 55% when calculating the final grade.

You should

- include a rationale for the grade awarded. Include any comments to cover any issues such as
    - areas that need to be addressed by the apprentice if they have failed
    - where evidence barely covers the criteria and further questioning will be needed in the Structured Professional Review
- note questions that were asked to test the breadth and depth of apprentice's knowledge plus the apprentice's response.

PASS criteria P Award 60 marks if **all** PASS criteria have been achieved	MERIT criteria M Award 5 marks for each MERIT criterion achieved	DISTINCTION criteria D Award 5 marks for each DISTINCTION criterion achieved
P1 Satisfies the health and safety requirements during the planning, execution and recovery of any allocated tasks.	**M1** Occasionally exceeds requirements. Endeavours to identify and proffer improvement suggestions.	**D1** Goes above and beyond the requirements. Consistently identifies and proffers improvement suggestions.
☐ **Achieved**	☐ **Achieved**	☐ **Achieved**
Evidence:		
P2 Applies pipefitting skills, knowledge and behaviours in the workplace to the specified standard.	**M2** Occasionally exceeds standards. Able to identify issues and resolve them as and when they occur.	**D2** Consistently exceeds the required standard. Identifies issues and resolves them before they occur.
☐ **Achieved**	☐ **Achieved**	☐ **Achieved**

PASS criteria P Award 60 marks if **all** PASS criteria have been achieved	MERIT criteria M Award 5 marks for each MERIT criterion achieved	DISTINCTION criteria D Award 5 marks for each DISTINCTION criterion achieved
Evidence:		
P3 Is able to meet the requires levels of accuracy whilst working against engineering specifications. Is able to select appropriate tools and techniques to execute given pipefitting tasks in accordance with stated tolerances and to stated specifications.	**M3** Consistently meets and occasionally exceeds the required levels of accuracy when working against engineering specifications. May offer suggestions for continuous improvement when prompted	**D3** Consistently exceeds the specified levels of accuracy. Will consistently seek to continuously improve methods and means of executing given pipefitting tasks.
☐ **Achieved**	☐ **Achieved**	☐ **Achieved**
Evidence:		

PASS criteria P Award 60 marks if **all** PASS criteria have been achieved	MERIT criteria M Award 5 marks for each MERIT criterion achieved	DISTINCTION criteria D Award 5 marks for each DISTINCTION criterion achieved
P4 Understanding and practical application of pipefitting and related engineering first principles meets the standard.	**M4** Displays comprehensive command across the full range of role knowledge requirements, When prompted applies this to problem solve and improve quality of own work.	**D4** Full command of first principles. Autonomously applies this in order to problem solve and improve quality of own work and overall process
☐ **Achieved**	☐ **Achieved**	☐ **Achieved**
Evidence:		

	FAIL

For PASS the apprentice must demonstrate all the pass criteria
For MERIT the apprentice must demonstrate all the pass criteria plus a minimum of three of the MERIT criteria
For DISTINCTION the apprentice must achieve the criteria for a MERIT plus a minimum of two of the DISTINCTION criteria

Guidance
Occasionally means that the KSB has been demonstrated at least once.
Consistently means that the KSB has been demonstrated most of the time

Standard (ST0162) references
P1, M1, D1: K6, K9, S1, S2, B6, B8
P2, M2, D2: K6, K8, S5, S6, S7, S8, S10, B2
P3, M3, D3: K4, K5, S4, B2
P4, M4, D4: K4, K5, S5, S6, S7, S8, S10, B2

Appendix F: Evidence Record for the Professional Review

Full Name of Apprentice	
Employer	

Completing the Evidence Record and compiling your mini-portfolio.

The Evidence Record must be submitted alongside a mini portfolio.

The Evidence Record is in two parts:

- Part A – description of evidence in the mini-portfolio cross-referenced to the Engineering Construction Pipefitter (ECP) standard
- Part B – Engineering Technician commentary (UK-SPEC ENG TECH).

Before you start your end-point assessment, you must compile a mini-portfolio which covers **three different** pipefitting jobs. The jobs chosen are expected to cover at least two of the following types of pipe:

- ferrous pipe
- plastic pipe
- non-ferrous pipe.

Your mini portfolio must contain at least one piece of evidence to cover each of the required ECP skills and behaviours. Do not include any other evidence.

Please save this Evidence Record and supporting evidence (mini-portfolio) as one pdf document before submitting it. The evidence must be submitted to Energy & Environment Awards at the same time as the Gateway meeting.

The form must be signed and authenticated by you and your supervisor

Declaration

Apprentice's declaration

I certify the information contained in this report and any accompanying documentation is correct.

Signature: ---------- Date: ----------

Supervisor's declaration

I confirm I have known the apprentice for a minimum of one year. To the best of my knowledge, all the information contained in this report is correct.

Name: ----------

Signature: ---------- Date: ----------

Part A

Standard Element	Description of evidence	Job Ref eg. Job 1 - 3
K1		
K2		
K3		
S1		
S2		
S3		
S4		
S5		
S6		
S7		
S8		
S9		
S10		
S11		
B2		
B3		
B4		
B5		
B6		
B7		
B8		
B9		

Reference to ECP Standard (ST0162 V1.2-V1.4)

Knowledge

K1 Relevant health, safety and environment legislation, regulations and company-specific requirements for safe working practises and procedures
K2 Importance and benefits of recognised industry safety passport schemes
K3 How to work safely, personal site safety responsibilities and how to respond to and provided solutions to problems and emergencies

Skills

S1 Comply with appropriate health and safety, risk and quality requirements
S2 Correctly select and safely use tools and equipment for the fabrication, assembly, installation and decommissioning of pipework components and systems
S3 Plan, organise and undertake the fabrication, assembly, installation, maintenance and decommissioning of pipework components and systems
S4 Read, interpret and apply engineering drawing information
S5 Shape pipework components using hand and power tools to cut, drill, shape and finish components to the required tolerance, specification and standard
S6 Assemble and install pipework using the appropriate methods, techniques and equipment in accordance with the specification including welded, threaded, bolted and clamped jointing solutions.
S7 Ensure the integrity of joints in accordance with specifications, in line with specified quality procedures and to precise tolerances
S8 Undertake the testing and inspection of the fabricated and/or installed pipework using the appropriate techniques
S9 Work with others and contribute to effective working relationships within an Engineering Construction environment
S10 Apply techniques for the temporary or permanent removal of an engineering construction piping related system or component
S11 Communicate by keeping others informed about work plans or activities which may affect them and seek assistance from others without causing undue disruption to normal work activities

Behaviours

B1 Work with others to effectively and efficiently complete the allocated tasks
B2 Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required
B3 Take responsibility as an individual and team member for the quality of the work

B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge
B5 Act ethically displaying maturity, honesty, integrity and responsibility
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements
B7 Maintain a safe, clean and tidy work area
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment
B9 Question unsafe behaviours and incorrect work practises and procedures

Part B

Describe your roles and responsibilities carefully and concisely, and give a brief description of Jobs 1, 2 and 3.

This is intended to give the panel members an **overview** of your particular working environment.

My Role:
Job 1:
Job 2:
Job 3:

Give an example of a project or task where you solved a technical problem, explaining your role and how you selected the appropriate techniques, procedures and methods used.

Include details about any scientific, technical or engineering principles you used.

[450-500 words]

EngTech (UK Spec) Reference

A Use engineering knowledge and understanding to apply technical and practical skills

Give an example of how you have identified, planned, and organised the resources needed to effectively complete a project or task, explaining how you took into consideration cost, quality, safety and any environmental impact.

Remember to think about what equipment was used, and/or how data was gathered and analysed to produce the desired outcome.

[450-500 words]

EngTech (UK Spec) Reference

B Contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of products, equipment, processes, systems or services

Give an example of how you have identified and taken responsibility for completing a task or activity that demonstrates your skills, including working to agreed procedures and codes, managing resources and assigning tasks to others.

[450-500 words]

EngTech (UK Spec) Reference

C Accept and exercise personal responsibility

Give examples of how you have contributed to discussions, meetings, presentations or reports, communicated and worked effectively with colleagues and others, showing your awareness of the importance of issues such as diversity and equality.

[450-500 words]

EngTech (UK Spec) Reference

D Use effective communication and interpersonal skills

Give an example of how you have:

- **Complied with your company's Code of Conduct**
- **Taken personal responsibility for your safety and the safety of others**
- **Contributed to sustainable development including environmental, social and economic aspects**
- **Kept in touch with developments in your technical area and continued to develop your knowledge and skills.**

[450-500 words]

EngTech (UK Spec) Reference

E Make a personal commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.

Appendix G: Practice Structured Professional Review based on the Evidence Record and mini portfolio

Instructions to Assessor

The questioning should synoptically examine the knowledge, skills and behaviours developed by the apprentice through their on-programme experience. Suggested questions are listed below. Where necessary, additional questioning may be asked to give the apprentice the opportunity to access the Merit and Distinction grades.

- Start by asking the Pass questions referencing the relevant job in the Evidence Record where required. Record the response in note form in the comments box at the end of each section and tick the relevant box (P1, P2, etc) if the apprentice has provided sufficient evidence to Pass.
- Ask additional questions to give the apprentice the opportunity to access the Merit and Distinction criteria, and record the question asked in relevant section of the form, together with the apprentice response in note form. Tick the relevant Merit/Distinction box if achieved.
- Behavioural questions are incorporated into each section. Ensure responses relating to behaviours are recorded. Tick the relevant Behaviour box if achieved.
- If there are behaviours which have not been met as part of the Professional Discussion phase of the structured review, you must ask questions, relating to the relevant behaviour(s), at the end of the document.
- The Apprentice should be advised that the SPR will move into a direct question and answer session using a standard set of questions. A record of the questions asked, and responses provided should be made.

Structured Professional Review Panel Summary

Apprentice Full Name	
Assessor Name(s)	1)
	2)
Date of Assessment	

Marks awarded against PASS criteria	FAIL / 60	Award 60 ONLY if all PASS criteria achieved and ALL Behaviours met	Grade
Marks awarded against MERIT criteria		Award 3 marks for each MERIT criterion achieved	Pass: 60 marks Merit: 75 marks
Marks awarded against DISTINCTION criteria		Award 2 marks for each DISTINCTION criterion achieved	Distinction: 85 marks
Total marks			

Please include a rationale for the grade awarded. Include any comments to cover any issues such as

a) Areas that need to be addressed by the apprentice if they have failed
b) Where evidence barely covers the criteria.

Section One: Working safely and understanding personal responsibilities for health, safety and the environment					
Pass		Merit		Distinction	
P1 Recognises the importance of health, safety, environmental and pipefitting related rules, legislation and regulations. Can explain the reasons why health, safety, environmental and pipefitting related rules, legislation and regulations are vital. **Achieved?**		**M1** Can explain instances where they have raised concerns. Can describe their subsequent actions. Award 3 marks if MERIT criterion achieved		**D1** Able to show instances where they have been able to proffer or implement improvements to work place safety and explain why these improvements have been successful. Award 2 marks if DISTINCTION criterion achieved	
Behaviours					✓
B2	Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements				
B3	Take responsibility as an individual and team member for the quality of the work				
B5	Act ethically, displaying maturity, honesty, integrity and responsibility				
B6	Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements				
B8	Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment				

Section One: Working safely and understanding personal responsibilities for health, safety and the environment
Pass Questions - *Develop some open ended questions that can be used to assess the apprentice*
Merit Questions- *Develop some open ended questions that can be used to assess the apprentice*
Distinction Questions *Develop some open ended questions that can be used to assess the apprentice*
Comments

Section Two: Establishing first principles, maintaining good communication and productive working relationships		
Pass	Merit	Distinction
P6 Able to explain the importance of conforming to the workplace behaviours articulated in the standard. Fully aware of the implications of deviating from these behaviours. **Achieved?**	**M6** Provides evidence of instances where they may have been exposed to unsafe/undesirable behaviours and how they dealt with these occurrences. Provides evidence of how they dealt with these occurrences. Award 3 marks if MERIT criterion achieved	**D6** Recognises the impact of non-conformance on workplace behaviours and organisational culture. Award 2 marks if DISTINCTION criterion achieved
P8 Can explain the importance of productive team working. **Achieved?**	**M8** Can explain in detail and can demonstrate where they have acted as an effective team member. Award 3 marks if MERIT criterion achieved	**D8** Can explain how they can personally contribute to the productivity and dynamics of the team. Award 2 marks if DISTINCTION criterion achieved
P2 Can evidence where engineering first principles and techniques required for pipefitting have been practically applied in the workplace to successfully complete allocated pipefitting tasks. **Achieved?**	**M2** Can explain the engineering first principles and techniques. Can explain the roles and responsibilities of allied trades and explains where the work of these trades will impact upon their tasks. Award 3 marks if MERIT criterion achieved	**D2** Can explain in detail the technical specialisms of allied trades and explain where the work of these trades will impact upon their tasks and what steps need to be taken to ensure de-confliction. Award 2 marks if DISTINCTION criterion achieved

Section Two: Establishing first principles, maintaining good communication and productive working relationships		
Behaviours		✓
B1	Work with others to effectively and efficiently complete the allocated tasks	
B2	Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements	
B3	Take responsibility as an individual and team member for the quality of the work	
B5	Act ethically, displaying maturity, honesty, integrity and responsibility	
B6	Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements	
B8	Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment	
B9	Question unsafe behaviours and incorrect work practises and procedures	
Pass Questions - *Develop some open ended questions that can be used to assess the apprentice*		
Merit Questions - *Develop some open ended questions that can be used to assess the apprentice*		

Section Two: Establishing first principles, maintaining good communication and productive working relationships
Distinction Questions - *Develop some open ended questions that can be used to assess the apprentice*
Comments

Section Three: Preparing for the pipefitting task and awareness of its importance					
Pass		Merit		Distinction	
P3 Is aware of the importance of own work and, **when questioned** can articulate where their work contributes to the objectives of their employer. **Achieved?**		**M3** Able to articulate where their work contributes to the overall commercial aims and objectives of the customer. Award 3 marks if MERIT criterion achieved		**D3** Recognises the overall impact of them not working to the standard. Award 2 marks if DISTINCTION criterion achieved	
P7 Fully understands the content of engineering specifications used in their work-based activities and how they are applied. **Achieved?**		**M7** Can explain in detail why engineering specifications are required. Can explain in detail how engineering specifications are applied to work-based activities. Award 3 marks if MERIT criterion achieved		**D7** Able to evidence where they have offered suggestions regarding how the specified engineering specifications could have been modified to improve the work process and quality of the end product. Award 2 marks if DISTINCTION criterion achieved	
Behaviours					✓
B1	Work with others to effectively and efficiently complete the allocated tasks				
B4	Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge				
B5	Act ethically, displaying maturity, honesty, integrity and responsibility				

Section Three: Preparing for the pipefitting task and awareness of its importance	
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements	
B7 Maintain a safe, clean and tidy work area	
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment	
Pass Questions - *Develop some open ended questions that can be used to assess the apprentice*	
Merit Questions - *Develop some open ended questions that can be used to assess the apprentice*	
Distinction Questions - *Develop some open ended questions that can be used to assess the apprentice*	
Comments	

Section Four: Carry out the pipefitting activities, effectively, efficiently, safely and also undertake fault finding using appropriate techniques					
Pass		Merit		Distinction	
P4 Provides correct information when questioned on a range of common fault diagnosis techniques related to pipefitting tasks. **Achieved?**		**M4** Can describe a range of common fault diagnosis techniques. Can recognise where common fault diagnosis techniques are best applied. Award 3 marks if MERIT criterion achieved		**D4** Contrasts the strengths and weaknesses of common fault diagnosis techniques. Award 2 marks if DISTINCTION criterion achieved	
P5 Provides evidence demonstrating where the pipefitting skills, knowledge and behaviours as described in the standard have been practically applied to identify and rectify faults. **Achieved?**		**M5** Can justify why the specific techniques was selected to identify and rectify faults. Award 3 marks if MERIT criterion achieved		**D5** Explains their actions and describes what other options may have been available and why these were not deemed suitable or pursued. Award 2 marks if DISTINCTION criterion achieved	
Behaviours					✓
B1 Work with others to effectively and efficiently complete the allocated tasks					
B2 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements					
B3 Take responsibility as an individual and team member for the quality of the work					

Section Four: Carry out the pipefitting activities, effectively, efficiently, safely and also undertake fault finding using appropriate techniques	
B4 Support their own learning and development and that of others through activities such as mentoring and sharing of expertise and knowledge	
B5 Act ethically, displaying maturity, honesty, integrity and responsibility	
B6 Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements	
B7 Maintain a safe, clean and tidy work area	
B8 Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment	
B9 Question unsafe behaviours and incorrect work practises and procedures	
Pass Questions - *Develop some open ended questions that can be used to assess the apprentice*	
Merit Questions - *Develop some open ended questions that can be used to assess the apprentice*	
Distinction Questions - *Develop some open ended questions that can be used to assess the apprentice*	

Section Four: Carry out the pipefitting activities, effectively, efficiently, safely and also undertake fault finding using appropriate techniques
Comments

All behaviours must be met

For PASS the apprentice must demonstrate **all** the pass criteria

For MERIT the apprentice must demonstrate **all** the pass criteria plus a **minimum of five** of the MERIT criteria

For DISTINCTION the apprentice must achieve a MERIT plus a **minimum of five** of the DISTINCTION criteria

BEHAVIOURAL QUESTIONS

The Apprentice should be advised that they will now proceed into a direct question and answer session using a standard set of questions.

The Apprentice should be advised that they

- can ask for the question to be repeated
- will then need to provide their answer drawing upon their Apprenticeship training and experience, including from personal experience from outside of the workplace, if appropriate.

You should ensure that the SPR results in evidence for each of the behavioural areas (B1-B9).

Record the questions asked and responses provided in the table below.

Behavioural Questions and Responses Record		
Ref	Already met? (Y/N)	Response notes
B1		**Work with others to effectively and efficiently complete the allocated tasks.** - *Develop some open ended questions that can be used to assess the apprentice*
B2		**Solve problems within their area of responsibility by applying technical skills and knowledge to define, identify, evaluate and select alternative solutions if required.** - *Develop some open ended questions that can be used to assess the apprentice*

Behavioural Questions and Responses Record		
Ref	Already met? (Y/N)	Response notes
B3		**Take responsibility as an individual and team member for the quality of the work.** - *Develop some open ended questions that can be used to assess the apprentice*
B4		**Support their own learning and development and that of others through activities such as mentoring and sharing of expertise** - *Develop some open ended questions that can be used to assess the apprentice*
B5		**Act ethically, displaying maturity, honesty, integrity and responsibility.** - *Develop some open ended questions that can be used to assess the apprentice*
B6		**Work safely in accordance with health, safety and environmental legislation, regulations and company-specific requirements,** - *Develop some open ended questions that can be used to assess the apprentice*
B7		**Maintain a safe, clean and tidy work area.** - *Develop some open ended questions that can be used to assess the apprentice*

Behavioural Questions and Responses Record		
Ref	Already met? (Y/N)	Response notes
B8		**Check for and identify potential hazards in the workplace and take collective responsibility to maintain a safe working environment.** - *Develop some open ended questions that can be used to assess the apprentice*
B9		**Question unsafe behaviours and incorrect work practises and procedures.** - *Develop some open ended questions that can be used to assess the apprentice*
Responses		

Appendix H: Checklist of appropriate codes, practices and industry standards (K9)

Piping design codes	
ASME B31 - American Society of Mechanical Engineers (ASME) code for pressure piping	ASME B31.1 - Power piping ASME B31.2 - Fuel Gas piping ASME B31.3 - Process piping ASME B31.4 - Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids ASME B31.5 - Refrigeration Piping and Heat Transfer Components ASME B31.8 - Gas Transmission and Distribution Piping Systems. ASME B31.8S - Managing System Integrity of Gas Pipelines. ASEM B31.9 - Building Services Piping. ASME B31.11 - Slurry Transportation Piping Systems. ASME B31.12 - Hydrogen Piping and Pipelines. ASME B31G - Manual for Determining Remaining Strength of Corroded Pipelines.
ISO EN 13480 – European metallic industrial piping	ISO EN 13480-1 – General ISO EN 13480-2 – Materials ISO EN 13480-3 – Design & Calculation ISO EN 13480-4 – Fabrication & installation ISO EN 13480-5 – Inspection & testing ISO EN 13480-6 – Additional requirements for buried piping ISO EN 13480-7 - Metallic industrial piping Guidance on the use of conformity assessment procedures ISO EN 13480-8 - Additional requirements for aluminium and aluminium alloy piping

ASME Dimensional Standards	
	B1.20.1 - Pipe Threads, General Purpose (Inch) B16.1 - Cast Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250 B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300 B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard B16.9 - Factory-Made Wrought Buttwelding Fittings B16.10 - Face-to-Face and End-to-End Dimensions of Valves B16.11 - Forged Fittings, Socket-Welding and Threaded B16.20 - Metallic Gaskets for Pipe Flanges: Ring-Joint, Spiral-Wound, and Jacketed B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges B16.25 - Buttwelding Ends B16.28 - Wrought Steel Buttwelding Short Radius Elbows and Returns B16.34 - Valves: Flanged, Threaded, and Welding End B16.36 - Orifice Flanges B16.39 - Malleable Iron Threaded Pipe Unions B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300 B16.47 - Large Diameter Steel Flanges (NPS 26 Through NPS 60) B16.48 - Steel Line Blanks B36.10 - Welded and Seamless Wrought Steel Pipe B36.19 - Stainless Steel Pipe
Flange joint integrity	ASME PCC-1 - Guidelines for Pressure Boundary Bolted Flange Joint Assembly BS EN 1591-4 - Flanges and their joints. Qualification of personnel competency in the assembly of the bolted connections of critical service pressurized systems

	Energy Institute (EI) - Guidelines for the Management of the Integrity of Bolted Joints in Pressurised Systems
The Manufactures Standardisation Society (MSS)	
	MSS-SP-6 - Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings MSS-SP-9 - Spot Facing for Bronze, Iron and Steel Flanges MSS-SP-25 - Standard Marking Systems for Valves, Fittings, Flanges, and Unions MSS-SP-42 - Class 150 (PN 20) Corrosion Resistant Gate, Globe, Angle and Check Valves With Flanged and Butt Weld Ends MSS-SP-43 - Wrought Stainless Steel Butt-Welding Fittings Including Reference to Other Corrosion Resistant Materials MSS-SP-44 - Steel Pipe Line Flanges MSS-SP-45 - Bypass and Drain Connections MSS-SP-51 - Class 150LW Corrosion Resistant Flanges and Cast Flanged Fittings MSS-SP-58 - Pipe Hangers and Supports MSS-SP-65 - High Pressure Chemical Industry Flanges and Threaded Stubs for Use with Lens Gaskets MSS-SP-69 - Pipe Hangers and Supports MSS-SP-70 - Cast Iron Gate Valves, Flanged and Threaded Ends MSS-SP-71 - Gray Iron Swing Check Valves, Flanged and Threaded Ends MSS-SP-72 - Ball Valves With Flanged or Buttwelding Ends for General Service MSS-SP-75 - Specifications for High Test Wrought Buttwelding Fittings MSS-SP-79 - Socket-Welding Reducer Inserts MSS-SP-81 - Stainless Steel, Bonnetless, Flanged, Knife Gate Valves

	MSS-SP-83 - Class 3000 Steel Pipe Unions, Socket-Welding and Threaded MSS-SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends MSS-SP-88 - Diaphragm Type Valves MSS-SP-95 - Swage(d) Nipples and Bull Plugs MSS-SP-97 - Integrally Reinforced Forged Branch Outlet Fittings
ASTM International – American Society for Testing and Materials	
ASTM Materials for steel pipes	A-53 - Welded and Seamless Steel Pipe A-106 - Seamless Carbon Steel Pipe for High-Temperature Service A-120 - Pipe, steel, black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses A-134 - Electric Fusion (Arc)-Welded Steel Plate Pipe (Sizes 16 in. and Over) A-135 - Electric-Resistance-Welded Steel Pipe A-139 - Electric-Fusion (Arc)-Welded Steel Plate Pipe (Sizes 4 in. and Over) A-155 - Electric-Fusion-Welded Steel Pipe for High-Pressure Service A-211 - Spiral-Welded Steel or Iron Pipe A-312 - Seamless and Welded Austenitic Stainless Steel Pipe A-333 - Seamless and Welded Steel Pipe for Low Temperature Service A-335 - Seamless Ferritic Alloy Steel Pipe for High-Temperature Service A-358 - Electric-Fusion-Welded Austenitic Chromium-Nickel Alloy Steel Pipe for High Temperature Service A-369 - Carbon and Ferritic Alloy Steel Forged and 80red Pipe for High Temperature Service A-376 - Seamless Austenitic Steel Pipe for High-Temperature Central-Station Service A-381 - Metal-Arc-Welded Steel Pipe for High-Pressure Transmission Systems

	A-405 - Seamless Ferritic Alloy Steel Pipe Specially Heat Treated for High Temperature Service A-523 - Plain End Seamless and Electric-Resistance-Welded Steel Pipe for High Pressure Pipe-Type Cable Circuits A-524 - Seamless Carbon Steel Pipe for Process Piping A-530 - General Requirements for Specialized Carbon and Alloy Steel Pipe API-5L - Line Pipe API-5LX - High-Test Line Pipe API-5LS - Spiral Weld Line Pipe
ASTM Materials for butt welding fittings	A234 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service. A420 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service. A403 - Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
ASTM Materials for forgings	A105 - Standard Specification for Carbon Steel Forgings for Piping Applications. A181 - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping. A182 - Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service. A350 - Standard Specification for Carbon and Low-Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components.
ISO 9001 – Implementation of quality management systems	
ISO 14001 – Environmental management systems	
ISO 45001 – Occupational health and safety management systems	
Company quality assurance and quality control procedures	