T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Building Services Engineering for Construction

Gas Engineering

Guide standard exemplification material

Distinction – Sample 2021

City & Guilds | eal

Version and date	Change detail	Section
June 2021 v1.0	Initial document	All
July 2021 v1.1	Transfer of existing content into updated document template	All

Contents

Introduction

The sample assessment materials within this document refers to the gas engineering sample occupational specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to a distinction grade. In this document all exemplar evidence attests as examples of a distinction grade. 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 provide a representative of all tasks in the sample assignment. 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 task and a distinction grade will be based on a synoptic mark across all tasks.

The materials in this GSEM are separated into three 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 including any photographic evidence. 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

Task 2

Task 3

Candidate evidence

This section includes exemplars of the candidate's 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.

Commentary

This section includes detailed comments to demonstrate how the candidate evidence attests to the standard of distinction 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 standard of knowledge, skills and understanding that need to be met for distinction.

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 Distinction, a candidate will be able to:

Demonstrate an exemplary performance that fully meets the requirement of the brief and is able to enter the industry to begin to work in the occupational area.

Demonstrate exemplary technical skills in cutting, bending, fixing pipework and installing components that is in line with industry standards. They will also demonstrate relevant and comprehensive knowledge and understanding of gas principles and processes through the tasks completed.

Work safely and make informed and appropriate use of tools, materials and equipment within the gas environments that they are working in.

Competently and independently interpret information and apply the technical skills to practical tasks and procedures to an exemplary standard as recognised by industry, producing an excellent quality of work that meets acceptable tolerances, regulations and standards.

Confidently attempt some complex tasks and the level of performance meets an exemplary level.

Identify causes and diagnose gas faults and have a thorough understanding and the skills to be able to repair and rectify them.

Consistently use accurate industry terminology in both written and verbal contexts.

Task 1 – Planning the installation

(Assessment themes: Health and Safety, Design and planning, Systems and components)

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

- Risk assessment
- Method statement with justifications
- Materials list
- Installation diagram with ventilation requirements, purge volume requirements and pipework sizing calculations
- Assessor observation of measurements and marking out of space allocation/ work area checked against scale drawing

For illustration, the guided exemplification materials (GSEM) for Task 1 contain examples of candidate evidence for the following assessment requirements only:

- Risk assessment
- Method statement with justifications
- Materials list
- Installation diagram with ventilation requirements, purge volume requirements and pipework sizing calculations
- Assessor observation of measurements and marking out of space allocation/ work area checked against scale drawing

Photographic evidence:

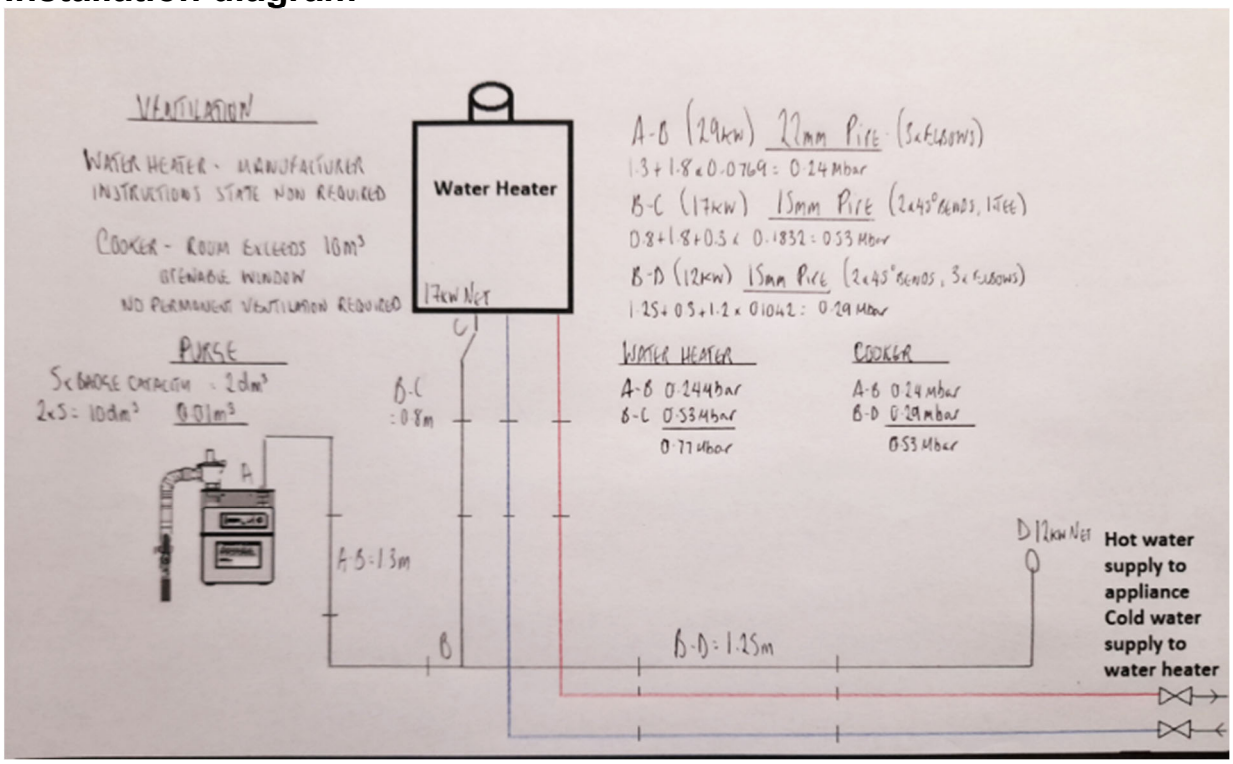
Measuring and marking out of proposed working area.

Photographic evidence which shows:

- Appropriateness of method and equipment used to measure and mark out. Photos may show inaccuracies or multiple attempts at marking out – **Photograph 1 and 2.**

Candidate evidence

Installation diagram



Commentary

The candidate has completed the installation diagram considering all aspects required to meet the assignment brief.

The candidate demonstrates excellent knowledge and understanding of components and has correctly identified all of the associated components and controls and positioned them in the correct order on the diagram. The pipe clips are clearly displayed and the distance between each clip has been noted.

The installation diagram has been annotated to include accurate pipework layout and correct pipework connections to the system.

The candidate shows an excellent understanding of the requirements of installation diagrams and the overall drawing is clear, detailed, well presented with detailed annotations.

Ventilation requirements, purge volume requirements and pipe sizes are noted on the diagram with clear calculations and reasoning.

Candidate evidence

Practical Observation Form – Measuring and marking out of proposed working area

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Systems and components (Installation)

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.*
Measuring and marking out of proposed working area	The candidate has followed the correct and logical process for marking out. The candidate installed a datum line to work from and this enabled them to establish the correct height for the installation. This resulted in all dimensions being taken and recorded accurately and free from errors.

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence

Appropriateness of method and equipment used to measure and mark out. Photos should show use of correct measuring equipment and correct marking out of pipework.

Photograph 1

Candidate marking out a work area using a spirit level to provide a straight and vertical line on the first attempt.

Photograph 2

Work area shows accurate and clear marking out on work surface.

Commentary

The candidate demonstrates that they can take measurements from an allocated space/ work area in line with their installation diagram.

The candidate used measuring equipment, which was best practice for this task, which resulted in measurements that were accurate.

The measurements were recorded accurately and clearly.

The pipe clips have been marked out and the spacing is equal, showing an excellent consideration to the aesthetics of the finished installation.

Candidate evidence

Risk assessment

This risk assessment may be modified by adding items only.

Activity: Installation of pipework **Location: Centre A**	**Date: 31/01/21** **Position: Candidate**
SEVERITY (S): Degree of harm which may be caused (including numbers affected) **1 Minor Injury 2 Major Injury 3 Fatality** **LIKELIHOOD (L): Probability that event will occur** **1 Remote 2 Possible 3 Likely**	**RISK RATING (RR): Severity x Likelihood** **1-2 Low** **3-5 Medium** **6-9 High**

Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Soldering	Burn/ fire/ damage to property/ damage to person	Self	Handle soldering equipment with care Use wet rag to cool hot pipework Fire extinguisher	2	1	2	Yes
2	Electrical wiring	Death Shock	Self	Carry out safe isolation procedure under supervised conditions and ensure appliance is locked off	3	1	3	Yes
3	Power tools	Dust and debris from operation Death Shock	Self	Correct use of PPE All power tools are subject to PAT testing procedures	2	1	2	Yes
4	Pipework	Cut	Self	Take care when handling pipework exposed could be sharp	1	1	1	Yes
5	Hazardous substances	Asphyxiation/ irritation/ contamination/ ingestion	Self Others	Correct use of PPE – wearing gloves. Correct ventilation Personal hygiene. Refer to material data sheet	3	1	3	Yes
6	Manual handling	Personal injury	Self	Correct kinetic lifting techniques. Awareness of maximum lifting weight. Suitable training	1	2	2	Yes
7	Commissioning	Explosion	Self Others	Ventilation and no naked flame	3	1	3	Yes

Activity: Decommissioning Location: Centre A	Date: 31/01/21 Position: Candidate
SEVERITY (S): Degree of harm which may be caused (including numbers affected) **1 Minor Injury 2 Major Injury 3 Fatality** **LIKELIHOOD (L): Probability that event will occur** **1 Remote 2 Possible 3 Likely**	**RISK RATING (RR): Severity x Likelihood** **1-2 Low** **3-5 Medium** **6-9 High**

Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Hazardous waste	Potential for foul waste and contaminated pipework from flux's or other waste materials	Self Others	Correct use of PPE including gloves Wash hands carefully and dispose of contaminate waste in suitable location to remove risk from contaminants	2	1	2	Yes
2	Manual handling	Personal injury	Self	Correct kinetic lifting techniques. Awareness of maximum lifting weight. Suitable training	1	1	1	Yes

Activity: Maintenance Location: Centre A	Date: 31/01/21 Position: Candidate
SEVERITY (S): Degree of harm which may be caused (including numbers affected) **1 Minor Injury 2 Major Injury 3 Fatality** **LIKELIHOOD (L): Probability that event will occur** **1 Remote 2 Possible 3 Likely**	**RISK RATING (RR): Severity x Likelihood** **1-2 Low** **3-5 Medium** **6-9 High**

Item No:	Activity:	Hazard	Persons at Risk	Existing Controls (Mitigation)	S 1-3	L 1-3	RR	Are the Risks Controlled?
1	Slipping hazard	Personal injury	Self Others	Wet floor signage Good housekeeping	2	1	2	Yes

2	Lighting appliance following maintenance task	Burns	Self	Be careful when lighting appliance after maintenance task	1	2	1	Yes
3	Live electrical components	Death Shock	Self Others	Carry out safe isolation procedure under supervised conditions and ensure appliance is locked off	3	1	3	Yes

Commentary

The candidate demonstrates a thorough knowledge and understanding of the different types of risk and hazards associated with plumbing activities. The candidate has identified all hazards and associated risks for each of the tasks.

The candidate demonstrates excellent understanding of the mitigations that can be used to minimise the identified risks and hazards, and has identified and provided thorough detail for the identified control/s.

The probability of each of the hazards/ risks occurring has been identified for each of the hazards.

Candidate evidence

Method statement

Ensure you have the correct PPE which includes steel toe cap boots, boiler suit and heat proof hi visibility vest to ensure risk of personal injury is limited and in line with risk assessment.
I will then carry out a visual inspection to make sure my workspace is safe; I will move anything that is unwanted out of the way. I will also put a dust sheet down in my working area to keep it protected and tidy.
Indicate the water heater position, cooker connection and pipework layout in pencil on the work surface to the correct measurements in line with drawing and ensuring the use of a datum line and spirit level to ensure all components and pipe-runs will be accurate.

Install the water heater and flue in line with the manufacturer instructions.
Fit the components to the correct height in line with specification and also meet the correct recommended installation height taking into consideration cupboards and kitchen features.
Collect all pipework, fittings and necessary tools required to complete the installation in line with my completed materials list, also checking that all the fittings and materials are British standard kite marked. This is an imprint on each fitting and show that they are of the right quality for purpose. I will put them in a safe place in the working area where they are easily accessible but do not cause a trip hazard.
Measure from the centre line for the cooker connection point/water heater connection point according to the specification and install all the appropriate pipe clips at equal distancing to both provide support and ensure the installation is aesthetically pleasing.
Carefully and accurately measure the pipe lengths and make allowance for any dimensions to allow for pipe gain and then cut the copper pipe, then continue to pull any angles, kicks, or Passovers needed for the task including the connection to the gas meter. (Meter must be removed for soldering)

Once all pipework is prefabricated, install the pipework and add the fittings tightening any compression joints to provide some stability. When happy with the fit of the installation pipework dismantle all joints and clean and apply flux to all the surfaces that are to be soldered, this will allow the solder to run smoothly once heat is applied and ensure that the installation is gas tight and free from leaks. Solder all the copper joints ensuring all surfaces are protected from damage using a suitable heat mat or shield.

Carry out the installation of the cooker as detailed in the manufacturer instructions, fix stability chain and complete wiring after confirming with assessor it is okay to proceed making sure to follow the correct safe isolation process to a high degree of accuracy detailed in the isolation report. The wiring to be carried out as per manufacturer instructions.

Complete the installation of the water heater by connecting the hot and cold-water supplies to the pre-existing pipework connections.

Carryout a tightness test and let by test as per industry requirements.
Let by between 7 and 10m bar leave for one minute checking for an increase in pressure.

Tightness test between 20 and 21mbar leave for two minutes checking for a drop in pressure. For this test I would need to lift cooker lids ensuring they are in the upright position.

Commentary

The candidate demonstrates a comprehensive understanding of the sequencing of activities in relation to the given tasks, detailing all aspects of the install for example, marking out tasks, collecting materials and marking out dimensions for fittings on straight pipe runs clearly demonstrating excellent understanding of system installation processes.

The methods given follow the logical and methodical stages of the installation, for example, dry fixing the installation for accuracy prior to soldering.

The method statement is detailed and accurate, and reasoning has been provided to support the methods and process given, for example, carrying out a visual inspection to make sure my work space is safe and hydraulic pressure testing to ensure the joints are free from leaks.

The methods described are both accurate and provide reasoning as to why the actions are carried out.

Candidate evidence

Materials list

Equipment/Materials	Quantity
Pencil	1
Spirit level	1
Tape measure	1
Pipe slice	1
Pipe bending machine	1
Philips screwdriver	1
Adjustable spanners	2
Water pump pliers	1
Wire Wool	1
Flux/flux brush	1
Heat proof mat	1
Blow torch	1
Solder	1
Power drill	1
Flat file	1
Electrical screwdriver	1
Side cutters	1
Wire strippers	1
Screws	20
15mm clips	10
15mm pipe	6
22mm clips	10
22mm pipe	6
15mm end feed elbows	4
15mm end feed sockets	2
22mm end feed elbows	2
22mm end feed tee	1
22 x 15 end feed reducer	1
Backplate elbow	1
Gas meter union	1
Bayonet fitting	1
Cooker hose	1
Gas PTFE	1
Meter washer	1
Cooker stability bracket	1
PPE	
Boiler suit/protective clothing	
Gloves	
Steel toe capped boots	
Goggles	

Commentary

The candidate shows excellent knowledge and understanding of the different resources required to carry out the tasks and meet the requirements of the assignment brief.

The quantities listed are accurate and relevant to the task.

The candidate has selected all of the materials and equipment required to meet the requirements of the installation, consideration has been given to the finished aesthetics of the installations, with the inclusion of cleaning cloths to allow the fixing of the brassware to be carried out with no tooling damage.

The candidate demonstrates a good understanding of health and safety and listed the PPE required to carry out the tasks safely, as well as including heat proof mats and dust sheets which demonstrates consideration to customer property.

The candidate has considered aspects of health and safety and listed the PPE required to carry out the tasks safely.

The candidate identifies individual fittings such as elbows and tees with quantities for each, showing an excellent knowledge and understanding of the different fixing methods, fitting types and jointing methods.

Task 2 – Installation, Commission and Decommission

(Assessment themes: Health and Safety, Systems and components, Reports and information, Inspecting and testing systems and components, Handover and communication)

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

- Commissioning checklist
- Assessor observations:
    - Safe isolation process
    - Installation of components
    - Commissioning
    - Handover to customer
    - Decommissioning

For illustration, the guided exemplification materials (GSEM) for Task 2 contain examples of candidate evidence for the following assessment requirements only:

- Assessor observations:
    - Safe isolation process
    - Installation of components
    - Commissioning
    - Handover to customer
    - Decommissioning

The following Task 2 candidate assessment requirements have not been included as example candidate evidence for this version of the guided exemplification materials.

- Commissioning checklist

Photographic evidence required:

Installation of components

Photographic evidence which shows:

- Tolerances have been met for the measurement of pipework – **Photograph 3**
- Two photos, one each of each installation showing finished pipework and component positioning which demonstrates the aesthetics of the completed installation – **Photographs 4, 5, 6 and 7**
- Use of tools (bending and cutting equipment) and piping skills – **Photograph 8**
- Tolerances have been met for the installation of the cooker and the water heater – **Photographs 9 and 10**
- Results of tool usage – **Photograph 11**
- Soldering/soldered fittings to show that heat mats have been used and no burn/scorch marks to the wall/or burn marks to the wall to support the assessors making of the jointing process – **Photograph 12**
- Use/type of clips – **Photograph 13**

Decommissioning

Photographic evidence which shows:

- The system being drained down safely and economically to the correct location – **Photograph 14**
- Decommissioning of pipework and components for the system installation – **Photograph 15**
- The finish of the working area after decommissioning following filling and repainting of surfaces – **Photograph 16**

Candidate evidence

Practical Observation Form – Safe isolation

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Health and safety

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.*
Safe isolation	Candidate was confident in carrying out the industry safe isolation procedure, Candidate correctly selected all the equipment required, including voltage indicator, lock off kit and correct signage. The candidate correctly checked the testing equipment and confirmed operation before continuing with tests to prove supply was DEAD. The candidate could clearly articulate the purpose of each step in ensuring the electrical supply was correctly isolated. Candidate correctly identified signage and placed notices to advise the system was isolated and tested.

Assessor signature	Date
Assessor A	31/01/2021

Commentary

Candidate demonstrated an excellent knowledge and understanding of the safe isolation process and was able to identify all steps and carried the process out confidently in the correct sequence.

Candidate evidence

Practical Observation Form – Installation of components and pipework

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	System and components

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.*
Installation of components	Candidate prepared the workspace with consideration to health and safety and good housekeeping, by putting dust sheets on floor, collecting all the correct equipment and storing tools and materials in a safe location. Throughout the task, the candidate demonstrated a good knowledge of health and safety and adhered to the risk assessment throughout the installation. Candidate maintained a safe and clear workspace throughout the task. Candidate details any pre-existing marks or damage to the wall prior to marking out for their installation. Candidate set about the task in a highly organized manor and prefabricated lengths of pipework including bends to ensure accuracy, consistency and efficiency. Candidate prepared the work space using accurate clipping distancing to support the installation of pipework. This was installed with 400mm spaces with attention to aesthetics and ensuring pipework is parallel and secured. Water heater was installed as per manufacturer instructions. Cooker point was installed at a suitable height for correct operation, however, when measured was not completely accurate but within 2mm of tolerance. Candidate has effectively marked out and measured pipework to suitable lengths to carry out the installation, with no wastage of materials. All

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.*
	tolerances met throughout the installation producing a piece of work that was aesthetically pleasing. Candidate correctly selects and uses tools, resulting in no tooling marks to components. Pipework skills resulted in no wasted materials.

Assessor signature	Date
Assessor A	31/01/2021

Photographic evidence

Tolerances have been met for the measurement of pipework.

Photograph 3

Tolerances of (+/-2mm) have been met during the installation of pipework.

Two photos, one each of each installation showing finished pipework and component positioning which demonstrates the aesthetics of the completed installation.

Photograph 4

Finished installation of the gas cooker and pipework meet all tolerances/standards.

Overall aesthetics of the installation have been met.

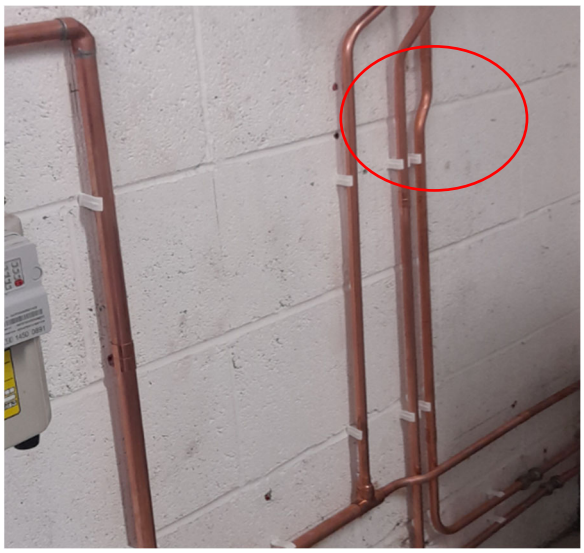
Photograph 5

Finished installation of the water heater and pipework meet all tolerances/standards.

Overall aesthetics of the installation have been met.

Copper pipework installation.

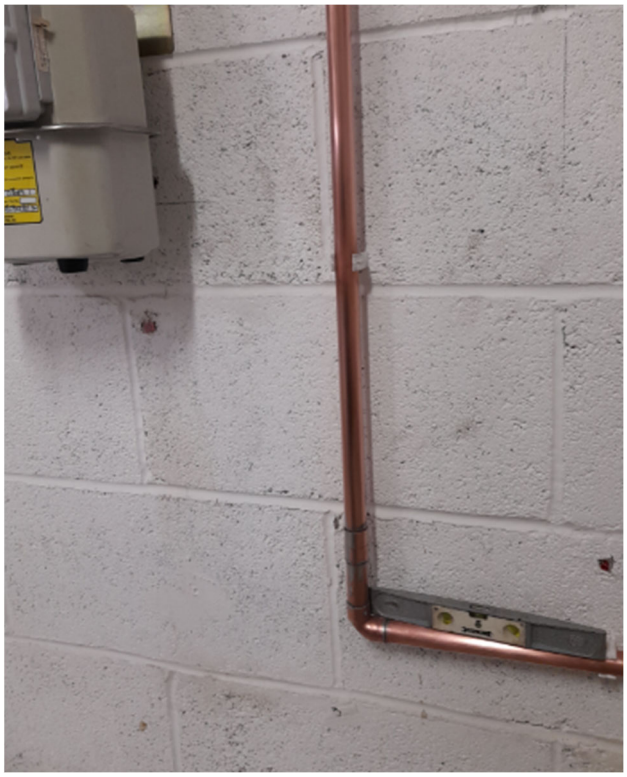
Photograph 6



Pipework installed to the required tolerance (+/-2mm). Bends have been completed to a high standard with no signs of throating or rippling.

Pipework level

Photograph 7



Pipework level and within tolerance. (+/-2mm)

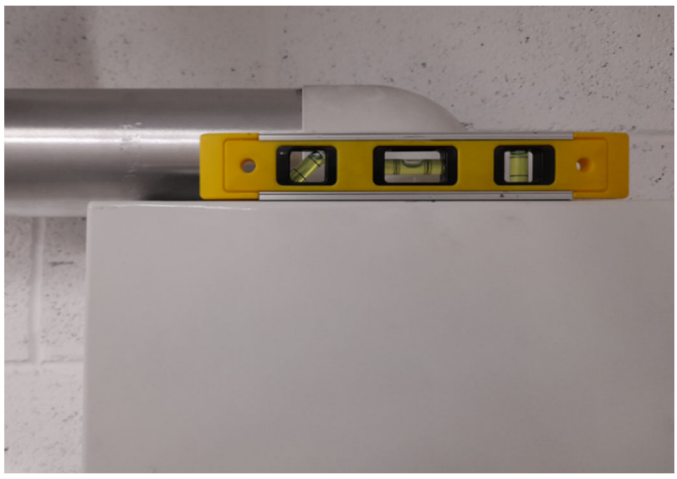
Use of tools (bending and cutting equipment) and piping skills.

Photograph 8

Fabricated bend with appropriate clearance.

Tolerances have been met for the installation of the gas cooker and water heater.

Photograph 9



Tolerances of (+/-2mm) have been met for the installation of the WHB.

Photograph 10

Results of tool usage.

Photograph 11

Component fitted correctly with no signs of tool marks from installation.

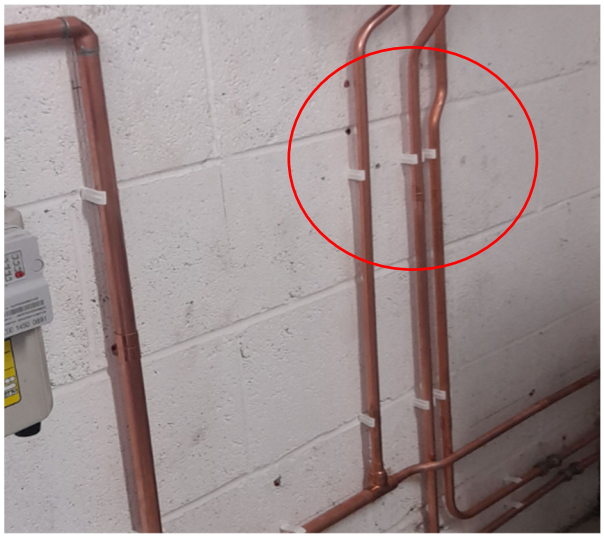
Soldering/soldered fittings to show that heat mats have been used and no burn/scorch marks to the wall/or burn marks to the wall to support the assessors making of the jointing process.

Photograph 12

Correct use of blow lamp, safe soldering, correct selection of solder, protection of customer property with heat mat centrally positioned. Removal of vulnerable heat sensitive components before soldering commences.

Use/type of clips.

Photograph 13



Pipework level and adequately clipped with appropriate spacing. Pipework fabricated without the use of additional fittings.

Commentary

Candidate demonstrates a thorough understanding of the installation requirements. The correct process is followed, and the candidate demonstrates an ability to sequence tasks logically as set out in their method statements.

The candidate prepares the workstation with dust sheets and stores tools safely, showing a good consideration and understanding of health and safety throughout the duration of the task.

The candidate is confident in the practical elements of the task and is able to correctly select and use appropriate tools and components, for the given tasks. The candidate demonstrates excellent skills throughout the installation, for example, pipework skills result in no wasted materials, use of tools result in no tooling marks, showing an excellent consideration of the aesthetics of the finished installations.

The candidate prefabricates all the pipework and meets all tolerances to produce an installation piece that was accurate first time.

Candidate evidence

Practical Observation Form – Commissioning

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Inspecting and testing of system and components/ reports and information

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.*
Commissioning	Candidate follows correct process for commissioning tests using manufacturer's instruction for the cooker and water heater to ensure no aspects of the commissioning had been omitted. After completing the visual inspection, the candidate carried out a let by test, tightness test, purge and completed operational checks on all the components as detailed in the manufacturer instructions. Candidate ensured both the cooker and water heater was commissioned to industry standards before handing over to customer. Correct use of the combustion analyser throughout all commissioning tasks.

Assessor signature	**Date**
Assessor A	31/01/2021

Commentary

The candidate demonstrates an excellent understanding of commissioning and completes the required commissioning tests and checks for both installations in a logical sequence, beginning with the visual inspection and then carrying out all operational and performance tests and checks accurately and efficiently.

Candidate makes reference to manufacturer's guidance at all relevant stages during the task.

Candidate records all relevant information from the commissioning checks accurately on the commissioning checklists.

Candidate evidence

Practical Observation Form – Handover to customer

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Handover & communication

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 to customer	Candidate interacts well with customer using eye contact and open body language. Candidate gives information about cooker and water heater operation and explains what to do in the event of a gas leak within the property. Candidate provides detail of maintenance requirements, e.g. cleaning processes, and details service requirements including the requirement to have this completed by a gas safe registered engineer. Candidate makes reference to manufacturer's instructions at relevant stages of the task, identifying relevant parts.

Assessor signature	Date
Assessor A	31/01/2021

Commentary

The candidate demonstrates an excellent understanding of the handover process and the operating principles of the systems and these were explained to the customer as part of the handover. The handover of the system to the customer was clear and accurate, and all details were covered.

The candidate displayed excellent customer care skills, ensuring eye contact and positive interaction with the customer throughout the handover.

Candidate evidence

Practical Observation Form – Decommissioning

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment theme**
City & Guilds	Systems and components

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.*
Decommissioning	Candidate follows a logical sequence for decommissioning. Candidate follows safe working practices throughout the duration of the task. The gas and electrical supply are safely isolated. Candidate removes the cooker/water heater first to limit risk of damage to components and where appropriate returned them to original packaging. Candidate removed as much of the straight lengths of pipework that could be reused and securely stored them. Candidate cut out any fitting containing solder and disposed of these into a contaminate recycling and then continued to remove pipework that was not contaminated with solder but could not be reused as it contained bends and offsets and correctly disposed of these separately to the contaminated waste. Candidate made a good attempt to make good the working area with the use of appropriate fillers and sands back completely, resulting in a good quality surface, before applying a top coat of paint to restore the work area to pre-installation condition.

Assessor signature	**Date**
Assessor A	31/01/2021

Photographic evidence

The system being drained down safely and economically to the correct location.

Photograph 14

Preparation for draining down: correct equipment and drain point used to drain down system pipework for decommissioning activities.

Decommissioning of pipework and components for the system installation.

Photograph 15

Pipework decommissioned correctly with consideration of recycling and reuse.

The finish of the working area after decommissioning following filling and repainting of surfaces.

Photograph 16

No holes and marks evident following decommissioning of pipework and surface preparation.

Commentary

The candidate demonstrates a comprehensive understanding of the decommissioning process and demonstrates the ability to sequence tasks logically whilst decommissioning the system.

The candidate correctly identified all of the components that can be reused, showing a thorough knowledge of reuse of recycling of materials

The candidate followed the correct process for the safe disposal of waste and all components were recycled correctly.

The candidate shows an excellent understanding of the methods and materials/ resources required to keep the working area clean and presentable. The candidate completed all of the process, filling holes, re-painting and sanding back, resulting in a high-quality finish, demonstrating excellent consideration to customer property.

House-keeping was excellent and candidate cleaned all water spillages and debris from sanding.

Task 3 – Carry out maintenance

(Assessment themes: Reports and information, Handover and communication, Working with faults)

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

- A written report of the maintenance activity
- Assessor observations
    - Fault diagnosis
    - Rectification of fault
    - Assessor feedback of discussion with customer

For illustration, the guided exemplification materials (GSEM) for Task 3 contain examples of candidate evidence for the following assessment requirements only:

- A written report of the maintenance activity
- Assessor observations
    - Fault diagnosis
    - Rectification of fault
    - Discussion with customer

Photographic evidence

Fault diagnosis and rectification of fault.

Photographic evidence which shows:

- Results of tool usage – **Photograph 17**
- Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component – **Photograph 18, 19 and 20**
- System on completion of all works – **Photograph 21**

Candidate evidence

Written report of maintenance activity

Maintenance activity

FAULT Faulty Water Heater

Description of fault diagnosis

I liaised with the customer asking suitable questions to check if the hot water was working at any other outlets, as this would confirm that either the problem was at the point of use tap or an issue with the water heater. After discussion with my assessor and initial investigations with reference to manufacturer instructions, I was able to confirm that there was a fault on the installation and traced this to faulty water flow control. This would need to be replaced.

Possible solutions

I decided the best solution to this problem was to isolate the water/gas and electrical supply following the safe isolation procedure, drain the water from the heater and replace the faulty component once I was confident the water is out of the system, as I am confident in safely isolating and draining system installations and I know the risk of water damage to the customer property has been reduced.

Actions taken to rectify fault

To repair the fault, I carried out the following sequence:

- Inform customer I was about to drain the system and chose a suitable method to drain the water
- Isolate the cold feed supply to the heater
- Isolate the gas/electrical/water supplies
- Open all hot water outlets and drain water from system to the suitable safe location.
- Remove faulty component and replace with a new one
- Ensure the valve compression connections are tight
- Close all outlets
- Refill system
- Recommission system including gas supply
- Inform customer of completed repair.

Appendix 1

Commentary

The maintenance report completed is clear and detailed.

The candidate demonstrates excellent understanding of the maintenance requirements, for the given task. The planned process for carrying out the repair is accurate, and reasoning has been given to support the methods selected to rectify the fault.

The candidate shows thorough consideration for industry processes of maintenance activities, for example, reference has been made to informing the customer and to the use of manufacturer instructions.

Candidate evidence

Practical Observation Form – Fault diagnosis and fault rectification

Assessment ID	Qualification number
8710-354	8710-34
Candidate name	**Candidate number**
Candidate A	CG12345
Centre name	**Assessment themes**
City & Guilds	Working with faults/ Handover & communication

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.*
Fault diagnosis and customer discussions	Candidate displays very good customer interaction with positive body language and asked questions with appropriate tone along with good use of eye contact that put the customer at ease. The candidate asked various meaningful questions to gain an insight into the fault and explained well to the customer that the responses to the questions were allowing an insight into the possible fault and diagnostic assessments of the issue. Through the asking of appropriate questions, including: • What is happening? • Frequency of fault? • Affected outlets? By expanding on the customer responses, this allowed the candidate to make some judgments and trace the fault to the appropriate component quickly and confidently, reassuring the customer at all times. The candidate selected an appropriate repair method and was focused and methodical in their approach to the maintenance repair, carrying out the task confidently. Explained the process that they would carry out in good time and no damage to customer property.

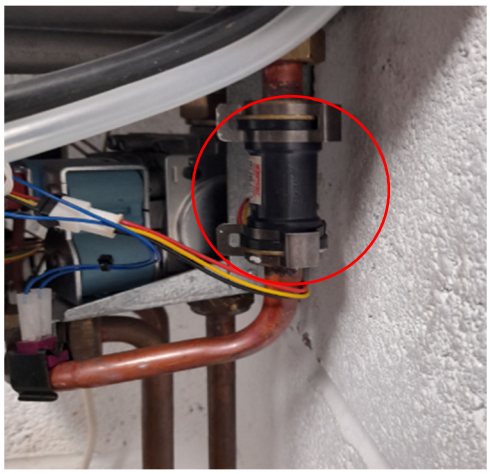
Task	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
Fault rectification	Candidate implemented all the health and safety preparations required to take care of components and customer property, ensuring safe isolation of services. Places warning notices as required. Candidate selects the correct tools and follows a methodical and logical sequence to remove and replace the defective component. The candidate completed the repair efficiently without error and in good time, checking the completed repair.

Assessor signature	**Date**
Assessor A	31/01/2021

Photographic evidence

Results of tool usage.

Photograph 17



Component fitted correctly with no signs of tool marks from installation of the replacement component.

Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component.

Photograph 18

Loosening of faulty component with

Photograph 19

Removal of faulty component.

Photograph 20

Replacement of component.

System on completion of all works.

Photograph 21

Repair completed and work area left tidy.

Commentary

The candidate displayed confidence when carrying out the discussion with the customer, ensuring eye contact and positive interaction and body language throughout the discussion.

The candidate asked relevant questions to the customer and was able to determine the cause of the fault, with confidence and efficiency, demonstrating an excellent knowledge and understanding of the operating principles/ service requirements of the water heater.

The candidate demonstrates a thorough understanding of the methods and techniques used to diagnose faults on gas systems/ components and the diagnosis of the fault followed a logical sequence.

The candidate shows excellent understanding of the techniques used to repair/ rectify faults in relation to the component that has been identified as being faulty.

The fault repair tasks followed a methodical order and is carried out confidently/ independently and free from errors.

The candidate is able to select the correct tools for the task. The use of tools is excellent and re-installed components/ pipework is aesthetically pleasing.

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.