

**T Level Technical  
Qualification in  
Building Services  
Engineering for  
Construction**

**Plumbing Engineering**

**Guide standard exemplification material**

**Threshold competence – Sample 2021**

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

<b>Introduction</b>	<b>4</b>
Grade descriptors	5
Task 1 – Planning the installation	6
Candidate evidence	7
<b>Installation diagram</b>	<b>7</b>
Commentary	7
Candidate evidence	8
<b>Practical Observation Form – Measuring and marking out of proposed working area</b>	<b>8</b>
Commentary	10
Candidate evidence	11
<b>Risk assessment</b>	<b>11</b>
Commentary	13
Candidate evidence	14
<b>Method statement</b>	<b>14</b>
Commentary	15
Candidate evidence	16
<b>Materials list (Cloakroom Installation)</b>	<b>16</b>
<b>Candidate evidence</b>	<b>17</b>
<b>Materials list (Unvented cylinder installation)</b>	<b>17</b>
Commentary	18
Task 2 – Installation, Commission and Decommission	19
<b>Photographic evidence</b>	<b>19</b>
Candidate evidence	21
<b>Practical Observation Form – Safe isolation</b>	<b>21</b>
Commentary	21
Candidate evidence	22
<b>Practical Observation Form – Installation of components and pipework</b>	<b>22</b>
Commentary	28
Candidate evidence	29
<b>Practical Observation Form – Commissioning</b>	<b>29</b>
Commentary	29
Candidate evidence	30
<b>Practical Observation Form – Handover to the customer</b>	<b>30</b>
Commentary	30
Candidate evidence	31
<b>Practical Observation Form – Decommissioning</b>	<b>31</b>
Commentary	33
Task 3 – Carry out maintenance	34
Candidate evidence	35
<b>Written report of maintenance activity</b>	<b>35</b>
Commentary	35
Candidate evidence	36



# Introduction

The sample assessment materials within this document refers to the plumbing engineering sample occupational specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to minimal threshold competence. In this document all exemplar evidence attests as examples of minimal threshold competence. The examples provided do not reflect all evidence from the sample assignment as the focus of this material is the quality and standards that need to be achieved rather than the volume of exemplar evidence provided. However, the examples provided are representative of all tasks in the sample assignment. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and standard of performance will vary across tasks. Minimal threshold competence will be based on a synoptic mark across all tasks.

The materials in this 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 candidates 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 minimal threshold competence by directly correlating to the grade descriptors for this occupational area. Centres can compare the evidence against the performance indicators in the marking grid descriptors within the assessor packs, to provide guidance on the standard of knowledge, skills and understanding that need to be met for minimal threshold competence.

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

# Grade descriptors

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

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

Demonstrate the adequate technical skills in cutting, bending, fixing pipework and installing components that is in line with industry standards.

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

Demonstrate basic knowledge and understanding of the principles and processes required for plumbing engineering.

Work safely showing an understanding in the selection and use of tools and equipment and demonstrate a basic awareness of straightforward preparation and application processes.

Attempt some complex tasks and the level of performance mostly meets an acceptable level.

Identify causes of plumbing faults and have some knowledge and skills in how to rectify them.

Use industry terminology most of the time that is accurate 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
- Installation diagrams (cloakroom and unvented hot water cylinder) with pipe layout, pipe clips and associated components
- Materials list
- Assessor observation of measurements and marking out of space allocation/ work area checked against installation diagram

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
- Installation diagram (unvented hot water cylinder) with pipe layout, pipe clips and associated components
- Materials list
- Assessor observation of measurements and marking out of space allocation/ work area checked against installation diagram

The following task 1 candidate assessment requirements have not been included as example candidate evidence for this version of the guided exemplification materials.

- Installation diagram (cloakroom)

### Photographic evidence required:

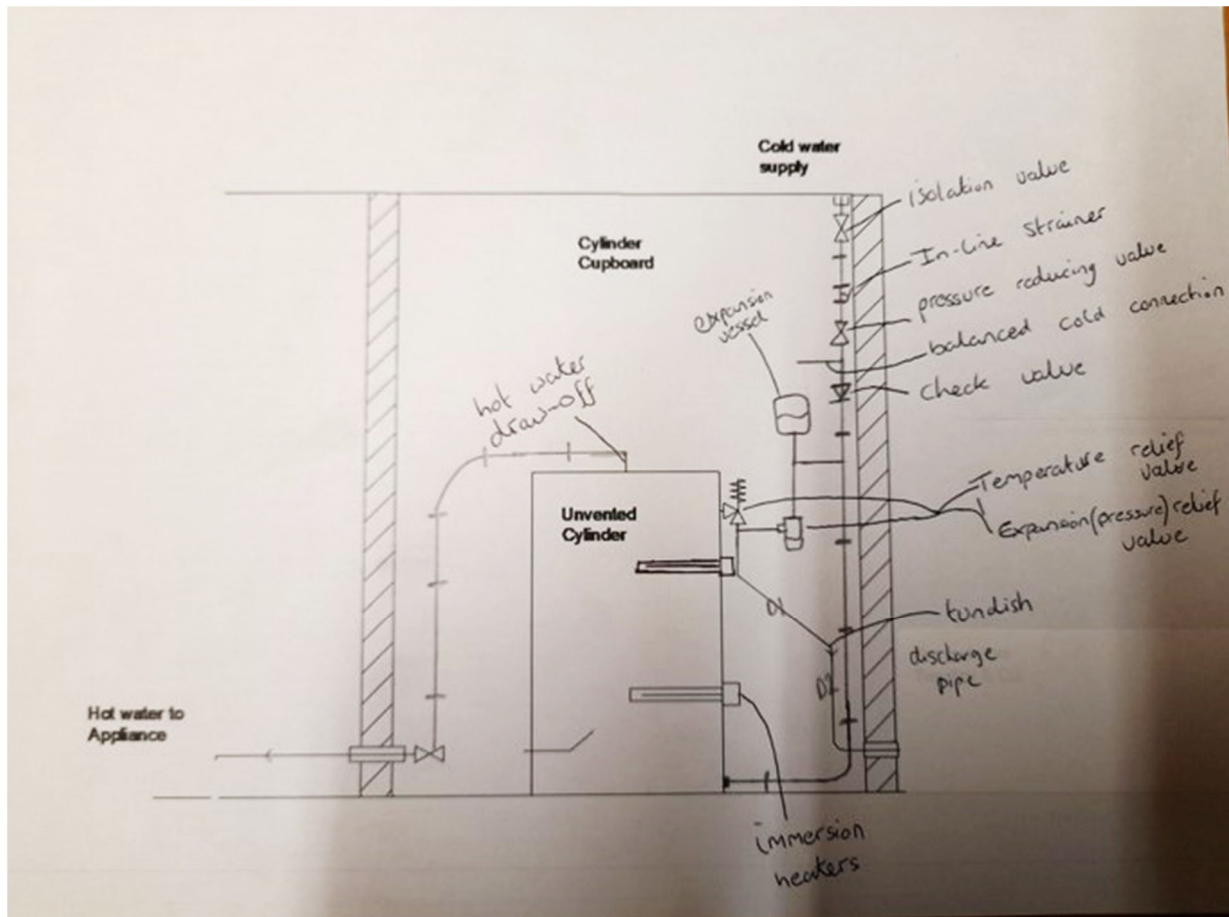
Measuring and marking out of proposed working area

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 good knowledge and understanding of plumbing components and functional controls and has correctly identified all of the associated components and functional controls and positioned them in the correct order on the diagram.

The candidate demonstrates good knowledge of current building and water regulations by correctly identifying D1 and D2 discharge pipework.

The pipework layout is clear, however there are minor inaccuracies in relation to the pipework connection to the cylinder.

The completed drawing does have minor inaccuracies, e.g. the distance of the pipe clips are not clearly displayed.

The candidate shows a good understanding of the requirements of installation diagrams and the overall drawing is clear.



## Candidate evidence

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

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
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.

<b>Task</b>	<b>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.</b>
Measuring and marking out of proposed working area	<p>Candidate used the edge of the wall to establish the correct level and falls for the installation. The measuring process had some minor inaccuracies which was caused by incorrect use of measuring equipment, the use of the edge of wall instead of a datum line or laser level.</p> <p>Candidate displayed some disorganisation in working from a set point and this resulted in them having to double check some dimensions from the position of pipework and components for the WHB and unvented hot water cylinder, which impacted on time. Overall key data was recorded and set out accurately.</p> <p>Candidate took several attempts to mark out resulting in lines left on wall. Candidate has marked out all pipe clips to industry standards and spacing is mostly accurate.</p>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021

## Photographic evidence

Appropriateness of method and equipment used to measure and mark out. Photos may show inaccuracies or multiple attempts at marking out.

### Photograph 1



Candidate marking out a work area using a straight edge that is not the approved method.

### Photograph 2



Work area shows multiple marks on work surface from marking out due to initial inaccurate measuring and marking out.

## 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 and marking out equipment which was not best practice for this task. This resulted in some minor inaccuracies, which could impact on the installation pipework not being plumb and level and the finished aesthetics of the installation.

The marking out took several attempts resulting in lines left on wall.

The measurements were recorded accurately and clearly.

The pipe clips have been marked out to industry standards and spacing is mostly accurate.

## Candidate evidence

### Risk assessment

<b>Activity: Installation of pipework</b> <b>Location: Centre A</b>		<b>Date: 31/01/21</b> <b>Position: Candidate</b>						
<b>SEVERITY (S): Degree of harm which may be caused (including numbers affected)</b> <b>1 Minor Injury   2 Major Injury   3 Fatality</b>						<b>RISK RATING (RR): Severity x Likelihood</b> <b>1-2 Low</b> <b>3-5 Medium</b> <b>6-9 High</b>		
<b>LIKELIHOOD (L): Probability that event will occur</b> <b>1 Remote          2 Possible          3 Likely</b>								
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	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	Loose Cables	Tripping	Self Others	Stick all cables down	2	2	4	Yes
4	Hazardous substances	Irritation	Self	Correct use of PPE and ventilation	2	1	2	Yes
5	Manual handling	Personal injury	Self	Correct kinetic lifting techniques	2	1	2	Yes

<b>Activity: Decommissioning</b>		<b>Date: 31/01/21</b>						
<b>Location: Centre A</b>		<b>Position: Candidate</b>						
<b>SEVERITY (S): Degree of harm which may be caused (including numbers affected)</b>					<b>RISK RATING (RR): Severity x Likelihood</b>			
1 Minor Injury    2 Major Injury    3 Fatality					1-2 Low			
<b>LIKELIHOOD (L): Probability that event will occur</b>					3-5 Medium			
1 Remote                  2 Possible                  3 Likely					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	Irritation	Self	Correct use of PPE	2	3	6	Yes
2	Wet surfaces	Slips and trips	Self Others	Clear away any spilt liquids to reduce risk of slips/trips	2	1	2	Yes
3	Manual handling	Personal injury	Self	Correct kinetic lifting techniques	2	1	2	Yes

<b>Activity: Maintenance</b>		<b>Date: 31/01/21</b>						
<b>Location: Centre A</b>		<b>Position: Candidate</b>						
<b>SEVERITY (S): Degree of harm which may be caused (including numbers affected)</b>					<b>RISK RATING (RR): Severity x Likelihood</b>			
1 Minor Injury    2 Major Injury    3 Fatality					1-2 Low			
<b>LIKELIHOOD (L): Probability that event will occur</b>					3-5 Medium			
1 Remote                  2 Possible                  3 Likely					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	Pipework	Cut	Self	Take care when handling and removing the valve as pipework exposed could be sharp	1	2	2	Yes
2	Wet surfaces	Slips and trips	Self Others	Watch out for any wet surfaces around the working area	2	1	2	Yes

## Commentary

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

The candidate demonstrates some understanding of the mitigations that can be used to minimise the identified risks and hazards and has attempted to identify controls, although these are somewhat brief the candidate does demonstrate some understanding by making links to the correct use of PPE, and use of wet rag to cool hot pipework.

The probability of each of the hazards/ risks occurring has been attempted and mostly accurate and realistic.

## Candidate evidence

### Method statement

#### **Cloakroom installation**

- 1) Ensure you have the correct PPE
- 2) Draw the component and pipework layout in pencil on the work surface to the correct measurements
- 3) Collect all pipework, fittings and necessary tools
- 4) Measure from the centre line for the WC and the WHB brackets and erect the brackets and basin in according to the specification
- 5) Fit pipe clips to the correct measurement's and according to the specification
- 6) Measure and cut the copper pipe, then continue to pull any angles, kicks, or Passovers needed for the task
- 7) Install the pipework and add the fittings
- 8) Tighten and double check fittings
- 9) Clean the pipework and apply flux, then solder pipework and fittings together
- 10) Pressure test your work.
- 11) Install waste connections as per the drawing

### **Unvented hot water installation**

- 1) Ensure you have the correct PPE
- 2) Draw the component and pipework layout in pencil on the work surface to the correct measurements
- 3) Collect all pipework, fittings and necessary tools
- 5) Fit pipe clips to the correct measurement's and according to the specification
- 6) Measure and cut the copper pipe, then continue to pull any angles, kicks, or Passovers needed for the task
- 7) Install the pipework and add the fittings
- 8) Tighten and double check fittings
- 9) Clean the pipework and apply flux, then solder pipework and fittings together
- 10) Pressure test your work.
- 12) Carry out the installation of the wiring after confirming with assessor it is okay to proceed

### **Commentary**

The candidate demonstrates a good understanding of the sequencing of activities in relation to the given tasks, marking out tasks, collecting materials and installing components before clipping out.

The methods given follow the logical stages of the installation; cutting and bending before soldering and pressure testing

The methods statements identify all of the key steps, the steps are brief but accurate, however no reasoning or justification has been given to support the methods given.



## Candidate evidence

### Materials list (Cloakroom Installation)

Equipment/Materials	Quantity
Pencil	1
Spirit level	1
Tape measure	1
Dust sheets	1
Pipe slice	1
Pipe bending machine	1
Philips screwdriver	1
Adjustable spanners	2
Pipe	3 metres
Fittings	20
Basin wrench	1
Heat proof mat	1
Blow torch	1
Power drill	1
Flat file	1
Waste Clips	3
Screws	20
15mm clips	10
15mm pipe	6
WHB and fixings	1
WC and fixings	1
Taps and waste	1
15mm fittings (elbows, tees and valves)	10
22mm fittings (elbows, tees and valves)	10
<b>PPE</b>	
Boiler suit/protective clothing	
Steel toe capped boots	
Gloves	
Goggles	

## Candidate evidence

### Materials list (Unvented cylinder installation)

Equipment/Materials	Quantity
<b>Pencil</b>	1
Spirit level	1
Tape measure	1
Dust sheets	1
Pipe slice	1
Pipe bending machine	1
Philips screwdriver	1
Adjustable spanners	2
Heat proof mat	1
Blow torch	1
Power drill	1
Flat file	1
Screws	20
22mm clips	10
22mm pipe	6
15mm pipe	3
15mm clips	3
Cylinder (Unvented)	1
Control components	1
15mm fittings (elbows, tees and valves)	10
22mm fittings (elbows, tees and valves)	10
<b>PPE</b>	
Boiler suit/protective clothing	
Steel toe capped boots	
Gloves	
Goggles	

## Commentary

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

The candidate has selected the minimum materials and equipment required for the cloakroom layout and the unvented hot water system to allow successful installations in line with the assignment brief.

The candidate has identified quantities that are accurate and relevant to the tasks.

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.

## 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:
  - Installation of components
  - Commissioning
  - Safe isolation process
  - 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:
  - Installation of components
  - Commissioning
  - Safe isolation process
  - 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. Photos may show any excess/ waste materials caused by inaccurate measurements – **Photograph 3**
- Two photos, one each of each installation showing finished pipework and component positioning which demonstrates the aesthetics of the completed installation. Visible signs of pipework damage that are not straight or horizontal/vertical and bends that are not properly formed. None of which stops the system operating correctly – **Photographs 4, 5, 6 and 7**
- Use of tools (bending and cutting equipment) and piping skills. Photos may show pipework cut offs – **Photograph 8**
- Results of tool usage. Photos may show tooling marks – **Photograph 9**
- 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 10**
- Use/type of clips. Photos may show clips that are not equally spaced or installed in line – **Photograph 11**

## Decommissioning

Photographic evidence which shows:

- The system being drained down safely and economically to the correct location – **Photograph 12**
- Decommissioning of pipework and components for both system installations – **Photograph 13**
- The finish of the working area after decommissioning following filling and repainting of surfaces – **Photograph 14**

## Candidate evidence

### Practical Observation Form – Safe isolation

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
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.

<b>Task</b>	<b>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.</b>
Safe isolation	<p>Candidate took some time starting the task and although was correct in performing the process, it was clear that there was a lack of awareness from the candidate about managing their time effectively throughout the process. Candidate correctly sourced all the equipment needed and gained permission to proceed from the assessor.</p> <p>The candidate correctly checked the testing equipment and confirmed operation and continued to isolate supply correctly.</p> <p>Tests to prove supply was DEAD had been carried out with accuracy and confirmed the installation was safe.</p> <p>Candidate correctly identified signage and placed notices to advise the system was isolated and tested.</p>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021

### Commentary

Candidate carried out all necessary steps in the safe isolation process. The safe isolation process was correct in method.

## Candidate evidence

### Practical Observation Form – Installation of components and pipework

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
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.

<b>Task</b>	<b>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.</b>
Installation of components and pipework	<p>Candidate has ensured all H&amp;S and site preparation works are in place before starting task by putting dust sheets on floor, storing tools and materials in safe location. However maintenance of work space during the task was minimal with some tools left out and not stored correctly after use.</p> <p>Candidate use of tools is mostly good however some tasks require more than one attempt. Candidate uses water pliers incorrectly on brass fittings, resulting in tooling marks to pipework/ components.</p> <p><b>Cloakroom Installation</b></p> <p>Candidate prepared the work space using a suitable 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.</p> <p>WHB was installed at a suitable height for correct operation however when measured was not completely accurate but within 5mm of tolerance.</p> <p>Candidate made some errors with the pulling of bends, these were correct but resulted in some wasted materials and inaccuracies from original design. Most tolerances met, but minor inaccuracies in the dimensions of the bends and offsets, at a tolerance of 5mm. Overall aesthetics of the installation has not been affected.</p> <p>Candidate has effectively marked out and measured pipework to suitable lengths to carry out the installation, with some wastage of materials. The forming of bends was carried out twice due to inaccuracy on first attempt which resulted in material wastage.</p> <p><b>Unvented cylinder installation</b></p>

<b>Task</b>	<b>Notes</b> – <i>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.</i>
	<p>Candidate prepared the work space using a suitable 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.</p> <p>Unvented hot water cylinder and safety controls were installed as per manufacturer instructions however when measured was not completely accurate but within 5mm of tolerance.</p> <p>Candidate made some errors with the pulling of bends, these were correct but resulted in some wasted materials and inaccuracies from original design. Most tolerances met, but minor inaccuracies in the dimensions of the bends and offsets, at a tolerance of 5mm. Overall aesthetics of the installation has not been affected.</p> <p>D1 pipework was installed as per the requirements detailed in Approved document Part G</p> <p>Candidate has effectively marked out and measured pipework to suitable lengths to carry out the installation, with some wastage of materials. The forming of bends was carried out twice due to inaccuracy on first attempt which resulted in material wastage.</p>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021



## Photographic evidence

Tolerances have been met for the measurement of pipework. Photos may show any excess/waste materials caused by inaccurate measurements

### Photograph 3



Tolerances (+/-5mm) 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. Visible signs of pipework damage that are not straight or horizontal/vertical and bends that are not properly formed. None of which stops the system operating correctly.

### Photograph 4



Finished installation of the unvented hot water cylinder and associated pipework including the installation of both functional and safety controls. Overall aesthetics of the installation have been met.

**Photograph 5**



Finished installation of the cloakroom including appliances and pipework to tolerances/standards.

Overall aesthetics of the installation have been met.

**Photograph 6**



Pipework not level but within tolerance.

**Photograph 7**



Components correctly installed but not level.

Use of tools (bending and cutting equipment) and piping skills. Photos may show pipework cut offs.

**Photograph 8**



The correct operation/use of pipe bend machine and pipe cutting tools.

Results of tool usage.

**Photograph 9**



Component fitted correctly with 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.

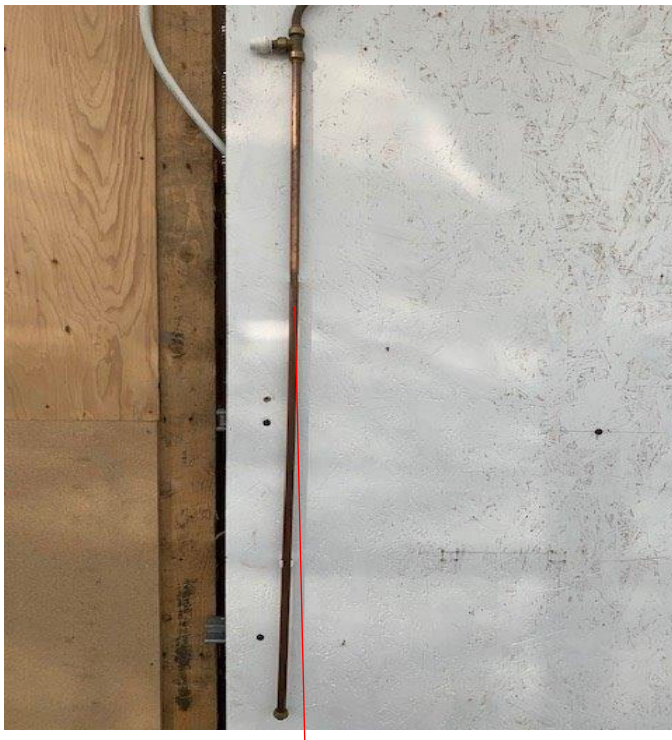
**Photograph 10**



Correct use of blow lamp, safe soldering, correct selection of solder and protection of customer property although heat mat not centrally positioned.

Use/type of clips. Photos may show clips that are not equally spaced or installed in line.

**Photograph 11**



Incorrect clipped pipe, not plumb.

## Commentary

Candidate demonstrates a good understanding of the installation requirements of both the cloakroom and the unvented hot water cylinder. 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 at some stages of the tasks, showing a good consideration and understanding of health and safety.

The candidate is mostly confident in the practical elements of the task, however they require some reassurance from the assessor, for example with the selection and use of appropriate tools and components. The candidate can successfully select correct tools and components but at times looks for confirmation from the assessor before proceeding with the task. The use of tools is mostly good however some tasks require more than one attempt/ or the wrong tool is used, for example water pliers incorrectly used on brass fittings, resulting in tooling marks to pipework/ components.

The candidate meets some tolerances for the task.

The candidate completes the installation in the allocated time, however it is clear that timing was not planned thoroughly and the later parts of the installation are rushed.

## Candidate evidence

### Practical Observation Form – Commissioning

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8711-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
City & Guilds	Inspecting and testing of systems 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.

<b>Task</b>	<b>Notes</b> – <i>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.</i>
Commissioning	<p>Candidate did not follow correct process for commissioning tests.</p> <p>Visual inspection is not completed which results in a small leak from the tap washer. Candidate rectifies leak successfully.</p> <p>Commissioning checks and test are completed.</p> <ul style="list-style-type: none"><li>• fill system, and repair any leaks if required</li><li>• pressure testing</li><li>• commission hot and cold-water including confirmation of flow rates checked</li><li>• operational checks</li></ul>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021

### Commentary

The candidate demonstrates a good understanding of commissioning and completes the required commissioning tests and checks for both installations, however the tests and checks do not always follow a logical sequence.

Test and checks are completed accurately but with some impact on timings, due to missing the visual inspection.

Candidate makes reference to manufacturer's guidance at some 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 the customer

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
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.

<b>Task</b>	<b>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.</b>
Handover to customer	<p>Candidate has arms folded and doesn't make eye contact.</p> <p>Candidate gives information about location of hot water and cold water and explains the operating principles of the unvented hot water cylinder.</p> <p>Candidate provides detail of maintenance requirements e.g. cleaning processes but misses information about limitations of the system e.g. servicing requirements</p> <p>Candidate makes reference to manufactures instructions at some stages of the task.</p>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021

### Commentary

The candidate demonstrates a good 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 mostly clear and accurate, however some minor details were missed, e.g. maintenance requirements.

The candidate displays some customer care skills, but these were limited with minimal eye contact and interaction with the customer.

## Candidate evidence

### Practical Observation Form – Decommissioning

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment theme</b>
City & Guilds	Systems and components (Decommissioning)

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

<b>Task</b>	<b>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.</b>
Decommissioning	<p>Candidate follows a logical sequence for decommissioning.</p> <p>Candidate follows safe working practices at most stages of the decommissioning.</p> <p>Candidate removed sanitary appliances first to limit risk of damage to components.</p> <p>Candidate correctly identified some of the components that could not be reused and disposed of them in the correct recycling bins. Candidate did miss opportunities to recycle plastic clips.</p> <p>Candidate attempts to make good the working area with the use of appropriate fillers but the area is not sanded back completely resulting in a poor quality finish.</p>

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021



## Photographic evidence

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

### Photograph 12



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

Decommissioning of pipework and components for both system installations

### Photograph 13



Pipework decommissioned correctly with minimal consideration of recycling.  
No separation of different materials.  
No separation of clean/dirty copper.

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

### Photograph 14



Some holes and marks still evident from complete decommissioning of pipework.

### Commentary

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

The candidate correctly identified some of the components that can be reused, showing a good knowledge and understanding of the reuse and recycling of different materials.

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

The candidate shows some understanding of the methods and materials/ resources required to make working area clean and presentable. The candidate completed some of the process, by filling holes, however, does not have time/ or attention to detail lacking when sanding back or re-painting, resulting in a poor quality finish, demonstrating minimal consideration to customer property.

House keeping was mostly good and candidate made attempts to clean 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
  - 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 required:

Fault diagnosis and rectification of fault

Photographic evidence which shows:

- Results of tool usage. Photos may show tooling marks – **Photograph 15**
- Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component – **Photograph 16, 17, 18, 19**
- System on completion of all works – **Photograph 20**

## Candidate evidence

### Written report of maintenance activity

#### Maintenance activity report

##### **FAULT Report of no flow at hot water outlet on WHB**

###### **Description of fault diagnosis**

I checked 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 on the installation, after investigation and discussion with my assessor I confirmed that there was a fault on the installation and traced this to a blocked strainer

###### **Possible solutions**

The solution to this problem is to drain all the water from the cylinder clean the strainer

###### **Actions taken to rectify fault**

To repair the fault I carried out the following sequence

- Isolate the cold feed supply to the hot water storage.
- Remove line strainer and cleared the blockage.
- Ensure the valve compression connections are tight
- Close all outlets
- Refill system.

## Commentary

The maintenance report completed is brief and, in a bullet, pointed format.

The candidate demonstrates good understanding of the maintenance requirements, for the given task, and provides a brief but accurate description of the fault diagnosis process.

The candidate identifies a brief but accurate 5 step process/ sequence to rectify the fault, which shows a good knowledge and understanding of how to repair and rectify the fault.

No reasoning has been given to support the methods selected to rectify the fault.

## Candidate evidence

### Practical Observation Form – Fault diagnosis and fault rectification

<b>Assessment ID</b>	<b>Qualification number</b>
8710-356	8710-36
<b>Candidate name</b>	<b>Candidate number</b>
Candidate A	CG12345
<b>Centre name</b>	<b>Assessment themes</b>
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.

<b>Task</b>	<b>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.</b>
Fault diagnosis and customer discussion	<p>Candidate shows some nerves at the beginning of the customer discussion, with an initial lack of eye contact. Candidate has their arms folded and misses some opportunities to put the customer at ease.</p> <p>The candidate asked various questions to gain an insight into the fault and some of these were irrelevant to the task.</p> <p>Appropriate questions were eventually asked:</p> <ul style="list-style-type: none"> <li>• Which outlets are effected?</li> <li>• Frequency of fault?</li> <li>• How long has the fault been happening?</li> </ul> <p>This allowed candidate to make some judgments and trace the fault to the appropriate valve although this may have been guesswork/trial and error rather than systematic fault analysis.</p> <p>Candidate carries out a visual inspection of the system to identify the source of the fault.</p>
Fault rectification	<p>Candidate considers health and safety preparations, using dust sheets, removing customer property where required and creating a safe route for the hose pipe to remove the waste water from the property.</p> <p>Candidate follows a logical sequence, safely draining down the system and disposing of the waste water correctly, prior to selecting the correct tools to remove and replace the defective component.</p> <p>Candidate selected correct tools to remove the defective component without excessive tool damage to the compression joints. The use of adjustable</p>

<b>Task</b>	<b>Notes</b> – <i>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.</i>
	spanners over water pump pliers ensured there was no marking to the brass compression fittings. The candidate completed the repair efficiently with only minor mistakes, strainer removed prematurely causing leak of water before installation had sufficiently drained. This did not impact the overall task.

<b>Assessor signature</b>	<b>Date</b>
Assessor A	31/01/2021

## Photographic evidence

Results of tool usage.

### Photograph 15



Component fitted correctly with signs of tool marks from installation of replacement component.

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

### Photograph 16



Loosening of faulty component.

**Photograph 17**



Removal of faulty component.

**Photograph 18**



Excess pipework removed during repair activity.



**Photograph 19**



Replacement of component.

System on completion of all works.

**Photograph 20**



Repair completed with signs of leaks which have been repaired.

## Commentary

The candidate lacked some confidence when carrying out the discussion with customer, not always making eye contact and standing with arms folded.

The candidate asked questions to the customer to try and determine the cause of the fault, however some of the questions asked were irrelevant to the task and fault-finding process. The candidate did eventually ask enough appropriate questions to diagnose the fault, demonstrating a good knowledge of the operating principles/ service requirements of the unvented hot water system.

The candidate demonstrates a good understanding of the methods and techniques used to diagnose faults on plumbing systems/ components.

The diagnosis of the fault followed a logical sequence

The candidate shows some 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, however some reassurance was needed from the assessor with some aspects and made some minor mistakes that did not impact the finished product.

The candidate is able to select the correct tools for the task. The use of tools is mostly good, however some tasks require more than one attempt resulting in tooling marks to components/ pipework.

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

Copyright in this document belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education, © 2020. 'T-LEVELS' is a registered trademark of the Department for Education. 'T Level' is a registered trademark of the Institute for Apprenticeships and Technical Education. 'Institute for Apprenticeships & Technical Education' and logo are registered trademarks of the Institute for Apprenticeships and Technical Education.

Every effort has been made to ensure that the information contained in this publication is true and correct at time of going to press. However, City & Guilds' products and services are subject to continuous development and improvement and the right is reserved to change products and services from time to time.

City & Guilds cannot accept responsibility for any loss or damage arising from the use of information in this publication. The City & Guilds of London Institute. All rights reserved. City & Guilds is a trademark of the City & Guilds of London Institute, a charity established to promote education and training registered in England & Wales (312832) and Scotland (SC039576).5-6 Giltspur Street, London, EC1A 9DE.