T-LEVELS | Institute for Apprenticeships & Technical Education

# T Level Technical Qualification in Building Services Engineering for Construction (8710-35/36)

## 8710-355 Heating Engineering Occupational Specialism Assessor Pack

Summer 2023

Version 1.1

City & Guilds | eal

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| Version and date | Change detail | Section |
|---|---|---|
| 1.1 March 2023 | Amendments to Assignment brief | Assignment brief - pages 6-8 |
| | Amendments to resources | General task guidance<br>Resources - page 10 |
| | Amendments to Task 1 | Task specific guidance<br>Task 1 - pages 11-12 |
| | Amendments to Task 2 | Task specific guidance<br>Task 2 - pages 13-16 |
| | Amendments to Task 3 | Task specific guidance<br>Task 3 - pages 17-19 |
| | Correction of ‘radiators’ to ‘radiator’ | Assignment brief – page 6<br><br>Task specific guidance<br>Task 1 – pages 11-12<br><br>Task 2 Assessor guidance – pages 14-16 |

## Assessment

The assessment for this component consists of a practical assignment that includes a project brief and then a number of tasks for the candidate to complete. The tasks set produce assessment themes that cover a range of knowledge and skills from the performance outcomes in the qualification specification. They are designed to allow judgement of the candidate to be made across different categories of performance.

The assessment for this component has been allocated a set number of marks against each task, based on weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

**The live Occupational Specialism assessment materials must be used in conjunction with the 'TQ Occupational Specialism assessment process guide', this is available on the T Levels Resource Hub.**

## Performance outcomes

The weightings for each performance outcome will remain the same for every version of the practical assignment. This ensures the appropriate depth and breadth of knowledge and skills for each specialism can be reliably assessed in every version and meets the needs of industry while keeping comparability between each assessment over time.

| Performance outcome | Typical knowledge and skills | Weighting |
|---|---|---|
| Install heating systems | Displays a breadth of knowledge and practical skills that enables them to complete the given installation tasks successfully. Has the technical skills to use tools and materials safely and in logical order in relation to a plan. | 36% |
| Commission heating systems | Working in a safe manner, carrying out testing and interpreting test results, use of tools and equipment, use of diagnostic equipment, working with documentation (manufacturer's instructions, building regulations), carrying out tasks in clear and logical sequence, carrying out clear record keeping of test results. | 24% |
| Maintain heating systems | Applying knowledge and understanding through practical skills to solve a particular scenario/problem – justifying decisions/approaches taken e.g. materials, techniques, appropriate protection of customer property and effective use of materials, consideration of costs and impacts to environment. | 26% |
| Decommission heating systems | Logical and systematic approach to task, clear consideration to environmental sustainability and recycling of materials, clear and practiced use of the techniques of making building fabric repairs to restore work area to pre-installation condition, including correct selection of materials and finish products. | 14% |

## 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 heating 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 heating faults and have some knowledge and skills in how to rectify them.

Mostly use industry terminology accurately in both written and verbal contexts.

**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 heating principles and processes through the tasks completed.

Work safely and make informed and appropriate use of tools, materials and equipment within the heating 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 heating 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.

## Assignment brief

You have been called to a children's nursery to undertake the planning and installation of pipework to an existing boiler and a S Plan Plus sealed central heating system with a new low surface temperature radiator circuit in accordance with the drawing (Figure 1).

As part of this work, you will be required to carry out a full survey of the proposed installation, including planning activities, measurements and calculations.

The customer has identified a suitable space and has requested the following:

- the installation of a low surface temperature radiator supplied with copper pipework
- the installation of pipework to existing boiler
- the installation of the S Plan Plus heating controls
- the installation of a magnetic filter

The layout of the boiler and radiator positions is shown in **Figure 1**. The boiler, unvented cylinder and underfloor heating circuit are pre-installed.

Your tutor/assessor will notify you of the requirements of the installation and a plan of the proposed space and location of existing services where you will carry out the installation.

The installation must include:

- the correct dressing of the radiator
- magnetic filter installation
- copper pipework to the radiator circuit
- all associated thermostatic and lock-shield radiator valves as well as plugs and vents
- associated 2 port control valves
- wiring of the 2 port valves into the wiring centre

Once your installation has been completed, commissioned and checked to the customer's satisfaction you are required to decommission the installation.

After a period of time, the neighbour of the original customer calls to notify you that their central heating is not working correctly. You are required to discuss the maintenance activity with the new customer, diagnose the fault, produce a written report and carry out the required repair work.

**Figure 1**

This assignment has a total time allocation of **20 hours**.

**Figure 2 Completed installation drawing and notes below (not for distribution to candidates)**

**Figure 2 notes for tutor/assessor**

- The wiring task should be the connection of the 2 port control valves into the wiring centre which should be pre-installed.
- All other controls shown on the drawing should be pre-installed and wired correctly.
- The safe isolation of the electrical circuit by the candidate should be directly observed by the assessor (1:1 ratio).

- The electrical supply should remain isolated and locked off until the assessor has inspected the work and is happy for the circuit to be made live.
- If a system boiler is used, the pump, expansion vessel and filling loop shown on the drawing may be integral to the appliance and disregarded.
- The boiler, unvented cylinder and underfloor heating circuit should be pre-installed.

# General task guidance

Please read **ALL** information carefully before the assessment.

Ensure you have read the following guidance before you undertake the assessment of candidates:

- T Level Qualifications – Teaching, Learning and Assessment Guide
- TQ Occupational Specialism – Assessment process guide
- Technical qualification guides on marking and moderation
- Practical Observation template
- Mark grids following the tasks below
- Feedback guidance for assessors

Centres have to meet the specification given in **Figure 1** as a minimum. If they are unable to implement or facilitate this specification, they must contact City & Guilds to agree appropriate actions to be taken in such extreme circumstances.

All work carried out should be to industry standards, carried out in a safe manner and compliant with building regulations. If a candidate fails to carry out the activities in a safe manner, the assignment should be suspended until this aspect is corrected.

Photographs must be used to support the qualitative statements captured on the Practical Observation form. Details of specific photograph requirements are outlined in the task information below. Photographs must have the date and candidate's name attached so that they can be differentiated. The candidate does not need to be in the photograph, the purpose of the photograph is to demonstrate the quality and standards of work of specific activities and of the work throughout various stages of the assignment.

**Time**

The following timings are provided to support centre planning.

The **recommended** time allocated for the completion of the tasks and production of evidence for this assessment is **20 hours**. Suggested timings for completion of specific tasks are outlined below.

- Task 1 – 5 hours
- Task 2 – 12 hours
- Task 3 – 3 hours

**Resources**

Candidates must have access to a suitable range of resources to carry out the tasks and, where appropriate, to have the opportunity to choose materials demonstrating their ability to select from a range of appropriate materials.

The candidate must have access to the following to select and carry out the tasks:

- Plumbing/heating tools
- Materials
- Equipment
- PPE
- Manufacturer's instructions for the boiler
- S Plan Plus wiring diagram and components for Tasks 1 and 2
- Radiators

The assessment area **must** also contain the following:

- Hot and cold supplies fitted with isolation valves
- Pre-installed boiler, unvented cylinder and underfloor heating circuit
- Suitable boiler (electric boiler or gas boiler that has been checked by a competent member of staff (tightness/flue/operation))
- Suitable electrical isolation point which can be locked off by the assessor
- S Plan or S Plan Plus heating system can be set up in a separate maintenance area for Task 3

# Task specific guidance

# Tasks

## Task 1 – Planning the Installation

**Resources**:

- Pen
- Pencil
- Tape measure
- Spirit level
- Materials catalogue

The purpose of this task is for the candidate to demonstrate they can correctly plan the installation, produce a detailed material list, complete a detailed method statement, assess the risks involved in the installation activity and produce an accurate installation diagram showing the pipework layout, pipe clips and control components.

Candidates must be provided with the scenario brief and given time to plan the installation of pipework to the existing boiler, magnetic filter, the S Plan Plus heating system controls and LST radiator circuit in the children's nursery.

**a) Plan the installation of pipework to existing boiler, magnetic filter, S Plan Plus heating system and LST radiator circuit in the children's nursery, following the client brief.**

Candidates should produce the following:

- Materials list
- Method statement to include planning their sequence of work and associated risks (to include justifications)
- Risk assessment
- Installation diagram with pipework layout, pipe clips and associated components

Templates for the method statement, materials list and risk assessment are provided.

The installation diagram should be applicable to the location they are being assessed in and the diagram completed to a commercially acceptable standard. The diagram should include all fixed services and the proposed installation layout (Task 1 - Drawing Grid can be used if required).

The installation diagram should be used by the candidate to carry out the installation and will also be used by the tutor/assessor for checking the dimensional tolerances of the installed system and pipework.

**b) Measure and mark out proposed working area.**

Candidates will be provided with a specific working area that has been set up according to Figure 1.

Candidates must measure and mark out their work area as detailed in their diagram.

Candidates must complete this activity prior to carrying out the installation.

If a candidate provides plans that are not fit for purpose it is expected that the tutor/assessor should intervene and provide necessary feedback and corrections to the plans prior to the candidate carrying out the installation; however, this should be commented on in the marking documentation and reflected in marks awarded.

**Conditions of assessment:**

- The time allocated for this task is 5 hours
- Candidates must carry out the task on their own, under controlled conditions

**What the candidate must produce for marking:**

- Risk assessment
- Method statement to include planning their sequence of work and associated risks (to include justifications)
- Installation diagram with pipework layout, pipe clips and associated components
- Materials list

**Additional evidence of candidate performance that must be captured for marking:**

Practical Observation Form detailing tutor/assessor observations on:

- accuracy of measurements and marking out (of space allocation/ work area checked against installation drawing)
- marking out in comparison with the proposed plan and completed drawing accuracy of recording of key dimensions

To support the comments made within the Practical Observation form the following photographs must be uploaded for each candidate:

**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.

## Task 2 – Installation, Commission and Decommission

**Resources:**

**Tools**

Selection of hand tools/equipment to include but not limited to:

- Pipe bending equipment
- Soldering equipment
- Dust sheets/heat mat
- Selection of suitable screwdrivers
- Selection of adjustable spanners
- Selection of water pump pliers
- Pressure testing equipment
- Suitable electrical testing equipment

**Materials**

- Radiator and associated valves
- S Plan Plus control pack (2 x 2 port valves)
- Magnetic filter
- 15 mm copper pipe
- 22 mm copper pipe
- Assortment of 15 mm copper fittings
- Assortment of 22 mm copper fittings
- Pipe clips
- Plugs and screws
- Various jointing materials
- Filler
- Sandpaper
- Paint
- Roller and brushes

**Assessor guidance**

Candidates must have access to their drawing and plans from Task 1.

Tutor/assessor must ensure that systems are fully decommissioned, and walls prepared, prior to candidates beginning installation.

**a) Install the pipework to the existing boiler, magnetic filter, S Plan Plus heating system and LST radiator circuit in accordance with your drawing and as agreed by your tutor/assessor.**

All central heating flow and return pipework to the radiator should be 100 mm centre to centre unless otherwise stated or agreed with the tutor/assessor.

All pipework is to be clipped directly to the wall surface with the pipe brackets at a maximum 600 mm spacing.

All pipe bends must be carried out with the correct size pipe bending tool.

Marking out and final measuring of installed components and pipework is to be within +/- 2 mm.

All pipework to be installed level and plumb.

No burns or excessive marking to walls/property.

Finished product should be aesthetically pleasing.

Good housekeeping to be maintained throughout assessment

**b) Wire the 2 port valves into the wiring centre, following the safe isolation process.**

Candidates must wire the 2 port valves into the existing wiring centre using a wiring diagram supplied by your tutor/assessor.

The safe isolation procedure should be followed and directly observed by your tutor/ assessor.

All power, interconnecting and control wiring must be in accordance with manufacturer's requirements and meet current UK regulations.

**c) Commission the system (pipework only) and handover to customer**

Once the installation has been completed, candidates must commission the system and handover to the customer.

The system will then be commissioned as per the commissioning document provided, with all the data recorded in full.

You must observe the candidate carrying out the commissioning checks detailed in the commissioning document.

The candidate must record all data in full on the commissioning document provided.

Following commissioning and testing the candidate will handover to the customer. The handover should include:

- Demonstration of system operation and controls

You will act as the customer during the handover and will capture notes on the candidate's performance on the Practical Observation Form.

**d) Decommission the system**

Once you have checked and verified the system and handover is complete, the candidate must decommission the system.

Decommissioning procedure:

- isolation of the fuel/electricity supply to the system as appropriate
- isolate water supply
- apply warning notices and signs
- drain system to a suitable location
- remove required pipework, radiator and controls
- repair and paint wall surfaces as required

**Conditions of assessment:**

- The time allocated for this task is 12 hours
- Candidates must carry out the task on their own, under controlled conditions

**What the candidate must produce for marking:**

- Commissioning checklist

**Additional evidence of candidate performance that must be captured for marking:**

Tutor/assessor observations (Practical Observation Form) of:

- Installation of system and components
- Safe isolation
- Commissioning
- Handover to customer
- Decommissioning

To support the comments made within the Practical Observation form the following photographs must be uploaded for each candidate:

**Installation**

**Photographic evidence which shows:**

- Tolerances have been met for the measurement of pipework. Photos may show any excess/ waste materials caused by inaccurate measurements.
- Finished 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.
- Use of tools (bending and cutting equipment) and piping skills. Photos may show pipework cut offs.
- Results of tool usage. Photos may show tooling marks.
- Soldering/soldered fittings to show that heat mats have been used and no burn/scorch marks to the wall to support the assessor's marking of the jointing process.
- Use/type of clips. Photos may show clips that are not equally spaced or installed in line.
- Correct installation of the LST radiator circuit.

**Decommissioning**

**Photographic evidence which shows:**

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

## Task 3 – Carry out maintenance

**Resources**

**Tools**

- Selection of hand tools
- Dust sheets
- Commissioning equipment

**Materials**

- Suitable replacement components

**Candidates must:**

**a) Discuss the fault with the customer, investigate and diagnose.**

Candidates must discuss the central heating fault with the tutor/assessor to determine the cause of the fault and suggest appropriate methods for repair. Candidates will be assessed on their ability to ask relevant questions to determine fault and to select a suitable solution.

The tutor/assessor will act as the customer during the maintenance discussion and record any feedback on the Practical Observation Form.

The candidate will inspect a pre-installed operational central heating system, functioning with electrical components and controls. You will need to make alterations to the system to create faults on various components within the system.

This system must be installed in a separate maintenance area and include the following:

- Suitable boiler (electric boiler or gas boiler that has been checked by a competent member of staff (tightness/flue/operation))
- A vented or unvented hot water cylinder
- A controllable heat source
- A fully pumped S plan or S Plan plus control system
- Appropriate filling, venting and safety controls.
- Wiring diagrams and manufacturer's instructions as required

**Faults table: Central Heating not working**

| | | |
|---|---|---|
| 1 | Poorly operating/non-functioning circulating pump | Replace pump: replacement of the pump should require complete rewiring into the central heating wiring centre or as required. |
| 2 | Faulty motorised valve (heating circuit) | Replace valve: replacement of the valve should require complete rewiring into the central heating wiring centre or as required. |
| 3 | Faulty Motorised valve (hot water circuit) | Replace valve: replacement of the valve should require complete rewiring into the central heating wiring centre or as required. |

NB: Faults table is not to be disclosed to candidates.

You must select **one** fault from the table above.

All the faults selected for re-creation must be pre-installed into the system before the candidate comes into contact with the assessment area. The faults selected must be varied from candidate to candidate. **Under no circumstances may the assessments be conducted as a group exercise.**

Candidates will be required to carry out testing to identify the fault and replace the faulty component. If a candidate does not initially identify the fault component, they are allowed to be prompted by the tutor/assessor but this must be reflected in the marking.

Once the candidate has diagnosed the fault, they should check with the tutor/assessor to ensure this has been done correctly. It should be reflected in the marking should the candidate require additional feedback and guidance.

**b) Produce a written report detailing the maintenance activity.**

Once fault diagnosis is confirmed, candidates must produce a written report detailing the maintenance activity to include:

- Details of the fault
- How to repair the fault
- Detailed process of how they will repair the system

**c) Repair and rectify fault**

This task requires candidates to:

- Isolate and/or drain down the heating system safely
- Apply temporary continuity bonding
- Install replacement component as required
- Refill system and commission to ensure no leaks are evident
- Wire the component

Notes for tutor/assessor:

- The safe isolation of the electrical circuit by the candidate should be directly observed by the assessor (1:1 ratio).
- The electrical supply should remain isolated and locked off until the assessor has inspected the work and is happy for the circuit to be made live.
- Re-commission system in line with manufacturer's instructions

**Conditions of assessment:**

- The time allocated for this task is 3 hours
- Candidates must carry out the task on their own, under controlled conditions.

**What the candidate must produce for marking:**

- A written report of the maintenance activity.

**Additional evidence of candidate performance that must be captured for marking:**

- Tutor/assessor observations (Practical Observation Form) of:
    - Discussion with customer
    - Fault diagnosis
    - Rectification of fault

To support the comments made within the Practical Observation form the following photographs must be uploaded for each candidate.

**Photographic evidence which shows:**

Results of tool usage. Photos may show tooling marks

- Sequence of photos which show the replacing and removal of the faulty component, and reinstallation of the new component.
- Re-commissioning of the system following component replacement.
- System on completion of all works.

## Centre guidance

Guidance provided in this document supports the administration of this project.

The following documents, available on the City & Guilds website, provide essential generic guidance for centres delivering Technical Qualifications and **must** be referred to alongside this guidance:

- ***T Level Qualifications – Teaching, Learning and Assessment Guide***
- ***TQ Occupational Specialism – Assessment process guide***

This practical assessment is designed to require the candidate to make use of their core knowledge, understanding and the practical skills they have built up over the course of their learning to tackle tasks/problems/challenges.

This approach to assessment emphasises to candidates the importance and applicability of the full range of their learning to practice in their industry area and supports them in learning to take responsibility for transferring their knowledge, understanding and skills to the practical situation, fostering independence, autonomy and confidence.

Candidates are provided with an assignment brief. They then have to draw on their knowledge and skills and independently select the correct processes, tools, equipment, materials and approaches to take, to complete the brief.

During the learning programme, it is expected that tutors/assessors will have taken the opportunity to set shorter, formative tasks that allow candidates to be supported to use the learning they have so far covered, drawing this together in a similar way, so they are familiar with the format, conditions and expectations of the practical assignment.

Candidates should be made aware during learning what the assessment themes are and how they are implemented in marking the assignment, so they will understand the level of performance that will achieve them high marks.

Candidates should not be entered for the assessment until the end of the course of learning for the qualification, so they are in a position to complete the assignment successfully.

### Health and safety

Candidates must not be entered for assessment without being clear of the importance of working safely and having attended sufficient practical training to be able to work safely. The tutor/assessor must immediately stop an assessment if a candidate works unsafely. At the discretion of the tutor/assessor, depending on the severity of the incident, the candidate may be given a warning. If they continue to work unsafely, risking the safety of themselves or others however, their assessment must be ended, and they must retake the assessment in a future series after significant further training has taken place.

### Compliance with timings

Due to the nature of this assessment, the maximum time allowances provided must be adhered to. They refer directly to assessment time, not any additional setting up or drying times the centre needs to create an appropriate assessment environment.

It is the centre's responsibility to plan sufficient assessment sessions, under the appropriate conditions, within the assignment window, to allow candidates reasonable time to complete the assessment tasks.

Where candidates are required to plan their work, they should have their plans confirmed for appropriateness in relation to the time allocated for each task.

Candidates should be allowed sufficient time to fully demonstrate the range of their skills. However, this also needs to be reasonable and practicable. Candidates should be allowed to

overrun their planned timings or professional service times (where they exist) in order for evidence of a range of their skills to be captured. If, however, the time required exceeds reasonably set assessment periods, or the tolerance suggested for professional service times, the centre may stop the assessment and base the marking on the evidence up to that point, including the tutor's/assessor's notes of how far over time the task has taken.

### Tutor/Assessor candidate ratios

Where the tutor/assessor is required to carry out observation of performance, detailed, descriptive notes must be recorded on the practical observation (PO) form provided. The centre has the flexibility to adapt the form to suit local requirements (eg. to use electronic and hand-written formats) as long as this does not change or restrict the type of evidence collected.

The number of candidates a tutor/assessor will be able to observe at one time will vary depending on:

- the complexity of evidence collection for the task
- local conditions eg. layout of the assessment environment,
- amount of additional support available (eg. to capture image/video evidence), staggered starts etc.,
- whether there are any peak times where there is a lot of evidence to collect that will need additional support or any that are quieter.

It is advisable to trial the planned arrangements where possible during formative assessment, reviewing the quality of evidence captured and manageability. It is expected that for straight forward observations, (and unless otherwise specified) no more than six candidates will be observed by a single tutor/assessor at one time, and the number will usually be fewer than this maximum. The key factor to consider is the logistics of collecting sufficient evidence.

As far as possible, candidates should not be distracted, or their performance affected by the process of observation and evidence collection.

### Observation evidence

The practical observation form (PO) is used to record descriptive information and evidence of candidate performance during an observation.

Observation notes form part of the candidate's evidence and must capture evidence of candidate performance during the practical tasks describing how well the activity has been carried out, rather than stating the steps / actions, the candidate has taken. The notes must be very descriptive and focus on the quality of the performance that are notable in relation to the quality indicators in the marking grid. They must provide sufficient, appropriate evidence that can be used by the marker (and moderator) to mark the performance using the marking grid. These descriptions will be used, along with any candidate produced evidence and supporting photographic/video evidence to choose the relevant marking band and mark within the band so that candidates can be reliably and validly differentiated based on their performance. Observation evidence captured in these forms must give the necessary information to enable the final assessment of the task at a later date. This is to allow a holistic judgement to be carried out after all evidence for the task is available, at which point full consideration of how the candidate has applied both their skills and their knowledge during the practical can be given.

Identifying what it is about the performances that is different between candidates can clarify the qualities that are important to record. Each candidate is likely to carry out the same steps, so a checklist of this information would not necessarily help differentiate between them. However, qualitative comments on how well they do it, and quantitative records of accuracy and tolerances would.

The tutor/assessor should refer to the marking grid to ensure appropriate aspects of performance are recorded. These notes will be used for marking and moderation purposes and so must be detailed, accurate and differentiating.

Tutors/Assessors must ensure that any required additional supporting evidence including photographs or video can be easily matched to the correct candidate, are clear, well-lit and showing the areas of particular interest in sufficient detail and clarity for assessment (i.e. taken at appropriate points in production, showing accuracy of measurements where appropriate).

If candidates are required to work as a team, each candidate's contribution must be noted separately. The tutor/assessor may intervene if any individual candidate's contribution is unclear or to ensure fair access (see below).

Tutor/Assessor marking and justification is completed on a separate form (CRF) to differentiate this evidence from the judgement, since in some cases the observation form will provide evidence relating to the judgement for more than one assessment theme.

The ***TQ Occupational Specialism – Assessment process guide*** is an essential guidance document and is available on the City & Guilds website. These provide further information on preparing for assessment, evidence gathering, standardisation, marking and moderation, and must be referred to when planning and carrying out assessment.

**Video and photograph evidence in T Level Technical qualifications**

The assessment materials for each practical assignment identify the minimum candidate and tutor/assessor evidence requirements to support marking and moderation. Where ephemeral evidence (e.g. areas of candidate performance that may be hard to capture with photographs and tutor/assessor notes alone) plays a significant part of the practical assignment, City & Guilds will prescribe the type/capture where the use of video evidence is necessary for practical assessment components (e.g. specifying exactly which elements of the practical must be videoed, or photographed).Any technical specifications for these forms of evidence e.g. length of videos, maximum file sizes etc will also be supplied. Photographic and video evidence will be submitted along with the written candidate evidence and tutor/assessor evidence (Practical Observation forms) as described in the additional evidence section of the task

If this is the case then the video evidence must meet these minimum requirements, in order to be considered by moderators and must be checked by the submitting tutor/assessor before submission:

- As per the guidance in section 2.2 (Observation Evidence) of the *TQ Occupational Specialism – Assessment process guide*, tutors/assessors must ensure that this evidence can be easily matched to the correct candidate and task, is audible, clearly shot, well-lit and shows the areas of particular interest in sufficient detail and clarity for assessment (i.e. filmed at appropriate points in production, showing accuracy of measurements where appropriate).

- The qualitative written evidence provided by tutors/assessors must
  - clearly identify the parts of the video that are being referred to, when used as supporting evidence. Using a timecode for this is recommended.

- include their judgement on the performance being demonstrated

- Section 6.5 of the *Centre Manual* also contains general information about the requirements for video evidence submission.

Please note that where video evidence is unclear, or does not meet these minimum requirements, moderators will disregard it.

**Minimum evidence requirements for marking and moderation**

The sections in the assignment:

- ***What the candidate must produce for marking***, and
- ***Additional evidence of candidate performance that must be captured for marking***

These list the minimum requirements of evidence to be submitted for marking and the moderation sample.

Evidence produced during assessment above and beyond this may be submitted, as long as it provides useful information for marking and moderation and has been produced under appropriate conditions.

While technological methods which support the capturing or creating of evidence can be helpful, e.g. pin board style websites for creating mood boards, the final evidence must be converted to a suitable format for marking and moderation which cannot be lost/ deleted or amended after the end of the assessment period (e.g. screen prints, pdf files). Considerations around tracking authenticity and potential loss of material hosted on such platforms during assessment is the centre's responsibility.

*Note: Combining candidates' individual pieces of evidence into single files or zip files may make evidence management during internal marking more efficient and will greatly simplify the uploading of the moderation sample.*

Where the minimum requirements have not been submitted for the moderation sample by the final moderation deadline, or the quality of evidence is insufficient to make a judgement, the moderation, and therefore any subsequent adjustment, will be based on the evidence that *has* been submitted. **Where this is insufficient to provide a mark on moderation, a mark of zero may be given.**

**Preparation of candidates**

Candidates should be made aware of which aspects of their performance will be creditworthy in the assessment. This is best carried out through routinely pointing out good or poor performance during the learning period, and through formative assessment.

During the learning programme, direct tutor/assessor instruction in how to approach tasks through modelling, support, guidance and feedback are critical. However, gradual removal of this support is necessary in preparation for summative assessment. This supported approach is not valid for summative assessment.

The purpose of summative assessment is to confirm the standard the candidate has reached as a result of participating in the learning process. Candidates should be encouraged to do the best they can and be made aware of the difference between these summative assessments and any prior formative assessments. Candidates may not have access to the full marking grids. Refer to the ***T Level Technical qualifications – teaching, learning and assessment*** centre guidance document, available on the City & Guilds website for further information on preparing candidates for Technical qualification assessment.

***Guidance on assessment conditions***

The assessment conditions that are in place for this practical assignment are to:

- ensure the rigour of the assessment process
- provide fairness for candidates
- give confidence in the outcome.

They can be thought of as the rules that ensure that all candidates who take an assessment are being treated fairly, equally and in a manner that ensures their result reflects their true ability.

The conditions outlined below relate to this practical assignment. These do not affect any formative assessment work that takes place, although it is advised that candidates are prepared for the conditions they will need to work under during summative assessment.

The evidence for the tasks that make up this practical assignment must be completed under the specified conditions. This is to ensure authenticity and prevent malpractice as well as to assess and record candidate performance for assessment in the practical tasks. Any aspect that may be undertaken in unsupervised conditions is specified. It is the centre's responsibility to ensure that local administration and oversight gives the tutor/assessor sufficient confidence to be able to confirm the authenticity of the candidate's work.

**Controlled conditions:**

- candidates must only work on their tasks in the allocated times
- assessment evidence must be handed in at the end session for secure storage which cannot be accessed by candidates
- tutor/assessor observations must be carried out within the tutor/assessor to candidate ratio stipulated by City & Guilds
- candidates must not share or discuss their work with other candidates
- where assessments need to be completed in a number of assessment sessions or over consecutive days, all practical work areas and any evidence produced must be kept secure and must only be accessed by the tutor/assessor
- candidates are not permitted to bring any materials into the assessment session.

**Internet access**

Where internet access is allowed as part of a task (e.g. for research purposes) candidates must be advised that this is the case and reminded of the importance of submitting their own work and the seriousness of plagiarism, malpractice and collusion. Candidates should be advised that their browser history can be monitored and checked. Depending on the type of task candidates may be requested to submit their internet search history to be considered as part of the submission of evidence, in order to confirm the authenticity of submitted evidence.

Where candidates are allowed the use of computer equipment, but not the use of the internet for a task, equipment should be provided with internet capability disabled (e.g. Wi-Fi disabled, machine disconnected from network etc).

**Scheduling assessment sessions**

It is the centre's responsibility to arrange how time is managed to fit with timetables and meet the times allocated for each task during the assessment window. Assessment windows are specified in the key date schedule.

The tasks must be issued in order, one at a time to candidates by centres in the scheduled assessment times. Candidates are able to refer to the brief and scenario during all of the scheduled assessment time. Candidates are not permitted to return to tasks after the assessment time for the task has ended and the next task has begun. Candidates must not move on to the next task within the assessment session until instructed to do so by the tutor/assessor. It is the tutor's/assessor's responsibility to ensure that all evidence for a task has been submitted before administering the next task. Candidates are not required to have formal reading time for the scenario and brief, this is included within the duration for Task 1.

When working under controlled conditions for longer sessions, supervised breaks can be facilitated outside of the controlled conditions, ensuring the room is locked and all candidates have vacated once the break begins. All materials must be kept securely during the break.

Centres should aim to schedule tasks in the fewest amount of assessment sessions but ensure that the durations dictated for each task are covered. However, to aid deliverability and manageability of assessment, sessions can be split where there is a requirement – for example where timetabling of an appropriate location for six hours is not possible, e.g. where centre's access to computer resources is limited, or where candidates are not available for six consecutive hours (e.g. due to work placement commitments). Where this is necessary, sessions must be timetabled over consecutive days and in as few sessions as possible. All

assessment evidence must be stored securely and access to assessment materials and their work only given to candidates during the formal assessment times. All candidates are required to complete a declaration of authenticity along with their evidence submission, and the arrangements must support the tutor/assessor in being confident in confirming authenticity.

Where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the tutor/assessor. Information and notices should be used to inform other users of the facility that no access will be granted when assessment sessions are in progress. Practical work areas, tools, equipment and systems for the assessment must not be reset until a candidate has completed the full assessment.

**Security and authentication of candidate work**

Candidate evidence must be kept secure to prevent unsupervised access by the candidate or others. Where evidence is produced over a number of sessions, the tutor/assessor must ensure learners and others cannot access the evidence without supervision. This might include storing written work or artefacts in locked cupboards and collecting memory sticks of evidence produced electronically at the end of each session.

Candidates are required to sign declarations of authenticity, as is the tutor/assessor. The relevant form is included in this assignment pack and must be signed after the production of all evidence.

**Where the candidate or tutor/assessor is unable to or does not confirm authenticity through signing the declaration form, the work will not be accepted at moderation and a mark of zero will be given. If any question of authenticity arises e.g. at moderation, the centre may be contacted for justification of authentication.**

**Accessibility and fairness**

Where a candidate has special requirements, tutors/assessors should refer to the *Access arrangements and reasonable adjustments* section of the City & Guilds website.

Tutors/Assessors can support access where necessary by providing clarification to any candidate on the requirements or timings of any aspect of this practical assignment. Tutors/Assessors should not provide more guidance than the candidate needs as this may impact on the candidate's grade, see the guidance and feedback section below.

All candidates must be provided with an environment, time frame and resources that allows them reasonable access to the full range of marks available.

Where candidates have worked in groups to complete one or more tasks for this synoptic assessment, the tutor/assessor must ensure that no candidate is disadvantaged as a result of the performance of any other team member. If a team member is distracting or preventing another team member from fully demonstrating their skills or knowledge, the tutor/assessor must intervene.

**Guidance and feedback**

To support centre file management, tutors/assessors may specify a suitable file format and referencing format for evidence (unless otherwise specified e.g. if file naming is an assessment point for the assignment). Guidance must only support access to the assignment brief and must not provide feedback for improvement. The level and frequency of clarification & guidance must be

- recorded fully on the candidate record form (CRF),
- taken into account along with the candidate's final evidence during marking
- made available for moderation.

Tutors/Assessors must not provide feedback on the quality of the performance or how the quality of evidence can be improved. This would be classed as malpractice. However, this does not apply if the tutor/assessor asks questions as part of the assessment process. Such requirements will be specifically stated within task centre guidance.

Tutors/Assessors should however provide general reminders to candidates throughout the assessment period to check their work thoroughly before submitting it, and to be sure that they are happy with their final evidence as it may not be worked on further after submission.

Candidates can rework any evidence that has been produced for this practical assignment during the time allowed. However, this must be as a result of their own review and identification of weaknesses and not as a result of tutor/assessor feedback. Once the evidence has been submitted for assessment, no further amendments to evidence can be made.

Tutors/Assessors should check and be aware of the candidates' plans and designs to ensure management of time and resources is appropriate, and so any allowed intervention can take place at an appropriate time.

Tutors/Assessors should ensure that candidates' plans for completion of the tasks distribute the time available appropriately and may guide candidates on where they should be up to at any point in a general way. Any excessive time taken for any task should be recorded and should be taken into account during marking if appropriate.

It is up to the marker to decide if the guidance the candidate has required suggests they are lacking in any performance outcome, the severity of the issue, and how to award marks on the basis of this full range of evidence. The marker must record where and how guidance has had an impact on the marks given, so this is available should queries arise at moderation or appeal.

**What is, and is not, an appropriate level of guidance**

- A tutor/assessor should intervene with caution if a candidate has taken a course of action that will result in them not being able to submit the full range of evidence for assessment. However, this should only take place once the tutor/assessor has prompted the candidate to check that they have covered all the requirements. Where the tutor/assessor has to be explicit as to what the issue is, this is likely to demonstrate a lack of understanding on the part of the candidate rather than a simple error, and full details should be recorded on the CRF.
- The tutor/assessor should not provide guidance if the candidate is thought to be able to correct the issue without it, and a prompt would suffice. In other words, only the minimum support the candidate actually needs should be given, since the more tutor/assessor guidance provided, the less of the candidate's own performance is being demonstrated and therefore the larger the impact on the marks awarded.
- A tutor/assessor must not provide guidance that the candidate's work is not at the required standard or how to improve their work. In this way, candidates are given the

chance to identify and correct any errors on their own, providing valid evidence of knowledge and skills that will be credited during marking.

- The tutor/assessor must not produce any templates, pro formas, work logs etc for candidates to use to support their performance unless instructed to in the assignment guidance. Where instructed to do so, these materials must be produced as specified and contain no additional guidance. Templates provided, as part of the assignment should be used as provided, and not adapted.

All specific prompts and details of the nature of any further guidance must be recorded on the relevant form and reviewed during marking and moderation.

**Guidance on marking**

Please refer to the **TQ Occupational Specialism – Assessment process guide** for further information on gathering evidence suitable for marking and moderation, and on using the marking grid and forms.

The candidate record form (CRF) is used to record:

- Details of any guidance or the level of prompting the candidate has received during the assessment period
- Rough notes bringing together relevant evidence from across tasks during marking.
- Summary justifications when holistically coming to an overall judgement of the mark for each performance objective and overall.

## Marking guidance

### Carrying out marking using assessment themes

The process of marking each assessment theme is iterative and should follow the process below which will become speedier over time as the descriptors become more familiar. It is recommended to refer back to these frequently however, so the standard does not unintentionally drift over the marking period.

The indicative content gives an indication of the expected content parameters the responses are likely to cover, and which aspects of the evidence are relevant. It is not exhaustive, and an acceptable answer may concentrate more on depth rather than fully cover the range indicated or deviate into relevant topics not listed.

The specific task evidence listed within the tutor/assessor guide and marking grid must be used to make a judgement on performance in relation the specific assessment theme.

The assessment tasks guide the production of valid evidence under appropriate conditions for assessment. Candidate evidence from a range of tasks may contribute to the marking of a single assessment theme, or from a single task to more than one assessment theme. In this case different aspects of the evidence are being considered for each theme and need to be judged against the marking descriptors specified in the assessment themes independently of each other.

In some cases, the quality indicators looked for in the judgement may naturally be more strongly evidenced in one piece of evidence than another. For instance, more formulaic/prescriptive forms of evidence may not be able to generate evidence of higher levels of performance, so this evidence would need to be looked for in the other forms of evidence. This means that where a range of evidence is to be assessed, it should be treated as a single package of evidence for the purposes of marking even if generated through different tasks.

### Timing of marking

As some assessment themes require the triangulation of a number of pieces of evidence, marking cannot take place until after all of these are available. This does not however mean that all marking needs to take place after all candidates have completed the whole assessment.

Also, it is possible to begin recording the notes that will justify the marking for some assessment themes as evidence is produced, with the final mark only being decided once the complete array of evidence is available. This is particularly the case if later evidence is more confirmatory, and the earlier evidence is sufficiently informative for the qualities being assessed to make this a useful exercise.

Through planning, it should be possible to identify any evidence that can start being reviewed earlier, and the assessment themes which could be scheduled for earlier completion of marking e.g. while observation evidence is fresh in the mind should this be helpful. Care must of course be taken to ensure any evidence required by candidates to progress with another task are available for that task to take place. In addition, it is recommended that a sense check across marking for each assessment theme, and across tutors/assessors, is carried out at the end to ensure marking has not drifted during the period. This may take the form of comparing candidate work to check that the ranking of quality of evidence matches the ranking of marks – where there are discrepancies marking should be checked for accuracy.

**Process for each assessment theme:**

- Select the range of evidence relevant for making the judgement – this is indicated in the mark scheme for each assessment theme.
- Scan / read the candidate evidence, evidence captured by the tutor/assessor and the indicative content & band descriptors in the mark scheme.
- Make an initial assessment of the required evidence as a whole, considering each band in turn to make a balanced judgement of the best band to use it as a starting point.
- Read the evidence and review it against the band descriptor in more detail, deciding if the response is securely sitting within the band; i.e. all quality characteristics described by the band descriptor are seen, and strongly meets the level of performance described by the descriptor holistically (i.e. across the range of relevant evidence).
    - Check the descriptor for the level above
    - If the evidence clearly shows some of the characteristics of the higher band, select a suitable mark at the bottom of that band
    - If *not* showing characteristics of the higher band revert to the original band, select a mark at the higher end of that mark range

  If the response is not securely in the band, but *is partially* showing the characteristics of the band,
    - check the descriptor of the level below.
    - decide on a suitable mark either at the bottom of the original band as some characteristics shown, or top of the lower band if it better describes the quality of the characteristics being shown.

  If the response is largely meeting the band, with only a few concerns, and is not showing characteristics aligning with the higher or lower bands, the appropriate mark is likely to be in the middle range.

  If there is no alignment with the descriptor, reassess the starting band, and begin again.
- Based on the level of alignment with the descriptor, confirm the final mark within the band, bearing in mind that the available marks form an *evenly distributed scale*:
    - If the quality of response *fully* aligns with the performance described by the descriptor – assign a high mark within the band
      If the quality of the response *partially* aligns with the performance described by the descriptor – assign a low to medium mark within the band
    - Consider the quality compared to a range of similar responses (e.g. relevant annotated training material exemplars, responses reviewed during standardisation, and through experience) choose a mark on the point on the scale that would give an appropriate ranking for the assessed piece of evidence in relation to this information and in comparison with that of the rest of the cohort for that assessment theme.

## Marking grid

There is a marking grid for each assessment theme that must be assessed as part of this occupational specialism assessment.

## Assessment theme - Health and Safety

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per assessment theme |
|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br>• Completion of a comprehensive assessment of risk and risk management.<br>• Identification of main hazards which include major danger of death or major injury hazards.<br>• Analysis of the risk to produce appropriate mitigation against these hazards for the planned task<br>• Probability of each of the hazards occurring.<br>• Identification of minor injury or delay hazards and provide appropriate mitigation for such risks.<br>• Correctly prepare tools, PPE and materials lists for the proposed installation.<br>• Work area to be kept tidy throughout the tasks.<br>• Wearing the correct PPE at all time, as identified in their risk assessment and/ or materials list.<br><br>Correct PPE must be worn at all times and as designated in their risk assessment (If unsafe working occurs the assessment is to be stopped immediately). | | | |

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|---|---|---|---|---|
| | Demonstrate the knowledge and understanding of safe isolation through carrying out correct safe electrical isolation procedure in a logical order that is specified below. (Failure to complete safe isolation as specified below leading to an unsafe situation the assessment will be stopped immediately).<br><br>**Safe isolation**<br>• Obtain permission to start work<br>• Identify the source(s) of supply using an approved voltage indicator<br>• Prove that the approved voltage indicator is functioning correctly<br>• Isolate the supply(s)<br>• Secure the isolation<br>• Prove the system/equipment is DEAD using an approved voltage indicator<br>• Prove that the approved voltage indicator is functioning correctly<br>• Put up warning signs to tell other people that the electrical installation has been isolated<br>• Once the system/equipment is proved DEAD, work can begin | | | |
| **Marks per band** | **1-4** | **5-8** | **9-12** | **12** |
| **Health and Safety** | Risk assessment is complete and covers the major risk factors.<br><br>Risk mitigation methods are limited.<br>Likelihood against probability has been attempted but not for all hazards.<br><br>Health and safety is followed during preparation and throughout tasks so that all | Risk assessment is complete and covers a good range of risk factors.<br><br>Risk mitigation methods have been identified for some of the potential risks, but not all. Consideration is given to potential for harm and probability factors.<br>Health and safety is followed during preparation and throughout tasks and all work completed safely. | Risk assessment is detailed and clearly identifies all of the associated risk factors.<br><br>Risk mitigation methods are detailed and have been clearly identified for all potential risks.<br>Potential for harm and probability factors have been identified throughout.<br>Health and safety is followed during preparation and throughout tasks and all work | |

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|---|---|---|---|---|
| | work is completed safely but when working some low risk hazards were missed. | | completed safely. Risks and hazards that occur during the tasks are correctly mitigated against as they are arise. | |

**Guidance for markers**

The following evidence from Task 1, Task 2 and Task 3 should be used to assess performance against this assessment theme.

**Task 1**

Risk assessment

**Task 2**

Assessor observations:

- Installation of components
- Decommissioning
- Safe isolation

**Task 3**

Assessor observations:

- Fault diagnosis
- Repair and rectify fault

## Assessment theme – Design and Planning

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment themes. | Total marks for assessment theme |
|---|---|---|---|---|---|
| **Indicative document** | **Typical knowledge, understanding and skills:**<br>• Produce a detailed method statement of how the task will be carried out in a safe and logical manor with reasoning to support the methods given. The safe storage of materials, pipework skills, protection of surfaces, pipework and other components and leak testing.<br>• The correct selection of components and tools, including pipe-bending machines, soldering equipment and small hand tools such as wire strippers for the electrical aspects of the assignment.<br>• The type, size and quantity of materials required to complete the tasks in a timely manner and to ensure the highest quality of finish which shows no evidence of damage to systems including pipework or aesthetics. | | | | |
| **Marks per band** | **1-3** | **4-6** | **7-9** | **9** | **18** |
| **Documents** | Documents are brief but correct in process but with minor inaccuracies in technical knowledge and sequencing. No reasoning provided to justify choices made.<br><br>Key materials and quantities to meet the brief | Documents are clear, and the correct process is set out in a logical sequence with accurate technical knowledge. Some reasoning is provided, and minimal links have been made to the brief and tasks to justify choices made.<br><br>Key materials, quantities and PPE required to meet | Documents are thorough and demonstrates comprehensive technical knowledge, and the process is set out in a logical order. There is detail in how to perform tasks with clear reasoning that links to the assignment brief and tasks to justify choices made.<br>All materials, quantities and PPE required to meet the | | |

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| | have been identified with no consideration given to the aesthetics of the finished installation. | the brief have been identified with some consideration given to the aesthetics of the finished installation. | brief have been identified with excellent consideration given to the aesthetics of the finished installation. | | |
| **Marks per band** | **1-3** | **4-6** | **7-9** | **9** | |
| **Drawings and diagrams** | Installation drawing(s) is/are complete with only minor inaccuracies in pipe layout.<br><br>Position of components is correct without consideration of aesthetics or performance. | Installation drawing(s) is/are complete with only minor inaccuracies in pipe layout.<br><br>Position of components is correct with some consideration of aesthetics or performance. | Installation drawing(s) is/are complete and accurate.<br><br>Position of components is correct with consideration of aesthetics or performance. | | |

**Guidance for markers**

The following evidence from Task 1 should be used to assess performance against this assessment theme.

**Task 1**

Method statement
Materials list
Installation diagram

## Assessment theme – Systems and components

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment theme | Total marks for assessment theme |
|---|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br>• The correct use of components and tools e.g. pipe-bending machines, soldering equipment, and small hand tools such as wire strippers for the electrical aspects of the assignment.<br>• Taking measurements from an allocated space/ work area in line with installation requirements.<br>• Pipework skills<br>• Complete the installation of pipework and components following manufacturer's guidance as appropriate.<br>• Recycling methods e.g straight lengths of pipe are removed and saved for possible reuse and all non-reusable bends and fitting are disposed of in correct manner. | | | | |
| **Marks per band** | **1-5** | **6-10** | **11-15** | **15** | **27** |
| **Installation of systems and components** | Marking out has been completed, methods used lacks efficiency resulting in some inaccuracies.<br><br>Measurement of pipework installation does not meet all tolerances, resulting in excessive use of joining and some waste materials. | Marking out is mostly accurate and method used is correct, resulting in only minor inaccuracies.<br><br>Measurement of pipework meets most tolerances and resulting in an install that has few errors from the proposed installation plan and minimal waste materials. | Marking out is accurate and uses correct method.<br><br>Measurement of pipework and component installation is accurate and meets the design specification. All tolerances are met and no undue waste or excessive use of joints. | | |

| | | | | | |
|---|---|---|---|---|---|
| | Installation does not always follow logical sequencing, which impacts on timely completion of task.<br><br>Some tolerances are met or within 2mm – 5mm.<br><br>Use of tools is basic, and requires more than one attempt, resulting in pipework installations that may be over soldered or with excessive tooling marks.<br><br>Pipework skills results in excessive off cuts/ wasted materials. | Installation follow some logic in process most of the time in line with the method statement which results in a timely completion of the task.<br><br>Most tolerances are met or within 2mm-5mm.<br><br>Use of tools is good but some tasks require more than one attempt.<br><br>Pipework skills results in some off cuts/ wasted materials. | Installation follows logical sequencing throughout the tasks in line with the method statement which results in a timely completion of the task.<br><br>All tolerances are met and within 2mm.<br><br>Use of tools is excellent and completed on first attempt, resulting in a high-quality finish<br><br>Pipework skills results in no off cuts/ wasted materials. | | |

| Marks per band | 1-4 | 5-8 | 9-12 | 12 | |
|---|---|---|---|---|---|
| **Decommissioning systems and components** | Decommissioning process does not always follow correct sequence, which may impact on timely completion of task.<br><br>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.<br><br>Process for safe removal of waste was not always followed, with minimal consideration to customer property<br><br>Some attempts were made to make good the working but not all techniques were used resulting in a poor-quality finish. | Decommissioning mostly follows a logical sequencing, resulting in timely completion of task.<br><br>Candidate correctly identified most of the components that could not be reused and disposed of them in the correct recycling bins.<br><br>Process for safe removal of waste was followed at most stages of the task<br><br>Good attempts were made to make good the working but not all techniques were appropriate, resulting in a finish that was mostly good. | Decommissioning follows logical sequencing throughout, resulting in timely completion of task.<br><br>Candidate correctly identified all the components that could not be reused and disposed of them in the correct recycling bins.<br><br>Process for safe removal of waste was followed throughout tasks with clear consideration of customer property<br><br>Excellent attempts were made to make good the working, all techniques were appropriate, resulting in a high-quality finish. | | |

## Guidance for markers

The following evidence from Task 1 and 2 should be used to assess performance against this assessment theme.

## Task 1

Assessor observation:

- Measuring and marking out

## Task 2

Assessor observations:

- Use of tools
- Installation of components
- Measurements of pipework are to within a tolerance of +/- 2mm
- Decommissioning

## Additional supporting evidence

Photographic and/or video evidence requirements are stated in the specific task guidance for each task within this assessor pack.

## Assessment theme – Reports and information

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks for assessment theme |
|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br><br>Recording and completion of a commissioning checklist.<br><br>Detailed reports/checklists for the following activities:<br>• Commissioning – temperatures, flow rates, heat source, handover to client.<br>• Maintenance report – description of fault diagnosis, reasons for repair, method of repair, actions taken to rectify fault.<br><br>Information and terminology should be accurate throughout and presented clearly. | | | |
| **Marks per band** | **1-2** | **3-4** | **5-6** | **6** |
| **Reports and information** | Reports/ checklists are partially completed/ brief in content with some incorrect terminology. No reasoning or justification to the method or choices made. | Reports/ checklists are completed in a clear format with only minor details missing. Content and terminology is mostly accurate. Some justification and reasoning for the work required is explained. | Reports/ checklists are detailed and accurate with correct terminology throughout. Clear justification and reasoning for works required. | |

## Guidance for markers

The following evidence from Task 2 and 3 should be used to assess performance against this assessment theme.

## Task 2

Commissioning checklist

## Task 3

Written report of the maintenance activity

## Assessment theme – Inspecting and testing of systems and components

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks for assessment theme |
|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br>Identification and completion of the following tests and checks in line with any relevant manufacturer's instructions:<br>• visual inspection of the system before commissioning<br>• fill and vent system<br>• ensure all valves are working and leak free | | | |
| **Marks per band** | **1-3** | **4-6** | **7-9** | **9** |
| **Inspecting and testing of systems and components** | Commissioning tests completed but needed guidance and reassurance from assessor.<br><br>Commissioning checks are inaccurate in sequence, resulting in issues that candidate can rectify, but may impact timely completion of task.<br><br>Candidate refers to manufacturer's instructions at some stages of the task. | Commissioning tests completed with minimal guidance and reassurance from assessor.<br><br>Commissioning checks are mostly accurate in sequence, resulting in a timely completion.<br><br>Candidate follows manufacturer's instructions at most stages of the task | Commissioning tests are completed confidently.<br><br>Commissioning checks are accurate in sequence resulting in a timely completion.<br><br>Candidate follows manufacturer's instructions throughout the task. | |

## Guidance for markers

The following evidence from Task 2 should be used to assess performance against this assessment theme.

## Task 2

Assessor observation:

- Commissioning

## Assessment theme – Handover & Communication

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks for assessment theme |
|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br>• Communication and interaction<br>• Handover to customer<br>• Demonstration of system<br>• System operating principles<br>• System maintenance requirements<br>• Fault diagnosis e.g. the use of relevant questions to help determine the cause of any faults. | | | |
| **Marks per band** | **1-2** | **3-4** | **5-6** | **6** |
| **Handover & Communication** | Interaction with customer demonstrated basic customer care skills and did not confirm customer understanding.<br><br>Demonstration of system provided basic functions; some information was unclear resulting in the customer having to ask questions. | Interaction with customer demonstrated some good customer care skills, through using appropriate language and checking the customer understood.<br><br>Demonstration of system was clear and provided all functions of the system.<br><br>Discussion with customer was mostly clear and most questions asked were relevant to the task. | Interaction with customer demonstrated strong customer care skill, adapting to type of customer and through using appropriate language and checking the customer understood.<br><br>Demonstration of system was thorough and provided all functions and information. Candidate proactively checked | |

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|---|---|---|---|---|
| | Discussion with customer was brief and some questions were not relevant to the task. | | and confirmed customer understanding.<br>Discussion with customer was clear and direct, all questions asked were relevant to the task. | |

**Guidance for markers**

The following evidence from Task 2 and 3 should be used to assess performance against this assessment theme.

**Task 2**

Assessor observations:

- Handover to customer

**Task 3**

Assessor observations:

- Discussion with customer

## Assessment theme – Working with faults

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks for assessment theme |
|---|---|---|---|---|
| **Indicative content** | **Typical knowledge, understanding and skills:**<br>• Fault finding tests and techniques e.g. speaking to the customer, systematic and logical approach to fault finding.<br>• Rectification of fault - confirm the system is ready for the repair to be carried out and carry out the removal of the faulty component.<br>• Select correct replacement component for the task and install the replacement.<br>• The system should then be refilled, and leak checked ensuring all air is removed from system and heating is functioning correctly.<br>• The correct use of components and tools that are appropriate to the task. | | | |
| **Marks per band** | **1-4** | **5-8** | **9-12** | **12** |
| **Working with faults** | Fault-finding techniques were carried out but were limited and showed a basic knowledge of fault-finding techniques.<br><br>Investigation and analysis of fault did not always follow a logical sequence | Fault-finding techniques were carried out with some success demonstrating knowledge of fault-finding techniques that was appropriate.<br><br>Investigation and analysis of fault was clear and followed some logic | Fault-finding techniques were carried out systematically and logically displaying accurate knowledge of fault-finding techniques.<br><br>Investigation and analysis of fault was detailed and logical. | |

| | | | | |
|---|---|---|---|---|
| | Candidate refers to manufacturer's instructions at some stages of the fault diagnosis.<br><br>Rectification of fault follows a logical process and is completed with some tutor support and guidance, with only minor mistakes.<br><br>Use of tools is basic, and requires more than one attempt, resulting in pipework installations that may be over soldered or with excessive tooling marks. | Candidate follows manufacturer's instructions at most stages of the fault diagnosis.<br><br>Rectification of fault follows a logical process and is completed efficiently with only minor mistakes.<br><br>Use of tools is good but some tasks require more than one attempt. | Candidate follows manufacturer's instructions throughout the fault diagnosis.<br><br>Rectification of fault follows a logical process and is completed efficiently and accurately with no mistakes.<br><br>Use of tools is excellent and completed on first attempt, resulting in a high-quality finish. | |

## Guidance for markers

The following evidence from Task 3 must be used to assess performance against this assessment theme.

## Task 3

Assessor observations:

- Discussion with customer
- Fault diagnosis
- Use of tools
- Repair and rectify fault

## Additional supporting evidence

Photographic and/or video evidence requirements are stated in the specific task guidance for each task within this assessor pack.

## Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: **technicals.quality@cityandguilds.com**

W: **http://www.cityandguilds.com/tlevels**

Web chat available **here**.

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