T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Maintenance, Installation and Repair for Engineering and Manufacturing

Employer-Set Project (8730-033)

Summer 2023 Marking Grids

City & Guilds | eal

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General marking approach

The following process details at high level the steps that will be undertaken by the external marking teams at City & Guilds following the submission of candidate's submitted evidence (including additional supporting evidence such as videos of presentations etc.).

Process

- Marker scans/reads the candidate's evidence, any notes on the Declaration of Authenticity e.g., regarding level of support/guidance recorded and the band descriptors. Evidence contained on the Declaration of Authenticity is taken into account along with all other candidate evidence at the point of marking. The external marker makes a judgement on the level of performance the candidate has demonstrated taking all the evidence into consideration and they then judge the appropriate mark following the normal process.
- Marker makes an initial assessment of the best fit to band.
- Marker reviews the candidate evidence against the initial band descriptor in more detail to decide if the response is securely sitting within the band; i.e., all characteristics described by the band descriptor are seen or it strongly meets the level of performance described by the descriptor holistically:
    - marker will also check the descriptor for the level above
    - if evidence clearly shows some of the characteristics of the higher band, the marker will select a suitable mark at the bottom of that band
    - if not showing characteristics of the higher band, the marker will revert to the original band, selecting 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:
    - marker will check the descriptor of the level below/above
    - marker will 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, the marker will reassess the starting band, and begin again.
- Based on the level of alignment with the descriptor, the marker will confirm a final mark within the band, bearing in mind the marks available form an evenly distributed scale:
    - if the quality of response fully aligns with the performance described by the descriptor, the marker will assign a high mark within the band
    - if the quality of the response partially aligns with the performance described by the descriptor, the marker will assign a low to medium mark within the band
    - the marker will consider the quality of a range of similar responses (e.g., annotated lead grade exemplification materials, responses reviewed during standardisation, and through experience) and choose a mark that would give an appropriate ranking amongst those responses in relation to the full range of marks available in each band.
- In order to fully assess the evidence, it may be necessary to focus on several distinct aspects. These have been grouped into separate sub-grids to allow the marker to make separate assessment decisions, rather than attempt to bring disparate

elements together as a holistic judgement, to support reliability, validity and manageability for the marker.

- Should a candidate make an error or display a weakness in one task that is further compounded through the inter-dependent nature of the tasks and carry through that error, the marker should penalise the candidate only once. Each task should be considered within the constraints of the marking for the task itself, focusing on the knowledge and skills to be demonstrated in that task. For example, if the candidate does not research suitable options for process improvement in task 1, when they get to the presentation task 4 where the solution is presented – the marker should focus on looking at how well the candidate presents the solution they are proposing, i.e. it is the presentation and communication skills that hold the main relevance in this task, rather than further penalising the candidate for a less than optimal equipment research and proposal from the initial task 1. Candidates can also use evaluation within later task responses to address issues they have identified.

Assessment objectives

The Employer-Set Project is assessed against five assessment objectives. The assessment objectives are mapped against each task within the marking grids:

AO Ref	Assessment Objective
AO1	Plan their approach to meeting the project brief
AO2	Apply core knowledge and skills as appropriate
• AO2a	○ core knowledge
• AO2b	○ core skills i) **Analysing and interpreting** – Evaluate and confirm the brief with reference to context, objectives and constraints (e.g., requirements, resources, precedents, technical issues, costs, health and safety, regulations, possibilities) ii) **Planning and preparation** – Propose and plan key activities, stages, methods, processes, techniques, documentation, resources (including types of tools and equipment) and risk assessments iii) **Developing responses** – Propose maintenance, installation and repair processes for achieving specific objectives and quality outcomes, using relevant techniques, and technology, within limits of own authority iv) **Evaluating and quality assuring** – Investigate components and systems, to gather and evaluate relevant evidence and data, and to confirm the suitability of processes, actions and outcomes (including quality control and quality assurance activities) v) **Communication and presentation –** Record, report, communicate and present plans, proposals, processes, issues, risks and outcomes to both technical and non-technical audiences, across a range of suitable formats and media (e.g., diagrams; physical and digital records, presentations).
AO3	Select relevant techniques and resources to meet the brief
AO4	Use maths, English and digital skills as appropriate
• AO4a	○ maths
• AO4b	○ English
• AO4c	○ digital
AO5	Realise a project outcome and review how well the outcome meets the brief
• AO5a	○ realise a project outcome – was the right outcome achieved
• AO5b	○ review how well the outcome meets the brief, how well was the brief met, the quality of the outcome in relation to the brief

Employer-Set Project mark distribution

This table illustrates how the 90 marks for the Employer-Set Project are distributed against the tasks and mapped to each assessment objective. These have been set by subject matter experts and employers and will support the comparability between versions of the Employer-Set Project over time.

Tasks	AO1	AO2a	AO2b	AO3	AO5a	AO5b	Total	AO4a	AO4b	AO4c
1. Research	3	3	6	3	0	0	15	3	3	3
2. Report	3	6	6	3	3	3	24			
3. Plan	3	6	6	3	0	0	18			
4. Present	3	6	6	3	3	3	24			
Total	**12**	**21**	**24**	**12**	**6**	**6**	**81**	**9**		**90**
AO marks	12	45		12	12		-	9		90
AO %	13.3%	50%		13.3%	13.3%		-	10%		100%

NB - AO2 collectively must be at least 50% (i.e., 45 marks)

1. Research

<table>
<tr><th colspan="4">Grid 1: AO1, AO2a, AO3 Research (Planning, core knowledge, selecting techniques and resource)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Technical brief which includes; possible causes of the fault, suitability/functionality of existing system, flowrate calculations, set points, operating parameters and any calibration requirements, potential modifications to the system, estimated cost of modifications, relevant legislation/regulations, references/sources
Any supporting documentation such as research notes
List of references/sources</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief
The candidate’s:
coherence of structure of the technical brief and research notes.
details of research approach and how they planned their research.
consistency of coverage of the technical brief in relation to:
possible causes of the fault reported by A2B Water
suitability and functionality of already installed parts and components
flowrate calculations, set points, operating parameters and any calibration requirements
potential modifications to the system
estimated costs of any modifications
laws and regulations that apply to the system and any suggested modifications.
clarity of references to sources of guidance and industry standards.
AO2a – Apply core knowledge
The candidate’s:
confidence and appropriateness of use of terminology.
accuracy of the technical brief contents in relation to sources.
refinement and narrowing of the chlorine dosing system technical specification.
exploration of different system technologies which are suitable to the needs of A2B water considering the context given in the brief</td><td>AOs (marks)

AO1 (3)

AO2a (3)

AO3 (3)</td><td>Total marks available

9</td></tr>
</table>

Grid 1: AO1, AO2a, AO3 Research (Planning, core knowledge, selecting techniques and resource)			
	• exploration of different types of installations within similar manufacturing environments where such designs have been produced and installed and commissioned, considering advantages and limitations. • Consideration of health and safety issues that impact any access arrangements, modifications, and final testing of the modified system, specifically the consideration of working with chlorine. **AO3 – Select relevant techniques and resources to meet the brief** The candidate's: • clarity of proposed solutions and how closely and clearly they are derived from industry guidance and manufacturer proprietary literature related to the context of the brief • clarity of references to sources of guidance and industry standards in the technical brief. • use of relevant data and documentation required such as sketches, diagrams, CAD technical drawings, schematics, images etc. • consideration of costings and how these are calculated, including consideration of tolerances and specifications.		

Grid 1: AO1, AO2a, AO3 Research (Planning, core knowledge, selecting techniques and resource)								
Marking descriptors – All versions 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**		
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Some evidence of a planned approach to research. (AO1) Some elements of core knowledge referenced but focus may be imbalanced and more focused on one area than another. (AO2a) Research techniques and resources clear as part of evidence submission. (AO3)			Approach to research and collation of information shows planning and consistency. (AO1) Core knowledge applied in most areas of the brief requirements for example in relation to technology, regulations and development of initial ideas. (AO2a) Evidence of a range of techniques and resources used and referenced, with different source types considered. (AO3)			Requirements of the brief are considered consistently throughout the research and information collation – clear evidence of methodical and thorough approach to research and information gathering. (AO1) Core knowledge applied in all areas of the brief requirements including - technology, regulation etc, and idea summation. (AO2a) Evidence of comprehensive research techniques, use of resources, and full range of sources. All sources fully detailed and presented fully and consistently. (AO3)		

<table>
<tr><th colspan="4">Grid 2: AO2b Research (Core Skills)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Technical brief which includes; possible causes of the fault, suitability/functionality of existing system, flowrate calculations, set points, operating parameters and any calibration requirements, potential modifications to the system, estimated cost of modifications, relevant legislation/regulations, references/sources
Any supporting documentation such as research notes
List of references/sources</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2b – Application of core skills
Core skills (definitions of each skill can be found in the Assessment Objective table at the front of this marking scheme):
Analysing and interpreting
Planning and preparation
Developing responses
Evaluating and quality assuring
Communication and presentation
The candidate’s:
judgement and reasoning in relation to the refinement to the review of the requirements from the brief and the content within the report.
effectiveness of communication of refined technical requirements for the modified chlorine system- clarity and conciseness of delivery.
expression of ideas in a written evaluation and level to which they are supported e.g. through inclusion of images, diagrams, sketches and references to sources.
planning of the technical brief in terms of consistency and balance of response (time spent consistently on elements).</td><td>AOs (marks)

AO2b (6)</td><td>Total marks available

6</td></tr>
</table>

Grid 2: AO2b Research (Core Skills)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Some basic elements of core skills drawn on and evidenced within task response - limited use of skills in relation to brief requirements. (AO2b)		A range of core skills applied and evidenced consistently in task response in relation to different elements of project brief. (AO2b)		Core skills applied consistently and comprehensively throughout task completion with - full range of core skills evidenced. (AO2b)	

2. Report

<table>
<tr><th colspan="4">Grid 3: AO1, AO3 Report (Planned approach, selecting techniques)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Written report which includes; benefits and limitation of chosen modification, considerations when implementing the modification (which includes access requirements, isolation and drainage procedures, risk assessment and H&S regulations), on-going maintenance requirements.
Labelled schematic diagram(s) which shows piping and instrumentation, electrical and mechanical connections</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief
The candidate’s
level of detail, annotations and accuracy in the diagram(s).
depth of explanation across the different element of the report
consistency and balance of coverage of points including the level of detail provided of any assumptions related to the potential causes of faults as detailed in the task.
consideration and balance of the different elements of the systems technical specification to produce a believable and realistic response.
use of layout, space when presenting the response
AO3 – Select relevant techniques and resources to meet the brief
The candidate’s
diagram(s) how it indicates location of parts, component connections – use of symbols, abbreviations and annotations clearly and in line with industry standards.
diagram(s) of positioning and mechanical/electrical component connections.
communication of their modified system and how closely the diagram(s) and their components (annotations etc) relate to industry practices/best practice and e.g., use of scale.</td><td>AOs (marks)

AO1 (3)

AO3 (3)</td><td>Total marks available

6</td></tr>
</table>

Grid 3: AO1, AO3 Report (Planned approach, selecting techniques)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Some evidence of a planned approach to task, response may lack detail and drawing information. (AO1) Some relevant techniques used in the preparation and presentation of drawings and associated information. (AO3)		Approach to report and drawings is planned, organised and complete. (AO1) Relevant techniques used throughout the preparation and presentation of drawings and associated information. (AO3)		Approach to report and drawing is fully comprehensive and in line with standard industry practices/best practice. (AO1) Preparation and presentation of drawings and associated information is fully in line with industry conventions showing the use of all correct techniques. (AO3)	

<table>
<tr><th colspan="6">Grid 4: AO2a Report (Core Knowledge)</th></tr>
<tr><td>Guidance for markers</td><td colspan="5">Only the following evidence must be used to assess performance against this marking grid:
Written report which includes; benefits and limitation of chosen modification, considerations when implementing the modification (which includes access requirements, isolation and drainage procedures, risk assessment and H&S regulations), on-going maintenance requirements.
Labelled schematic diagram(s) which shows piping and instrumentation, electrical and mechanical connections</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td colspan="3">AO2a – Apply core knowledge
The candidate’s
choice of language used in any text on the annotations etc, its technical level and consistency with the intended audience.
proposed solutions for the modification to the system, how well they meet industry guidance, have the potential to be implemented and their technical sense and level of consideration of safety factors including risk assessments.
labelled diagram(s) indicating location of parts and component connections – use of symbols and abbreviations clearly and in line with industry standards.</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO2a (6)</td><td>6</td></tr>
<tr><td colspan="6">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
<tr><td colspan="2">Band 1 descriptor</td><td colspan="2">Band 2 descriptor</td><td colspan="2">Band 3 descriptor</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td colspan="2">Some elements of core knowledge drawn on and evidenced - limited comprehension of knowledge in relation to brief requirements e.g., brief requirements omitted indicating lack of knowledge of that area. (AO2a)

Some links to the application of core knowledge to support judgements, but connections are not always clear and accurate. (AO2a)</td><td colspan="2">Knowledge from across the core applied and evident in relation to different elements of project brief. (AO2a)

Links to the application of core knowledge to justify and support judgements, but with some gaps or inaccuracies. Concepts explained/ referenced clearly and correctly. (AO2a)</td><td colspan="2">Core knowledge applied consistently throughout response with minimal technical inaccuracies. (AO2a)

Connections between elements of core knowledge exploited to strengthen arguments and demonstrate understanding. (AO2a)</td></tr>
</table>

<table>
<tr><th colspan="4">Grid 5: AO2b Report (Core skills)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Written report which includes; benefits and limitation of chosen modification, considerations when implementing the modification (which includes access requirements, isolation and drainage procedures, risk assessment and H&S regulations), on-going maintenance requirements.
Labelled schematic diagram(s) which shows piping and instrumentation, electrical and mechanical connections</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2b – Application of core skills
Core skills (definitions of each skill can be found in the Assessment Objective table at the front of this marking scheme):
Analysing and interpreting
Planning and preparation
Developing responses
Evaluating and quality assuring
Communication and presentation
The candidate’s:
incorporation of the required aspects in the response – use of logical and synergised approach to requirements.
communication positioning and mechanical/electrical component connections through labels and symbols.</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO2b (6)</td><td>6</td></tr>
</table>

Grid 5: AO2b Report (Core skills)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Some elements of core skills drawn on and evidenced within task response - limited use of skills in relation to brief requirements. (AO2b) Response has limited logic and shows superficial coherence between different aspects of the brief. (AO2b)		A range of core skills applied and evident in task response in relation to different elements of project brief. (AO2b) Response is logical and shows some coherence between different aspects of the brief. (AO2b)		Core skills applied consistently throughout task completion - full range of core skills evidenced. (AO2b) Response is logical and demonstrates detailed coherence between different aspects of the brief. (AO2b)	

<table>
<tr><th colspan="4">Grid 6: AO5a, AO5b Report (Realise outcome, review outcome)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Written report which includes; benefits and limitation of chosen modification, considerations when implementing the modification (which includes access requirements, isolation and drainage procedures, risk assessment and H&S regulations), on-going maintenance requirements.
Labelled schematic diagram(s) which shows piping and instrumentation, electrical and mechanical connections</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO5a - realise a project outcome – was the right outcome achieved
Considering the candidate’s proposed modification and;
the effectiveness of the solution in relation to the context given in the project brief
the extent the solution meets the requirements of the system technical specification.
the extend to which the evidence addresses the key requirements of the task
how ‘fit for purpose’ the modifications are
how ‘believable’ the solution is to meet client requirements.
the feasibility of the modifications presented, and the levels of amendments required.
AO5b – review how well the outcome meets the brief, how well the brief was met, the quality of the outcome in relation to the brief
The candidate’s
depth and detail of given within the notes on diagram(s),
evaluation and review of how the proposed modification meets the brief requirements and recognition of how these have been met.
consideration of how the preventative maintenance systems/routine maintenance programmes will minimise the risk of recurrence and future failure.</td><td>AOs (marks)

AO5a (3)

AO5b (3)</td><td>Total marks available

6</td></tr>
</table>

Grid 6: AO5a, AO5b Report (Realise outcome, review outcome)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Response partially addresses some of the task requirements. (AO5a) Justification and review do not clearly address how well the task outcome met the brief and lacks clarity and reasoning in places. (AO5b)		Response addresses most aspects of the task requirements. (AO5a) Justification and review address how well the task outcome was achieved. (AO5b)		Response fully addresses all aspects of all elements of the task requirements. (AO5a) Justification and review are comprehensive and specifically addresses how well the task outcome was achieved. (AO5b)	

3. Plan

<table>
<tr><th colspan="4">Grid 7: AO1, AO3 Plan (Planned approach, selecting techniques)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
A planning chart of work including purchasing of the parts and component(s), the order of installation and setting up of parts and components, isolation and drainage requirements, the tools required for the installation, commissioning/testing and calibrations on site, duration and sequence of the project including a critical path, who will be involved with each process and resources required.
A supporting statement including job roles and responsibilities, health and safety, environmental factors, cost considerations and implications.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief.
The candidate’s
consideration of how the plan is presented and structured.
consideration of dependencies between the different activities, clarity and accuracy of connections.
use of a key, colour coding or clear indication of tasks allocations durations etc – annotations or description of how to interpret as appropriate (legend or key included).
AO3 – Select relevant techniques and resources to meet the brief.
The candidate’s
judgements in the sequencing of the activities, level of reasoning provided.
judgements in the selection of the resources that will be required to install the modifications.
use of technical terminology with the supporting statement, its consistency and appropriateness.</td><td>AOs (marks)

AO1 (3)

AO3 (3)</td><td>Total marks available

6</td></tr>
</table>

Grid 7: AO1, AO3 Plan (Planned approach, selecting techniques)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Limited approach to planning, response contains evidence of some of the required elements. (AO1) There is limited justification for the selection of resources (e.g., equipment, tools), safety considerations etc. The choices made are not always the most effective or appropriate for the project brief. (AO3)		Response contains required elements in logical order with consideration of those involved and layout. (AO1) Sequencing of activity and/or resources (e.g. equipment, tools), methods, and materials selected from those available to respond to the brief requirements with justification. The choices made are mostly accurate and appropriate for the project brief. (AO3)		Logical and clear approach used with evidence of a detailed plan and methodology in line with standard engineering industry practices / best practice and effective prioritisation. (AO1) There is a detailed and justified approach to the proposed resources (e.g. equipment, tools), sequence of activities, safety considerations etc. The choices made are accurate and appropriate for the project brief. (AO3)	

<table>
<tr><th colspan="4">Grid 8: AO2a Plan (Core Knowledge)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
A planning chart of work including purchasing of the parts and component(s), the order of installation and setting up of parts and components, isolation and drainage requirements, the tools required for the installation, commissioning/testing and calibrations on site, duration and sequence of the project including a critical path, who will be involved with each process and resources required.
A supporting statement including job roles and responsibilities, health and safety, environmental factors, cost considerations and implications.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2a – Apply core knowledge
The candidate’s
assumptions made relating to the installation of the modification, the fullness of their explanation in the supporting statement, their validity and alignment to accepted best practice in industry.
use of industry recognised terminology
knowledge of different type formats for planning charts to display the plan i.e. use of a Gantt chart
knowledge of installation processes evidence through the activities identified, selection of resources, sequencing, and duration of activities.
consideration of costing and lead-time for purchasing where costs may increase or savings could be made, similar examples of costings and associated risks.
understanding of testing/commissioning procedures through consideration of calibration time, sequencing and allocated resource
consideration of health and safety and environmental considerations linked to the use of tools, live systems etc for each component.
calculations, including consideration of cost, tolerances, flowrates and specifications.</td><td>AOs (marks)

AO2a (6)</td><td>Total marks available

6</td></tr>
</table>

Grid 8: AO2a Plan (Core Knowledge)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Some elements of core knowledge referenced within plan - limited comprehension of knowledge in relation to brief requirements. (AO2a) Supporting information details some links to the application of core knowledge to support judgements, but connections are not always clear and accurate. (AO2a)		Elements of core knowledge directly highlighted in brief referenced within plan – knowledge evidenced may have gaps or show some misunderstanding. (AO2a) Supporting information details links to the application of core knowledge to justify and support judgements, but with some gaps or inaccuracies. (AO2a)		Knowledge from across the core applied and evident in plan in relation to different elements of project brief. (AO2a) Connections between elements of core knowledge fully explained within the supporting information to strengthen arguments and demonstrate understanding. (AO2a)	

<table>
<tr><th colspan="4">Grid 9: AO2b Plan (Core skills)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
A planning chart of work including purchasing of the parts and component(s), the order of installation and setting up of parts and components, isolation and drainage requirements, the tools required for the installation, commissioning/testing and calibrations on site, duration and sequence of the project including a critical path, who will be involved with each process and resources required.
A supporting statement including job roles and responsibilities, health and safety, environmental factors, cost considerations and implications.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2b – Application of core skills
Core skills (definitions of each skill can be found in the Assessment Objective table at the front of this marking scheme):
Analysing and interpreting
Planning and preparation
Developing responses
Evaluating and quality assuring
Communication and presentation.
The candidate’s:
professionalism of the presentation of the planning chart and to what extent it is conveyed using industry standard notation and features.
use of recognised methods of presentation for the programme (e.g., Gantt Chart) and comprehensiveness of completion (e.g., tasks, milestones, resources, and identification of critical path).
coverage of the activities required to complete the installation of the modifications and how comprehensive this is.
structure, logic and coherence of the supporting statement and coverage of the required considerations.</td><td>AOs (marks)

AO2b (6)</td><td>Total marks available

6</td></tr>
</table>

Grid 9: AO2b Plan (Core skills)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Some elements of each core skill applied - limited application of skills in practice in relation to brief requirements. (AO2b)		Elements of all core skills directly highlighted in brief used efficiently and consistency throughout. (AO2b)		All aspects of all core skills applied effectively throughout plan creation with clear focus on required outcomes and linking of skills to task elements is fully considered. (AO2b)	

4. Present

<table>
<tr><th colspan="4">Grid 10: AO1, AO3 Present (Planned approach, selecting techniques)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Video recording of presentation
Presentation materials (slides, handouts, notes etc)
Presentation Q&A Record (if this cannot be heard on the video)
The presentation should cover: findings for the possible causes of the intermittent fault, modifications and components selected with justification, how the new component functions will meet the client's requirements and improves the existing system, system commissioning, health and safety considerations for testing and calibration, preventative and routine maintenance schedule, proposed costings, challenges presented by the brief and how these have been overcome, how well the proposal addresses the requirements of the brief.

Audience: Representative from the client with a non-technical engineering background.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief
The candidate's
logic and order of the presentation (e.g., containing an introduction to themselves, an introduction to what will be covered within the presentation, a conclusion, and an invitation to ask questions from the audience).
AO3 – Select relevant techniques and resources to meet the brief
The candidate's
selection and application of techniques for delivering the presentation, how appropriate and effective they are (e.g., use of slide deck, reference to notes, provision of handouts, use of other reference material).
use of positive non-verbal communication during delivery (e.g., maintaining eye contact with the audience) and the clarity of speaking/delivery, and the level of which distraction behaviour is displayed (e.g. rocking, tapping, pausing).</td><td>AOs (marks)

AO1 (3)

AO3 (3)</td><td>Total marks available

6</td></tr>
</table>

Grid 10: AO1, AO3 Present (Planned approach, selecting techniques)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
The presentation lacks structure and does not always follow a logical approach due to ineffective planning. (AO1) Technique used to deliver the presentation is sometimes effective. However technical information is not always complete and accurate. (AO3)		The presentation is structured and follows a logical approach in response to the task with evidence of planning. (AO1) Techniques used to deliver the presentation are mostly effective. The technical information provided is accurate most of the time with valid reasoning. (AO3)		The presentation is organised, structured and logical in its approach. It is clear that the presentation content has been considered in terms of its audience. (AO1) Techniques used to deliver the presentation are effective with well justified reasoning behind the information provided. Technical information is fully accurate and reasoned. (AO3)	

<table>
<tr><th colspan="4">Grid 11: AO2a Present (Core Knowledge)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Video recording of presentation
Presentation materials (slides, handouts, notes etc)
Presentation Q&A Record (if this cannot be heard on the video)
The presentation should cover: findings for the possible causes of the intermittent fault, modifications and components selected with justification, how the new component functions will meet the client's requirements and improves the existing system, system commissioning, health and safety considerations for testing and calibration, preventative and routine maintenance schedule, proposed costings, challenges presented by the brief and how these have been overcome, how well the proposal addresses the requirements of the brief.

Audience: Representative from the client with a non-technical engineering background.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2a – Apply core knowledge
The candidate's
judgements in the preparation of the presentation, how well they are reasoned and cover the key features of the task requirements.
interpretation and definition of the challenges posed within the brief and explanation of how these have been overcome by the proposed modifications presented.
coverage of technology, components selected with relevant and considered justifications.
application of core knowledge when responding to the requirements of the task.
recommendations for installation, sourcing, commissioning and calibration of the system, including preventative and routine maintenance.
confidence and accuracy when responding to question from the client (tutor/assessor)
use of technical language (with consideration of a non-technical audience)
understanding of the factors influencing the task outcome.</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO2a (6)</td><td>6</td></tr>
</table>

Grid 11: AO2a Present (Core Knowledge)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Engineering concepts relating to the core knowledge conveyed through the presentation - these may not always be accurate or be directly linked to the brief requirements. (AO2a) Terminology used may have inaccuracies and content provided may include inconsistencies and not clear to the target audience. (AO2a)		Engineering concepts relating to the core knowledge are coherent throughout the presentation to meet the requirements of the brief set. (AO2a) Terminology used is mostly accurate with minor errors. The content provided is mostly correct but does not always consider the target audience / may be imbalanced or biased (e.g., to either technical or non-technical focus). (AO2a)		Engineering concepts relating to the core knowledge are coherent with clear justifications on how these are applied in response to the brief requirements. (AO2a) Terminology used is accurate and error free. The content provided is clear and easily understood by the target audience, with no bias in tone / imbalance across audience type (where appropriate). (AO2a)	

<table>
<tr><th colspan="4">Grid 12: AO2b Present (Core skills)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Video recording of presentation
Presentation materials (slides, handouts, notes etc)
Presentation Q&A Record (if this cannot be heard on the video)
The presentation should cover: findings for the possible causes of the intermittent fault, modifications and components selected with justification, how the new component functions will meet the client’s requirements and improves the existing system, system commissioning, health and safety considerations for testing and calibration, preventative and routine maintenance schedule, proposed costings, challenges presented by the brief and how these have been overcome, how well the proposal addresses the requirements of the brief.

Audience: Representative from the client with a non-technical engineering background.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO2b – Application of core skills
Core skills (definitions of each skill can be found in the Assessment Objective table at the front of this marking scheme):
Analysing and interpreting
Planning and preparation
Developing responses
Evaluating and quality assuring
Communication and presentation.
The candidate’s:
effectiveness in communicating modification of the system and their considerations – including fluency, clarity and conciseness.
professionalism of presentation resources (slides/presentation methods.)
clarity and size of images and figures, inclusion of labels, font size.
use of digital features to enhance the quality of the presentation.</td><td>AOs (marks)

AO2b (6)</td><td>Total marks available

6</td></tr>
</table>

Grid 12: AO2b Present (Core skills)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Communication of engineering concepts is sometimes effective. The delivery of technical information may lack accuracy and clarity for the audience. (AO2b)		Engineering concepts are communicated effectively most of the time in an appropriate manner for the target audience. There are minor inaccuracies in the delivery of information which causes a lack of clarity in some instances. (AO2b)		Highly effective communication of engineering concepts is appropriate for the target audience. Technical information is presented accurately and delivered with clarity. (AO2b)	

<table>
<tr><th colspan="4">Grid 13: AO5a, AO5b Present (Realise outcome, review outcome)</th></tr>
<tr><td>Guidance for markers</td><td colspan="3">Only the following evidence must be used to assess performance against this marking grid:
Video recording of presentation
Presentation materials (slides, handouts, notes etc)
Presentation Q&A Record (if this cannot be heard on the video)
The presentation should cover: findings for the possible causes of the intermittent fault, modifications and components selected with justification, how the new component functions will meet the client's requirements and improves the existing system, system commissioning, health and safety considerations for testing and calibration, preventative and routine maintenance schedule, proposed costings, challenges presented by the brief and how these have been overcome, how well the proposal addresses the requirements of the brief.

Audience: Representative from the client with a non-technical engineering background.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO5a - realise a project outcome – was the right outcome achieved
The candidate's
effectiveness in evaluating the challenges presented by the brief and how these have been overcome.
identification of which areas of the brief were/were not satisfied.
reflections on additional aspects of research/modification process they could have done, any rework that would improve / enhance a future project outcome.
AO5b – review how well the outcome meets the brief, how well the brief was met, the quality of the outcome in relation to the brief
The candidate's
clarity within their evaluation and review of the challenges presented in the brief, and indications within the presentation on how these have been overcome.
clarity of explanation of how the proposed modifications address the requirements of the brief, including any featured considered by the candidate to be improved.
evaluation on ideas relating to how earlier tasks could be built on and indications of reasons why this has happened.</td><td>AOs (marks)

AO5a (3)

AO5b (3)</td><td>Total marks available

6</td></tr>
</table>

Grid 13: AO5a, AO5b Present (Realise outcome, review outcome)					
Marking descriptors – All versions 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**	
1	**2**	**3**	**4**	**5**	**6**
Project outcome as a whole partially addresses some of the brief requirements. Articulates some challenges encountered. (AO5a) No or minimal reasons and justification in how effectively the brief was met across project tasks. (AO5b)		Project outcome as a whole address all aspects of the brief requirements. Articulates all challenges encountered and attempts to overcome them. (AO5a) There is reason and justification in how effectively some areas of the brief were met across project tasks. (AO5b)		Project outcome as a whole fully addresses all aspects of the brief requirements and considers alternative options where appropriate. Articulates fully all challenges encountered and comprehensively covers how they were overcome. (AO5a) Detailed reasoning behind how successfully the project brief was met across project tasks. (AO5b)	

Maths, English and Digital skills (AO4)

<table>
<tr><th colspan="5">Grid 14: AO4a (Maths)</th></tr>
<tr><td>Guidance for markers</td><td colspan="4">Only the following evidence must be used to assess performance against this marking grid:
Technical Brief - calculations relating to costings (and consideration of estimations), flowrates, set points, operating parameters, and calibration requirements (Task 1)
Calculations related to installation requirements within the Report (Task 2)
Scaling and dimensions on diagrams (Task 2)
Calculation of timescales and critical path within the planning chart (Task 3)
Any calculations within the supporting statement (Task 3)</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td colspan="2" rowspan="2">The candidate’s:
use of appropriate mathematics in relation to installation considerations as part of system design and reporting
calculation considerations of the flowrates and suitability of existing components.
clarity and accuracy in calculation of electrical and mechanical components ratings/operating parameters and conversions.
accuracy in calculation of budgets, timings and critical path analysis as part of completion of planning.</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO4a (3)</td><td>3</td></tr>
<tr><td colspan="5">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
<tr><td colspan="2">Band 1 descriptor</td><td>Band 2 descriptor</td><td colspan="2">Band 3 descriptor</td></tr>
<tr><td colspan="2">1</td><td>2</td><td colspan="2">3</td></tr>
<tr><td colspan="2">Limited mathematical concepts and calculations applied. (AO4a)</td><td>A range of mathematical concepts and calculations shown and applied appropriately. (AO4a)</td><td colspan="2">Mathematical approaches and concepts applied fully and consistently. (AO4a)</td></tr>
</table>

Grid 14: AO4a (Maths)		
Workings or techniques omitted as part of calculations, assumptions lack detail and full definition. Workings shown but calculation errors made / inaccurate execution. (AO4a)	Working contains inaccuracies or could be more efficient (i.e., expressed in shorthand). Workings inconsistently shown. (AO4a)	Calculations presented accurately and in correct format, workings shown and evidence of checking to ensure correct results (e.g., estimation workings, reverse calculation checks). (AO4a)

Grid 15: AO4b (English)			
Guidance for markers	**Only** the following evidence must be used to assess performance against this marking grid: • Technical brief and any supporting notes (Task 1) • Report (Task 2) • Supporting statement for the plan of work (Task 3) • Presentation delivery (orally) and materials to support presentation (e.g. slides etc) (Task 4)		
Indicative Content (Summer 2023)	The candidate's: • use of appropriate and accurate English • clarity and articulateness of use of English to present information and ideas • accuracy of grammar, spelling and punctuation • use of terminology, which is technical and consistent with the intended audience (people from non-technical background) • confidence in the use of language during verbal presentations, level of articulation and clarity in the delivery of information to summarise information/ideas.	**AOs (marks)** **AO4b (3)**	**Total marks available** **3**

Marking descriptors – All versions 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**
1	**2**	**3**
Evidence within task responses lacks structure where outcome is partially understandable. Communication style is generally appropriate to the outcome but has some inconsistencies across tasks. (AO4b) Meaning is clear, but the language is not always fluent. Grammar and/or spelling contain	Evidence within task responses uses conventional structure which is understandable. Communication style is appropriate to the outcome across most tasks. (AO4b) Meaning is clear, language is fluent, although the response may contain colloquialisms or	Evidence within task responses uses a structure which makes it easy to fully understand. Communication style is appropriate to the outcome across all tasks. (AO4b) Meaning is clear, language is fluent and consistent across tasks. Grammar and spelling are consistently accurate across tasks.

Grid 15: AO4b (English)		
errors or inconsistencies. Audibility of oral presentation is inconsistent. (AO4b)	jargon etc. Grammar and spelling are mainly accurate. Audibility of oral presentation is good. (AO4b)	Deploys a range of grammatical constructions. Audibility of oral presentation is excellent. (AO4b)

Grid 16: AO4c (Digital)			
Guidance for markers	**Only** the following evidence must be used to assess performance against this marking grid: • Types of sources used for Research (Task 1) • Presentation of the planning chart (Task 3) • Presentation materials (slides, handouts, notes etc) (Task 4)		
Indicative Content (Summer 2023)	The candidate's: • selection of digital resources and the effective of the resource in meeting task requirements • application of features available within digital resources (e.g. formatting, layout, presentation modes, animations / transitions in presentation, application of software package features). • selection and use of software to support delivery of the presentation. • use of a range of digital options used across tasks, the extent to which they have been used to add value and their effectiveness of use. • use of current digital techniques, resources, and sources in adherence with industry practice, convention, and trends.	**AOs (marks)** **AO4c (3)**	**Total marks available** **3**

Marking descriptors – All versions

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
1	**2**	**3**
Digital technology attempted as part of task responses. (AO4c)	Consideration and use of basic digital options/features to strengthen task responses throughout project across tasks. (AO4c)	Digital options applied effectively in line with industry practices/ best practice, demonstrating use of range of technology features. Digital techniques used effectively to add value to task responses. (AO4c)

Get in touch

City & Guilds Technicals Quality Team

We are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

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