T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Design and Development for Engineering and Manufacturing

Employer-Set Project (8730-035)

Summer 2023 Marking Grid

City & Guilds | eal

Contents

Contents 1
General marking approach 2
Assessment objectives 4
Employer-Set Project mark distribution 5
1. Research 6
2. Design 10
3. Plan 18
4. Present 24
Maths, English and Digital skills 32

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 recorded and the band descriptors. Evidence contained on 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; ie all characteristics described by the band descriptor are seen or it strongly meet 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
    - Maker 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 (e.g., 1.1, 1.2 etc. 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 materials 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, ie, 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 material 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) **Planning and preparation** e.g., interpret and confirm project requirements; plan and scope project (e.g., timescales, requirements, resources, cost); develop project plans. ii) **Communication** e.g., interpret, use and produce engineering representations and drawings (including graphical language/conventions), interpret and use relevant technical information in a range of formats and media, communicate appropriately with technical and non-technical audiences (using appropriate technology, as appropriate). iii) **Develop and manufacture** e.g., design or devise a proposal to meet the brief, develop, model and revise concept/s. iv) **Evaluation** e.g., carry out appropriate tests, evaluation and analysis (at relevant stages), confirm appropriate model for final realisation, testing for suitability, evaluate how well the final product meets the brief (e.g., quality, time, resources, cost).
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 the brief was 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. Design	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% (ie 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 including opening and closing mechanisms for the lock gates, technologies for the automation and remote monitoring of the lock gates, materials that can be used for key components of the gates such as hinges and seals, references/sources
Any supporting documentation such as research notes</td></tr>
<tr><td>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.
consideration of the different aspects of the task specifically:
sustainable material and component options,
automated drive mechanism,
hinge and seal details,
remote monitoring system and manual call point,
preventative measures for protection against boat collision.
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 lock gate product design specification.
selection and definition of the properties of a sustainable material for the key components of the lock gate including the hinges and seals, consideration of routine operational maintenance needs.
determination of an automated drive mechanism for the lock gate and method of remote monitoring during opening and closing operations.</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)			
	• consideration of the functionality of the lock gate and any further developed guidance on the overall shape and material finish. **AO3 – Select relevant techniques and resources to meet the brief** The candidate's: • selection of sustainable materials and component options, automated drive mechanism, hinge and seal details, remote monitoring systems, and boat collision protection measure solutions for the lock gate. • clarity of these solutions and how closely and clearly they are derived from industry guidance and manufacturer proprietary literature related to the contexts of the brief. • clarity of references to sources of guidance and industry standards in the technical brief.		

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)			Approach to research and collation of information shows planning and consistency. (AO1)			Brief requirements are considered consistently throughout the research and information collation – clear evidence of methodical and thorough approach to research and information gathering. (AO1)		
Some elements of core knowledge referenced but focus may be imbalanced and more focused on one area than another. (AO2a)			The application of core knowledge is referenced consistently for example in relation to technology, selection of materials and development of initial ideas. (AO2a)			Core knowledge applied in all areas of the brief requirements including - technology, construction materials, and idea summation. (AO2a)		
Research techniques and resources detailed as part of evidence submission. (AO3)			Evidence of a range of techniques and resources used and referenced, with different source types considered. (AO3)			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 including opening and closing mechanisms for the lock gates, technologies for the automation and remote monitoring of the lock gates, materials that can be used for key components of the gates such as hinges and seals, references/sources
Any supporting documentation such as research notes</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):
Planning and preparation
Communication
Developing proposals and concepts
Evaluation.
The candidate’s:
demonstration of judgement and reasoning in relation to the refinement of the product design specification.
level of synergy of initial ideas for the lock gate into a written evaluation covering, the functionality, sustainable materials, automated drive mechanism and monitoring systems, method of preventing boat collision, approach to limit routine maintenance and hinge and lock gate seal details.
effectiveness of communication of refined technical requirements for the lock gate- 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.</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO2b (6)</td><td>6</td></tr>
<tr><td colspan="4">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
<tr><td>Band 1 descriptor</td><td>Band 2 descriptor</td><td colspan="2">Band 3 descriptor</td></tr>
</table>

Grid 2: AO2b Research (Core Skills)					
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. Design

<table>
<tr><th colspan="4">Grid 3: AO1, AO3 Design (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:
Annotated sketches of at least two potential designs which illustrate gate hinges, seals and opening/closing mechanism,materials from which the lock gate is to be constructed, remote surveillance details, gate shape, material finishes and aesthetic features, full dimensions, preventative measures to decrease the risk of a boat colliding, the sustainable features of key lock gate components.
Hydrostatic pressure calculations which determining the hydrostatic pressure the lock gate should be designed to resist.
Notes on how the potential designs meet the brief requirements.
Dimensioned and scaled CAD drawing(s) of preferred chosen lock gate design.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief
The candidate’s
layout of sketches and CAD drawing(s) for the lock gate, into plans, elevations, sections and details.
coverage of the requested elements of the task i.e. sketches and CAD drawing(s) including the request elements of the task, specifically:
gate hinges, seals and opening mechanism
materials from which the lock gate is to be constructed
remote monitoring details
gate shape, material finish and functionality
full dimensions
preventative measures to decrease the risk of a boat colliding
the sustainable features of lock gate components
coherence of structure and clarity of assumptions in relation to the hydrostatic pressure calculations
AO3 – Select relevant techniques and resources to meet the brief
The candidate’s
presentation of sketches and CAD drawings, adherence to convention and annotations, clarity, quality and accuracy.</td><td>AOs (marks)

AO1 (3)

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

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

<table>
<tr><th colspan="6">Grid 3: AO1, AO3 Design (Planned approach, selecting techniques)</th></tr>
<tr><td></td><td colspan="3">use of a drawing frame for drawings, and inclusion of titling block.
Consideration of industry practices and use of adopted scale when creating the sketches and drawings.
presentation and format of calculations for the hydrostatic pressure at the base of the gate e.g. use of engineering calculation sheets; including a column for references (from design standards) and results.</td><td></td><td></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><th colspan="2">Band 1 descriptor</th><th colspan="2">Band 2 descriptor</th><th colspan="2">Band 3 descriptor</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr>
<tr><td colspan="2">Some evidence of a planned approach to design task, response may lack detail and calculation information. (AO1)

Some relevant techniques used in the preparation and presentation of drawings/sketches and associated calculations. (AO3)</td><td colspan="2">Approach to design and calculations information is planned, organised and complete. (AO1)

Relevant techniques and industry drawing conventions used throughout the preparation and presentation of drawings/sketches and associated calculations. (AO3)</td><td colspan="2">Approach to design and calculations fully comprehensive and in line with standard industry practices / best practice (AO1)

Preparation and presentation of drawings/sketches and associated calculations is fully in line with industry drawing conventions showing the use of all correct techniques. (AO3)</td></tr>
</table>

<table>
<tr><th colspan="6">Grid 4: AO2a Design (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:
Annotated sketches of at least two potential designs which illustrate gate hinges, seals and opening/closing mechanism,materials from which the lock gate is to be constructed, remote surveillance details, gate shape, material finishes and aesthetic features, full dimensions, preventative measures to decrease the risk of a boat colliding, the sustainable features of key lock gate components.
Hydrostatic pressure calculations which determining the hydrostatic pressure the lock gate should be designed to resist.
Notes on how the potential designs meet the brief requirements.
Dimensioned and scaled CAD drawing(s) of preferred chosen lock gate design.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td colspan="3" rowspan="2">AO2a – Apply core knowledge
The candidate’s
choice of language used in any text on the sketches and CAD drawings, its technical levels and consistency with the intended audience.
proposed solutions for the design of the lock gate, how well they meet industry guidance, have the potential to be implemented and their technical sense.
approach to determining hydrostatic pressure calculations, selected method used to determine this and level of consideration of safety factors.</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)</td><td colspan="2">Knowledge from across the core applied and evident in relation to different elements of project brief. (AO2a)</td><td colspan="2">Core knowledge applied consistently throughout response with minimal technical inaccuracies. (AO2a)</td></tr>
</table>

Grid 4: AO2a Design (Core Knowledge)		
Some links to the application of core knowledge to support judgements, but connections are not always clear and accurate. (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)	Connections between elements of core knowledge exploited to strengthen arguments and demonstrate understanding. (AO2a)

<table>
<tr><th colspan="4">Grid 5: AO2b Design (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:
Annotated sketches of at least two potential designs which illustrate gate hinges, seals and opening/closing mechanism,materials from which the lock gate is to be constructed, remote surveillance details, gate shape, material finishes and aesthetic features, full dimensions, preventative measures to decrease the risk of a boat colliding, the sustainable features of key lock gate components.
Hydrostatic pressure calculations which determining the hydrostatic pressure the lock gate should be designed to resist.
Notes on how the potential designs meet the brief requirements.
Dimensioned and scaled CAD drawing(s) of preferred chosen lock gate design.</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):
Planning and preparation
Communication
Developing proposals and concepts
Evaluation.
The candidate’s:
demonstration of judgement and reasoning in relation to the preparation of the solution, considering the original product design specification for the lock gate.
selection of shape, material finish, functionality, key components and preventative collision measures for the lock gate.
incorporation of the required aspects in the design- use of logical and synergised approach.
use of proportion within sketches for the lock gate, use of dimension and annotations on CAD drawings.
effectiveness in communicating idea/information through sketches, CAD drawings and associated annotations so the key features of the lock gate can be interpreted (i.e. materials from which the lock gate is to be constructed and technology that is to be used for monitoring, automated lock gate opening drive mechanism and call point system.)</td><td>AOs (marks)

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

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

Grid 5: AO2b Design (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) Design has limited logic and shows superficial coherence between different aspects of the brief. Representations lack proportionally, dimension, and annotation. (AO2b)		A range of core skills applied and evident in task response in relation to different elements of project brief. (AO2b) Design is logical and shows some coherence between different aspects of the brief. Representations are mostly proportional and correctly dimensioned with significant annotation. (AO2b)		Core skills applied consistently throughout task completion with - full range of core skills evidenced. (AO2b) Design is logical and demonstrates detailed coherence between different aspects of the design brief. Representations are proportional, have detailed dimensions and annotation. (AO2b)	

<table>
<tr><th colspan="4">Grid 6: AO5a, AO5b Design (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:
Annotated sketches of at least two potential designs which illustrate gate hinges, seals and opening/closing mechanism,materials from which the lock gate is to be constructed, remote surveillance details, gate shape, material finishes and aesthetic features, full dimensions, preventative measures to decrease the risk of a boat colliding, the sustainable features of key lock gate components.
Hydrostatic pressure calculations which determining the hydrostatic pressure the lock gate should be designed to resist.
Notes on how the potential designs meet the brief requirements.
Dimensioned and scaled CAD drawing(s) of preferred chosen lock gate design.</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 preferred chosen lock gate design 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 product design specification.
how ‘fit for purpose’ the lock gate design is
how ‘believable’ the solution is to meet client requirements.
the feasibility of the lock gate solution 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
evaluation and review of requirements of the product design specification and recognition of how these have been met with proposed lock gate design.
Development of ideas from two potential solutions to one final solution, rationale for the selection of a lock gate design option from the prepared sketches, clarity on which has been taken forward and drawn up as a fully annotated and dimensioned CAD drawings.
evaluation of how the final lock gate design has met the client requirements given in the product design specification.
development of ideas throughout the task, refining, improving and building upon potential solutions as they progress.</td><td>AOs (marks)

AO5a (3)

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

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

Grid 6: AO5a, AO5b Design (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**
Task response partially addresses some of the task requirements. (AO5a) Evaluation and review do not clearly address how well the task outcome met the brief and lacks clarity and reasoning in places. (AO5b)		Task response addresses all aspects of the task requirements. (AO5a) Evaluation and review address how well the task outcome was achieved. (AO5b)		Task response fully addresses all aspects of all elements of the task requirements. (AO5a) Evaluation 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:
Programme of work detailing the stages and considerations (technology and resources needed to install the gates, duration and sequence of activities, identification of critical path) required to complete the design, development and installation of the final lock gate design.
A supporting statement which considers health and safety (including risk assessment requirements), relevant standards, specialist equipment, waste management and environmental considerations and any assumptions relating to resources.</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td>AO1 – Plan their approach to meeting the project brief
The candidate’s
planning of activities (e.g., installation of the gate hinges, lifting of the dock door into position), and the sequence presented.
adherence to the constraints set within the brief (52 weeks, rate of one lock gate system per four weeks). The achievability and realism of their plan.
consideration of dependences between the different activities, clarity and accuracy of connections.
AO3 – Select relevant techniques and resources to meet the brief
The candidate’s
choice of resources and installation methods.
judgements and justification of in the selection of the resources that will be required to design, develop and install the lock gate.
use of technical terminology with the supporting statement, its consistency and appropriateness.
consideration of techniques deployed to minimise waste, and use of the selected resources, and clarity and depth of justifications provided within the supporting statement.</td><td>AOs (marks)

AO1 (3)

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

6</td></tr>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 7: AO1, AO3 Plan (Planned approach, selecting techniques)					
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 techniques, resources (e.g., equipment, contractors), methods, and materials (including disposal) to be used. The choices made are not always the most effective or appropriate for the prescribed project brief. (AO3)		Response contains required elements in logical order with consideration of deadline and layout. (AO1) Techniques and/or resources (e.g., equipment, contractors), methods, and materials (including disposal) selected from those available to respond to the brief requirements. The choices made are mostly accurate and appropriate for the prescribed 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 selection of resources (e.g., equipment, contractors), methods and materials (including disposal). The choices made are accurate and appropriate for the prescribed 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:
Programme of work detailing the stages and considerations (technology and resources needed to install the gates, duration and sequence of activities, identification of critical path) required to complete the design, development and installation of the final lock gate design.
A supporting statement which considers health and safety (including risk assessment requirements), relevant standards, specialist equipment, waste management and environmental considerations and any assumptions relating to resources.</td></tr>
<tr><td>Indicative Content

(Summer 2023)</td><td>AO2a – Apply core knowledge
The candidate’s
choice of language used its technical level and consistency with the intended audience (supervisor).
assumptions made relating to the installation of the lock gate, the fullness of their explanation in the supporting statement, their validity and alignment to accepted best practice in industry.
level of detail within explanation of the approach taken to installation
level of detail of current health and safety requirements that should be considered during the installation process.
consideration of relevant regulations, for example the influence of LOLER and PUWER regulations on crane operations.
consideration and selection of specialist equipment
consideration and level of knowledge relating to waste management and environment factors
breadth and depth of assumptions made in relation to the installation from across the core content</td><td>AOs (marks)

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

6</td></tr>
<tr><td colspan="4">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 8: AO2a Plan (Core Knowledge)					
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:
Programme of work detailing the stages and considerations (technology and resources needed to install the gates, duration and sequence of activities, identification of critical path) required to complete the design, development and installation of the final lock gate design.
A supporting statement which considers health and safety (including risk assessment requirements), relevant standards, specialist equipment, waste management and environmental considerations and any assumptions relating to resources.</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):
Planning and preparation
Communication
Developing proposals and concepts
Evaluation.
The candidate’s:
professionalism of the presentation of the programme of works 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 design, development, and installation of the lock gate 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>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 9: AO2b Plan (Core skills)					
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 most 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 to 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: the key features of the chosen lock gate design, the installation plan, challenges present by the brief and how these were overcome, how well the design meets the brief.

Audience: Presentative of the client, a mixture of both technical and non-technical backgrounds.</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, order and coherence, 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>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 10: AO1, AO3 Present (Planned approach, selecting techniques)					
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 of 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. (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: the key features of the chosen lock gate design, the installation plan, challenges present by the brief and how these were overcome, how well the design meets the brief.

Audience: Presentative of the client, a mixture of both technical and non-technical backgrounds.</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 lock gate design, development and the proposed approach to installation of the gate.
interpretation of the challenges within the Canal Heritage’s design brief and explanations as to how these have been overcome in the design of the gate presented.
coverage of details of the purpose and function of the sensors and surveillance technology deployed to monitor the operation of the lock gate.
explanation on the functionality features of the lock gate.
explanation of the approach taken to protect the gate from boat collision and explanation of the magnitude of the hydrostatic pressure the lock gate can resist, and explanation of how this was assessed.
confidence and accuracy when responding to question from the client (tutor/assessor)
use of technical language (with consideration of both technical and non-technical audience)
understanding of the factors influencing the key components of the lock gate.</td><td>AOs (marks)

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

6</td></tr>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 11: AO2a Present (Core Knowledge)					
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 targeted 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 in the most correct but does not always consider 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 requirement. (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: the key features of the chosen lock gate design, the installation plan, challenges present by the brief and how these were overcome, how well the design meets the brief.

Audience: Presentative of the client, a mixture of both technical and non-technical backgrounds.</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):
Planning and preparation
Communication
Developing proposals and concepts
Evaluation.
The candidate’s:
effectiveness in communicating the key features of the lock gate design – 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>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 12: AO2b Present (Core skills)					
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: the key features of the chosen lock gate design, the installation plan, challenges present by the brief and how these were overcome, how well the design meets the brief.

Audience: Presentative of the client, a mixture of both technical and non-technical backgrounds.</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/design process they could have done, any rework of 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 of the product design specification, and indications within the presentation on how these have been overcome.
clarity of explanation of how the final design addresses the requirements of the product design specification 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>
<tr><td colspan="3">Marking descriptors – All versions

Note: where there is insufficient evidence to award a mark, a zero mark may be given</td></tr>
</table>

Grid 13: AO5a, AO5b Present (Realise outcome, review outcome)					
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 the 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 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

<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:
Annotations on sketches (Task 2)
Dimensioning and scaling CAD drawing (Task 2)
Hydrostatic pressure calculations (Task 2)
Calculation of timescales and critical path within the Programme of work (Task 3)</td></tr>
<tr><td rowspan="2">Indicative Content

(Summer 2023)</td><td colspan="2" rowspan="2">The candidate’s:
use of numeracy to provide dimensioned sketches and scaled CAD drawing(s).
selection and use of mathematical methods to determine the hydrostatic pressure.
clarity and accuracy in the calculations for hydrostatic pressure calculation, determining duration of activities and critical path within programme of work.</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><th>Band 1 descriptor</th><th colspan="2">Band 2 descriptor</th><th colspan="2">Band 3 descriptor</th></tr>
<tr><td>1</td><td colspan="2">2</td><td colspan="2">3</td></tr>
<tr><td>Some mathematical concepts and calculations applied appropriately. (AO4a)

Workings or techniques omitted as part of calculations, assumptions lack detail and full definition. Workings shown but calculation errors made / inaccurate execution. (AO4a)</td><td colspan="2">A range of mathematical concepts and calculations applied. (AO4a)

Working contains inaccuracies or could be more efficient (i.e., expressed in shorthand). Workings inconsistently shown. (AO4a)</td><td colspan="2">Mathematical approaches and concepts applied fully and consistently. (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)</td></tr>
</table>

Grid 15: AO4b (English)			
Guidance for markers	**Only** the following evidence must be used to assess performance against this marking grid: • Technical brief (Task 1) • Notes detailing how the designs meet the brief requirement (Task 2) • Supporting statement for the programme 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 both technical and non-technical backgrounds) • 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 errors or inconsistencies. Audibility of oral presentation is inconsistent. (AO4b)	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 jargon etc. Grammar and spelling are mainly	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. Deploys a range of grammatical constructions.

Grid 15: AO4b (English)		
	accurate. Audibility of oral presentation is good. (AO4b)	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) • CAD Drawing (Task 2) • Presentation of the programme of work (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 CAD 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.

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

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