HM Government

T-LEVELS

T Level Technical Qualification in Engineering, Manufacturing, Processing and Control

Employer-Set Project (8730-034)

Marking Grid

(Autumn 2025)

Version 1.0

City & Guilds | eal

Version and date	Change detail	Section
1.0	Version used for marking	

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General marking approach

The following process details at high level the steps that will be undertaken by the external markers following the submission of candidate's submitted evidence.

Candidate evidence includes work produced by the candidate such as notes, reports, plans or drawings. As well as other generated evidence which demonstrates the candidate's performance such as the video of a presentation or notes of the Q&A session following the presentation. Only certain pieces of evidence should be considered for certain marking grids. The evidence which should be considered for a marking grid will be clearly outlined in the 'Guidance to markers' section.

Process

- Marker reviews the administrative paperwork for the candidate which includes;
    - Evidence checklist
        - **Has this form been completed fully?**
        - **Does it highlight any evidence which has not been uploaded?**
        - **Does the checklist align to the evidence available in the system?** – if no, make a note of this, mark the tasks which do have all evidence, Save, then flag as an Error making clear what is missing.
    - Declaration of Authenticity
        - **Has this been signed by the candidate and the provider?** – if no, make a note of this, mark the evidence, Save, then flag as an Error making clear that the DoA is not signed.
        - **Does it detail any support the candidate was given during the assessment which should be taken into consideration when marking?** – if yes, flag to supervisor and your assessment contact.

- Marker attempts to open/play all evidence files and checks the following:
    - Does the evidence contain a header form where the candidate details align to the candidate details in the marking platform?
    - Does all the evidence open/play?
    - Do the video files have clear sound?
      – if no, make a note of this, mark the tasks where evidence is available, Save, then flag as an Error making clear what is wrong.

- Marker begins 'marking' starting with the first marking grid and working through them in order.

- Marker must consider what the marking grid is trying to assess by:
    - noting what candidate evidence must be taken into consideration for this marking grid.
    - reading through the indicative content and familiarising themselves with the 'lens' they should be evaluating the candidates work through in relation to the prescribed assessment objective(s) the marking grid is assessing.
    - reading the band descriptors, noting how the descriptors differentiate performance between bands.

- Once familiar with the requirements of the marking grid the marker will:
    - scan/read the candidate's evidence that is relevant to that marking grid.
    - make an initial judgement on the level of performance the candidate has demonstrated taking all the relevant evidence for that grid into consideration.
    - allocate the marking band the candidate's performance best aligns to.

- Once the initial assessment is made, the marker needs to determine how well aligned the candidate's performance is to the band descriptor. The marker will:
    - review the relevant candidate evidence against the initially allocated band descriptor in more detail.
    - determine how well the candidate aligns to the band by placing them into one of the four levels of alignment detailed below:
        A. The candidate is **securely** in the band (i.e. meeting the band descriptor(s) fully).
        B. The candidate is **largely** meeting the band with most of the descriptor(s) met, but some may not be fully met.
        C. The candidate is **partially** meeting the band with some of the descriptor(s) met, but some may not be met.
        D. The candidate **does not align** to the descriptor(s) within the band.

- To help determine how well the candidate aligns to the band, the marker will consider the four levels of alignment in detail, taking into account:

    A. If the candidate's performance is **securely** in 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.) To confirm the correct band has been assigned the marker will also check the descriptor for the band 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.

    B. If the candidate's performance is **largely** meeting the band. To confirm the correct band has been assigned the marker will:
        - check the descriptor for the band above
        - check the descriptor for the band below

    If there are only a few concerns with the initially allocated band, and the performance is not showing characteristics aligning with the higher or lower bands, the appropriate mark is likely to be in the middle range.

    C. If the candidate's performance is **partially** meeting the band. To confirm the correct band has been assigned the marker will:
        - check the descriptor of the level below.
        - decide on a suitable mark either:
            - at the bottom of the initial band as some characteristics shown, or
            - at the top of the lower band if it better describes the quality of performance being shown.

    D. If there is no alignment with the descriptor, the marker will reassess the starting band and begin again.

- Once the appropriate band has been identified, where the band covers a range of marks, the marker will determine a final mark awarded from that band. Marks are evenly distributed across the bands.
    - if the quality of candidate performance fully aligns with 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.

To support this decision, the marker will consider the quality of a range of similar responses (eg responses reviewed during standardisation, or experience as they move through candidate's scripts) 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.

Follow-through errors

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.

Evidence should be considered within the constraints of the relevant marking grid, focusing on the knowledge and skills to be demonstrated as outlined in the indicative content. For example, if the candidate does not research suitable options in Task 1, when they get to 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 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 (eg 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** - Apply engineering and manufacturing processes to achieve specific objectives and to produce quality outcomes, using relevant techniques and technology, within limits of own authority iv) **Evaluating and quality assuring** - Carry out investigations, generate proposals and options, identify standard components and systems at relevant stages to gather and evaluate relevant evidence and data, and to confirm the suitability of plans, 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 (eg diagrams, physical and digital records, presentations)
AO3	Select relevant techniques and resources to meet the brief

AO Ref	Assessment Objective
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	0	0	18				
3. Design	3	6	6	3	3	3	24				
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:
• Research notes which should include a list of sources/references.</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO1 – Plan their approach to meeting the project brief
The candidate's:
• structure of the research notes and analysis.
• exploration of the requirements and the issues outlined in the task, and how consistent/balanced the consideration of each of these are in comparison to each other.

AO2a – Apply core knowledge
The candidate's:
• confidence and appropriateness of use of terminology.
• accuracy of the research notes in relation to sources.
• refinement of their approach to the problem in relation to the brief given.
• selection and definition of key aspects of the task in relation to:
○ the different types of sensors that can be used to:
▪ detect if a slot is empty or has an egg in it
▪ provide a signal when an egg needs to be inserted into an empty slot
▪ confirm all eggs are in the carton correctly so the lid can shut.
○ where the sensors need to be located in relation to the eggs / production line
○ the costs of the sensors and mounting fixtures that will be used
○ the estimated dimensions of medium eggs that weigh 53-63 g
○ the dimensions of a rubber suction cup to lift and grip a medium sized egg
○ the size of an egg carton that contains six medium sized eggs, and the size of each individual slot
○ the methods of how the sensors would be mounted to the production line
○ the components, fixtures and fittings required to securely mount the sensors to the production line
○ sensors that can detect up to 12,000 eggs an hour</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)			
	AO3 – Select relevant techniques and resources to meet the brief The candidate's: • range of techniques/sources used to carry out research (such as the number of websites and the types of websites the candidate has used). • consideration of the relevance and reliability of the sources used during research. • range of potential solutions/options. • references to sources from research of guidance and/or industry standards. • use of pictures, drawings, schematics, specifications, and sketches alongside prose to communicate their findings. • use of material supplier data sheets and extracts from OEM catalogues to support research		

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)			Approach to research and collation of information shows planning and consistency. (AO1) Core knowledge applied in most areas of the brief requirements. (AO2a)			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. (AO2a)		

Grid 1: AO1, AO2a, AO3 Research (Planning, core knowledge, selecting techniques and resource)		
Research techniques and resources clear 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)

Grid 2: AO2b Research (Core Skills)			
Guidance for markers	**Only** the following evidence must be used to assess performance against this marking grid: • **Research notes** which should include a list of **sources/references.**		

Indicative Content	**AO2b – Application of core skills**
	
	Core skills being assessed:
	• Analysing and interpreting
	  ○ demonstration of judgement and reasoning in relation to the review of the requirements from the brief
	  ○ investigation into the specific and general issues provided in the brief
	  ○ analysis of the requirements set out in the brief and consideration of how this impacts the design.
	
	• Planning and preparation
	  ○ evidence of planning the research in terms of consistency and balance of response (time spent consistently on researching different elements).
	  ○ evidence of taking a planned approach to the research by addressing all factors which needs to be considered stated in the task.
	
	• Developing responses
	  ○ expression of ideas in associated research analysis and level to which they are supported eg through inclusion of images and level of referencing to sources.
		AOs (marks)
		AO2b (6)
			Total marks available
			6

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 the 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</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO1 – Plan their approach to meeting the project brief

The candidate’s:
planning of their report, in consistency and balance of coverage of points.
coverage of the requested elements of the task, specifically:
the types of sensors you propose to use and why
how the sensors will:
detect if a slot is empty or has an egg in it
provide a signal when an egg needs to be inserted into an empty slot
confirm all eggs are in the carton correctly so the lid can shut
how the sensors would be mounted to the production line
where you will be placing your sensors in relation to the eggs / production line
how much your selected sensors and mounting fixtures will cost
the dimensions of a rubber suction cup to lift and grip a medium sized egg
calculations for the lifting force to pick up a medium egg
calculations for the gripping force for the rubber suction cup to be able to hold a medium egg
how many eggs your sensors can detect in an hour
planning and fitting the different elements of the brief together to produce a correct response.
level of detail provided of any assumptions related to the design problem detailed in the task.</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)			
	AO3 – Select relevant techniques and resources to meet the brief The candidate's: • ability to apply the findings from the research into their initial proposals. • clarity of solutions, and how closely, they are derived from brief guidance and research. • references to sources from research of guidance and/or industry standards. • use of pictures, drawings, schematics, specifications, and sketches alongside prose to communicate their findings. • use of OEM catalogues and standards.		

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 required information. (AO1) Some relevant techniques used in the preparation and presentation of report and associated information. (AO3)		Approach to report and required information is planned, organised and complete. (AO1) Relevant techniques and industry conventions used throughout the preparation and presentation of report. (AO3)		Approach to report and required information fully comprehensive and in line with standard industry practices. (AO1) Preparation and presentation of report and associated information is fully in line with industry conventions. (AO3)	

Grid 4: AO2a Report (Core Knowledge)			
Guidance for markers	**Only** the following evidence must be used to assess performance against this marking grid: • **Written report**		

Indicative Content	**AO2a – Apply core knowledge**
	The candidate's:
	• accuracy of using of technical terminology.
	• technical accuracy and soundness of their proposed solution:
	  ○ the technical validity of the report
	  ○ the viability of the initial approach and whether it would realistically work within the context of the brief
	• interpretation of the information found within research and the accuracy of how this has been applied.
	• exploration of different options and reasoning for refining/selecting solutions, how this links back to the specifics of the brief.
	• connection and link between knowledge and understanding.
		AOs (marks)
		AO2a (6)
			Total marks available
			6

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 drawn on and evidenced – limited comprehension of knowledge in relation to brief requirements eg brief requirements omitted indicating lack of knowledge of that area. (AO2a)		Knowledge from across the core applied and evident in relation to different elements of the project brief. (AO2a)		Core knowledge applied consistently throughout response with minimal technical inaccuracies. (AO2a)	

Grid 4: AO2a Report (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 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</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO2b – Application of core skills

Core skills being assessed:
Analysing and interpreting
judgement and reasoning in relation to the refinement of the requirements from the brief and the content within the report.
interpretation of the requirements set out in the brief and consideration of how this impacts the solution.
Developing responses
incorporation of the required aspects in the response – use of logical and synergised approach to requirements.
development of relevant evidence and data, to confirm the suitability of solution
Planning and preparation
evidence of planning, this is demonstrated through the structure of the report, by providing a logical and coherent response.
Communication and presentation
effectiveness of communication of refined technical requirements for the solution - clarity and conciseness of delivery.
expression of ideas in a written report.</td><td>AOs (marks)

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

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 the project brief. (AO2b) Response is logical and shows some coherence between different aspects of the brief. (AO2b)		Core skills applied consistently throughout task completion with - full range of core skills evidenced. (AO2b) Response is logical and demonstrates detailed coherence between different aspects of the brief. (AO2b)	

3. Design

<table>
<tr><th colspan="4">Grid 6: 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:
plan view drawing for the sensor system and an annotated assembly drawing detailing how the sensors will be mounted
Supporting calculations
Reflective notes around how the design has evolved throughout the task.</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO1 – Plan their approach to meeting the project brief
The candidate’s:
layout of drawings and the conformance to industry standards/best practice
inclusion of required coverage of the requested elements within the drawings:
the layout of the sensors, and their position in relation to the eggs / production line
a Bill of Materials (BOM) identifying the sensors, parts, materials and components required to mount the sensors to the production line
the method of mounting the sensors to the production line.
an annotated assembly drawing detailing how the sensors will be mounted to the production line, including components, fixtures and fittings
coherence of structure and clarity of assumptions in relation to the calculations
AO3 – Select relevant techniques and resources to meet the brief
The candidate’s
presentation of drawings, use of recognised techniques, adherence to drawing conventions and annotations, clarity, quality, and accuracy.
use of a drawing frame for drawings, and inclusion of title block.
consideration of industry practices and use of adopted scale when creating the sketches and drawings.
presentation and format of calculations</td><td>AOs (marks)
AO1 (3)
AO3 (3)</td><td>Total marks available
6</td></tr>
</table>

Grid 6: AO1, AO3 Design (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 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)		Approach to design and calculation 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)		Approach to design and calculations fully comprehensive and in line with standard industry practices. (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)	

<table>
<tr><th colspan="4">Grid 7: AO2a Design (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:
plan view drawing for the sensor system and an annotated assembly drawing detailing how the sensors will be mounted
Supporting calculations
Reflective notes around how the design has evolved throughout the task.</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO2a – Apply core knowledge

The candidate’s
choice of language used in any text on the drawings, its technical level and consistency with the intended audience.
proposed solutions for the design, how well the solutions comply with industry guidance, have the potential to be implemented (it’s viability) and the technical sense of the solution specifically:
the layout of the sensors, and their position in relation to the eggs / production line
a Bill of Materials (BOM) identifying the sensors, parts, materials and components required to mount the sensors to the production line
the method of mounting the sensors to the production line.
an annotated assembly drawing detailing how the sensors will be mounted to the production line, including components, fixtures and fittings
accuracy of technical principles applied throughout the design.
ability to make links between knowledge and understanding of engineering principles and apply this to the given scenario
approach to determining calculations, selected method used to determine this</td><td>AOs (marks)

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

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

Grid 7: AO2a Design (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 drawn on and evidenced - limited comprehension of knowledge in relation to brief requirements eg brief requirements omitted indicating lack of knowledge of that area. (AO2a) Supporting information details some links to the application of core knowledge to support judgements, but connections are not always clear and accurate. (AO2a)		Knowledge from across the core applied and evident in relation to different elements of the project brief. (AO2a) Supporting information details links to the application of core knowledge to justify and support judgements, but with some gaps or inaccuracies. (AO2a)		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)	

<table>
<tr><th colspan="4">Grid 8: 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:
plan view drawing for the sensor system and an annotated assembly drawing detailing how the sensors will be mounted
Supporting calculations
Reflective notes around how the design has evolved throughout the task.</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO2b – Application of core skills
Core skills being assessed:
Planning and preparation
evidence of planning, this is demonstrated through the completion of the drawings, supporting calculations and the reflective notes.
Developing responses
use of draft iterations of the design to show how the design idea has developed during the completion of the tasks
demonstration of judgement and reasoning in relation to the preparation of the solution
incorporation of the required aspects in the design- use of logical and synergised approach.
Evaluating and quality assuring
refinement of design ideas to present one final design, reflection on how the design meets the requirements.
consideration of the solution and its functionality, by performing relevant calculation to consider the viability
use of reflective notes to evaluate design and how well it meets the outlined requirements
Communication and presentation
effectiveness in communicating idea/information through drawings and associated annotations so the key features of the designs can be interpreted.
use of proportion, dimension and annotations on drawings.</td><td>AOs (marks)
AO2b (6)</td><td>Total marks available
6</td></tr>
</table>

Grid 8: 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)		A range of core skills applied and evident in task response in relation to different elements of the project brief. (AO2b)		Core skills applied consistently throughout task completion with - full range of core skills evidenced. (AO2b)	

<table>
<tr><th colspan="4">Grid 9: AO5a, AO5b Design (Realise/Review)</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:
plan view drawing for the sensor system and an annotated assembly drawing detailing how the sensors will be mounted
Supporting calculations
Reflective notes around how the design has evolved throughout the task.</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO5a – realise a project outcome – was the right outcome achieved

Considering the candidate’s preferred chosen design and;
the effectiveness of the solution (fit for purpose) in relation to the context given in the project brief.
the extent the solution meets the requirements of the brief.
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 brief and recognition of how these have been met with proposed design.
development of ideas, rationale for the selected design option, clarity on which has been taken forward.
evaluation of how the final design has met the client requirements given in the brief
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 9: AO5a, AO5b Design (Realise/Review)					
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) Evaluation and review do not clearly address how well the task outcome met the brief and lacks clarity and reasoning in places. (AO5b)		Response addresses all aspects of the task requirements. (AO5a) Evaluation and review address how well the task outcome was achieved. (AO5b)		Response fully addresses all aspects of all the elements of the task requirements. (AO5a) Evaluation and review are comprehensive and specifically addresses how well the task outcome was achieved. (AO5b)	

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)
Audience: technical background</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO1 – Plan their approach to meeting the project brief

The candidate’s:
logical approach and structure of the presentation
consideration of all aspects of the project, Task 1 – Task 4.
planning of the presentation to consider their target 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 (eg, use of slide deck, reference to notes, provision of handouts, use of other reference material).
use of positive non-verbal communication during delivery (eg, maintaining eye contact with the audience) and the clarity of speaking/delivery, and the level of which distraction behaviour is displayed (eg 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. (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)
Audience: technical background</td></tr>
<tr><td rowspan="2">Indicative Content</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 sensor system
interpretation of the challenges within the brief and explanations as to how these have been overcome in the design presented.
understanding of engineering principles which has influenced the solution and with reasoning of why these suitably meet the brief from the client for the following features:
consideration of how your design proposal has met both the specific and general issues identified in the project brief
the types of sensors you propose to use and why
how the sensors will:
detect if a slot is empty or has an egg in it
provide a signal when an egg needs to be inserted into an empty slot
confirm all eggs are in the carton correctly so the lid can shut
confidence and accuracy when responding to question from the client (tutor/assessor)
use of technical language</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 (eg 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)
Audience: technical background</td></tr>
<tr><td rowspan="2">Indicative Content</td><td>AO2b – Application of core skills

Core skills being assessed:

• Developing responses
○ explanation of how the design has developed throughout the tasks
○ incorporation of the required aspects in the response – use of logical and synergised approach to requirements

• Communication and presentation
○ professionalism of presentation resources (slides/presentation methods.)
○ effectiveness in communicating the key features of the design – including fluency, accuracy, clarity and conciseness.
○ clarity and size of images and figures, inclusion of labels, font size.
○ communicated information accurately to the appropriate target audience.

• Evaluation and quality assurance
○ justification for final design proposal
○ how well your design meets the requirements of the brief.
○ what challenges were overcome.
○ improvements that could be made if the project was repeated.</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 target 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)
Audience: technical background</td></tr>
<tr><td rowspan="2">Indicative Content</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 brief, and indications within the presentation on how these have been overcome.
clarity of explanation of how the final design addresses 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>
<tr><td colspan="3">Marking descriptors – All versions</td></tr>
</table>

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

<table>
<tr><th colspan="4">Grid 14: AO4a (Maths)</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:
Research Notes – Task 1
Report – Task 2
Design - Task 3</td></tr>
<tr><td rowspan="2">Indicative Content</td><td rowspan="2">Task 1: Research
The candidate conducts research into potential approaches:
calculations for the lifting force to pick up a medium egg
calculations for the gripping force for the rubber suction cup to be able to hold a medium egg
the costs of the sensors and mounting fixtures that will be used
the dimensions of a rubber suction cup to lift and grip a medium sized egg
Task 2: Report
The candidate creates a written response to the project brief including:
how much your selected sensors and mounting fixtures will cost
the dimensions of a rubber suction cup to lift and grip a medium sized egg
calculations for the lifting force to pick up a medium egg
calculations for the gripping force for the rubber suction cup to be able to hold a medium egg
how many eggs your sensors can detect in an hour
Task 3: Design – Part A and Part B
The candidate must include any relevant design calculations related to their annotated drawing with consideration of:
calculations for the cost of the sensors and mounting fixtures
the lifting force needed for the vacuum gripper rubber suction cup to pick up a medium sized egg
the gripping force required to hold an egg that weighs between 53-63g</td><td>AOs (marks)</td><td>Total marks available</td></tr>
<tr><td>AO4a (3)</td><td>3</td></tr>
</table>

Grid 14: AO4a (Maths)		
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**
Limited mathematical concepts and calculations applied. (AO4a) Workings or techniques omitted as part of calculations, assumptions lack detail and full definition. Workings shown but calculation errors made/ inaccurate execution. (AO4a)	A range of mathematical concepts and calculations shown and applied appropriately. (AO4a) Working contains inaccuracies or could be more efficient (i.e. expressed in shorthand). Workings inconsistently shown. (AO4a)	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 (eg 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: • Research notes - Task 1 • Report - Task 2 • Reflective notes - Task 3 • Video of presentation - Task 4 • Presentation materials to support presentation (eg slides etc) - Task 4		
Indicative Content	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 a 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)	Evidence within task responses uses conventional structure which is understandable. Communication style is appropriate to the outcome across most tasks. (AO4b)	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)

Grid 15: AO4b (English)		
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)	Meaning is clear, language is fluent, although the response may contain colloquialisms or jargon etc. Grammar and spelling are mainly accurate. Audibility of oral presentation is good. (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. 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 • Report - Task 2 • Drawings - Task 3 • Presentation materials (slides, handouts, notes etc) - Task 4		
Indicative Content	The candidate's: • use of appropriate digital resources to meet task requirements (eg presentation, internet research). • application of features available within digital resources where appropriate (eg formatting, layout, presentation modes, animations/transitions in presentation etc). • delivery of the presentation for task four using appropriate software. • 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)

T-LEVELS

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City & Guilds Technicals Quality Team

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