HM Government

T-LEVELS

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

Employer-Set Project (8730-034)

Candidate Pack

(Sample)

September 2025 Version 2.0

City & Guilds

Contents

Contents 2
Employer-Set Project introduction 4
General guidance for candidates 5
Brief 7
Task 1 Research 12
Task 2 – Report 14
Task 3 – Design 15
Task 4 – Present 17

Version and date	Change detail	Section
1.0 September 2023	Published version.	Full document
2.0 September 2025	Candidate guidance, Brief and Tasks amalgamated into one document. 'Assessment Objectives and Core Skills' section removed.	Full document Employer Set Project Introduction

Employer-Set Project introduction

The Employer-Set Project (ESP) is an assessment, made up of a number of tasks, which will assess the knowledge and skills you have learnt as part of the 'Core' element of your T Level.

Each project is developed together with employers in the industry to reflect realistic types of developments, activities and challenges.

All the tasks relate to the same ESP brief in the following order:

Task		What will you be doing?	Timings	Marks
1	Research	You will plan and conduct research in relation to the project brief.	3 hours	15
2	Report	Using the results of your research from task 1 you will draft a written report detailing your response to the brief requirements.	4 hours	18
3	Design	Using the results of your research from task 1, report from task 2 and the knowledge and skills you have been taught, you will draft a design to meet the requirements of the brief.	6 hours	24
4	Present	You will present the outcomes of tasks 1, 2 and 3 to your tutor, as if they were a client.	2.5 hours	24
		Totals	15.5 hours	81
			Maths, English and digital skills	9
			Total marks	90

Maths, English and digital skills

Throughout the completion of the tasks within the project, you will generate evidence towards your maths, English and digital skills. There are 9 marks allocated to maths, English and digital skills across all tasks like this:

Maths	3 marks available
English	3 marks available
Digital	3 marks available

General guidance for candidates

As all the tasks relate to the project brief, it is important that you read it carefully and fully **before you start the project**. You will be given 30 minutes' reading time for this purpose at the start of the project.

The ESP is a formal assessment that you will be marked and graded on. You will be marked on the quality and accuracy of the written work you produce. It is therefore important that you carry out your work to the highest standard you can. How well you know and understand the subject, and how you have used your knowledge to complete the project must be clear to the marker. This means you should explain your thinking and how and why you have made your decisions within your written work e.g. as part of your planning, reflections, or evaluations.

Plagiarism

Plagiarism is the failure to acknowledge sources properly and/or the submission of work that is not your own. Plagiarism is **not** allowed in this project.

This project is an assessment of your abilities, so the work submitted **must** be all your own and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the project. Your tutor is allowed to give you some help understanding the instructions, if necessary, but they will record any other guidance you need, and this will be taken into account during marking.

Where research is allowed, your tutor **must** be able to identify which work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge sources used and clearly reference any information taken from them (e.g. providing as a minimum a list of web addresses/books/articles etc. used).

Use of Artificial Intelligence (AI)

AI may only be used as a source where the use of the internet is allowed for a research task. Where you use AI, you **must** acknowledge its use and show clearly how you have used it. Please be aware that how you have decided to use it may impact on the overall mark you are allocated.

Guidance and feedback

There are some rules around how much guidance and feedback your tutor can provide as part of completing the project. Your tutor is allowed to give you some help in understanding the task instructions if necessary. However, if your tutor has to provide significant clarification and guidance, this will be recorded and considered as part of the marking process and may reduce your mark. Your tutor will make it clear if any guidance given may reduce your mark before it is given, so that you understand this when asking for guidance.

Timings and planning

Each task has an allocated duration – you will have to plan your work so you can complete the task within the time allowed. You should take care to make sure you have divided the time available between parts of the task appropriately. If you are not sure how much time you have, check and clarify this with your tutor.

When working under supervised conditions for longer sessions, your tutor will advise you on how breaks can be facilitated.

At the end of the project, before submitting your work, you will be required to sign a 'Declaration of authenticity'. This document confirms the work submitted work is your own and that the project tasks were completed within the set assessment times. The 'Declaration of authenticity' will also be signed by your tutor.

Presentation of work

Presentation of work must be neat, legible and appropriate to the task. You should make sure that each piece of evidence, including any forms, are clearly labelled with your name. Where there is a template to use this will be provided by your tutor.

All electronic files must be given a clear file name that allows your tutor to identify it as your work. You should consider using a consistent, clear file-naming convention across all the pieces of evidence you generate for submission.

Written work may be word processed or handwritten, unless stated otherwise. Any sketches should be neat and tidy, and annotated appropriately. Any technical drawings should be neat and tidy, drawn to an appropriate scale and annotated appropriately.

Any calculations should be set out clearly, with all working shown, and any assumptions made. You should use appropriate units of measurement at all times. Answers must be expressed to a degree of accuracy, consistent with the requirements of the project.

Word counts

Typical word counts or numbers of pages of evidence are provided within the requirements of each task. Where word counts have been provided, these are given as an indicative guide only to support you to understand the type of response that is expected from you. You will not be penalised as part of the marking if your response is below or above the indicative word count provided, however you should consider the clarity and succinctness of your response if it goes above the word count.

Submission of evidence

Your work will be submitted as final at the end of each assessment session. You will **not** have an opportunity to rework any of your evidence once the assessment session ends. However, if through other tasks within the project, you develop your ideas or build on earlier tasks, then you should continue to build on these and should use your evaluation to outline the reasons why this happened.

Brief

The employer

DH Engineering Ltd is a medium sized engineering company. It has been in business for 17 years primarily undertaking manufacture of machined components to customer designs.

Machining tasks range from the manufacture of one-off components and assemblies often made by hand on manual machines, through to larger batches of components normally manufactured on CNC machines.

Complex shapes whether in batches, or a single item are all machined on 5 axis CNC machines to reduce the time it would take to produce these manually and reduce the skilled labour required. However, assembly and finishing operations are normally undertaken manually because of the significant cost in creating machinery and AI to undertake what is a complex handling task.

The project

DH Engineering Ltd has received an order for 350 bespoke shoulder screws which comprise of a:

- shoulder screw body
- nut
- washer
- split pin (standard bought in part).

The split pin is to be inserted through a hole drilled through the nut and threaded portion of the shoulder screw body following assembly.

Whilst all of the individual components have been manufactured on a CNC machine, assembly needs to be undertaken by hand, and the hole for the split pin is drilled manually. This is due to the complexity of holding the screw body, fitting the washer, screwing on the nut followed by cross drilling and insertion of a split pin. Whilst it is possible to automate this process, it would be uneconomic.

The current arrangement is to hold the assembly in a standard Vee-Block and drill the hole using a centre drill, followed by standard twist drill. However, there is a problem with this method as the current method is resulting in holes being drilled out of position on the flat of the nut and not passing through the centre of the thread and not exiting the nut in the correct position.

This is leading to increased scrap rates and takes a significant amount of time to correctly drill each assembly. Figure 1 below shows the final assembly with the split pin inserted through the drilled hole and gives the size and position of the hole to be drilled.

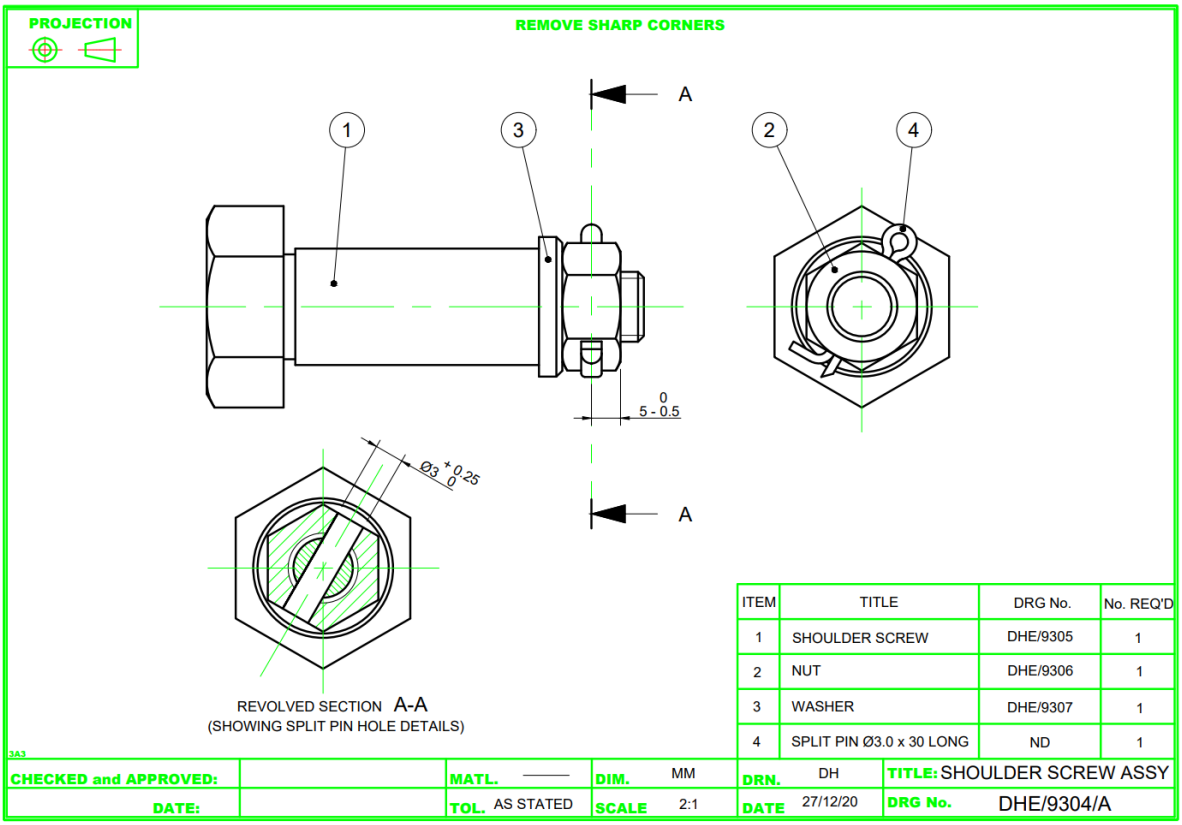

Figure 1 Shoulder Screw Assembly and Split Pin Hole Details

Given the number (350) of assemblies to be drilled, and the issue with inaccurate drilling, it has been decided that a drill jig is required to reduce the drilling operations to one single activity and remove any marking out operations and centre drilling operation. This will significantly reduce the time taken to accurately align and clamp the assembly, will remove the requirement to centre drill, ensure accurate alignment and remove the principle source of defects.

It is possible to automate the assembly, drilling, and insertion of the split pin but the costs of doing this are significant. Drilling by hand using simple workshop tooling and marking out techniques is possible, however would require an additional centre drilling operation after marking out and take a significant amount of time. The most economic approach is for a simple drill jig to be designed which, when manufactured, will allow the workpiece assembly to be firmly held in the correct orientation and a quick single drilling operation undertaken.

Product design specification

As an Engineering Technician, you are tasked with designing a simple drill jig which can be used to hold the component assembly ready for drilling so that the cross hole can be efficiently, and accurately, drilled using a simple workshop pillar drill as shown in Figure 1. To assist the design process the sizes of the individual components are identified in figure 2, figure 3, and figure 4 below. Your drill jig must ensure that the hole is drilled through the centre of one face of the nut, pass through the centre of the Shoulder Screw thread and exit through the centre of the opposing centre face of the nut, as shown in the assembly drawing in Figure 1, within +/- 0.5mm of the nominal position.

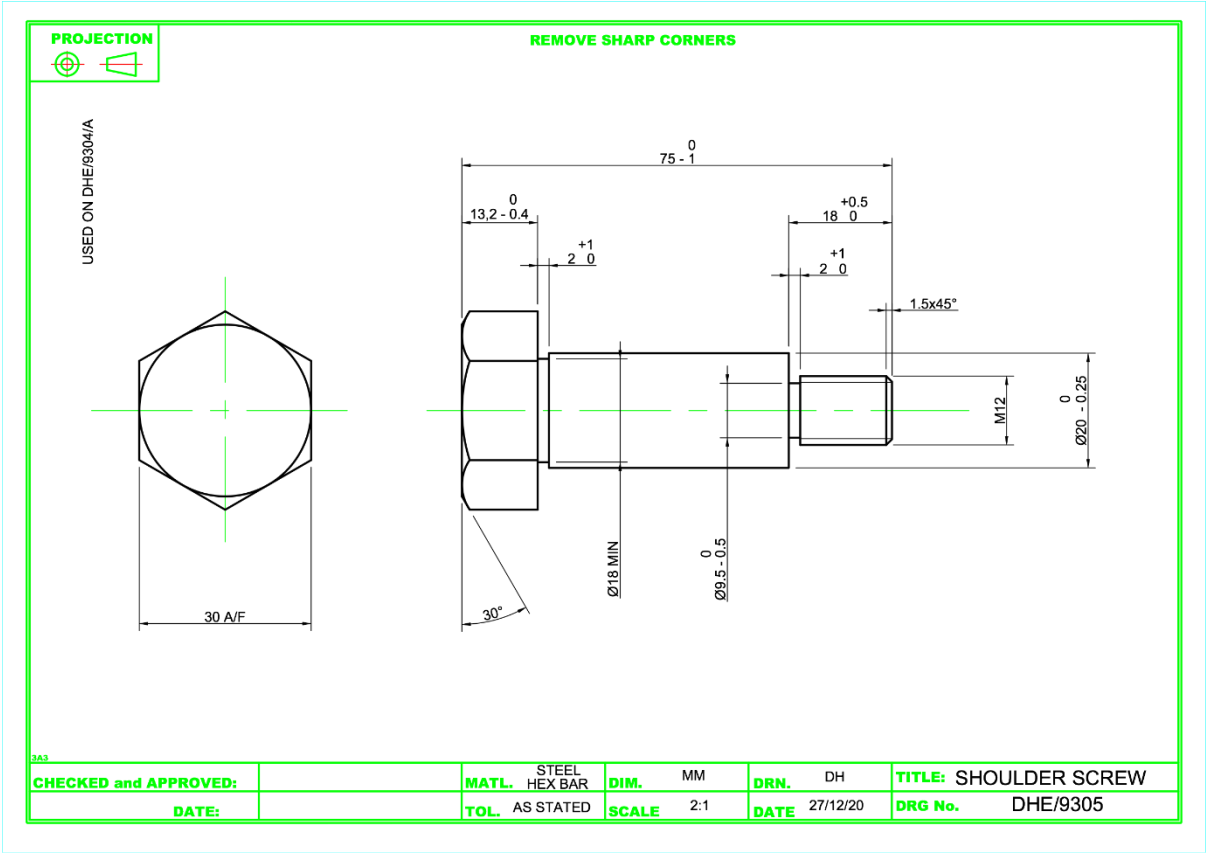

Figure 2 Shoulder Screw Body

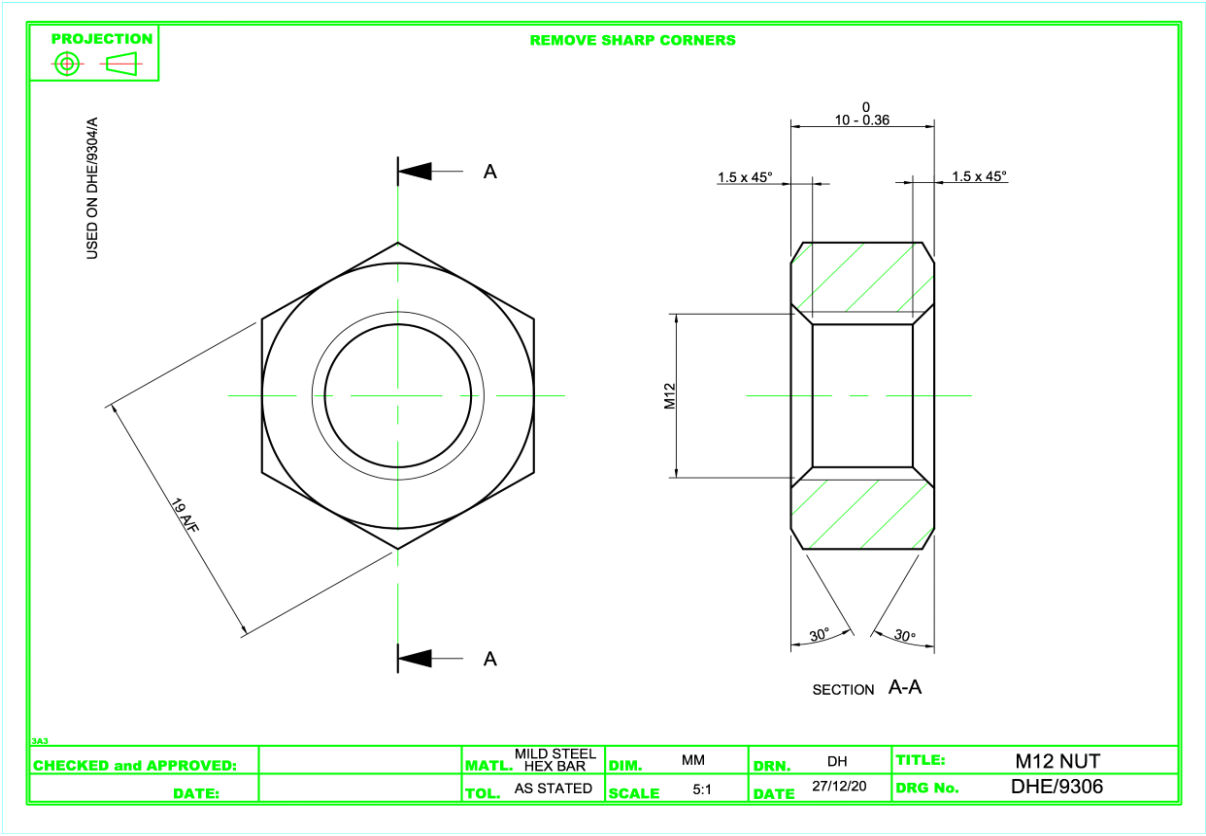

Figure 3 Nut

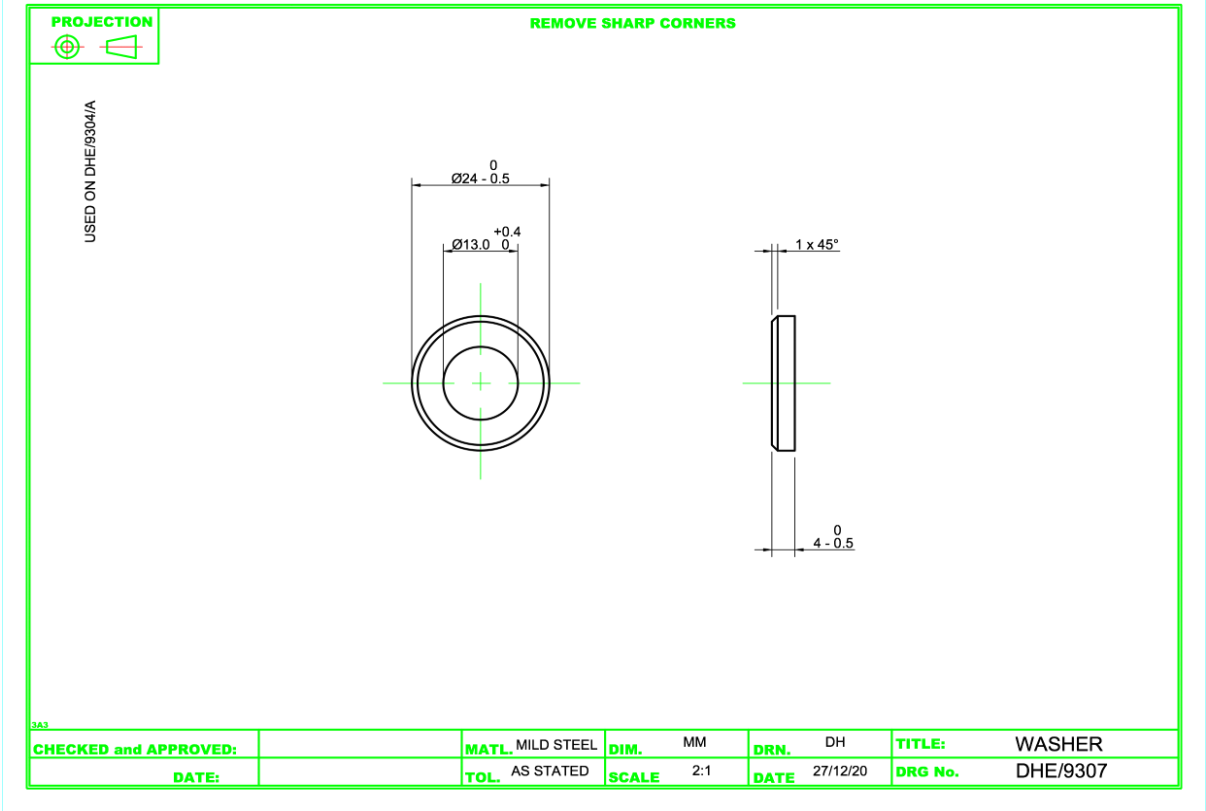

Figure 4 Washer

Specific issues

The DH Engineering Ltd Manager has identified some specific issues which relate to this task:

- the hole has to be drilled through the centre of the flat of the nut on both the entry and exit sides in accordance with the assembly drawing as shown in Figure 1
- the basic design of the dimensioned drill jig assembly has a tight timeline for completion and must be ready in 1 weeks' time
- the jig must be designed so it is capable of being used by semi-skilled operators using hand operations only, and the jig must not require any automation.

General issues

The Engineering Manager has also noted the following more general considerations that relate to this project brief:

- health and safety risks and issues i.e. consider mass, and ergonomic issues
- component insertion/extraction
- checks required to ensure quality outputs.

Task 1 Research

You have been asked to review the project brief and research the specific and general issues which have to be overcome.

You are to conduct research to determine:

- options for how the component could be held in position in the correct orientation whilst being drilled
- options for how the design of the holding mechanism can allow for small changes in component size due to manufacturing tolerances
- identification of a standard method of how the drill bit can be supported by mechanical means such as guide holes or guide bushes so that it drills a hole in the correct position without requiring any centre marking or drilling
- options which show how the component can be easily inserted and removed from the jig
- whether any potential materials considered for use present any health and safety issues
- the maximum mass the jig could be without presenting any handling issues for the operator.

Record notes on the findings of your research and initial analysis. Your notes may include:

- sketches
- basic calculations
- research materials that identify potential solutions
- standard parts that may be incorporated into your design
- downloads of existing drill jigs
- sections taken from manufacturers of tooling aids such as bushes, pins, clamping aids and standard blocks
- specifications such as BS, DIN, ASME, BS EN and/or ISO relating to tooling aids, limits and fits and materials.

The research notes and analysis will typically be 1500 words (not including sources).
You must include a list of your references/sources alongside your research notes. How well you have planned your research will contribute to marks achieved for this task.

Timing of assessment

- You will have **three hours** to complete the research and record your findings.

Conditions of assessment

- Your research should be completed working alone under supervised conditions.
- You must **not** share or discuss your work with other candidates.
- You will have access to the Internet to conduct your research.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- Research notes (typically 1500 words) hard copy or file saved securely (e.g. on memory stick to be handed in).
- List of references/sources.

Additional evidence of your performance that will be captured for marking

- N/A

Marks available

- 15

Task 2 – Report

You are to create a written response to the project brief outlining your suggestions for responding to the brief and the presented issues.

With reference to the project brief and your research notes, write a report detailing your intended initial approach to designing a drill jig with consideration of:

- how the component will be held in position whilst being drilled
- how the design of the holding mechanism will allow for small changes in component size due to manufacturing tolerances
- how the drill bit will be supported by mechanical means such as guide holes or guide brushes so that it drills a hole in the correct position without requiring any centre marking or drilling
- how the component will be inserted and removed from the jig
- whether any potential materials considered for use present any health and safety issues
- the maximum mass the jig could be without presenting any handling issues for the operator
- health and safety considerations relating to the approach proposed
- quality assurance considerations relating to the approach proposed.

The written report will typically be 2000 words.

You can include downloads from Original Equipment Manufacturers (OEM) catalogues showing tooling aids and basic design sketches to support your intended approach as detailed in your report.

Timing of assessment

- You will have **four hours** to complete your report.

Conditions of assessment

- Your report should be completed working alone under supervised conditions.
- You must **not** share or discuss your work with other candidates.
- You will have access to a copy of your response to the previous task (for review purposes only).
- You will have access to the Internet for the completion of this task.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- Written report (typically 2000 words) hard copy or file saved securely (e.g. in a secure online location or on memory stick to be handed in).

Additional evidence of your performance that will be captured for marking

- N/A

Marks available

- 18

Task 3 – Design

You are to develop your initial approach design solution in response to the project brief.

With reference to the project brief, and your research from task one, you must produce a detailed design of a drill jig with consideration of:

- how the component will be held in position whilst being drilled
- how the design of the holding mechanism will allow for small changes in component size due to manufacturing tolerances
- how the drill bit will be supported by mechanical means such as guide holes or guide brushes so that it drills a hole in the correct position without requiring any centre marking or drilling
- how the component will be inserted and removed from the jig
- whether any potential materials considered for use present any health and safety issues
- the maximum mass the jig could be without presenting any handling issues for the operator.

Create a dimensioned assembly drawing for a drill jig that addresses the brief detailing:

- the component located within the jig, differentiated from being part of the assembly - this means that a drawing needs to be produced showing the workpiece seated within the jig but differentiated by use of dashed lines or differing colours
- the method of component insertion and extraction - this can be achieved by either a separate drawing or use of dashed lines and colours to indicate the path of the workpiece when being inserted or removed
- the method of component retention in the correct orientation - a view on the drawing(s) should show that the axis of any drill is presented perpendicular to the face of the workpiece nut. Also, in the correct longitudinal and axial position such that the hole will be drilled as shown detailed on the workpiece assembly drawing.

You do not need to create all detail drawings and assemblies, just a dimensioned assembly drawing containing all the critical dimensions and identification of standard parts.

Include any relevant design calculations related to your assembly drawing and notes reflecting on how well the drill jig meets the outlined requirements.

You can include draft iterations of your design to show how your design idea has developed.

Assembly drawings can either be produced using a CAD package or by hand as a paper-based drawing. Assembly drawings must be produced in 3rd Angle Projection and in accordance with the drawing standard BS8888.

The submission for this task will typically be two A3 drawings and two A4 sides of supporting calculations and notes.

Timing of assessment

- You will have **six hours** to complete your design and calculations.

Conditions of assessment

- Your design should be completed working alone under supervised conditions.
- You must **not** share or discuss your work with other candidates.
- You will have access to copies of your responses to the previous tasks (for review purposes only).
- You will have access to relevant CAD software for the completion of drawings.
- You will **not** have access to the Internet for the completion of this task.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- Assembly drawing (typically two A3 drawings) – this may include design iterations if you wish to include them.
- Supporting design calculations and reflection notes (typically two sides of A4) – hard copy or file saved securely (e.g. in a secure online location or on memory stick to be handed in).

Additional evidence of your performance that will be captured for marking

- N/A

Marks available

- 24

Task 4 – Present

You are to prepare and deliver a presentation to present the findings from your report, and your designs, to the DH Engineering Manager.

You must use digital technology for the presentation.

You must cover:

- consideration of both the specific and general issues identified in the brief
- challenges that were found when selecting and designing for the process (e.g. materials, design ideas, components)
- how well you think your design and proposal addresses the requirements of the brief.

Your assessor will take on the role of a manager from DH Engineering. They will ask questions relating to your presentation from the client's perspective.

Timing of assessment

- You will have **two hours** to prepare your presentation.
- You will have **30 minutes** to present your findings and respond to questions (typically split with 20 minutes for presenting your findings and ten minutes for responding to questions).

Conditions of assessment

- Your presentation should be developed and delivered working alone under supervised conditions.
- You must **not** share or discuss your work with other candidates.
- You will have access to copies of your responses to the previous tasks (for review purposes only) as well as any presentation materials or notes (e.g. PowerPoint slides).
- You will have access to digital technology for the presentation of your findings - you can choose the format or program you wish to use (e.g. PowerPoint, Keynote).
- You will **not** have access to the Internet for the completion of this task.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- Presentation materials – e.g. slides, handouts etc. hard copy or file saved securely (e.g. in a secure online location or on memory stick to be handed in).

Additional evidence of your performance that will be captured for marking

- Video recording of presentation.

Marks available

- 24

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