Chief Examiner and Chief Moderator Report

NCFE Level 1/2 Technical Award in Engineering 603/7006/3

Series: Summer 2024

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NCFE Level 1/2 Technical Award in Engineering (603/7006/3)

Paper numbers: P002444, P002481, P002443

This report contains information in relation to the examined assessment (EA) from the chief examiner and non-exam assessment (NEA) from the chief moderator, with an emphasis on the standard of learner work within this assessment series.

The aim is to highlight where learners generally performed well as well as any areas where further development may be required.

Key points:

- grade boundary information
- administering the EA and NEA
- evidence creation
- standard of learner work
- responses to the tasks
- Regulations for the Conduct of External Assessment and the NEA

The qualification is linear, meaning both assessments must be taken in the same assessment series and cannot be combined across different assessment series. Learners are allowed one attempt at each assessment, and there are no resit opportunities.

Grade boundary and achievement information (V Certs)

This qualification consists of two assessments: the EA and the NEA.

After both assessments are completed and marked or moderated, the marks are combined to give a final mark for each learner. Where the raw marks do not reflect the required weighting of the assessment, a scaling factor is applied. For further information on grading information and scaling factors, please see the Qualification Specification.

Qualification scaled mark boundaries in this series are:

		*Notional boundaries**	
	Overall	*EA*	*NEA*
Scaling factor		*1*	*1*
Max	**200**	*80*	*120*
Level 2 Distinction*	**165**	*67*	*98*
Level 2 Distinction	**142**	*57*	*85*
Level 2 Merit	**119**	*47*	*72*
Level 2 Pass	**97**	*38*	*59*
Level 1 Distinction	**76**	*30*	*46*
Level 1 Merit	**56**	*22*	*34*
Level 1 Pass	**36**	*14*	*22*

The grade boundaries given for each assessment are known as 'notional grade boundaries', as they are for illustrative purposes only. Grade boundaries are the lowest mark with which a grade is achieved.

Administering the EA and NEA

The EA is invigilated and must be conducted in line with our Regulations for the Conduct of External Assessment document.

Learners must be given the resources to carry out the tasks and these are highlighted within the Qualification Specific Instructions for Delivery (QSID) document.

The NEA must be conducted in line with the regulations outlined in the Tutor Guidance Document Tutor Guidance Document

Evidence creation

EA

Learners should use the space provided to answer questions. Where answers are typed or additional pages included, the learners name, centre number, centre name and task number must be clearly visible. The additional paper must then be securely attached to the workbook.

Where assessments are completed online, centres must ensure they are familiar with the Surpass platform and have completed all testing and preparation before the assessment, to ensure learners are unaffected by technological issues.

NEA

Learners should approach all tasks in the NEA with reference to time requirements and control conditions which can be located in the QSID document. Learners should produce evidence to meet each task independently and with no feedback or guidance from tutors during the assessment.

Learner evidence requirements are stated per task and give required outcomes which can often be evidenced in a variety of ways to best meet the needs of the learner, unless otherwise stated.

Learner evidence submissions in this session often included a range of word-processed documents, PowerPoint presentations, hand drawings, CAD drawing and photographic evidence of process activities and the final outcome in line with expectations.

Centres are reminded that template documents, word frames and other supporting documents should not be supplied to the learner for the purposes of generating evidence against this assessment. Use of such materials to generate assessment evidence could potentially be considered malpractice.

Standard of learner work

EA

This is the first time this assessment has been completed for this new model of NCFE V Cert.

Within the paper learners were required to demonstrate all assessment objectives (AOs) (knowledge recall, application of knowledge and forming opinions and conclusions). It was pleasing to see that many learners were demonstrating all three AOs consistently across the paper.

Across the paper learners demonstrated good subject knowledge based on the more common areas taught from the course content including the application of maths and science, materials and properties and engineering disciplines. Centres should ensure that learners are prepared for assessment across the entire curriculum.

Learner responses were mixed, but marks were awarded across the range available within the paper. Learners were at times most comfortable responding when applying knowledge within context.

NEA

This was the first NEA for the qualification. The assessment consisted of six tasks to be completed by learners over 18 hours. The assessment was marked, and quality assured internally by centres, with a sample of work externally moderated by NCFE.

A total of 120 marks was available across the assessment. Each task was allocated a range of marks placed against stated assessment objectives (AO's)linked to task focus. In this assessment AO's 1-5 were assessed via levels of response mark grids aligned to each task, with weightings per task varied to reflect the nature of the qualification outcomes.

Learner outcomes were achieved across the available range of awarded grades in this assessment, which was suggestive of learner engagement and useful differentiation of assessment. Most learners had attempted all tasks within the assessment, producing appropriate evidence in most cases to accrue marks against AO's. A minority of learners registered for the assessment had not submitted any evidence or had not gained any marks for evidence produced. Some learners had not attempted all tasks within the assessment, which led to a reduction in the available marks.

Learner evidence was generally appropriately presented with tasks referenced to learner submissions. A minority of learners had not clearly referenced evidence to tasks which in some cases led to some lack of structure in responses. The CM notes that evidence should be referenced to task responses to aid in clarity of assessment and to aid learners in ensuring coverage of tasks.

The majority of learners had produced credible outcomes which indicated application of engineering skills and understanding of key areas of the qualification content. Outcomes generally reflected the demands of the brief and in some cases showed creativity alongside technical fluency at level. Learners who achieved well in practical outcomes tended to be able

to demonstrate not only understanding of the requirements of the brief but the ability to refine ideas throughout the project.

It was noted by moderators that summative assessor feedback to learners was generally useful and positive. However, assessor feedback did not always include marks and commentary at AO level within tasks. This, on occasion, made assessor decisions unclear for both the purposes of accuracy of feedback to learners and external moderation.

Evidence upload for moderation was generally well handled by centres, although it was noted that some uploads did not initially include all submitted learner evidence and, in some cases, did not include assessment documents. This potentially led to some delays in moderation of learner work. Centres must use the learner evidence upload checklists, available with the live assessment materials to support this.

Responses to the assessments

EA

Question 1
A one mark question to open the paper, however many learners struggled to correctly identify the correct name of the machine as a wood lathe, with a range of incorrect responses, or no responses, seen.

Question 2
Despite many learners not being able to identify the correct name of the machine in question 1, many were able to correctly identify suitable PPE to be worn when using it. Common responses included apron and safety goggles.

Question 3 - 5
Three multiple choice questions which learners were broadly able to receive marks, however identification of a non-ferrous alloy posed a challenge for many learners, with less than half of all learners correctly identifying bronze for this question.

Question 6
Learners demonstrated good knowledge on the use of a laser cutter and were able to identify a range of advantages of using a laser cutter. Learners were less successful at identifying disadvantages of using the machine, either providing incorrect responses or only giving advantages, limiting the marks awarded.

Question 7
Many learners seemed to misread this question and did not focus upon the benefits to the manufacturer. This led to many responses not being in context to the question, talking generally about recycling or other beneficial activities for a manufacturer, limiting the marks that could be awarded.

Question 8
Learners were knowledgeable on the properties of aluminium and were able to apply this knowledge in context to the performance of the aircraft, with many good examples of descriptions presented.

Question 9
A well answered question where learners were able to recall good knowledge on engineering disciplines to correctly answer this question.

Question 10
A number of learners misread that the question asked for products other than transportation, leading to many responses which repeated examples relating to aircrafts. Learners should be encouraged to engage with the questions fully, to ensure that they are not failing to access marks across the paper due to comprehension errors.

Question 11 - 13
Three multiple choice questions which, again, learners were able to access marks. However, identifying a hardwood presented a challenge for many learners, with the majority of learners unable to correctly identify sycamore.

Question 14
Learners were less knowledgeable regarding AC and DC and this showed through the responses give. Whilst some learners had good insight into this subject area and were able to access the marks for knowledge recall of valid reasons, there were many learners who either did not provide a response, or gave incorrect and confused responses, indicating that this is an area where learner knowledge could be improved.

Question 15
Most learners were able to correctly identify at least 2 safety features, often blade guard and emergency stop, indicator a good level of familiarity with a bandsaw.

Question 16
Most learners were able to correctly identify at least one hazard covered by COSHH. However, many learners either repeated answers (rewording the same hazard for both examples) or incorrectly chose to instead define COSHH, which was not an awardable response.

Question 17
A question in which learners were able to correctly identify different methods of fixing wood together. The most common responses included PVA glue, and screws.

Question 18
The focus of this question was why quality control was important during the manufacture process. A number of learners focussed their response on the customer, having misread or misunderstood the question, giving at times lengthy responses which were unable to be rewarded. Where learners understood the question, the majority were able to be rewarded.

Question 19
Whilst some learners correctly identified a Gantt chart, often stating it is used to show progress over time, fewer learners went onto be able to describe how it was used, and therefore were limited in the awarding of AO2 marks. Gantt charts are referenced within the Qualification Specification and should be a production plan tool which learners are familiar and comfortable identifying and using, however this was not evident from responses to this question.

Question 20 - 21
Two multiple choice questions which, particularly for question 20, learners were able to identify the correct marks. The calculation for seconds in an hour was a question in which the majority of learners were able to correctly complete.

Question 22
Learners were successful in correctly using the formulae given in context to work out the volume of the cylinder. Despite prompted within the question, some learners failed to show all workings, limiting the marks awarded.

Question 23
Another question requiring learners to complete a calculation. Most learners were able to correctly use the formulae given to them to work out the force required to move the truck, however some learners did not state the units with their answer.

Question 24
Most learners were able to correctly identify how to attach aluminium and steel together to manufacture a trailer. Learners successfully stated methods such as rivets, and nuts and bolts.

There were some learners who did not have a good subject knowledge of properties incorrectly suggested welding as a response in this question.

Question 25
Most learners were able to correctly suggest a range of reasons why mild steel would need a surface finish, with most correctly referencing protection from corrosion or rust as their reason.

Question 26
A question in which the majority of learners were able to correctly state that the abbreviation meant personal protective equipment.

Question 27
While just over half of learners were able to correctly identify the notation as the tolerance of parts being manufactured from an engineering drawing, there were a lot of learners who either failed to respond to this question or gave incorrect responses which often had no relation to tolerance.

Question 28
A question where most learners were able to correctly apply the scale to the measurement to calculate dimension on the drawing in cm, or m, with some learners giving a response in mm, which was also awardable.

Question 29
A 4-mark question with marks requiring an explanation and analysis within the response. Many learners were to explain the importance of accurate measurements when using pre-existing parts, however fewer learners were able to provide a sufficiently accurate analysis to achieve all 4 marks available.

Question 30
A one-mark question which only a small number of learners received a mark. The Qualification Specification references 3D printing; therefore it was surprising that so few learners could correctly identify additive manufacturing, and where learners did receive a mark, it was often through describing the manufacture as CAM.

Question 31
A range of good responses were given by learners to describe ways in which 3D printers and software has helped society. Common responses included cheap prototyping and 3D simulations of buildings, allowing most learners to be awarded at least one mark.

Question 32
Learners mostly identified one correct reason for rendering a sketch, often to make a product look realistic. However, many learners only attempted to provide one reason, limiting the marks awarded.

Question 33
The question asked learners to focus upon drawings and freehand sketches, giving an analysis and justification. However, a large proportion of learner responses incorrectly focussed upon formal drawings, limiting the marks awarded. Also, learners should be able to identify the different requirements from command verbs within a question. When asked to give examples and a justification, giving short lists without further justification, awarded marks will again be limited.

Question 34
Of the two extended response questions within this paper, learners performed better on this question. Many learners were successful in being able to demonstrate all assessment objectives (AOs) in their answer.

Higher scoring learners identified a range of transport examples and discussed the impact of global trade and the impact to economies. It was pleasing to see a number of learners able to demonstrate the ability to form opinions and justify them in context, with some giving an excellent analysis based on application of knowledge and understanding of the use of transportation.

Where learners gave brief, superficial responses, or only gave response recalling knowledge and failing to engage in analysis, they were limited to the lower mark bands.

Question 35
A question on which only a small number of learners were successful in being able to demonstrate all assessment objectives (AOs) in their answer.

Learners who could identify a range of raw materials and the impact extracting them has upon our environment were rewarded with marks in the higher bands. It was pleasing to see learners able to demonstrate the ability to form opinions and justify them in context.

However, a large number of learners were limited in the number of marks awarded either through a lack of knowledge in the subject area, or through their exam technique which saw them give brief, short responses and fail to engage in analysis and application of knowledge.

NEA

Task 1

In this first task, learners were required to undertake research regarding materials and tools / machinery which would be required to manufacture their model. Most learners had submitted evidence to meet the task by provision of written evidence supported by visual examples. A minority of learners had not undertaken the task.

Most learners engaged well with this task to produce a creditable outcome which utilised research findings. Evidence of research and selection was often usefully supported by commentary to access the range of AO1, AO2 and AO3 marks available.

Research sources were not always well referenced in learner responses, which in some cases suggested a limited understanding of how source material should be presented and credited.

Learners who achieved well in this task tended to have selected materials and tools / machinery which were relevant to the given brief and provided justification for their selections, via consideration of properties and characteristics in the context of the required outcome. Tools and machinery were often considered in terms of application to the project with development in mind with reference to function.

Justifications pointed to a process of discounting selections, showing an understanding of how specific materials and tools would interact, alongside availability. Learners were able to consider all aspects of the brief and comment appropriately.

Learners who achieved lower marks tended to have undertaken less coherent research, often spanning a range of materials but with less consideration of context. Properties and characteristics were stated but with more limited reference to potential application against the brief. Material, tools and machinery tended to be less well justified and selections were often more limited against the research undertaken. In some cases, not all aspects of the brief were considered, or some areas were given considerably more focus leading to an inconsistent response.

An understanding of properties, characteristics and application in this task tended to allow learners to approach subsequent tasks with greater confidence.

Task 2

In task 2 learners were required to describe the requirements of BS8888 and create hand drafted engineering drawings to inform the development of their project. Most learners had submitted evidence including a written response and hand drawings to evidence this task. A minority of learners had not produced evidence to meet the task requirements.
Learners who achieved well in this task tended to have used research to draw out key elements of BS8888 and show clear understanding of how these could be applied to drawings. Understanding of requirements tended to reflect in the presentation of drawings with consideration of scale, dimensions, lines and title block information. Drawings were often well considered in terms of representing all required elements, alongside accurate angles, scaling

and dimensions. The resulting drawings often provided a useable starting point for continued development of the model.

Learners who achieved less well in this task tended to have identified fewer features of the BS with regard to the production of drawings, in some cases providing a (sometimes unreferenced) definition of the nature of a standard in broad terms. Application of drawing requirements was often more inconsistent with less appreciation of requirements in evidence. In some cases, drawings were not wholly accurate in terms of angles and dimensions, leading to more basic outcomes. Learners working at this level did not always consider all aspects of the brief which tended to result in less useable outcomes.

It was noted that in some cases, learners had been able to produce creditable hand drawings which demonstrated appreciation drawing skills with more limited reference to a descriptive understanding of BS requirements, so being able to accrue marks in AO4

Learners who had produced well considered hand drawings in this task were often able to move into task 3 with greater confidence.

Task 3

In this task, learners were required to use CAD software to produce drawings which made use of the hand drawn engineering drawings created in task 2. The majority of learners had produced evidence of CAD drawings for this task. A minority of learners had not produced evidence.

Learners who achieved greater marks in this task tended to exhibit confidence in the application of CAD software to create accurately dimensioned and scaled drawings, which in some cases refined the outcomes seen in task 2. Some learners had produced a range of drawings including orthographic, isometric and exploded views which suggested useful understanding of software and considered representation of the outcome. Consideration of requirements, for example in the use of lines and provision of title block information, was in evidence. The outcomes tended to consider all aspects of the brief and result in useable engineering drawings.

Learners who achieved less marks tended to have provided outcomes with less sophistication in application of CAD skills and were not as developed. In some cases, consideration of dimensions and scaling were more limited, alongside more basic reference to title block information. As in task 2, appreciation of brief requirements were often less consistent, which in some cases made the drawings less functionally useable.

In a minority of submissions, CAD drawings were not consistent with prior hand drawings. It was noted that some learners exhibited differing levels of skills across task 2 and task 3 which allowed for useful differentiation of marks between these tasks.

A minority of learners had produced some considerable evidence in regard to the process of using various CAD tools in a step-by-step approach. Whilst this was interesting to see, it did not always add value or gain marks.

Creation of accurate and useable drawings tended to allow learners to approach subsequent development of their model with greater confidence.

Task 4

Task 4 in this NEA required that learners 'create a production plan for their model', with reference to tool / equipment requirements, health and safety measures, QC measures and a time plan. Learners had generally engaged with this task to provide coverage of some, or all elements noted above in their responses. A minority of learners had not produced evidence in response to this task, limiting available marks against the stated AO2 and AO3 outcomes.

Learners who achieved well in this task tended to be able to produce a concise and useable plan which referenced time planning against requirements and measures. Learners had often given clear consideration to timelines referenced against the NEA to consider realistic approaches to production.

Details of processes against each stage of production were logically stepped and, in some cases, justified in detail via commentary. A range of techniques were considered in respect to materials as a coherent expansion from task choices. Risk assessments were suitably documented with consideration of relevant hazards and control measures. Some thought was given to quality control at this stage, with consideration of a testing phase in evidence.

Learners who achieved less well in this task tended to have produced less coherent planning documents which tended to impact on credit available against AO2

Timelines were in some cases not considered or were unrealistically short. Choices of process and tools was often more limited and not subject to justification within the learner commentary.

Risk assessments were generally functional, showing some learner engagement with this area of specification content but identified hazards were not always contextually considered and measures to inhibit risk were sometimes not interlinked. Consideration of quality control and testing were less often in evidence.

Learners who had engaged with this task to produce a coherent and considered plan were often able to move into task 5 with greater confidence.

Task 5

Task 5 was credited against the highest proportion of marks in this assessment and learners were allocated 6 hours to complete. The task required that learners created and tested their model, alongside provision of evidence to give show application of production processes, skills and techniques.

Most learners had presented evidence of engagement with this task. A minority of learners had not attempted this task. The range of AO4 marks allowed for differentiation of marks against learner evidence across of a range of evidence outcomes.

Learners who achieved well in this task tended to be able to have created a functioning model which addressed the brief, alongside evidence of testing and with reference to drawings and planning completed in previous tasks.

The final model was well supported by commentary on process which demonstrated stages of the production process, skills and techniques often with annotated against visual evidence. Evidence of the final model was clear and indicated how the brief had been fulfilled. Many learners had produced convincing outcomes using a range of materials, tools and techniques with clear focus and application of skills to meet any difficulties they encountered.

Learners who achieved lower marks in this task tended to have produced limited evidence of a functioning outcome and limited evidence of process. In some cases, models were not functional or complete or had not met significant areas of the brief. Evidence of process in some cases was not in place or was limited to statements confirming some activities undertaken, rather than providing evidence of processing skills and techniques.

Photographic evidence submitted in response to this task was not always useful in identifying functionality or process, with a limited range of visual evidence sometimes in place. Assessor commentary in some cases was usefully detailed in supporting outcomes, but this was not always the case.

Learners who had engaged with all elements of this task were often able to develop more confident approaches to undertaking task 6

Task 6

In this final task learners were required to evaluate their model in terms of functionality and potential improvements. Most learners had produced evidence against this task, although a slightly higher minority had not produced evidence in comparison to previous tasks.

Learners who were able to produce a considered evaluation and engage with the given areas of evaluation were often able to achieve well. Evaluation of functionality linked back to model with reference to the brief was often in place. Suggestions for improvement were in some cases usefully specific and considered difficulties encountered, previous tasks and expansions to the learners work with suitable reference to skills, tools and materials. Coherent and relevant documentation of the evaluation often allowed for positive achievement against AO5
Learners who achieved less well tended to produce evaluations against this task were not always substantive, and in some cases did not identify evidence explicitly against the task. Consideration of all targeted areas of the evaluation was not always handled consistently, and learners working at this level sometimes moved to a ‘what went well’ and ‘even better if’ (WWW / EBI) approach which in some cases constrained depth of commentary in this respect.

Often a pattern was notable in that learners who had not achieved well in the earlier tasks tended not to accrue marks as successfully in response to task 5