Qualification Verification Summary Report
NQ Verification 2018–19

01 Section 1: Verification group information

Verification group name:	**Engineering Science**
Verification event/visiting information	**Event**
Date published:	**June 2019**

National Courses/Units verified:

H23E 74	National 4	Engineering Science Assignment — added value unit
H23B 75	SCQF level 5	Electronics and Control
H23B 76	SCQF level 6	Electronics and Control
H23D 76	SCQF level 6	Mechanisms and Structures
C723 77	Advanced Higher	Engineering Science — project

02 Section 2: Comments on assessment

Assessment approaches

The vast majority of centres chose to use SQA-developed instruments of assessment (either unit assessment support pack, SQA-produced added value unit or the mandatory project at Advanced Higher). In these cases, the approach was judged to have been satisfactory.

While it is acceptable for centres to choose to use their own instruments of assessment for units (including the added value unit), we strongly recommend that all centre-devised assessments are submitted to SQA for prior verification before use (unless it is an adaptation of an existing unit assessment support pack and the changes are not significant).

Please note that the revised coursework assessment (assignment) for National 5 Engineering Science (which is an externally assessed, annually issued task, published at the end of January each session), is **not** intended for use to assess the National 4 added value unit. If centres choose to adapt the assignment to serve this purpose, it will require significant alteration in order to assess only National 4 content (National 5 content would invalidate the assessment) and to ensure that all of the assessment standards can be met. In addition, due to the

timing of publication and assessment, there would be no opportunity for prior verification of this adapted instrument of assessment.

Assessment judgements

National 4 Engineering Science Assignment — added value unit

A total of 25 centres were verified for the National 4 added value unit, of which 11 were deemed to have been 'not accepted'.

Some of the issues observed were:

- Assessment standard 1.1 requires a system diagram clearly showing all inputs and outputs. Centres were assessing 'electricity' (an inappropriate response) as correct and were also accepting sub-systems such as 'switch' and 'sensor' — acceptable responses would include 'movement', 'user input', 'light', 'sound', or similar.
- Assessment standard 1.1 requires all main sub-systems to be identified and described. Centres were assessing responses where sub-system diagrams were drawn, as correct. While this would be sufficient for the identification part of the requirement, a description of how each sub-system would operate is still required.
- Assessment standard 1.2 requires complete and labelled sketches of an appropriate drive mechanism **and** support structure. Centres were assessing candidate evidence to have passed this assessment standard without appropriate annotations.
- Assessment standard 1.2 requires a flowchart to follow a valid order and make sense to the given brief.
- Assessment standard 1.2. Flowcharts and mechanisms may be manually drawn or digitally produced to provide evidence.
- Assessment standard 1.3 requires a completed model or simulation of **both**, the control sub-system **and** the mechanical/support sub-system. Please note that, for evidence of simulation of the control sub-system, a flowchart on its own is insufficient. To demonstrate that simulation actually took place, the flowchart and the microcontroller module must both be included as evidence.

You can find more guidance and details on the requirements on assessing these assessment standards contained in the judging evidence section of the National 4 added value unit assessment support packs, available on SQA's secure website.

H23B 75 Electronics and Control — SCQF level 5

Of the centres verified for the SCQF level 5 Electronics and Control unit, few were deemed to have been 'not accepted'.

Some of the issues observed were:

- Assessment standard 1.1. To pass this assessment standard, candidates should be able to identify and describe the function of a range of components.
- Assessment standard 1.4. This assessment standard addresses a candidate's ability to use simulation software and/or construction materials. Therefore, minimal errors may be present in the circuit and candidates can still pass this assessment standard.

You can find more guidance and details on the requirements on assessing these assessment standards contained in the judging evidence section of the SCQF level 5 Electronics and Control unit assessment support packs, available on SQA's secure website.

H23B 76 Electronics and Control — SCQF level 6

All centres selected for verification were accepted. There were no issues with the verification of this unit.

H23D 76 Higher Mechanisms and Structures — SCQF level 6

All centres selected for verification were accepted. There were no issues with the verification of this unit.

C723 77 Advanced Higher Engineering Science — project

All centres verified for the Advanced Higher project were accepted. This accounted for approximately 30% of all candidates across Scotland.

Assessment judgements were to be closer to the national standard than in previous sessions.

One point of note was that some centres were assessing candidates' evaluations in isolation. Please remember that evaluative comments may appear throughout candidates' work and these comments should be included in the assessment of the evaluations.

03 Section 3: General comments

Evidence of internal verification was variable. While some examples of good practice were observed (such as clear, transparent processes), many centres provided evidence of internal verification that did not appear to have an impact on the final assessment judgements — as external verification relies on agreeing a centre's assessment judgements, external verifiers must be able to identify what these are. As such, it would be helpful to see the original assessor judgement, the internal verifier's judgement **and** the final agreed judgement.

A small number of centres submitted interim evidence for verification. Guidance on this is available on SQA's website, in the document 'Interim Evidence for Unit Verification', and this must be adhered to when submitting interim evidence — for example, it details that interim evidence must include assessment judgements for a majority of assessment standards of the selected unit.

Please note that printouts of flowcharts, programs, etc must be complete and large enough to be read by the verifier. In some occasions, evidence was cropped — meaning that it could not be read properly. If evidence is not clear, this could affect external verification judgements.

For the National 4 added value unit, although a 'record of progress' should be included, it is not a requirement to meet assessment standards 1.3 and 1.4 as it is not mandatory evidence.

You can find more guidance and details on the requirements on assessing these assessment standards contained in the judging evidence section of the National 4 unit assessment support packs, available on SQA's secure website.

For the National 4 added value unit, please note that some assessor support may be given for assessment standards 1.1 and 1.2. For assessment standards 1.3 and 1.4, candidates must carry out the task independently, with minimal advice and guidance. Any support given must be recorded in the comments of the candidate assessment record.