National Unit specification

General information

Unit title: Drawing for Construction (SCQF level 5)

Unit code: H66E 45

Superclass: TD

Publication date: January 2014

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This Unit is designed to introduce learners to a range of construction drawings. The Unit is intended to give learners confidence in the production of sketches, basic manual drawing techniques and the interpretation of construction drawings.

This Unit is suitable for learners who have limited or no experience of construction or of technical drawing.

Outcomes

On successful completion of the Unit the learner will be able to:

1 Sketch in proportion basic construction features.
2 Draw basic construction features using drawing instruments.
3 Interpret construction drawings.

Credit points and level

1 National Unit credit at SCQF level 5: (6 SCQF credit points at SCQF level 5).

Recommended entry to the Unit

Entry is at the discretion of the centre.

National Unit specification: General information (cont)

Unit title: Drawing for Construction (SCQF level 5)

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

The Assessment Support Pack (ASP) for this Unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable instrument of assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (http://www.sqa.org.uk/sqa/46233.2769.html).

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website **www.sqa.org.uk/assessmentarrangements**.

National Unit specification: Statement of standards

Unit title: Drawing for Construction (SCQF level 5)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Sketch in proportion basic construction features.

Performance Criteria

(a) Produce a basic 2D freehand sketch of a construction feature from a model or photograph.
(b) Produce a basic 3D freehand sketch of a construction feature from a model or photograph.
(c) Dimension and annotate freehand sketches.

Outcome 2

Draw basic construction features using drawing instruments.

Performance Criteria

(a) Use drawing instruments produce a 2D detail of a construction feature to scale from the produced sketch.
(b) Use drawing instruments to produce 3D illustration of a simple construction feature to scale from the produced sketch.

Outcome 3

Interpret construction drawings.

Performance Criteria

(a) Identify symbols, abbreviations and methods of dimensioning based on current standards.
(b) Explain and identify a range of drawing features from a selection of construction drawings.

National Unit specification: Statement of standards (cont)

Unit title: Drawing for Construction (SCQF level 5)

Evidence Requirements for this Unit

Evidence is required to demonstrate that learners have achieved all Outcomes and Performance Criteria.

Evidence in the form of sketches and drawings is required which demonstrates that the learner has achieved Outcomes 1 and 2 to the standards specified in the Outcomes and Performance Criteria. Evidence must be produced in controlled open-book conditions, learners should produce:

- one proportionally dimensioned and annotated 2D freehand sketch of a construction feature
- one proportionally dimensioned and annotated 3D freehand sketch of a construction feature
- one 2D orthographic dimensioned and annotated scaled drawing
- one 3D orthographic dimensioned and annotated scaled drawing

Written and/or recorded oral evidence should be produced to demonstrate that the learner has achieved Outcome 3 to the standard specified in the Outcome and Performance Criteria. Evidence should be produced under controlled closed book conditions. For outcome 3(a) learners should respond to a series of short answer questions. For outcome 3(b) learners should respond to a series of short answer questions based on a selection of construction drawings. The questions for (a) and (b) should cover drawing symbols, drawing abbreviations and methods of dimensioning.

National Unit Support Notes

Unit title: Drawing for Construction (SCQF level 5)

Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

Outcome 1 introduces learners to the representation of construction features by means of freehand sketching. Lecturers/teachers should begin with basic drawing conventions, and proceed from simple 2D shapes to more complex 3D shapes. Both isometric and perspective 3D representations should be covered, though either could be used for the assessment. Dimensioning should start from simple linear dimensions, progressing to baseline dimensions, continued dimensions, angles, radii of curves, and annotations with leaders.

For this Outcome, a suitable construction feature such as a manhole or roof details should be sketched. Consideration of presentation techniques should be encouraged.

Outcome 2 provides learners with the Knowledge and Skills required to present simple manual drawings effectively and accurately. Use of standard drawing instruments and presentation techniques should be covered and the finished drawing should be clearly presented, and in accordance with current British Standards. Sufficient information should be included for a contractor to construct the feature..

Outcome 3 provides learners with the Knowledge and Skills required to interpret a wide range of construction drawings effectively and accurately.

The types of drawing considered should include site location, site layout, general arrangement, assembly, component details, sections and fabrication drawings, and should cover a range of project types, including both building and civil engineering examples, and a range of construction materials and methods, including steel and reinforced concrete. Ideally centres should obtain good examples of a wide range of such drawings for learners to examine. The purpose, interpretation, drawing conventions of symbols and abbreviations and appropriate scales should be considered for each type of drawing.

Learners should become familiar with appropriate current standards and any other current guidance on construction drawing.

Guidance on approaches to delivery of this Unit

It is recommended that Outcomes 1 and 2 be completed in the sequence presented, though Outcome 3 could be presented at any stage of the Unit.

This Unit should be viewed almost entirely as product based in that the learner is required to practice and develop skills in sketching, manual drawing and interpretation of drawings.

Underpinning knowledge of the requirements for construction drawings can be provided through examination and interpretation of a range of construction drawings, covering a range of project types and of drawing purposes as detailed in Outcome 3. These should be compared with the requirements of appropriate current standards. This will help learners to appreciate the standard of presentation currently expected within industry.

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

For Outcome 1 learners could be presented with a model or photograph of a construction feature, with sufficient information to enable them to sketch the feature freehand in 2D and 3D. The finished sketches should show the various parts of the construction in approximately the correct proportions, but should not necessarily be to a specific scale. Drawing instruments, including scale rules, should NOT be used for this exercise.

For Outcome 2 learners could prepare 2D and 3D drawing to scale from the sketches produced in Outcome 1 using drawing instruments. The finished drawings should include a border, title block, and suitable text. No software drawing packages should be used.

For Outcome 3(a) learners should be presented with a series of short answer questions. It is recommended that the assessment contain six questions on drawing symbols, four on drawing abbreviations and two on methods of dimensioning. For outcome 3(b) learners should respond to a series of short answer questions relating to a selection of construction drawings. The questions should cover symbols, abbreviations and dimensions. It is recommended that 3(b) would consist of no more than eight questions to give a total of twenty for both parts (a) and (b).

It is anticipated that the assessment of Outcomes 1 and 2 will be carried out under open book supervised conditions to ensure originality and authenticity of learners' work. Learners should be allowed to work at their own pace within the time constraints of the Unit.

Outcome 3 will be carried out under supervised closed book conditions to ensure authenticity of the learner's work.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at **www.sqa.org.uk/e-assessment**.

Opportunities for developing Core and other essential skills

There are opportunities to develop the Core Skill of *Problem Solving* in Outcomes 1 and 2. Learners will be required to work efficiently and select appropriate measuring equipment and recording techniques depending on the size and complexity of the construction feature or component.

There are opportunities to develop the Core Skill of *Numeracy* Outcomes 1 and 2 as learners are required to measure and record three dimensional constructional features or components.

History of changes to Unit

Version	Description of change	Date

General information for learners

Unit title: Drawing for Construction (SCQF level 5)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit is suitable if you have little or no experience of construction methods or technical drawing skills. The Unit offers an introduction to basic manual drawing techniques and the production of 2D and 3D sketching. The sketches will have to be in proportion and annotated.

You will develop skills in the recognition of various construction drawing types and a range of commonly used construction drawing symbols and abbreviations.

In order to achieve this Unit you will be required to produce both 2D and 3D sketches and a series of manually produced technical drawings. In Outcome 1 the sketches will be freehand and in Outcome 2 the use of drawing instruments is expected, but no drawing software packages should be used.

The assessment of outcomes one and two is based on the production of well-proportioned sketches and accurately produced technical drawings.

A closed book written assessment is used in Outcome 3 to prove your knowledge of drawing symbols, abbreviations and dimensioning methods as used in the production of construction drawings.

There are opportunities to develop the Core Skill of *Problem Solving* in Outcomes 1 and 2. Learners will be required to work efficiently and select appropriate measuring equipment and recording techniques depending on the size and complexity of the construction feature or component.

There are opportunities to develop the Core Skill of *Numeracy* Outcomes 1 and 2 as learners are required to measure and record three dimensional constructional features or components.