



## National Unit Specification: general information

**UNIT** Drawing for Construction (SCQF level 5)

**CODE** F3JN 11

### SUMMARY

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

This Unit aims to introduce candidates to a range of construction drawings. The Unit is intended to give candidates confidence in the production of sketches for construction features, implementation of basic manual drawing techniques and the interpretation of construction drawings.

### OUTCOMES

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

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 credit at SQA level 5 (6 SCQF credit points at SCQF level 5\*).

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

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### Administrative Information

**Superclass:** TD

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## **National Unit Specification: general information (cont)**

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### **CORE SKILLS**

There is no automatic certification of Core Skills or Core Skill components in this Unit. Opportunities for developing aspects of Core Skills are highlighted in *Guidance on Learning and Teaching Approaches*.

## **National Unit Specification: statement of standards**

### **UNIT        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 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 simple 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) Using drawing instruments produce a 2D detail of a construction feature to scale from the produced sketch.
- (b) Using drawing instruments produce a 3D illustration of a simple construction feature to scale from the produced sketch.

#### **OUTCOME 3**

Interpret construction drawings.

##### **Performance Criteria**

- (a) Scale off dimensions and identify orientations from a given site plan.
- (b) Identify a range of features from a given site plan.
- (c) Identify features and critical levels from a given cross section.
- (d) Identify selected bar marks and provide full details from a given reinforcement drawing and bar bending schedule.
- (e) Identify a range of steel sections, dimensions and jointing methods from a given steel erection drawing.

## National Unit Specification: statement of standards (cont)

### UNIT Drawing for Construction (SCQF level 5)

#### EVIDENCE REQUIREMENTS FOR THIS UNIT

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

Written and/or oral evidence, and sketches, a drawing and an illustration, are all required to demonstrate that candidates have achieved all Outcomes to the standard specified in the Performance Criteria. Evidence should be produced in controlled open-book conditions.

Appropriate instruments of assessment would be:

- ◆ producing a finished, dimensioned and annotated 2D freehand sketch of a construction feature
- ◆ producing a finished, dimensioned and annotated 3D freehand sketch of a construction feature
- ◆ producing a finished 2D scale drawing using drawing instruments
- ◆ producing a finished 3D scale illustration using drawing instruments

**Views** — Orthographic (Plans, Elevations), Isometric

**Dimensions** — Horizontal, Vertical

**Orientations** — Compass directions

**Features** — Symbols; Trees, Buildings, Roads, Railways, Overhead wires, Telegraph poles, Sign posts, Manholes, Gullies, Stairs/steps

**Critical levels** — Floor levels, Ceiling levels, Soffit levels, Ground levels, Foundation/formation levels,

**Reinforcement Drawings** — Bar marks, Bar sizes, Bar types, Bar spacings, Bar locations, Bar laps, Bar shapes, Cover, Identification of individual bar marks on drawings, Groups of bars

**Steel Erection Drawings**

**Steel sections** — I beam, H column, Square hollow section, Angle section, Channel section, Round hollow section

**Dimensions** — Section dimensions, Bolt dimensions, Hole dimensions, Fixing locations,

**Jointing methods** — Black bolts, Friction grip bolts, Welds

For Outcome 3 candidates could be presented with a range of drawings from which to answer 25 short answer questions. These questions should cover the performance criteria as follows:

- ◆ four questions from performance criteria a
- ◆ four questions from performance criteria b
- ◆ five questions from performance criteria c
- ◆ five questions from performance criteria d
- ◆ seven questions from performance criteria e

Candidates may use notes, textbooks, handouts and internet material in producing the assessment responses, but must provide appropriate bibliographies and references. Sketches, drawings and illustrations must be drawn by the candidate manually.

Evidence should be produced in controlled open-book conditions at appropriate points throughout the Unit. The total time given in the assessment of all Outcomes should not exceed two and a half hours. Assessments must be manageable and practicable for centres and candidates.

## **National Unit Specification: statement of standards (cont)**

### **UNIT**    Drawing for Construction (SCQF level 5)

The Assessment Support Pack for this Unit provides appropriate sample assessment materials. Where centres wish to develop their own assessment materials they should refer to the Assessment Support Pack to ensure a comparable standard.

## **National Unit Specification: support notes**

### **UNIT        Drawing for Construction (SCQF level 5)**

This part of the Unit Specification is offered as guidance. The support notes 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 candidates 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 candidates 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 candidates 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 candidates to examine. The purpose, interpretation, drawing conventions and appropriate scales should be considered for each type of drawing. Candidates should become familiar with appropriate current British Standards and any other current guidance on construction drawing.

#### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR 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 candidate 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 to the requirements of appropriate current British Standards. This will help candidates to appreciate the standard of presentation currently expected within industry.

## National Unit Specification: support notes (cont)

### UNIT Drawing for Construction (SCQF level 5)

#### OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates will be:

- ◆ interpreting and producing data
- ◆ analysing construction drawings

These offer opportunities to develop aspects of the Core Skills of:

- ◆ *Numeracy*
- ◆ *Problem Solving*

#### GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

##### Opportunities for the use of 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 communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

For Outcome 1 candidates 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 candidates could prepare a 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.

For Outcome 3 candidates could be presented with a range of drawings from which to answer 25 short answer questions. These questions should cover the performance criteria as follows:

- ◆ four questions from performance criteria a
- ◆ four questions from performance criteria b
- ◆ five questions from performance criteria c
- ◆ five questions from performance criteria d
- ◆ seven questions from performance criteria e

It is expected that this assessment will be carried out under supervised controlled conditions.

## **National Unit Specification: support notes (cont)**

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### **CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).