

## National Unit Specification: general information

**UNIT** Technical Drawing: Introduction (Intermediate 1)

**NUMBER** D3SJ 10

### COURSE

### SUMMARY

On completion of this unit the candidate will be competent in the setting out and production of basic drawings and technical information for construction crafts.

### OUTCOMES

- 1 Identify drawing equipment, instruments, and materials.
- 2 Set out a drawing sheet.
- 3 Produce geometric plane figures using drawing equipment and instruments.
- 4 Produce annotated scale drawings in first angle orthographic projection, from given 3-dimensional shapes.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

### CREDIT VALUE

1 Credit.

### CORE SKILLS

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

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## Administrative Information

**Superclass:** VF

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## National Unit Specification: statement of standards

### UNIT Technical Drawing: Introduction (Intermediate 1)

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 the Scottish Qualifications Authority.

#### OUTCOME 1

Identify drawing equipment, instruments, and materials.

##### Performance criteria

- a) Equipment, instruments and materials used in technical drawing are correctly identified and their functions stated accurately.
- b) Items appropriate to the given task are selected in accordance with the needs of the task.
- c) The maintenance requirements for each item is described accurately.
- d) All items are stored safely and in a manner appropriate to the particular item.

##### Note on range for the outcome

Equipment: drawing board; T-square drawing boards, board squares T and sliding, drawing pencils, drawing sheet securing clips.

Instruments: 45° fixed set square; 60°/30° fixed set square; adjustable square; protractor; compasses; spring compasses; scale ruler; drawing pencils.

Materials: drawing/cartridge paper of standard dimensions; masking tape.

##### Evidence requirements

Please refer to *Evidence requirements for the unit* at the end of the Statement of Standards.

#### OUTCOME 2

Set out a drawing sheet.

##### Performance criteria

- a) Equipment appropriate to the task is selected correctly.
- b) The drawing sheet with title panel is laid out correctly and set out to correct position and size in compliance with appropriate British Standards.
- c) Annotation produced is clear and legible using a style and sizes in compliance with appropriate British Standards.
- d) Terminology used in drawing is correct.

##### Note on range for the outcome

Annotation: freehand; stencilled; dry transfers.

Terminology: margins; title panel; information panel; British Standards.

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

## **UNIT**            Technical Drawing: Introduction (Intermediate 1)

### **Evidence requirements**

Please refer to *Evidence requirements for the unit* at the end of the Statement of Standards.

### **OUTCOME 3**

Produce geometric plane figures using drawing equipment and instruments.

#### **Performance criteria**

- a) Equipment, instruments and materials used in technical drawing are correctly identified and their functions stated accurately.
- b) The drawing sheet with title panel is set out to correct position and size in compliance with appropriate British Standards.
- c) By using compasses, lines and angles are bisected correctly.
- d) Using appropriate drawing instruments, divides lines into any given number of equal parts.
- e) Plane figures are set out and drawn to scale accurately.
- f) Drawings produced are clean and legible.
- g) All drawing equipment is maintained in working condition and in a manner appropriate to the particular item.

#### **Note on range for the outcome**

Plane figures: triangles; quadrilaterals; polygons; circles.

### **Evidence requirements**

Please refer to *Evidence requirements for the unit* at the end of the Statement of Standards.

### **OUTCOME 4**

Produce annotated scale drawings in first angle orthographic projection, from given 3-dimensional shapes.

#### **Performance criteria**

- a) Equipment, instruments and materials selected are appropriate to the given task.
- b) The drawing sheet with title panel is set out to correct position and size in compliance with appropriate British Standard.
- c) First angle orthographic projection from three-dimensional shapes is set out and drawn accurately to scale.
- d) Drawings produced are clean and legible and in accordance with the given task.
- e) All drawing equipment is maintained in working condition and in a manner appropriate to the particular item.

#### **Note on range for the outcome**

The range statement for this outcome is fully expressed within the performance criteria.

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

**UNIT**            Technical Drawing: Introduction (Intermediate 1)

**Evidence requirements**

Please refer to *Evidence requirements for the unit* at the end of the Statement of Standards.

**EVIDENCE REQUIREMENTS FOR THE UNIT**

**Outcome 1**

Written and/or oral evidence plus actual performance is needed to show the candidate can identify and state the function of drawing equipment and instruments; select items appropriate to the task; and maintain and store them safely and correctly after use.

All working practices must be in line with current and relevant health and safety legislation and regulations.

All the performance criteria must be met and all items in the range statement covered.

**Outcome 2**

Written and/or oral evidence plus actual performance is needed to show the candidate can set out a drawing sheet, and produce consistently clear and legible annotation.

All working practices must be in line with current and relevant health and safety legislation and regulations.

All the performance criteria must be met and all items in the range statement covered.

**Outcome 3**

Written and/or oral evidence plus actual performance is needed to show the candidate can select equipment appropriate to the tasks; and on two occasions for each, bisect lines and angles, divide lines into any given number of equal parts; and set out and draw plane figures accurately to scale.

Drawings must be clean and legible, and equipment/instruments maintained and stored safely and correctly after use.

All working practices must be in line with current and relevant health and safety legislation and regulations.

All the performance criteria must be met and all items in the range statement covered.

**Outcome 4**

Written and/or oral evidence plus actual performance is needed to show the candidate can on two occasions, set out and draw to scale accurately in first angle orthographic projection: an elevation, plan, right and left hand elevations in accordance with the specification.

All working practices must be in line with current and relevant health and safety legislation and regulations.

All the performance criteria must be met and all items in the range statement covered.

## National Unit Specification: support notes

**UNIT**            Technical Drawing: Introduction (Intermediate 1)

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 xx hours.

### **GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT**

The candidate successfully completing this unit will require underpinning knowledge and skills relating to the practical applications of setting out and bisecting lines and angles. Acceptable practices in the production of drawings and technical information for construction crafts.

This unit would be offered to candidates who may wish to pursue a career in the construction and related services industries. The skills are transferable within different working environments but the unit is primarily aimed at candidates whose normal place of work would eventually be a site, workshop, or similar environment.

The range statement is applicable to all areas of construction and other related or similarly structured industries. The competencies and underpinning knowledge gained in successfully completing this unit would be transferable across a range of related disciplines.

The unit deals with the principles of accurate setting out and the production of drawings and technical information for construction crafts and is complemented by units dealing with related work in the construction crafts.

It should be delivered as part of a structured programme of training and orientated to the context of the candidate's work and area of responsibility.

The following information may be helpful with regard to specific outcomes:

#### **Outcome 1**

The candidate should be introduced to:

Drawing Equipment: drawing boards, board squares T and sliding, set squares 45° and 30°/60°, adjustable square, protractor, scale rulers, compasses, drawing pencils, erasers, cartridge paper, drawing sheet sizes, securing of drawing sheets, clips, masking tape.

Emphasis should be placed on the necessity to regularly maintain/clean equipment and instruments to enable clean drafting to be accomplished. Careful and correct storage methods should be shown.

#### **Outcome 2**

The candidate should be given guidance on what constitutes:

Drawing sheet layout and formatting: to British Standards, for example, (BS) 1192, 1, 2 and 3 (BS) 308, title layouts X-Y axes, lettering and annotation.

## National Unit Specification: support notes (cont)

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### **Outcome 3**

The candidate should be informed of:

Geometrical terms and principles: straight lines, curved lines, angles, triangles, quadrilaterals, polygons, circles and parts thereof. It is imperative that the candidate is made fully aware of the exacting demands required to produce drawings of a high quality and being one of the formative core unit in drafting in the SVQ programmes, correct procedures and an attitude of care cannot be overstressed. Correct terminology should be used throughout with best practice in the use of equipment to produce drawings of an acceptable standard being clearly and legibly emphasised.

The candidate should become proficient in setting out and drawing: lines, angles and plane figures through the production of a formative reference portfolio. At the appropriate time for summative assessment, the candidate should be provided with appropriate material and a specification outlining the demands of the practical exercise and the performance criteria. The candidate should undertake the summative assessment without the use of reference material.

### **Outcome 4**

The candidate should be informed of:

- a)     what constitutes first angle orthographic projection;
- b)     method of projection;
- c)     projection symbols;
- d)     x-y axes;
- e)     scales.

The candidate should become proficient in setting out and producing first angle orthographic projection drawings to scale (using common construction industry scales) from three dimensional shapes through the production of a formative reference portfolio. At the appropriate time for summative assessment, the candidate should be provided with appropriate material and a specification outlining the demands of the practical exercise and the performance criteria. The candidate should undertake the summative assessment without the use of reference material.

### **GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT**

The achievement of skills and underpinning knowledge required for this unit would be assisted by the provision of information sources which may be in the form of: oral or written instructions; sketches; drawings; schedules; specifications; technical literature; manufacturers' data; codes of practice; building standards; statutory regulations; slides; videos; computer software.

Tutors/trainers should demonstrate practical elements step-by-step until the candidate feels confident enough to attempt them on his/her own. The requirement to adopt safe working practices and comply with current safety legislation should be emphasised throughout.

Supervisors and/or employers could also play an important part in assisting candidates to generate evidence where applicable.

## National Unit Specification: support notes (cont)

## **UNIT**            Technical Drawing: Introduction (Intermediate 1)

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

Centres may use the Instruments of Assessment which are considered to be the most appropriate. Examples of Instruments of Assessment which could be used are:

Outcome 1 PC (a)-(d)    Matching Exercise

Outcome 2 PC (a)-(d)    Practical Exercise

Outcome 3 PC (a)-(g)    Practical Exercise

Outcome 4 PC (a)-(e)    Practical Exercise

### **Assessment Specifications**

The following specifications may assist the assessor in judging the candidate's performance against the performance criteria:

#### **Outcome 1**

The candidate could be presented with a list of drafting situations, and be required to select the appropriate equipment/instrument(s) for each one. Correct maintenance and storage knowledge could also be assessed by this method.

#### **Outcome 2**

The candidate will be required to set out a drawing sheet, with correct title and information panels, and with neat lettering/annotation.

Summative assessment for this outcome could form part of the summative assessment for Outcome 4.

#### **Outcome 3**

The candidate will be presented with a specification outlining the requirements of the outcome. The specification could include the following guidance: sufficient information, ie scales, dimensions and angles, to enable the candidate to set out and draw:

- a)     lines divided into any given number of equal parts;
- b)     scalene triangle with each angle bisected to determine centroid;
- c)     equilateral triangle with each side bisected to determine centre of enclosing circle;
- d)     regular and irregular quadrilaterals;
- e)     regular polygons;
- f)     circle (from the span and rise of a segment);

Satisfactory performance in this outcome will be demonstrated by the candidate producing annotated scale drawings in compliance with the performance criteria and evidence requirements.

## National Unit Specification: support notes (cont)

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### **Outcome 4**

The candidate will be presented with a specification outlining the requirements of the outcome. The specification could include the following guidance: sufficient information, ie scales and dimensions, to enable the candidate to set out and draw in first angle orthographic projection; an elevation, a plan, right and left hand elevations of rectangular shaped components with rebated edge(s). The specification to include an isometric view of the components.

Satisfactory performance in this outcome will be demonstrated by the candidate producing annotated scale drawings in compliance with the performance criteria and evidence requirements.

Evidence can be generated using a variety of methods such as:

- Performance under instruction (recorded in Candidate's Assessment and Evidence Record or other methods).
- Technical Drawing Exercises (recorded in Candidate's Assessment and Evidence Record or other methods).
- Project work set by Centre.

For detailed guidance on assessment, reference should be made to the publications listed at the end of the Support Notes and to the Assessment Guidance Notes available for the delivery of the Scottish Vocational Qualification of which this unit is a component.

### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering special alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).