

## Higher National Unit Specification

### General information for centres

**Unit title:** Civil Engineering Contract and Project Management B

**Unit code:** DW5A 35

**Unit purpose:** This Unit seeks to provide the candidate with skills required in the management of projects, in the context of both design terms and site management.

On completion of the Unit the candidate should be able to:

- 1 Use CESMM in billing sub structures, concrete work, formwork and earthworks.
- 2 Deal with variations, dayworks, disputes, and payments.
- 3 Use both manual and computerised cost and project control techniques.

**Credit points and level:** 1 HN Credit at SCQF level 8: (8 SCQF credit points at SCQF level 8\*)

*\*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.*

**Recommended prior knowledge and skills:** It is recommended that Civil Engineering Contract and Project Management A Unit will be delivered prior to this Unit. No specialist prior knowledge or skills are required by the candidate for this Unit.

**Core Skills:** There are opportunities to develop the Core Skill(s) of Communication, Numeracy, IT and Problem Solving in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

**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.

**Assessment:** Assessment may be on an individual outcome basis, or parts may be combined as an integrated assessment. They should be conducted under supervised, controlled conditions. The assessment papers should be composed of an appropriate balance of short answer, restricted response and structured questions. It should be noted that candidates must achieve all the minimum evidence specified for each outcome in order to pass this unit.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

## **General information for centres (cont)**

The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

An exemplar instrument of assessment and marking guidelines has been produced to provide examples of the type of evidence required to demonstrate achievement of the aims of this Unit and to indicate the national standard of achievement at SCQF level 8.

## Higher National Unit specification: statement of standards

**Unit title:** Civil Engineering Contract and Project Management B

**Unit code:** DW5A 35

The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Throughout the unit emphasis will be placed where appropriate on the application of Health & Safety and Sustainability. Safe working practises should be looked at in accordance with current safety codes of practise and regulations. Sustainability should include reference to criteria affecting sustainability, impact of not implementing sustainability on the environment and the legislation promoting sustainability.

### Outcome 1

Use CESMM in billing sub structures, concrete work, formwork and earthworks

#### Knowledge and/or skills

- ◆ Taking off sheets
- ◆ Length, area and volume calculations
- ◆ Method related charges
- ◆ Preparation of bill of quantities
- ◆ Make up of unit rates

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that, in relation to using CESMM, they can:

- ◆ create and explain bills relating to sub-structures, concrete work, formwork and earthworks

Evidence for the knowledge and/or skills for this outcome will be provided on a sample basis. In any assessment of this outcome, a minimum of **four out of five** knowledge and/or skills items should be sampled, including the preparation of a bill of quantities. Candidates must provide a satisfactory response to all four items.

Questions used to elicit candidate evidence should take the form of an appropriate balance of short answer, restricted response and structured questions, and preparation of a small bill of quantities for a given part of a simple project, including piles, earthworks, in situ concrete and method related charges.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Civil Engineering Contract and Project Management B

### **Assessment guidelines**

The assessment instrument should be designed to take approximately 45 to 60 minutes to complete.

Assessment should be undertaken under open book conditions.

### **Outcome 2**

Deal with variations, dayworks, disputes and payments

#### **Knowledge and/or skills**

- ◆ Variations
- ◆ Dayworks
- ◆ Dispute resolution
- ◆ Payment calculations

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that, in relation to variations, dayworks, disputes and payments, they can:

- ◆ identify and explain causes and processes for dealing with variations, dayworks, disputes and payments

Evidence for the knowledge and/or skills for this outcome will be provided on a sample basis. In any assessment of this outcome, a minimum of **three out of four** knowledge and/or skills items should be sampled, including calculation of interim payments. Candidates must provide a satisfactory response to all three items.

Questions used to elicit candidate evidence should take the form of an appropriate balance of short answer, restricted response and structured questions, and calculation of interim payments for a given situation.

### **Assessment guidelines**

The assessment instrument should be designed to take approximately 45 to 60 minutes to complete.

Assessment should be undertaken under open book conditions.

### **Outcome 3**

Use both manual and computerised cost and project control techniques

#### **Knowledge and/or skills**

- ◆ Purpose of cost control
- ◆ Importance of cost control in respect of sub-contractors
- ◆ Manual cost control techniques

## Higher National Unit specification: statement of standards (cont)

**Unit title:** Civil Engineering Contract and Project Management B

- ◆ Computerised cost control techniques
- ◆ Purpose of project control
- ◆ Importance of project control in respect of sub-contractors
- ◆ Manual project control techniques
- ◆ Computerised project control techniques

### Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that, in relation to cost and project control techniques, they can:

- ◆ use manual and computerised cost and project control techniques

Evidence for the knowledge and/or skills for this outcome will be provided on a sample basis. In any assessment of this outcome, a minimum of **six out of eight** knowledge and/or skills items should be sampled, including calculation of at least one manual and one computerised control technique. Candidates must provide a satisfactory response to all six items.

Questions used to elicit candidate evidence should take the form of an appropriate balance of short answer, restricted response and structured questions.

### Assessment guidelines

The assessment instrument should be designed to take approximately 45 to 60 minutes to complete.

Assessment should be undertaken under open book conditions.

## **Administrative Information**

<b>Unit code:</b>	DW5A 35
<b>Unit title:</b>	Civil Engineering Contract and Project Management B
<b>Superclass category:</b>	TL
<b>Date of publication:</b>	June 2006
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## Higher National Unit specification: support notes

### Unit title: Civil Engineering Contract and Project Management B

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

This Unit provides the candidate with the knowledge and skills to manage common civil engineering projects at both design and site stages.

Recommended time allocation to each outcome is given as guidance towards the depth of treatment which might be applied to each topic. This guidance has been used in the design of the assessment exemplar material provided with the Unit.

#### 1 Billing of sub structures, concrete work, formwork and earthworks using CESMM (16 hours)

*Length:* straight; arc.

*Area:* regular and irregular polygons; circular; Simpson's Rule; Prismoidal Rule.

*Volume:* extrusions of regular cross section; pyramid; cone; truncated cone; sphere; Simpson's Rule; Prismoidal Rule.

*Application of rules of current CESMM:* measurement rules; definition rules; coverage rules; additional description rules

*Method related charges:* time related; fixed charge; purpose; procedure.

*Preparation of bill of quantities:* substructures; concrete work; formwork; earthworks; method related charges; adjustment items.

*Make up of unit rates:* Labour; Plant; Materials; Overheads; Profit.

#### 2 Variations, dayworks, disputes, and payments (10 hours)

*Variations:* causes; instructions.

*Dayworks:* labour; materials; plant; supplementary charges; FCEC daywork schedules.

*Dispute resolution:* negotiation; mediation; conciliation; adjudication; dispute review boards; arbitration; litigation.

*Payment calculations:* measured items; variations; method related charges; adjustment item; retention; interim payment; final payment.

## Higher National Unit specification: support notes (cont)

**Unit title:** Civil Engineering Contract and Project Management B

**3 Manual and computerised cost and project control techniques, including sub contractor scenarios (14 hours)**

*Cost control techniques:* project cash flow statements; finance required.

*Project control techniques:* network precedence diagram; network arrow diagram; bar chart; linked bar chart; resource histogram.

### Guidance on the delivery and assessment of this Unit

This Unit should be delivered in the second year of a two year programme, and after the Civil Engineering Contract and Project Management A Unit.

It is recommended that evidence for learning outcomes is achieved through well-planned course work, assignments and projects. Assessment may be formative and summative and both may feature as part of the process. Although assessments must be focused on the individual achievement of each candidate, group work and role-play activities may contribute to the assessment. Integrative assignments and project work will help to link this unit with other related units.

The volume of evidence required for each assessment should take into account the overall number of assessments being contemplated within this unit and the design of the overall teaching programme.

In designing the assessment instruments, opportunities should be taken to generate appropriate evidence to contribute to the assessment of Core Skills units.

Where available, evidence from the workplace can also be incorporated to enhance the learning outcomes, provided that this evidence is appropriate and authenticated as the students own work.

#### *Opportunities for developing Core Skills*

Opportunities for the development of Core Skills at the output level are more fully identified in the 'Core Skills Sign Posting Guide'. The grid below is indicative of the opportunities for core skills development within this Unit.



## Higher National Unit specification: support notes (cont)

**Unit title:** Civil Engineering Contract and Project Management B

Core Skill	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5
<b>1 Communication</b>					
Reading					
Writing		✓			
Oral					
<b>2 Numeracy</b>					
Using Number	✓	✓			
Using Graphical Information	✓		✓		
<b>3 IT</b>					
Using Information Technology			✓		
<b>4 Problem Solving</b>					
Critical Thinking	✓	✓	✓		
Planning and Organising	✓	✓	✓		
Reviewing and Evaluating			✓		
<b>5 Working with Others</b>					

### Open learning

Where appropriate materials exist, this unit could be delivered by distance learning, which may incorporate some degree of online support. However, with regard to assessment, planning would be required by the centre concerned to ensure the sufficiency and authenticity of candidate evidence. Arrangements would need to be put in place to ensure that assessments were conducted under controlled, supervised conditions.

### Candidates with additional support needs

This Unit specification is intended to ensure that there are no artificial barriers to learning or assessment. 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. For information on these, please refer to the SQA document *Guidance on Alternative Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: [www.sqa.org.uk](http://www.sqa.org.uk).

## **General information for candidates**

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On completion of the Unit you should be able to:

- 1 Use CESMM in billing sub structures, concrete work, formwork and earthworks.
- 2 Deal with variations, dayworks, disputes, and payments.
- 3 Use both manual and computerised cost and project control techniques.

Evidence that you can satisfy the knowledge and skill elements of this unit will be obtained by assessment in controlled, supervised conditions.