

Higher National Unit Specification

General information for centres

Unit title: Building Measurement and Cost Studies

Unit code: DW3X 34

Unit purpose: This Unit is designed to enable candidates to gain knowledge and understanding of the processes involved in the preparation of a tender for building works. The Unit begins with the preparation of quantified item descriptions and proceeds to examine the factors affecting labour and plant outputs and how these and other factors such as material costs impact on the overall estimate for the work and the subsequent tender submitted to the Client.

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

- 1 Produce quantified items for superstructure walls, together with associated openings and finishes, for a single building of straightforward construction using the current Standard Method of Measurement (SMM) for building works.
- 2 Describe the factors which affect building costs.
- 3 Explain the production and adjudication of an estimate for building works.

Credit points and level: 1 HN Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**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 would be an advantage for candidates to have a basic knowledge and understanding of external wall construction, although this is not essential because the Unit covers all the basic principles. Possession of basic knowledge and understanding may be evidenced by the candidate having obtained a Unit or Units in construction technology at HN level.

Core Skills: There are opportunities to develop the Core Skills of Communication, Numeracy 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.

General information for centres (cont)

Assessment: It is possible to assess candidates either on an individual Outcome basis, combinations of Outcomes or by a single holistic assessment combining all Outcomes.

It is recommended that assessment of this Unit should take the form of two separate papers.

Outcome 1 should be assessed individually and last two hours. The assessment paper will require the candidate to prepare a draft Bill of Quantities for the external walls of a single building of straightforward construction.

The assessment for Outcomes 2 and 3 should be combined together into one assessment paper which it is anticipated would take the candidate approximately two hours to complete. This assessment paper will take the form of an assignment which will require the submission of a written report.

The assessment for Outcome 1 should be conducted under controlled, supervised conditions. It should be noted that candidates must achieve all the minimum evidence specified for each Outcome in order to pass the 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.

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 7

Higher National Unit specification: statement of standards

Unit title: Building Measurement and Cost Studies

Unit code: DW3X 34

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

Produce quantified items for superstructure walls, together with associated openings and finishes, for a single building of straightforward construction using the current Standard Method of Measurement (SMM) for building works

Knowledge and/or skills

- ◆ Brickwork/Blockwork walls
- ◆ Adjustments for openings in walls
- ◆ Accessories to Brickwork/Blockwork
- ◆ Windows and Doors
- ◆ Sundry items associated with Windows and Doors
- ◆ Ironmongery
- ◆ Internal/External Finishes

Evidence Requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- ◆ produce comprehensive lists of items
- ◆ draft comprehensive item descriptions
- ◆ express quantities in the correct Unit of measurement
- ◆ take off quantities accurately
- ◆ produce accurate waste calculations
- ◆ correctly interpret the technology
- ◆ correctly analyse drawings

Higher National Unit specification: statement of standards (cont)

Unit title: Building Measurement and Cost Studies

In any assessment of this Outcome **all** knowledge and/or skills should be included. Candidates must provide a satisfactory response to all items.

Evidence should be generated through assessment undertaken in controlled, supervised conditions 'Open-book' with the current SMM for building works. The candidate should have access to their own notes.

Assessment guidelines

Evidence for competence in this Outcome should be generated using drawings and specification notes for a single building of straightforward construction with a flat roof and only two or three openings in the external wall.

The candidate should be asked to prepare suitable item descriptions and take off accurate quantities for the following:

- ◆ Brickwork/Blockwork
- ◆ Brickwork/Blockwork Accessories
- ◆ Windows
- ◆ Doors
- ◆ Sundry Items for Windows & Doors
- ◆ Ironmongery
- ◆ Internal/External Finishes

Outcome 2

Describe the factors which affect building costs

Knowledge and/or skills

- ◆ Labour
- ◆ Plant
- ◆ Materials
- ◆ Project specific factors

Evidence Requirements

Candidates will need evidence to demonstrate their skills and/or knowledge by showing that they can:

- ◆ identify the factors which affect labour output
- ◆ identify the factors which affect plant output
- ◆ identify the factors which affect material costs
- ◆ identify project specific factors which affect the overall building costs

In any assessment of this Outcome **all** knowledge and/or skills should be included. Candidates must provide a satisfactory response to all items

Higher National Unit specification: statement of standards (cont)

Unit title: Building Measurement and Cost Studies

Assessment guidelines

Assessment for this Outcome should take the form of an Assignment whereby the candidate can research the subject area and submit written evidence to demonstrate competence.

The assessment for this Outcome should be combined with that for Outcome 3 to form a single assessment paper, details of which are given at the end of Outcome 3.

Outcome 3

Explain the production and adjudication of an estimate for building works

Knowledge and/or skills

- ◆ Calculation of Estimate
- ◆ Conversion of Estimate to Tender
- ◆ Preparing Estimates using Bills of Quantities
- ◆ Preparing Estimates without Bills of Quantities

Evidence Requirements

Candidates will need evidence to demonstrate their knowledge and/or skills by showing that they can:

- ◆ explain the factors which have to be taken into account when preparing an estimate for building works
- ◆ explain the function of a Bill of Quantities when preparing an estimate for building works.
- ◆ describe the process involved when compiling an estimate for building works
- ◆ explain the factors which require to be taken into consideration when converting an estimate into a tender for a building contract
- ◆ describe how the estimating process differs when there are no Bills of Quantities included with the tender documentation

In any assessment of this Outcome **all** knowledge and / or skills should be included. Candidates must provide a satisfactory response to all items

Assessment guidelines

The assessment of this Outcome should be combined with that for Outcome 2 to form a single assessment paper, taking the form of an assignment requesting the production of a written report. This report should explain the estimating process undertaken by a construction company and outline the factors which have to be considered and incorporated into an estimate for building works and the subsequent tender.

Administrative Information

Unit code:	DW3X 34
Unit title:	Building Measurement and Cost Studies
Superclass category:	TC
Date of publication:	June 2006
Version:	01
Source:	SQA

© Scottish Qualifications Authority 2005

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

Higher National Unit specification: support notes

Unit title: Building Measurement and Cost Studies

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 has been written in order to allow candidates to develop knowledge, understanding and skills in the following areas:

- 1 Producing quantified items for superstructure walls, together with associated openings and finishes for a single building of straightforward construction using the current SMM for building works.
- 2 Describing the factors which affect building costs.
- 3 The process of producing and adjudicating on estimates for building work.

Recommended time allocations for each Outcome are 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 Produce quantified items for superstructure walls together with associated openings and finishes for a single building of straightforward construction using the current SMM for building works. (20 hours)

◆ **Taking off quantities**

— **Preparing accurate lists of item descriptions (SMM)**

Waste calculations

— **Side notes**

— **Units of measurement**

- Brickwork/Blockwork
 - Single skin and cavity wall
 - Adjustment for openings
 - Accessories to brickwork /blockwork
- Windows
- Doors, including all frames and facings etc
- Ironmongery
- Internal/External Finishes

2 Describe the factors which affect building costs. (8 hours)

◆ **Labour rate:**

Working Rule Agreement
Overtime
Bonus payments
Weather
Site location

Higher National Unit specification: support notes (cont)

Unit title: Building Measurement and Cost Studies

- ◆ **Plant rate:**
 - Machine capacities
 - Hire plant/Company-owned plant
 - RICS Plant Hire charges
 - Plant operator
 - Transportation of plant

- ◆ **Material Costs:**
 - Specification
 - Delivery costs
 - Small/bulk orders
 - Waste

- ◆ **Project Specific Costs:**
 - Geographical location
 - Weather conditions
 - Ease of access
 - Security
 - Location of services
 - Ground conditions
 - Site topography
 - Existing use of site
 - Storage space on site

3 Explain the production and adjudication of estimates for a building of straightforward construction. (8 hours)

- ◆ **Calculation of *Estimate*:**
 - Labour Costs
 - Plant Costs
 - Material Costs
 - Sub Contract Enquiries
 - Site Visit Report
 - Overheads
 - Location of site

- ◆ **Conversion of Estimate to *Tender*:**
 - Profit
 - Current Workload
 - Anticipated Workload
 - Type of Work
 - Risk

- ◆ Preparing estimates for building projects with Bills of Quantities
- ◆ Preparing estimates for building projects without Bills of Quantities
- ◆ CIOB Code of Estimating Practice (COEP)

Higher National Unit specification: support notes (cont)

Unit title: Building Measurement and Cost Studies

In order to assist the candidate during the assessment of this Outcome the following key points may be stated as being necessary for inclusion in their report:

- ◆ Factors affecting labour output and costs
- ◆ Factors affecting plant output and costs
- ◆ Factors affecting material costs
- ◆ Subcontract Enquiries
- ◆ Site Visit Report
- ◆ Location of site
- ◆ Overheads and Profit
- ◆ Current and Anticipated Workload
- ◆ Type of Work
- ◆ Preparation of Estimate
- ◆ Adjudication of Estimate

Guidance on the delivery and assessment of this Unit

As this Unit introduces fundamental measurement and costing principles it is recommended that it be delivered in the first year of HND Built Environment awards and HNC where appropriate. However, it would benefit the candidate to have some knowledge of external wall construction and therefore would be best delivered towards the latter part of the first year.

Where this Unit is incorporated into other Group Awards it is recommended that it be delivered in the context of the specific occupational area(s) that the award is designed to cover.

Details on approaches to assessment are given under Evidence Requirements and Assessment guidelines under each Outcome in the Higher National Unit specification: statement of standards section. It is recommended that these sections be read carefully before proceeding with assessment of candidates.

In the delivery of this Unit there should be clear differentiation between the terms 'estimate', 'quotation' and 'tender'.

Higher National Unit specification: support notes (cont)

Unit title: Building Measurement and Cost Studies

Opportunities for developing Core Skills

The following grid provides a general guide to opportunities for the development of Core Skills in this Unit. Opportunities for the development of Core Skills at the output level are more fully identified in the Core Skills Signposting Guide.

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

Open learning

Given that appropriate materials exist this Unit could be delivered by distance learning, which may incorporate some degree of on-line 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 be required to be put in place to ensure that assessment/s were conducted under controlled, supervised conditions.

For information on normal open learning arrangements, please refer to the SQA guide *Assessment and Quality Assurance of Open and Distance Learning (SQA 2000)*

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.

General information for candidates

Unit title: Building Measurement and Cost Studies

This Unit has been designed to introduce you to and develop knowledge, understanding and skills in the measurement and description of quantities for building work. In particular it covers the measurement of external walls, windows and doors. This Unit also explains the process involved in producing an estimate and tender for building work and outlines the factors which affect the costs for building works. Even if you do not intend to follow a career in quantity surveying, this Unit will help you understand how building work is measured and priced by a building contractor.

You will be required to examine building drawings and specification notes and your knowledge of building construction will be enhanced by undertaking this Unit.

By the end of this Unit you will be aware of the many and varied factors which affect the cost of building projects and how the contractor includes for these in his tender for a construction project.

The formal assessment for this Unit will consist of two separate assessment papers lasting a total of four hours. The assessment for Learning Outcome 1, lasting two hours, will be conducted under supervised conditions with access to the current SMM for building works. You will be allowed to take in your own notes and a scientific calculator. The second assessment, covering both Learning Outcomes 2 and 3, will take the form of an assignment requesting you to submit a written report.