

## **SQA Advanced Unit specification**

### **General information for centres**

**Unit title:** Building Measurement and Cost Studies (SCQF level 7)

**Unit code:** HR4D 47

**Superclass:** TC

**Publication date:** August 2017

**Source:** Scottish Qualifications Authority

**Version:** 01

### **Unit purpose**

This Unit is designed to enable learners 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 for a single building of straightforward construction using a current Standard Method of Measurement (SMM) for building works. It then 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 successful completion of the Unit the learner will be able to:

- 1 Produce quantified items for walls, associated openings and finishes using SMM.
- 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 SQA Advanced Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

### **Recommended entry to the Unit**

Whilst entry is at the discretion of the centre, it would be an advantage for the learner to have a basic knowledge of the construction industry and an understanding of external wall construction. This may be evidenced by the learner having previously obtained appropriate qualification or vocational experience in construction technology.

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### **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 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](http://www.sqa.org.uk/assessmentarrangements).

### SQA Advanced Unit specification: statement of standards

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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.

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. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

#### Outcome 1

Produce quantified items for walls, associated openings and finishes using SMM.

#### Knowledge and/or skills

- ◆ brickwork/blockwork walls
- ◆ adjustments for openings in brick/block walls
- ◆ accessories to brickwork/blockwork walls
- ◆ windows and doors
- ◆ general joinery items associated with windows and doors
- ◆ ironmongery
- ◆ internal/external wall finishes

#### Evidence Requirements

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

- ◆ produce 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

Evidence for the knowledge and/or skills for this Outcome may be provided on a sample basis. In any assessment of this Outcome a minimum of **four out of seven** knowledge and/or skills items should be sampled. The instrument of assessment used should permit all knowledge and/or skills to be assessed therefore allowing the learners themselves to select which knowledge and/or skills they wish to demonstrate.

Evidence should be generated through assessment undertaken in controlled, supervised conditions, 'Open-book' with a current SMM for building works. The learner should have access to their own notes. Evidence for competence in this Outcome should be generated using drawings and specification notes for a single building of straightforward construction.

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### Outcome 2

Describe the factors which affect building costs.

#### Knowledge and/or skills

- ◆ labour
- ◆ plant
- ◆ materials
- ◆ project-specific factors

#### Evidence Requirements

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

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

The assessment for Outcomes 2 and 3 might reasonably be combined together into one assessment paper and take the form of an assignment which will require the submission of a written report.

### 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 for projects without Bills of Quantities

#### Evidence Requirements

Learners 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

The assessment for Outcomes 2 and 3 might be combined together into one assessment paper and take the form of an assignment which will require the submission of a written report.

### SQA Advanced Unit support notes

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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

This Unit has been written in order to allow learners 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 a 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.

#### Guidance on approaches to delivery of this Unit

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

The recommended time allocations for each Outcome are given as guidance towards the depth of treatment which might be applied to each topic.

- 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
      - Adjustments for openings
      - dpc
    - Windows and doors
      - Door frames and facings, etc
      - Ironmongery
    - Internal/external finishes
      - Plasterwork or roughcast
- 2 Describe the factors which affect building costs. **(10 hours)**

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- ◆ **Labour rate:** Working Rule Agreement
    - Overtime
    - Bonus payments
    - Weather
    - Site location
  - ◆ **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. **(10 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)**

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### **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.

An exemplar assessment pack and marking guidelines have been produced to indicate the National Standard of achievement required at SCQF level 7.

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

It is suggested that assessment of this Unit might take the form of two separate papers.

It should be noted that learners 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. Learners should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

#### **Outcome 1**

Outcome 1 could be assessed individually and last two hours. The assessment paper will require the learner to prepare a draft Bill of Quantities for internal and external walls of a single building of straightforward construction. The learner should be provided with both drawings and specification details which provide sufficient information to take off the quantities for brick/block walls, doors, windows and internal/external finishes.

The assessment for Outcome 1 should be conducted under controlled, supervised conditions appropriate to an open-book event.

#### **Outcome 2 and 3**

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

### **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](http://www.sqa.org.uk/e-assessment).

### Opportunities for developing Core and other essential skills

Throughout the Unit, learners should be able to develop the Core Skill of *Communication* through reading, evaluating and understanding written and graphical communication of different types, and should be producing written documents that convey a range of information and ideas on construction pricing matters. Learners will also be able to develop the Core Skill of *Numeracy* through the interpretation of construction drawings and the measurement of quantities Using Graphical Information.

Learners may also be able to develop the Core Skill component of Critical Thinking by analysing and interpreting construction drawings, reviewing and evaluating case study information and identifying opportunities and constraints contained therein.

## History of changes

Version	Description of change	Date

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

**FURTHER INFORMATION:** Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000. Alternatively, complete our [Centre Feedback Form](#).

### General information for learners

#### **Unit title:** Building Measurement and Cost Studies (SCQF level 7)

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 may consist of two separate assessment papers. The assessment for Learning Outcome 1 will be conducted under supervised conditions with access to a 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, can take the form of an assignment requesting you to submit a written report.

Throughout the Unit, you should be able to develop the Core Skill of *Communication* through reading, evaluating and understanding written and graphical communication of different types, and should be producing written documents that convey a range of information and ideas on construction pricing matters. You will also be able to develop the Core Skill of *Numeracy* through the interpretation of construction drawings and the measurement of quantities Using Graphical Information.