

SQA Advanced Unit specification

General information for centres

Unit title: Estimating

Unit code: HT10 47

Unit purpose: The Unit is designed to enable candidates to gain knowledge, understanding and skills in estimating costs and rates at various stages of a building project.

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

- 1 Apply approximate estimating techniques to carry out estimates at outline proposal stage.
- 2 Build up an hourly rate for a tradesman or labourer based on given data.
- 3 Build up unit rates for items in a bill of quantities.
- 4 Perform *pro rata* calculations.

Credit points and level: 1 SQA 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 National 1 to Doctorates.*

Recommended prior knowledge and skills: It would be beneficial if candidates had a basic knowledge and understanding of the construction industry, the various stages of a building project and traditional domestic building construction. Possession of basic knowledge and understanding may be evidenced by possession of appropriate NC or NQ Unit awards.

Core Skills: There are opportunities to develop the Core Skills 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: It is possible to assess candidates either on an individual Outcome basis, combinations of Outcomes or by a single holistic assessment combining all Outcomes such as a single case study. The assessment paper/s should be composed of structured calculative questions. Assessment should be conducted under supervised, controlled conditions. A single assessment covering all Outcomes should not exceed 3 hours in duration. 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.

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.

SQA Advanced Unit specification: statement of standards

Unit title: Estimating

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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 and 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

Apply approximate estimating techniques to carry out estimates at outline proposal stage.

Knowledge and/or skills

- ◆ Unit of accommodation method
- ◆ Area method
- ◆ Volume method
- ◆ Cost analysis method
- ◆ Approximate quantities and composite rates

Evidence Requirements

In this Outcome candidates will be required to demonstrate their knowledge and/or skills by showing that they can:

- ◆ carry out an approximate estimate at the outline proposal stage of a project

Evidence for the knowledge and/or skills in this Outcome will be provided on a sample basis.

In any assessment of this Outcome **two out of five** knowledge and/or skills items should be sampled, **one of which must be** either the cost analysis or approximate quantities method.

In order to ensure that candidates will not be able to foresee what items they will be questioned on, a different sample of two out of five knowledge and/or skills is required each time the Outcome is assessed. Candidates must provide a satisfactory response to each of the two items sampled.

Assessment guidelines

The assessment instrument for this Unit might use a single case study requiring outline proposal stage estimates to be prepared. Candidates should be given drawings, specification notes and data as required. The assessment should be carried out under supervised, controlled, open-book conditions.

If this Outcome is to be assessed separately then candidates would be allowed 0.75 hours to complete the assessment.

It may be considered that a complete estimate using either cost analysis or approximate quantities, together with evidence of competence in using another technique is not possible in 0.75 hours. In such a case, relevant parts of estimates may be asked for each technique in order to test the candidate's capabilities.

Outcome 2

Build an hourly rate for a tradesman or labourer based on given data.

Knowledge and/or skills

- ◆ All-in hourly rate for labour
- ◆ The Working Rule Agreement (WRA)

Evidence Requirements

In this Outcome candidates will be required to demonstrate their knowledge and/or skills by showing that they can:

- ◆ calculate an hourly rate for labour

Each candidate will need to demonstrate that they can calculate a complete “all-in” hourly rate for labour from first principles addressing the allowances paid in accordance with the Working Rule Agreement, published by the Construction Industry Joint Council, eg expenses, statutory payments, supervision and insurance. In any assessment of this Outcome, candidates will be required to calculate a rate for **either** a tradesman or a labourer. In order to ensure that candidates will not be able to predict which WRA allowances and additions will apply, different samples of the allowances applying for both labourers and tradesmen will be required each time the Outcome is assessed or reassessed.

Assessment guidelines

Questions used to elicit candidate evidence should take the form of calculations. The assessment instrument for this Unit might use a single case study, and candidates would be given a building project that at tender stage requires the calculation of an all-in hourly labour rate. Candidates will be given the WRA criteria for calculating the rate and the circumstances of the project as regards expenses, statutory payments, supervision and insurance and whether or not the rate is for a labourer or a tradesman.

If assessment for this Outcome is carried out separately it will be the calculation of an hourly rate for which no more than 0.75 hours will be allowed. It should be noted that candidates must achieve all the minimum evidence specified.

Outcome 3

Build unit rates for items in a bill of quantities.

Knowledge and/or skills

- ◆ Labour rates and outputs
- ◆ Plant rates and outputs
- ◆ Materials requirements, rates and waste allowances
- ◆ Head office and site overheads allowances
- ◆ Profit allowances

Evidence Requirements

In this Outcome candidates will be required to demonstrate their knowledge and/or skills by showing that they can

- ◆ calculate unit rates for building works

In any assessment of this Outcome **all five** knowledge and/or skills items should be assessed using **two out of five** from the following:

- ◆ groundworks
- ◆ *in situ* concrete
- ◆ masonry
- ◆ *in situ* finishes
- ◆ roof coverings

In order to ensure that candidates will not be able to foresee what items they will be questioned on, a different sample of **two out of five** builders work items is required each time the Outcome is assessed. Candidates must provide a satisfactory response to each of the items sampled.

Assessment guidelines

The assessment instrument for this Unit might use a single case study requiring two builders work unit rates to be prepared. Candidates will be given drawings, specification notes and data as required.

If assessment for this Outcome is to be carried out separately, no more than 0.75 hours will be allowed.

Outcome 4

Perform *pro rata* rate calculations.

Knowledge and/or skills

- ◆ Analysis of an original unit rate
- ◆ Analysis of the changes in the original rate in order to price a variation

Evidence Requirements

In this Outcome candidates will be required to demonstrate their knowledge and/or skills by showing that they can:

- ◆ price variations to a building project by calculating *pro rata* rates for building works

In any assessment of this Outcome **all** knowledge and/or skills items should be assessed using **two out of five** from the following:

- ◆ groundworks
- ◆ *in situ* concrete
- ◆ masonry
- ◆ *in situ* finishes
- ◆ roof coverings

In order to ensure that candidates will not be able to foresee what items they will be questioned on, a different sample of two out of five building works items is required each time the Outcome is assessed. Candidates must provide a satisfactory response to each of the two items sampled.

Assessment guidelines

The assessment instrument for this Unit might use a single case study requiring two building works *pro rata* rates to be prepared. Candidates will be given drawings, specification notes and data as required.

In any assessment of this individual Outcome the two knowledge and/or skills items will be assessed for each of the two builders work rates calculated. Candidates should be allowed 0.75 hours to complete this individual Outcome.

Administrative information

Unit code:	HT10 47
Unit title:	Estimating
Superclass category:	TC
Date of publication:	August 2017
Version:	01
Source:	SQA

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SQA Advanced Unit specification: support notes

Unit title: Estimating

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 Carrying out approximate estimates using appropriate techniques.
- 2 Building up of hourly labour rates.
- 3 Building up and analysis of unit rates.
- 4 Carrying out *pro rata* calculations.

This Unit has been developed to introduce candidates to estimating procedures used in the construction industry and is suitable for those with no previous experience of estimating. However, candidates would benefit from a prior knowledge of traditional domestic building construction. This Unit is at SCQF level 7 and is a mandatory Unit within the SQA Advanced Certificate and SQA Advanced Diploma in Built Environment.

In designing this Unit, the writers have identified the range of topics they would expect to be covered by lecturers. The writers have also given recommendations as to how much time should be spent on each Outcome. This has been done to help lecturers to decide what depth of treatment should be given to the topics attached to each of the Outcomes. While it is not mandatory for a centre to use this list of topics, it is strongly recommended that it does in order to ensure continuity of teaching and learning across the Estimating Unit, and because the assessment exemplar pack for this Unit is based on the knowledge and/or skills and list of topics in each of the Outcomes.

The list of topics is given below. Lecturers are advised to study this list of topics in conjunction with the assessment exemplar pack so that they can get a clear indication of the standard of achievement expected of candidates in this Unit.

Outcome 1

Apply approximate estimating techniques to carry out estimates at feasibility or sketch design stage. (12 hours)

RIBA Plan of Work: Outline Proposal Stage.

Outline Proposal Stage Methods

Technique for Approximate Estimating:

Unit Method:

Unit of Accommodation

Area

Volume

Elemental Cost Analysis in BCIS format

BCIS data and other published data

Updating using indices

Location indices

Additions for:	Fees
	VAT
	Contingencies
Sketch Design Stage	Approximate Quantities
	Approximate Quantities
	Composite Rates

Outcome 2

Build up an hourly rate for a tradesman and/or labourer based on given data. (6 hours)

Working Rule Agreement as published by the Construction Industry Joint Council

Productive Hours

Basic Wages

Enhancements: (Emoluments)

Overtime

Bonus

Supervision

Travel: Time

Fares

(lodging allowances)

Holidays: Public

Annual

Sickness Pay

Severance Pay

Pension Scheme

CITB Levy

National Insurance

Employer's Liability Insurance

Calculation of hourly rate based on above.

Outcome 3

Building up Unit Rates for Items in a Bill of Quantities. (12 hours)

Labour — rates and outputs

Plant — hire, buy, charges

Materials — measured unit and purchase unit, waste

Overheads — site and head office

Profit

Excavation: Basement, reduced level, trench; disposal and filling; earthwork support

Concrete: mix specification, mixer output and costs, transport and placing.

Brickwork: Mortar, brick materials, waste, squad costs, pointing.

Plasterwork: Coats, width, outputs.

Roof coverings: Tiling, slating, felt, asphalt.

Outcome 4

Performing *Pro Rata* Calculations. (10 hours)

Pricing variations
Original *pro rata* analysis
Assessment of variations in each element and consequent adjustment of labour, plant materials to calculate new rate

Guidance on the delivery and assessment of this Unit

This is a mandatory Unit of the Quantity Surveying SQA Advanced Diploma and SQA Advanced Certificate. It is recommended that the Unit be delivered in conjunction with measurement, cost studies, quantity surveying practice, contracts and construction technology Units.

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

Opportunities for developing Core Skills

This Unit provides opportunities for the development of Core Skills in Communicating, Numeracy, IT and Problem Solving. 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

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. Arrangement would be required to be put in place to ensure that the assessment, which is required to be at a single event, was 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*.

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.

General information for candidates

Unit title: Estimating

This Unit is designed to prepare candidates for a career in the construction industry where estimating costs at all stages of a project is important. This Unit is suited to quantity surveyors and contracts managers mainly, although all who are involved in construction projects from their inception through to completion on site and use by the client will find the knowledge, understanding and skills to be of use.

In Outcome 1 candidates will look at the various methods of estimating the cost of a project. Outline Proposal Stage estimates such as unit of accommodation, costs/m² area and costs/m³ volume will also be covered. The use of elemental cost analyses in BCIS format will be outlined. The use of published and office data together with updating and relocating estimates using indices will be described. The importance of adding fees, VAT and contingencies will be emphasised. Outline Proposal Stage estimates using plans and details from which approximate quantities and composite rates are prepared will be described.

In Outcome 2 candidates will look at the elements that go to make up an hourly rate for labour starting with the provisions of the Working Rule Agreement concerning basic wages and hours. Mandatory additions such as National Insurance and optional additions such as pension schemes will also be covered.

In Outcome 3 unit rates as would be entered in a bill of quantities will be prepared from first principles. This will include analysis of labour, plant, materials, overheads and profit. The rates covered will be sampled from items of substructure and superstructure eg excavation, earthwork support, disposal of excavated material, concrete, brickwork and plasterwork.

In Outcome 4 candidates are introduced to *pro rata* calculations as would be used during construction stage in pricing variations to a project. The rate for the item to be varied is analysed and amendments made to it to cover the changes specified. Sampling from substructure and superstructure items similar to that in Outcome 3 will be carried out.