

SQA Advanced Unit specification

General information

Unit title: Civil Engineering Contract and Project Management B (SCQF level 8)

Unit code: HR6J 48

Superclass: TL

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Version: 01

Unit purpose

This Unit aims to provide the learner with knowledge of contractual procedures, forms of contract and gain skills in the measurement, descriptions and take off quantities for civil engineering applications.

Outcomes

On successful completion of the Unit the learner will be able to:

- 1 Describe procedures to establish construction contracts and the advantages and disadvantages of common forms of construction contracts.
- 2 Use CESMM in billing substructures, concrete work, formwork and earthworks.
- 3 Deal with variations, dayworks, disputes and payments.
- 4 Use both manual and computerised cost and project control techniques.

Credit points and level

1 SQA Credit at SCQF level 8: (8 SCQF credit points at SCQF level 8)

Recommended entry to the Unit

Entry is at the discretion of the centre, however, it is recommended that learners study *Civil Engineering Contract and Project Management A* prior to undertaking this Unit.

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.

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.

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

Describe procedures to establish construction contracts and the advantages and disadvantages of common forms of construction contracts.

Knowledge and/or Skills

- ◆ Procedures for establishing construction contracts
- ◆ Common forms of contract

Evidence Requirements for Outcome 1

Learners will need to provide written and/or oral evidence to demonstrate all Knowledge and/or Skills items by showing that, in relation to construction contracts, they can:

- ◆ explain the procedures required to establish a construction contract.
- ◆ explain the basis of and advantages and disadvantages of common forms of construction contract, including the allocation of risk between various parties and the reason for the allocation of risk.

Assessment may be carried out by individual Outcome or by combining two or more Outcomes together. Assessment should be conducted under open-book conditions and as such learners should be allowed to bring any textbooks or notes to the assessment.

Outcome 2

Use CESMM in billing substructures, 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 for Outcome 2

Learners will need to provide written and/or oral evidence to demonstrate their Knowledge and/or Skills by showing that, in relation to CESMM, they can:

- ◆ create and explain bills relating to substructures, 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.

Assessment may be carried out by preparing a bill of quantities for a given part of a simple project including earthworks, in-situ concrete and method related charges. Assessment should be conducted under open-book conditions and as such learners should be allowed to bring any textbooks or notes to the assessment.

Outcome 3

Deal with variations, dayworks, disputes and payments.

Knowledge and/or Skills

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

Evidence Requirements for Outcome 3

Learners will need to provide written and/or oral evidence to demonstrate their Knowledge and/or Skills by showing that, in relation to construction projects, they can:

- ◆ identify and explain causes and process 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.

Assessment may be carried out by individual Outcome or by combining two or more Outcomes together. Assessment should be conducted under open-book conditions and as such learners should be allowed to bring any textbooks or notes to the assessment.

Outcome 4

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

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- ◆ 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 for Outcome 4

Learners will need to provide written and/or oral evidence to demonstrate their Knowledge and/or Skills by showing that, in relation to construction projects, 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.

Assessment may be carried out by individual Outcome or by combining two or more Outcomes together. Assessment should be conducted under open-book conditions and as such learners should be allowed to bring any textbooks or notes to the assessment.

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 provides the learner with the knowledge and skills for the site management of common civil engineering projects.

Recommended time allocation to each Outcome is given as guidance towards the depth of treatment which might be applied to each topic.

Reference should be made to all current legislation relating to Health and Safety and Environmental processes.

1 Describe procedures to establish construction contracts and the advantages and disadvantages of common forms of construction contracts (10 Hours).

Procedures: Identify parties to contracts — client; consultant; contractor; quantity surveyor; sub-consultant; sub-contractor. Explain the relationship between parties.

Procurement Options: Discuss procurement option advantages and disadvantages — traditional; design and build; turnkey; target price; management contracting; partnering; PFI; term maintenance. Outline types of construction contract — NEC3.

2 Use CESMM in billing substructures, concrete work, formwork and earthworks (14 Hours).

Calculating lengths: straight; arc.

Calculating area and volumes: regular and irregular shapes; Simpson's rules; Prismoidal rules.

Application of rules of current CESMM: measurement rules; definition 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 rate: Labour; plant; materials; overheads; profit.

3 Deal with variations, dayworks, disputes and payments (8 Hours).

Variations: Explain causes; instructions.

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Dayworks: Explain causes and prepare dayworks schedules considering — labour; materials; plant; supplementary charges.

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.

4 Use both manual and computerised cost and project control techniques (8 Hours).

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

Project control techniques: network precedence diagram, Gantt chart; bar chart; resource histogram.

Guidance on approaches to delivery of this Unit

This Unit should be delivered in the second year of a two-year programme and after *Civil Engineering Contract and Project Management A*. Delivery should be delivered in the context of a small to medium construction project.

Case studies of a variety of construction projects of differing size and scale should be used to differentiate construction activities. Site visits, videos, photos and construction drawings can be used to appreciate construction sequence, resourcing and enable work to be measured. Group work and discussions allow for varying construction related expertise to enhance the learning and teaching experience.

Appropriate attention must be given to health, safety, welfare and environmental arrangements throughout the Unit and reference should be made to British standards where appropriate.

The centre may incorporate E-learning by encouraging learners to access available specialist information such as product catalogues through internet and other electronic media. The learners may be encouraged to access Journals and online material featuring developments in the construction industry.

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.

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

The assessment for the Unit will be based on a case study project that will contain circumstances from which the learners can prepare a report covering:

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- ◆ Parties involved in the contract and procurement options available
- ◆ Selection of a procurement option and NEC3 contract
- ◆ Preparation of a bill of quantities including earthworks, in-situ concrete and method related charges
- ◆ Identify variations and prepare dayworks schedules
- ◆ Discuss dispute resolution and payment methods
- ◆ Utilise cost and project control techniques

Evidence for the Knowledge and/or Skills for this Outcome may be generated through a report undertaken in unsupervised conditions. Assessment should be conducted under open-book conditions to encourage reference to be made to current legislation relating to Health and Safety and Environmental processes where appropriate.

Assessment can be separate case studies for individual Outcomes or a single case study for one holistic assessment of the Unit covering all Outcomes.

Where available, evidence from the workplace can also be incorporated providing evidence is appropriate and authenticated as the learners own work. Learner's work can be authenticated by oral questioning or professional discussion of all evidence produced.

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.

Opportunities for developing Core and other essential skills

In this Unit learners will be able to:

- ◆ Identify suitable procurement options and contracts
- ◆ Evaluate the sequence of construction activities
- ◆ Measure and price work

These offer opportunities to develop aspects of the Core Skill of:

- ◆ *Problem Solving*
- ◆ *Numeracy*
- ◆ *Communication*

Additional opportunities to develop Core Skills through suggested learning, teaching and assessment approaches:

- ◆ *Working with Others*
- ◆ *Information and Communication Technology (ICT)*

History of changes to Unit

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: Civil Engineering Contract and Project Management B
(SCQF level 8)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit provides the learner with the knowledge and skills for the site management of common civil engineering projects.

On successful completion of the Unit the learner will be able to:

- 1 Describe procedures to establish construction contracts and the advantages and disadvantages of common forms of construction contracts.
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Evidence you can satisfy the Knowledge and/or Skill elements of this Unit will be obtained by open-book assessment and may be produced in coursework.

The Unit will provide the opportunity to develop:

Core Skills

- ◆ *Problem Solving*
- ◆ *Numeracy*
- ◆ *Working with Others*
- ◆ *Communication*
- ◆ *Information and Communication Technology (ICT)*

Skills

- ◆ Citizenship
- ◆ Employability
- ◆ Sustainable development