

## SQA Advanced Unit Specification

### General information for centres

**Unit title:** Architectural CADT: Commercial Building Systems (SCQF level 8)

**Unit code:** HR7C 48

**Superclass:** TD

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**Version:** 01

### Unit purpose

This Unit is designed to enable learners to develop advanced skills and knowledge required in the electronic production of 3-dimensional complex models and 2-dimensional CAD drawings for real-world environments in the realisation of design solutions and specifications for a variety of systems relevant to large-scale, commercial building types, using sophisticated computer-aided design software packages.

### Outcomes

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

- 1 Evaluate and select overcladding systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.
- 2 Evaluate and select partitioning systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.
- 3 Evaluate and select substructure and support systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.
- 4 Evaluate and select air management systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.
- 5 Evaluate design solutions.

### Credit points and level

2 SQA Advanced Credits at SCQF level 8: (16 SCQF credit points at SCQF level 8)

## Recommended entry to the Unit

This Unit advances CAD competencies with new knowledge and skills relevant to the production of design and working details for sophisticated and/or specialist systems associated to the realisation of large-scale, commercial buildings. It is recommended that learners have a range of underpinning CAD skills prior to the commencement of this Unit, preparatory to the introduction of a range of new design software approaches. Such experience may be evidenced by possession of the Units HR6P 47 *Architectural CADT: Principles and Practice*, HR70 47 *Architectural CADT: Construction Detailing* or similar, equivalent Units. It is recommended that learners have prior knowledge and skills in the area of construction technologies, or similar. Such experience may be evidenced by possession of the Units HR71 47 *Architectural CADT: Building Technologies*, HR75 47 *Architectural CADT: Building Systems and Services*, or similar, equivalent Units.

## 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.

## 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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(SCQF level 8)

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**

Evaluate and select overcladding systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.

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

- ◆ design brief:
  - client type
  - building type
  - site/location
- ◆ CAD modelling skills
- ◆ CAD draughting skills
- ◆ CAD presentation tools
- ◆ CAD standards
- ◆ overcladding systems:
  - wall enclosure systems
  - curtain walls assembly systems
  - roof systems
- ◆ overcladding system performance requirements:
  - components
  - materials
  - connections
  - technical performance
  - aesthetics
  - openings

### **Outcome 2**

Evaluate and select partitioning systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.

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

- ◆ design brief
  - client type
  - building type
  - site/location

- ◆ CAD modelling skills
- ◆ CAD draughting skills
- ◆ CAD presentation tools
- ◆ CAD standards
- ◆ partitioning systems
  - floor systems
  - ceiling systems
  - wall systems
- ◆ partitioning system performance requirements
  - system type
  - materials
  - connections
  - technical performance
  - aesthetics

### Outcome 3

Evaluate and select substructure and support systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.

#### Knowledge and/or skills

- ◆ design brief:
  - client type
  - building type
  - site/location
- ◆ CAD modelling skills
- ◆ CAD draughting skills
- ◆ CAD presentation skills
- ◆ CAD standards
- ◆ substructure system types:
  - pad/raft
  - piled
  - footings
  - diaphragm wall
- ◆ support system types:
  - post and beam
  - post and slab
  - continuous support
  - portal frame
- ◆ substructure design criteria:
  - site — topographic implications
  - deep excavations
  - technical performance
- ◆ support system design criteria:
  - materials
  - load dynamics
  - bracing
  - connections
  - technical performance

## Outcome 4

Evaluate and select air management systems for a large-scale commercial building and produce accurate CAD models and drawings in response to a given brief.

### Knowledge and/or skills

- ◆ design brief:
  - client type
  - building type
  - site/location
- ◆ CAD modelling skills
- ◆ CAD draughting skills
- ◆ CAD presentation skills
- ◆ CAD standards
- ◆ air management:
  - filtration
  - passive ventilation
  - airflow
  - air quality
  - thermal comfort
- ◆ cooling systems:
  - mechanical ventilation
  - system specifications
  - controls
  - shading
  - solar position
  - building orientation
  - solar response

## Outcome 5

Evaluate design solutions.

### Knowledge and/or skills

- ◆ evaluation skills
- ◆ design solutions
- ◆ technical requirements
- ◆ supporting considerations

### Evidence Requirements for this Unit

#### Outcome 1

Evidence for the knowledge and/or skills sections for this Outcome will be provided on a sample basis. In any assessment of this Outcome a minimum of any **two out of three** overcladding systems and any **three of the six** performance requirements knowledge and/or skills items should be sampled. In order to ensure that learners will not be able to foresee what items they will be assessed on, a different sample of knowledge/skills items is required on each assessment occasion. Learners must provide a satisfactory response to all items. The assessment should be carried out under closed-book supervised conditions.

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can evaluate the design brief for a specified large-scale, commercial building type and:

- ◆ produce industry-quality CAD models and drawings for **two of the three** overcladding systems knowledge and skills items. Each should include a **minimum of three** of the overcladding system Performance Requirements knowledge and skills items
- ◆ for each of the two design solutions reached for the overcladding systems items, generate a **minimum of one** hard-copy plot of the CAD models and drawing details to suitable paper sizes (minimum A3) using appropriate output scales

The use of CAD standards and presentation tools must be of typical industry-quality requirements and be consistently applied at all times.

## Outcome 2

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can evaluate the design brief for a specified large-scale, commercial building and:

- ◆ produce two design solutions incorporating industry-quality CAD models and drawings. Evidence for the last two knowledge and/or skills items for this Outcome will be provided on a sample basis. One design solution must include wall partitioning systems
- ◆ each partitioning system assessed should include a minimum of **three of the five** partitioning system performance requirements. In order to ensure that learners will not be able to foresee what items they will be assessed on, a different sample of knowledge/skills items is required on each assessment occasion. Learners must provide a satisfactory response to all items
- ◆ for each of the two design solutions reached for the partitioning systems, generate a **minimum of one** hard-copy plot of the CAD models and drawing details to suitable paper sizes (minimum A3) using appropriate output scales

The assessment should be carried out under closed-book supervised conditions.

The use of CAD standards and presentation tools must be of typical industry-quality requirements and be consistently applied at all times.

## Outcome 3

Evidence for the knowledge and/or skills sections for this Outcome will be provided on a sample basis. In any assessment of this Outcome **one substructure system type** and **one support system type** should be sampled. All other knowledge and skills items should be assessed relevant to this. In order to ensure that learners will not be able to foresee what items they will be assessed on, a different sample of knowledge/skills items is required on each assessment occasion. Learners must provide a satisfactory response to all items.

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can evaluate the design brief for a large-scale, commercial building type and:

- ◆ produce industry-quality CAD models and drawings for **one substructure system** and **one support system** in light of the design criteria for each system

- ◆ for each of the two design solutions reached, generate **a minimum of one** hard-copy plot of the CAD models and drawing details to suitable paper sizes (minimum A3) using appropriate output scales

The use of CAD standards and presentation tools must be of typical industry-quality requirements and be consistently applied at all times.

#### **Outcome 4**

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can evaluate the design brief for a specified large-scale, commercial building:

- ◆ produce industry-quality CAD models and drawings for the **air management** and/or **cooling system** requirements
- ◆ for the design solution(s) reached, generate **a minimum of one** hard-copy plot of the CAD models and drawing details to suitable paper sizes (minimum A3) using appropriate output scales

The use of CAD standards and presentation tools must be of typical industry-quality requirements and be consistently applied at all times.

Assessment will be open-book, undertaken in controlled, supervised conditions. Learners will be allowed access to course material, textbooks or the Help files associated with the software used in the generation of the solutions.

#### **Outcome 5**

Learners will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can evaluate the design solutions reached in Outcomes 1 to 4.

The evaluation must include evidence of the following for **each** design solution:

- ◆ interrogation of design brief
- ◆ reference to technical requirements set
- ◆ how effective the design solution satisfied the design brief, with reference to:
  - elemental specification
  - component materials
  - component connections
  - technical performance
  - aesthetics

Assessment will be open-book, and reflective of output produced from Outcomes 1 to 4. Learners will be allowed access to course material, textbooks or the Help files associated with the software used in the generation of the solutions.

## **SQA Advanced Unit support notes**

**Unit title:** Architectural CADT: Commercial Building Systems  
(SCQF level 8)

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 80 hours.

### **Guidance on the content and context for this Unit**

The Unit is at SCQF level 8 and has been devised as a mandatory Unit within the SQA Advanced Diploma in Computer Aided Architectural Design and Technology award. However, this does not preclude the use of the Unit in other Group Awards where award designers feel this to be appropriate.

A suggested range of topics required to introduce the knowledge and skills to be covered by centres along with recommendations as to how much time should be spent on each Outcome assessment is provided. This has been done to help lecturers decide what depth of treatment should be given to topics attached to each of the Outcomes.

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

In all Outcomes the learner should be able to evaluate the range of design criteria and building project briefs, as provided by lecturer(s) from given building briefs, following the knowledge and skills items.

Learners should be encouraged to explore a range of possible solutions. Additional learning from acceptable texts, e-learning environments and other resources should be actively supported. Assessor(s) should make maximum use of visual data in the delivery of all topics. Learners should evaluate the briefs and select the most appropriate medium with which to develop and realise design solutions — no specific software is recommended, though it is anticipated centres will use industry standard CAD software of a sophisticated nature for the learning and assessment tasks.

At all times, learners are required to illustrate solutions in a clear and coherent manner, typical of professional requirements in industry. Emphasis throughout delivery of the topic should be placed on the professional standards of technical accuracy, reflecting performance criteria of systems and technical, administrative and regulatory requirements in the production of computer-aided construction details. Learners will be encouraged to use their own discretion and judgement in the selection of CAD software best suited to both the interrogative study of solutions, recording of elemental data and the production of graphic solutions. It is however, understood, that learners may be limited to the software available at any given centre.

Centres delivering this Unit should have access to CAD software capable of meeting the demands of tasks efficiently and it is generally expected that this could include such software types as AutoCAD Inventor, Revit Architecture, Revit Structure, StruCAD, or similar.

Learners are required to produce a range of CAD models and drawings for each assessment task. The 3-dimensional CAD models should be both illustrative and pictorial, and the



2-dimensional drawings providing detailed construction information. The 2-dimensional details generated would typically be plan, elevation and section views to illustrate clarity of expression in terms of **detailed** construction information and connections.

The precise nature of details views generated are nominally the result of the selections and design choices made by learners, but should be driven by original briefs set by the lecturer(s) for each assessment event.

At all times, the design criteria should be the governing aspects of learner critical thinking and evaluation, with the resulting CAD details displaying strengths in technical knowledge and fast, practical skills in the communication of these.

In **Outcome 1**, learners should be introduced to the principal factors governing the choices made for overcladding systems, as they relate to the enclosing envelope in terms of wall and roof assemblies, including:

- ◆ appearance and aesthetics
- ◆ construction methods
- ◆ weather tightness
- ◆ maintenance
- ◆ finishes
- ◆ performance issues:
  - thermal
  - acoustic
  - environmental
  - structural
  - stability

In **Outcome 2**, learners should be introduced to the principal factors governing the choices made for partitioning systems, as they relate to the internal environment of commercial buildings, including:

- ◆ appearance and aesthetics
- ◆ construction methods
- ◆ maintenance
- ◆ finishes
- ◆ performance issues:
  - thermal
  - acoustic
  - environmental
  - fire resistance
  - service concealment

In particular, it is recommended learners be introduced to the variety of partitioning systems available for walls, floors and ceilings, as they pertain to a variety of building types and functions.

For walls, this could extend to, but not limited to, consideration of:

- ◆ timber and metal stud partitioning
- ◆ demountable partitioning
- ◆ sliding/flexible partitions
- ◆ glazed partitions

- ◆ interstitial partitions
- ◆ variable height partitions

For floors, this could extend to, but not limited to, consideration of:

- ◆ floating floor systems
- ◆ raised access floor systems
- ◆ engineered floor systems
- ◆ cassette systems

For ceilings, this could extend to, but not be limited to, consideration of:

- ◆ grid lay-in ceiling systems
- ◆ suspended ceiling systems
- ◆ open cell systems
- ◆ M/F systems
- ◆ vaulted, radial and waveform ceilings

In **Outcome 3**, learners should be introduced to the principal factors governing the choices made for substructure and support systems, as they relate to large-scale commercial buildings, including:

- ◆ appearance and aesthetics
- ◆ construction methods
- ◆ weather tightness
- ◆ maintenance
- ◆ finishes
- ◆ performance issues:
  - thermal
  - acoustic
  - environmental
  - structural
  - stability

In terms of substructure choice and specification, consideration should be given to issues respondent to the building type, form and proportions as well as the given local data for plot, site and soil conditions. An analysis of this data should lead learners towards effective and appropriate understanding in terms of:

- ◆ substructure — superstructure relationship
- ◆ deep excavation requirements
- ◆ groundwater improvement and water exclusion/extraction recommendations
- ◆ basement systems
- ◆ shoring requirements
- ◆ deeply situated foundation types (pile/slab)
- ◆ reinforcement requirements
- ◆ simple load dynamics

In terms of support systems (above ground), consideration should be given to simple recommendations for superstructure type. This could easily be integrated to work produced in earlier Outcomes, for example in determining the appropriate support systems to carry and

support the overcladding elements determined in Outcome 1, and might extend to recommendations for:

- ◆ continuous support
- ◆ point loading support
- ◆ portal frame support

It is strongly recommended that centres delivering this Unit, integrate the requirements of this Outcome with other Units within the framework being delivered, for example the Unit HR7D 48 *Architectural CADT: Structural Design and Detailing* or similar, equivalent Units where a closer interrogation of load dynamics, structural engineering or mechanics is being taught.

In **Outcome 4**, learners should be introduced to the principal factors governing the choices made for air management systems, and towards a reasonable level of understanding of the specialist building services requirements of large-scale commercial buildings. In these terms, critical learning should reflect a clear rationale towards the satisfaction of an environmental strategy and whole life considerations.

Key features and topics for learning should concentrate on efficient management of heat, light and shade, in achieving well realised solutions in passive and mechanical methods of cooling, air conditioning and air management. Client needs, as governed by the building type and function should be paramount at all times. The following topics are provided as a guide:

- ◆ air-quality improvement; filtration, dust/fume extraction
- ◆ air-quality performance; air-change rate requirements
- ◆ natural ventilation; the passive stack
- ◆ solar considerations; geometry, solar gain, thermal comfort, shading
- ◆ balance between natural and mechanical ventilation
- ◆ balance between ventilation and air conditioning
- ◆ air conditioning types; all-air, air-water
- ◆ central plant implications
- ◆ multi-zone needs
- ◆ split systems
- ◆ chilled beam/column cooling systems
- ◆ ducted systems
- ◆ commissioning and maintenance

Learners should, **at all times**, be led towards the best solutions most appropriate for industry-quality graphic production as design considerations are evaluated, and increase awareness and familiarity with sophisticated CAD approaches in the realisation of solutions. Such CAD software should allow for the use of:

- ◆ advanced 3-dimensional modelling tools suitable for overcladding elements
- ◆ extensive 3-dimensional overcladding component libraries
- ◆ object-orientated parametric editing of 3-dimensional overcladding models and components
- ◆ extensive 2-dimensional overcladding component libraries
- ◆ object-orientated parametric editing of 2-dimensional overcladding components
- ◆ sophisticated layout and presentation options
- ◆ extensive project documentation scheduling options
- ◆ detailed dimension and tolerance tools
- ◆ materials library and render engine

Learners should use the full range of CAD options available to them in the production of graphics and drawings, as they pertain to the manifestation of illustrative/pictorial production and detailed construction drawings and data. Accuracy of detail is critical in linework representation of 2D drawings, and dimensions, tolerances and drawing scales should be used consistently throughout.

In pictorial/illustrative work, learners should use the CAD software options available to them effectively to indicate form, aesthetics, materials and finishes, and use appropriate display options, including Rendered output, where appropriate, to communicate these ideas.

One presentation of A3 size or larger, is the **minimum required hard-copy** output in each assessment instance. However, this should contain a sufficient range of views and details to communicate clearly and cohesively the design solutions reached in each instance. It is expected that the **minimum** range of views in each practical assessment should extend to:

- ◆ one (1) x PLAN detail
- ◆ one (1) x ELEVATION detail
- ◆ one (1) x SECTION detail
- ◆ one (1) x 3D PICTORIAL detail

In **Outcome 5**, learners should evaluate the success of their design solutions from all of the practical tasks undertaken during Outcomes 1 to 4. In terms of providing feedback on the critical success of their design solutions, a range of reporting formats could be exploited. Typically, a formal written document, suitably illustrated, could be used. However, alternative approaches are encouraged in the use of ICT solutions, such as electronic presentation files, or similar submission on CD, DVD format or similar. Other alternatives could include interrogative questioning, or a formal oral presentation.

## 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.

Assessment for this Unit could be delivered as individual assessment events or could be integrated into one single assessment covering all Outcomes. Different building types or project briefs could be used for separate Outcome tasks. If assessment is conducted using an integrated approach, it is recommended that building project brief guidelines should be provided based on contemporary design in significant, specialist, commercial building types and a project driven approach to the development of solutions adopted. Suitable building types could include, but not be limited to, commercial office buildings, colleges and universities, shopping malls, or other.

A suitable design approach would match very closely to industry practice. Learners should be encouraged to follow an established design protocol for the considerations of solutions, and subsequently produce the detailed specifications and design/construction Evidence Requirements using sophisticated CAD packages suitable to the task, and produce fully annotated and referenced drawings.

## **Assessment guidelines**

### **Outcome 1**

Focus of the assessment should be on the production of graphic evidence in the production of 3-dimensional CAD models appropriate to the design brief and the knowledge and skills items being assessed, and the subsequent production of 2-dimensional CAD drawings generated from the CAD models. The model details and drawings produced should demonstrate the learners' grasp of advanced design and detailing for the systems evaluated in light of their performance criteria and relevance to the design brief specified, and their ability to express and communicate these concepts and ideas accurately and effectively.

Learners could be provided with a design brief containing data for a specified large-scale, commercial building of contemporary style and be required to produce a solution for the overcladding systems required. The CAD details provided should be clear and effective visually and be supported by extensive and appropriate annotation. The hard-copy output for each design solution would include both 3D model and 2D detail representation, though the exact range of views produced would be dictated by the nature of the solution. It would be anticipated that in addition to the 3D views, additional views from plan, elevation and section would be required.

A checklist could be used to support the assessment requirements for each of the knowledge and/or skills required in the Outcome.

### **Outcome 2**

Focus of the assessment should be on the production of graphic evidence in the production of 3- dimensional CAD models appropriate to the design brief and the knowledge and skills items being assessed, and the subsequent production of 2-dimensional CAD drawings generated from the CAD models. The model details and drawings produced should demonstrate the learners' grasp of advanced design and detailing for the systems evaluated in light of their performance criteria and relevance to the design brief specified, and their ability to express and communicate these concepts and ideas accurately.

Learners could be provided with a design brief containing data for a specified large-scale, commercial building of contemporary style and be required to produce a solution for the partitioning systems required. The CAD details provided should be clear and effective visually and be supported by extensive and appropriate annotation. The outputted hard copy for each design solution would include both 3D model and 2D detail representation, though the exact range of views would be dictated by the nature of the solution. It would be anticipated that in addition to the 3D views, additional views from plan, elevation and section would be required.

A checklist could be used to support the assessment requirements for each of the knowledge and/or skills required in the Outcome.

### **Outcome 3**

Focus of the assessment should be on the production of graphic evidence in the production of 3- dimensional CAD models appropriate to the design brief and the knowledge and skills items being assessed, and the subsequent production of 2-dimensional CAD drawings generated from the CAD models. The model details and drawings produced should demonstrate the learners' grasp of advanced design and detailing for the systems evaluated in light of their performance criteria and relevance to the design brief specified, and their ability to express and communicate these concepts and ideas accurately.

Learners could be provided with a design brief containing data for a specified large-scale, commercial building of contemporary style and be required to produce a solution for the substructure and support systems required. The CAD details provided should be clear and effective visually and be supported by extensive and appropriate annotation. The outputted hard copy for each design solution would include both 3D model and 2D detail representation, though the exact range of views would be dictated by the nature of the solution. It would be anticipated that in addition to the 3D views, additional views from plan, elevation and section would be required.

A checklist could be used to support the assessment requirements for each of the knowledge and/or skills required in the Outcome.

#### **Outcome 4**

Focus of the assessment should be on the production of graphic evidence in the production of 3-dimensional CAD models appropriate to the design brief and the knowledge and skills items being assessed, and the subsequent production of 2-dimensional CAD drawings generated from the CAD models. The model details and drawings produced should demonstrate the learners' grasp of advanced design and detailing for the systems evaluated in light of their performance criteria and relevance to the design brief specified, and their ability to express and communicate these concepts and ideas accurately.

Learners could be provided with a design brief containing data for a specified large-scale, commercial building of contemporary style and be required to produce a solution for the air management and cooling systems required.

The CAD details provided should be clear and effective visually and be supported by extensive and appropriate annotation. The hard-copy output for each design solution would include both 3D model and 2D detail representation, though the exact range of views would be dictated by the nature of the solution. It would be anticipated that in addition to the 3D views, additional views from plan, elevation and section would be required.

A checklist could be used to support the assessment requirements for each of the knowledge and/or skills required in the Outcome.

#### **Outcome 5**

The assessment for this Outcome could be conducted distinctly at the end of the Unit, but is likely to draw upon earlier recorded effort by learners. In the case of the latter, learners could be given clear guidelines on the requirements of this Outcome at the outset of the Unit, and encouraged to develop their response on a continuing basis. It is recommended that centres develop checklists to support the assessment requirement for each of the knowledge and/or skills items.

### **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

Although no automatic certification of Core Skills or Core Skills components exists within this Unit, opportunities to develop components of some Core Skills are possible. Learners are working to design brief remits which requires the ability to create and manipulate objects in a computer-aided design environment, thus developing the Core Skills of *Numeracy, Problem Solving and ICT* at SCQF level 6. Access to, and evaluation of, examples of complex design drawings would be of value in formative work. Learners should be able to work unaided in correct file management: considerations of security and safety should be a routine aspect of good practice. The selection of appropriate software application packages and the ability to manipulate objects, components and annotation is integral to achievement, as are techniques in editing data to meet identified needs of purpose and content.

Accuracy of interpretation and effective communication of numerical and graphic information underpins the competencies developed in the Unit, and learners are assessed on their ability to create and edit elements within a drawing using a full range of software commands. All these tasks provide further opportunities to challenge the learner to improve on the breadth of Core Skills mentioned above. Some learners may benefit from formative opportunities to further develop effectiveness in the understanding, analysis and application of numerical and graphic data, and the use of software packages or on-line tutorials to reinforce numeracy skills may be useful. Learners could additionally benefit from discussions with the class group and/or lecturer in order to encourage analytical evaluation of approaches to the design process.

## 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.

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## General information for learners

### **Unit title:** Architectural CADT: Commercial Building Systems (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 has been designed to help you develop underpinning knowledge in the understanding and practical production of detailed drawings and graphics related to the elemental specialist requirements of large-scale, commercial buildings. For a variety of elemental systems and connections in large buildings you will produce such detail using advanced computer-aided design software packages.

Within this Unit, a wide range of detail requirements for large building projects will be considered, including overcladding elements, specialist partitioning systems, substructure systems and components, and specialist building service requirements. Throughout the Unit, traditional, contemporary and innovative technologies and systems will be considered, and emphasis will be placed on the determination of appropriate technical design solutions to given project briefs.

The Unit will be taught with a series of lectures, practical exercises and design tutorials, which will logically, and sequentially progress knowledge and skills from the simple to the complex. At all times, a strong design base will underpin your learning and assessment.

It is imperative that you develop your technical knowledge within this Unit so learning within the Unit builds upon other knowledge and skills. As you will begin the Unit with a range of existing CAD skills, you will advance with new tools and techniques to produce both 2-dimensional and 3-dimensional CAD. The use of CAD standard template files, conventions, symbols, annotation and referencing should be consistently applied at all times, these being assumed knowledge and skills at point of entry to the Unit.

In this Unit, adherence to the appropriate British Standards, Building Regulations and other accepted design parameters is essential to effective communication of solutions. Individual learning tasks, lectures and tutorials will also form part of the delivery of this Unit.

There are five formal assessment events, which may be integrated. The greater element of assessment time and effort will be on the practical production of CAD solutions appropriate to a building brief. The supporting evidence for all the practical assessment events are likely to be integrated into a covering report submission for the practical CAD work generated, although other approaches for this are possible.

Assessments will be supervised and conducted under open-book conditions in which you will be allowed access to notes, textbooks and other material during the assessment. You will sit these assessments at prescribed points during the Unit at the discretion of the lecturer.

As you will be working consistently with numerical and graphical data within an IT based platform, opportunities exist within this Unit for you to also develop Core Skills in *Information and Communication Technology (ICT)*, *Problem Solving and Numeracy* to SCQF level 6.