

**BUILDING AND ARCHITECTURAL
TECHNOLOGY**
Advanced Higher

Second edition – published April 2000

NOTE OF CHANGES TO ADVANCED HIGHER ARRANGEMENTS SECOND EDITION PUBLISHED APRIL 2000

COURSE TITLE: Building and Architectural Technology
(Advanced Higher)

COURSE NUMBER: C021 13

National Course Specification

Course Structure: *Advanced Building Technology* is replaced by two new units.
Introduction of choice of units for third unit credit.

Course Content: Significant changes in line with new units.

Grade Description: Some minor modifications.

National Unit Specification

Two new units – *Construction Technology: Substructure and Remedial Works* and *Construction Technology: Industrial/Commercial Superstructure* - have replaced *Advanced Building Technology*.

Drawing and Design has been added to *Conversion and Adaptation of Building* to form a small group from which Candidates should select one.

National Course Specification

BUILDING AND ARCHITECTURAL TECHNOLOGY (ADVANCED HIGHER)

COURSE NUMBER C021 13

COURSE STRUCTURE

This course has two mandatory units and one optional unit as follows:

D33B 13	<i>Construction Technology: Substructure and Remedial Works (AH)</i>	<i>1 credit (40 hours)</i>
D33A 13	<i>Construction Technology: Industrial/Commercial Superstructure (AH)</i> <i>and</i> <i>either</i>	<i>1 credit (40 hours)</i>
D32Y 13	<i>Drawing and Design (AH)</i>	<i>1 credit (40 hours)</i>
D116 13	<i>Conversion and Adaptation of Buildings (AH)</i>	<i>1 credit (40 hours)</i>

In common with all courses, this course includes 40 hours over and above the 120 hours for the component units. This may be used for induction, extending the range of learning and teaching approaches, support, consolidation, integration of learning and preparation for external assessment. This time is an important element of the course and advice on its use is included in the course details.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Higher Construction and Higher Building and Architectural Technology
- a Higher Scottish Group Award in Construction
- appropriate units from the Design, Engineering and Technology: Construction framework at Higher level

Administrative Information

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National Course Specification: general information (cont)

COURSE Building and Architectural Technology (Advanced Higher)

CORE SKILLS

Core skills for Advanced Higher remain subject to confirmation and details will be available at a later date.

National Course Specification: course details

COURSE Building and Architectural Technology (Advanced Higher)

RATIONALE

This is a specialist course providing an opportunity to study construction principles and processes related to large, high-rise residential, commercial and industrial buildings. It will contribute to the development of appropriate skills and knowledge for the construction candidate and will make a significant contribution to his or her general education and personal development through promotion of the core and transferable skills important for future employment within the industry.

The course is designed to further develop the candidate's knowledge and understanding of construction practices and processes related to large, high-rise residential, commercial and industrial buildings. The course is intended to provide a sound appreciation of ground works, basement construction, foundation types, structural forms used for superstructures, constructional detailing, and temporary and remedial works to existing buildings. The candidate may also choose to study the procedures associated with the conversion and adaptation of buildings such as feasibility assessment, option analysis, design and the production of working drawings. As an alternative, the candidate may choose to extend knowledge of architectural design concepts and to further develop skills in the preparation of and graphical presentation of architectural proposals.

The course is particularly suitable for the candidate wishing to pursue a career in the construction industry and is suited for occupations involving planning, programming, designing, detailing, measuring, taking-off, estimating, building control, quality control, supervision and inspection.

The course should appeal to those candidates who aspire to a practical creative career, to those who enjoy teamwork and seek variety in their work. It provides an important step both in the development of construction skills and on the academic pathway to construction professional status. Candidates who have studied Higher Construction and Higher Building and Architectural Technology will find the Advanced Higher Building and Architectural Technology course to be a natural extension of their previous study.

The aims of the course are to develop:

- the ability to plan operations
- a systematic, logical and economic approach to sequencing construction operations
- the ability to select building techniques for medium and large scale structures and to select suitable elements such as foundations, basements, floors and roofs
- competence in complex constructional detailing
- the ability to prepare graphical presentations of architectural and construction proposals
- the ability to research and extract information from relevant regulations and technical data

Satisfactory completion of the course should provide the candidate with:

- an understanding of the principles of foundation and basement design
- the ability to resolve problems associated with the provision of foundations and basements
- an understanding of the principles of construction and the main construction methods used for large residential, commercial and industrial buildings in precast concrete, *in-situ* concrete and steel
- the ability to produce complex construction drawings in accordance with recognised practice
- an understanding of the legislative procedures to be observed before and during construction operations
- a desire to extend his or her professional development

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

The course will also make a significant contribution to the general education and personal development of the candidate by assisting in the development of core skills in communication, investigation, analysis and problem solving.

COURSE CONTENT

Each of the component units of the course highlights a key activity in the overall building technology process. Completion of the Advanced Higher course, with its external assessment component, in addition to the completion of the individual units, will provide candidates with a sound grasp of the overall process and of the inter-relationship of separate elements. Completion of the Advanced Higher course will enable candidates to apply in-depth study of the various elements in an integrated fashion.

The additional 40 hours assigned to the course will allow candidates time to develop a project, to carry out further and deeper research, and to practise the integration of the knowledge and skills acquired through earlier study of Higher Building and Architectural Technology and of the individual units of the course.

Safety aspects of construction activity should be stressed throughout delivery of the course content.

All of the course content will be subject to sampling in the external assessment.

Construction Technology: Substructure and Remedial Works

The following topics will be covered:

Application of information from site investigation

This study should introduce the candidate to the importance of site survey and investigation in order to ensure the stability of structures.

The candidate should study site investigation methods including desk study, walk over and ground investigation. The following should be covered: bore hole methods including mechanical augers, sample shells and wash boring, borehole data logs, soil properties, particle size and classification.

The following test methods should be briefly covered: standard penetration test, vane test, unconfined compression test, triaxial compression test, shear box test and consolidation test (Oedometer).

Ground water control methods should be covered including the principles of de-watering and the concepts of temporary and permanent exclusion of water from the site.

Temporary exclusion methods should include sump pumping, well pointing and freezing techniques. Permanent exclusion methods should include grouting, contiguous piling and diaphragm walling.

Ground support systems should be introduced, including cofferdams, caissons, and methods suitable for basement construction, such as open excavations with battered sides, perimeter trenches and raking struts.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Various ground improvement techniques should be covered including: ground replacement, surcharging, dynamic compaction, vibration methods and jet grouting.

Substructures

This study should develop the candidate's knowledge and understanding of simple domestic building construction to the methods of support to structures. The types of foundation covered should include: pad foundations (including grillage), raft foundations (solid, beam and slab) and piles. Coverage of piled foundations should include the methods of classification according to method of load transfer (end bearing and friction) and method of construction (bored and driven). Piling rigs, hammers, toes and caps should be covered.

Candidates should be introduced to the problems which occur due to design failure of foundations resulting in building movement due to differential settlement, overloading and subsidence (including mining subsidence). This section of work should include prevention of problems during design, by spreading loads evenly, choice of correct foundation and precautions to be taken when building in areas where mining settlement is likely to occur (eg clasp building). Remedial work should include methods of underpinning.

Basement construction methods should be covered including: the use of box and cellular rafts, ground anchors, waterproofing requirements such as internal and external membranes, tanking and the use of drained cavities, and provision of service entries.

The selection of plant for substructure construction should be covered including: plant economics, maintenance, plant outputs, dozers, scrapers, types of mobile excavator and dumper for excavation for large buildings.

Major reconstruction work

This study should cover the deterioration of industrial and commercial buildings along with the techniques of remedial and reconstruction work.

Reasons for deterioration should be covered including: settlement, subsidence, thermal movement, dry and wet rot, infestation of wood boring insects, sulphate attack and corrosion.

Remedial actions covered should include: replacement of foundations, underpinning using traditional and piled methods including support considerations, shoring and support requirements during dewatering, demolition and remedial work.

Methods of façade retention, as an alternative to demolition of complete structures, should be covered. These should include: use of proprietary systems, scaffolding and steelwork. The requirements for bracing and propping should also be covered.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Construction Technology: Industrial/Commercial Superstructure

Structural forms for large buildings

This study should introduce the candidate to the common structural forms used for medium and large commercial and industrial buildings.

Portal frames should be covered including those in steel, concrete and timber, with fixed, two-pinned and three-pinned supports. The use of single and multi-span frames should be considered, including foundation construction and connections.

Steel framed buildings should be introduced including: steel sections, foundation construction, connections, fire protection and safe erection procedures.

Reinforced concrete frames should also be introduced including: *in-situ* and precast concrete.

For *in-situ* frames the following should be covered: advantages and disadvantages, types and positions of reinforcement, beam and column details, principles of formwork design, formwork to beams and columns, concrete placement and safe erection procedures.

For precast concrete frames, beam to column and column to foundation connections should be covered along with safe erection procedures.

Walls to framed structures

This study should introduce the candidate to the various methods of wall construction used for framed structures.

Infill panels mentioned should include masonry, composite or sandwich panels and glazed units, including fixing and damp proofing details.

Cladding coverage should include: functional requirements of cladding panels and metal profile sheeting to both concrete and steel framed structures.

Curtain walling coverage should include: functional requirements, typical arrangements and details for aluminium and plastic walling, and assembly details.

Floor and roof structures

On entry to the course, the candidate should have knowledge of the basic functional requirements of floors and roofs. This study should provide the candidate with a knowledge and understanding of the types of floors and roofs commonly used for large buildings and of construction details.

Basic roof forms in steel, timber and concrete should be studied including: pitched roofs, north lights, flat roofs, shell roofs and space decks. The reasons for the use of each type of roof should be considered.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Candidates should also study construction details for each type of roof, including fixings to structures and the requirements for insulation and movement. The provision of natural should be considered, including the use of rooflights, patent glazing, lantern lights, dome lights, positioning and fixing of such lights, damp proofing and ventilation.

Roof coverings should be covered including: installation methods, fixing details for aluminium and lead, and built up felt roofing and asphalt.

Ground floor construction in plain and reinforced *in-situ* concrete should be covered including the use of strip flooring, thermal movement, crack inducement joints and dewatering. Surface finishes considered should be floor screeds, DPM bonded and unbonded screeds and floating screeds.

The study of reinforced concrete floors should cover one and two-way spanning slabs, ribbed and waffle floors, hollow pot floors, and pre-tensioned and post-tensioned prestressed concrete units. The advantages of *in-situ* and precast concrete should be covered.

Formwork and falsework required for *in-situ* concrete floor construction should be studied.

Coverage of precast flooring should include: composite construction prestressed planks with filler blocks, channel units, solid units and hollow units.

Other aspects of floor construction covered should include: provision of service entries, holes for lifts and stairs, fire proofing considerations, floor finishes, criteria for the selection of floor finishes, methods of application for concrete screeds, tiles, sheet flooring and applied finishes.

Drawing and Design

Basic architectural concepts and elements

This study should provide knowledge of the basic process of architectural design and assist the candidate to develop competence in freehand drawing and sketching.

The process of architectural design should include the problem-solving cycle of *analysis, synthesis, appraisal and decision*. The candidate should explore design concepts to meet specified objectives, along with the expression of elements of unity such as: colour, texture, tone, proportion, scale, form or shape, solid or void, symmetry, balance and rhythm. The candidate should also experiment with different freehand techniques of graphical presentation appropriate to the subject area and level. The study should be viewed as the introduction to both architectural design and graphical communication within the architectural environment.

Architectural form, function and mass

This study should develop knowledge and understanding of the terms *form, function and mass* as they are applied to architecture. The candidate should learn of the inter-relationship between the terms and develop the ability to illustrate such with reference to specific buildings.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Ergonomic and anthropometric data

This study should provide knowledge of basic ergonomic principles. The sources of ergonomic and anthropometric data should be identified. The candidate should develop the ability to interpret the data and apply such to a range of architectural tasks such as kitchen and bathroom design, and furniture design and layout. The application of ergonomic principles should be fully illustrated on drawings to enable the candidate to further develop graphical presentation skills.

Conversion and adaptation of buildings

Assessment of existing buildings

This study should provide the candidate with the skills to carry out assessments of existing buildings prior to conversion, adaptation or restoration.

The procedure for carrying out a measured survey of an existing building to record dimensions, materials used and existing services should be covered. Spatial information required should include: sketch plans and elevations, room sizes, locations and dimensions of doors, windows, stairs, sizes of structural components, walls, joints, rafters, location of internal and external services.

A visual inspection of the building to record its condition should also be carried out and the main defects commonly associated with existing structures should be highlighted. Defects should include cracking of walls, decay in masonry and mortar pointing, dry rot, wet rot, all forms of dampness, render defects, pitched and flat roof defects.

Choice between conversion, adaptation and restoration

This study should provide the candidate with knowledge and understanding of the main factors affecting the choice between conversion, adaptation and restoration. These should include social, environmental, economic, functional, organizational and technical factors. Problems commonly found in building projects of this nature should be covered, such as dampness, thermal insulation continuity, structural support, movement and temporary support.

Reference should be made to constraints, such as current legislation, planning control, building control and restrictions on historic buildings.

Other relevant criteria to be identified and applied when considering choice should be included, such as client's requirements, budget and programme.

Outline scheme for change of use

This study should enable the candidate to develop skills in planning the conversion of an existing building to a new use. This will involve preparation of outline sketches in plan, indicating appropriate activity spaces and circulation areas. Other factors to be considered are spatial parameters, means of escape, lighting, ventilation and access for services.

Factors within the building fabric should be considered including: floor loadings, thermal insulation, sound insulation and fire safety. Use should be made of the current Building Standards (Scotland) Regulations when delivering this part of the unit.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Preparation of production information

This study should enable the candidate to develop skills in the preparation of annotated working drawings, at scale 1:5, of various building elements such as floors, walls, beams and intersections of elements.

The details produced must clearly illustrate the technology of the building and the proposals for making good at duntaking, matching and joining new work to existing construction. Annotated notes must refer to the materials used and to appropriate British Standard specifications. Factors such as thermal insulation, sound insulation and fire proofing must be covered in detail, ensuring that proposals comply with current legislation.

ASSESSMENT

To gain the award of the course the candidate must pass all the unit assessments, as well as the external assessment. External assessment will provide the basis for grading attainment in the course award.

When the units are taken as component parts of a course, candidates will have the opportunity to achieve at levels beyond that required to attain each of the unit outcomes. This attainment may, where appropriate, be recorded and used to contribute towards course estimates and to provide evidence for appeals. Additional details are provided, where appropriate, with the exemplar assessment materials. Further information on the key principles of assessment are provided in the paper *Assessment*, published by the HSDU in May 1996.

DETAILS OF THE INSTRUMENTS FOR EXTERNAL ASSESSMENT

In undertaking the course assessment, candidates will be expected to demonstrate that the knowledge and understanding, graphical, managerial and problem-solving skills that they have developed through their study of the component units have been retained and can be integrated and applied in less familiar and more complex contexts.

The external assessment will sample across the content of the four units of the course and will consist of a 3 hour question paper, externally devised and assessed. The paper will comprise three sections.

Section A

This will cover all four units of the course. It will feature five extended response and/or structured questions, examining candidates' knowledge and understanding of construction principles, materials and design procedures. Candidates will be required to attempt questions 1, 2 and 3, and either question 4 or question 5.

Section B

This will cover the two mandatory units of the course. It will feature three extended response and/or structured questions, requiring candidates to apply design principles and prepare construction details for industrial and commercial buildings. Candidates will be required to attempt two questions.

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

Section C

This will cover the two optional units of the course. It will feature two extended response and/or structured questions, requiring candidates to explain and apply design principles and procedures. Candidates will be required to attempt one question.

GRADE DESCRIPTIONS

The grade descriptions below are of expected performances at Grade C and at Grade A. They are intended to assist candidates, teachers/lecturers and users of the certificate and to help establish standards when question papers are being set. The grade of the award will be based on the total score obtained in the examination.

At C

Candidates can:

- use the appropriate knowledge and understanding acquired through the study of the component units
- demonstrate a depth of underpinning knowledge, for instance, by preparing new construction and/or conversion proposals
- illustrate graphically, basic architectural concepts
- clearly explain procedures, such as those of option analysis and choice
- demonstrate the ability to integrate skills acquired in component units to solve and manage problems to a suitable conclusion
- apply knowledge and understanding to solve problems set in less familiar contexts

At A

Candidates can:

- solve problems in which the contexts and given information may not be specified in the content statements but which require the skills, knowledge and understanding developed within the course
- show originality in the approach to analysis and apply knowledge and understanding to solve problems which are less structured or set in more complex contexts
- relate theory to practice by illustrating basic architectural concepts and procedures with reference to specified buildings
- draw relevant conclusions from design problems and explain alternative designs and modifications to designs
- show well developed skills in graphical communication of construction proposals

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

APPROACHES TO LEARNING AND TEACHING

The learning and teaching of building and architectural technology is most effective when the concepts, logistics, principles and technology are set in relevant industrial and commercial contexts. Practical activities provide opportunities to develop a wide range of skills associated with building technology and practical problem-solving. The practical activities should be designed to assist in the understanding of the concepts being studied.

Drawing has an important role in the course. Candidates should be given time to develop and practise the graphical presentation skills required for the illustration of architectural design concepts and application of the principles of ergonomics, and for the preparation of construction details.

Although each of the component units may be taught sequentially, concurrent delivery is preferred since this will allow candidates to gain an early appreciation of the overall process of constructing large commercial buildings. It is not, however, recommended that the delivery of the units be fully integrated.

Site visits, video presentations and slide presentations of recent building projects will help candidates relate construction principles and techniques to practical industrial situations. The study of building and architectural technology should be based on actual projects or hypothetical but realistic case studies. Throughout the course, contact with the building industry should be encouraged through site visits, investigations and visiting speakers, etc. This will help candidates to feel more involved with the industry and motivate them to further study. Issues of construction safety, quality and environmental awareness and responsibility should permeate the learning and teaching process. Use should be made of the following:

- current British Standards
- Building Research Establishment digests, information papers, good practice guides, and defect action sheets
- current Building Standard (Scotland) Regulations

SPECIAL NEEDS

This course specification is intended to ensure that there are no artificial barriers to learning or assessment. Special 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 Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

National Course Specification: course details (cont)

COURSE Building and Architectural Technology (Advanced Higher)

SUBJECT GUIDES

A Subject Guide to accompany the Arrangements documents has been produced by the Higher Still Development Unit (HSDU) in partnership with the Scottish Consultative Council on the Curriculum (SCCC) and Scottish Further Education Unit (SFEU). The Guide provides further advice and information about:

- support materials for each course
- learning and teaching approaches in addition to the information provided in the Arrangements document
- assessment
- ensuring appropriate access for candidates with special educational needs

The Subject Guide is intended to support the information contained in the Arrangements document. The SQA Arrangements documents contain the standards against which candidates are assessed.

National Unit Specification: general information

UNIT	Construction Technology: Substructure and Remedial Works (Advanced Higher)
NUMBER	D33B 13
COURSE	Building and Architectural Technology (Advanced Higher)

SUMMARY

This unit allows the candidate to develop skills in more complex areas of Building and Architectural Technology relating to large high-rise residential, commercial and industrial buildings. The content of the unit includes site investigation, preliminary site works, foundations, basement construction and major reconstruction work.

The unit has been developed to broaden the candidate's knowledge of construction techniques and to develop skills in the selection of substructures and methods of reconstruction.

The unit is a component of Advanced Higher Building and Architectural Technology.

OUTCOMES

- 1 Apply information from site investigations.
- 2 Select and describe suitable forms of substructure.
- 3 Outline the techniques used when undertaking major reconstruction work.

Administrative Information

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National Unit Specification: general information (cont)

UNIT Construction Technology: Substructure and Remedial Works
(Advanced Higher)

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Higher Construction and Higher Building and Architectural Technology
- a Higher Scottish Group Award in Construction
- appropriate units from the Design, Engineering and Technology: Construction framework at Higher level

CREDIT VALUE

1 credit at Advanced Higher.

CORE SKILLS

Core skills for Advanced Higher remain subject to confirmation and details will be available at a later date.

National Unit Specification: statement of standards

UNIT Construction Technology: Substructure and Remedial Works (Advanced Higher)

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 the Scottish Qualifications Authority.

OUTCOME 1

Apply information from site investigations.

Performance criteria

- (a) Methods of collecting site information from survey and ground investigation are described correctly.
- (b) Information from site investigation is used correctly to recommend methods of ground water control.
- (c) Suitable ground support systems used in foundation and basement construction are sketched correctly.
- (d) Suitable ground improvement techniques are described correctly.

Note on range for the outcome

Site surveys: desk study, walk over survey, ground investigation.

Evidence requirements

Written and/or oral evidence is required to show that the candidate knows the procedures for desk study and walk over survey and can interpret a borehole log in order to recommend alternative methods of ground water control and ground support systems. Graphical evidence of appropriate ground support systems is also required.

The candidate is also required to describe the techniques available to improve the bearing capacity of soils.

All working practices must be in line with the current building regulations, codes of practice and relevant health and safety legislation.

OUTCOME 2

Select and describe suitable forms of substructure.

Performance criteria

- (a) Foundations are selected and the selections justified.
- (b) Common foundation problems and appropriate remedial work are described correctly.
- (c) Methods of basement construction are described correctly.
- (d) Items of plant for use in excavation and substructure construction are selected correctly.

National Unit Specification: statement of standards (cont)

UNIT Construction Technology: Substructure and Remedial Works (Advanced Higher)

Note on range for the outcome

Foundation types: pile, raft.

Foundation problems: settlement, subsidence.

Plant selection: excavation plant, piling plant.

Evidence requirements

Written and/or oral evidence and graphical evidence are required to show that the candidate has a knowledge of the types of foundation construction and the problems which occur with large and heavy buildings. The candidate is also required to select and justify the selection of suitable foundations for two buildings and to describe basement construction techniques. Suitable items of plant must also be selected.

All working practices must be in line with the current building regulations, codes of practice and relevant health and safety legislation.

OUTCOME 3

Outline the techniques used when undertaking major reconstruction work.

Performance criteria

- (a) Methods of underpinning to existing buildings are described correctly.
- (b) Methods used in downtakings in order to repair buildings are described correctly.
- (c) Methods of temporary support and façade retention are described correctly.

Note on range for the outcome

Underpinning: mass concrete, piling, support methods.

Evidence requirements

Written and/or oral evidence and graphical evidence is required of the candidate's ability to describe, with the aid of annotated sketches, techniques used in underpinning and façade retention.

All working practices must be in line with the current building regulations, codes of practice and relevant health and safety legislation.

National Unit Specification: support notes

UNIT Construction Technology: Substructure and Remedial Works (Advanced Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT

When delivering the unit as a free-standing unit, refer to the Advanced Higher Building and Architectural Technology course details for further information on the content of the unit.

This unit should be seen as building on the knowledge gained at Higher and extending it into areas of advanced building technology. Projects chosen as vehicles for study should be large or high-rise residential, commercial or industrial buildings on greenfield or brownfield sites, with refurbishment/restoration of an adjacent building also forming part of the development.

Corresponding to Outcomes 1 to 3

- 1 This outcome should allow the candidate to develop skills to interpret reports and to select appropriate ground support systems, groundwater control techniques and ground improvement methods.
- 2 This outcome should enable the candidate to interpret reports and to select appropriate foundation types for a new building along with items of plant required for construction. A knowledge of common foundation problems, remedial works and basement construction will also be provided.
- 3 This outcome should allow the candidate to describe with sketches appropriate techniques to strengthen and support an existing structure and methods of façade retention. These measures are commonly associated with the refurbishment of existing buildings.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Delivery of the unit should be within the industrial context. Theory should be related to practice through examination of site investigation reports for existing construction projects and discussion of the influence of the report data on foundation design. Live projects, simulations and site visits to large high-rise buildings will build the candidate's knowledge of the various stages of the design and construction procedures for large buildings. Aspects of this unit can also be related to the unit Conversion and Adaptation of Buildings, since areas of technology covered are relevant to conversion and adaptation work.

The use of technical data from British and European Standards, CIOB, CCA and other technical and manufacturing sources will add realism to the learning and teaching.

For further information about learning and teaching, refer to the course details and the Subject Guide for Advanced Higher Building and Architectural Technology (published by HSDU/SCCC/SFEU 1997).

National Unit Specification: support notes (cont)

UNIT Construction Technology: Substructure and Remedial Works (Advanced Higher)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

An assessment plan could be given to the candidate at the introduction of the unit, showing the relationship between the assessment requirements for this unit and those for the other units of the course. A study project could also be given to the candidate at this time for completion by an agreed date. As part of the project the candidate could be required to prepare a programme indicating how he or she proposes to plan and monitor all assessment tasks.

Projects, simulations and sharing of experience are also useful. A study project, in which the separate assignment tasks are aligned with the staged development of the project and the sequence of learning outcomes, would seem a beneficial way of generating the evidence required.

Centres may use instruments of assessment which they consider to be most appropriate. Examples of suitable instruments are provided below.

Outcome 1 – Assignment (open book)

The candidate could be given a site plan and section for a project which includes a series of large and high-rise structures. A minimum of two borehole logs should be included, with differing ground conditions across the site. The candidate could be asked to describe the methods used to collect site information, ie desk study, walk over and ground investigation, before evaluating the borehole logs and recommending ground water control, ground support and ground improvement methods. The candidate could be asked to evaluate different solutions and to make recommendations for the site.

Outcome 2 – Assignment (open book)

This could follow on from the assignment for outcome 1, being based on the same construction project. The candidate could be issued with an information sheet indicating which buildings are to have raft and piled foundations and which building is to have a basement. The candidate could be required to select, justify and describe, with the aid of sketches, suitable foundation and basement constructions, along with suitable plant for excavation and piling operations.

The candidate could also be asked to describe possible foundation settlement and subsidence problems arising from the use of the wrong types of foundation and the remedial measures which are commonly adopted.

Outcome 3 – Assignment (open book)

The candidate could be presented with a report, detailing the existing condition of a large industrial/commercial building, and be required to recommend appropriate action to be taken to repair defects in the building. The evidence presented could be in the form of a report to the owner of the building, detailing the reconstruction work required, including the underpinning of foundations, downtakings and façade retention. Alternative measures should be covered by the report.

National Unit Specification: support notes (cont)

UNIT Construction Technology: Substructure and Remedial Works
(Advanced Higher)

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special 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 Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

National Unit Specification: general information

UNIT	Construction Technology: Industrial/Commercial Superstructure (Advanced Higher)
NUMBER	D33A 13
COURSE	Building and Architectural Technology (Advanced Higher)

SUMMARY

This unit allows the candidate to gain knowledge and understanding of the common structural forms used for large industrial and commercial buildings. The candidate will develop skills in the description of structural forms and elements by means of sketches.

The unit has been developed to broaden the candidate's knowledge of construction techniques beyond those required for domestic buildings.

The unit is a component of Advanced Higher Building and Architectural Technology.

OUTCOMES

- 1 Sketch and describe selected common structural forms.
- 2 Describe methods of forming walls to framed structures.
- 3 Select and describe floor and roof structures.

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National Unit Specification: general information (cont)

UNIT Construction Technology: Industrial/Commercial
Superstructure (Advanced Higher)

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Higher Construction and Higher Building and Architectural Technology
- a Higher Scottish Group Award in Construction
- appropriate units from the Design, Engineering and Technology: Construction framework at Higher level

CREDIT VALUE

1 credit at Advanced Higher.

CORE SKILLS

Core skills for Advanced Higher remain subject to confirmation and details will be available at a later date.

National Unit Specification: statement of standards

UNIT Construction Technology: Industrial/Commercial Superstructure (Advanced Higher)

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 the Scottish Qualifications Authority.

OUTCOME 1

Sketch and describe selected common structural forms.

Performance criteria

- (a) Portal frame construction is sketched and described correctly.
- (b) Main features of steel framed buildings are sketched and described correctly.
- (c) Methods of constructing concrete framed buildings are sketched and described correctly.
- (d) Diaphragm, fin and cross wall construction are sketched and described correctly.
- (e) Items of plant for use in superstructure construction are selected correctly.

Note on range for the outcome

Portal frames: steel, concrete.

Plant selection: crainage, mechanical handling.

Evidence requirements

Written and/or oral evidence and graphical evidence to show that the candidate has a knowledge of and can select from the alternative methods of constructing large industrial and commercial buildings in steel and concrete. The candidate must describe such methods using suitable sketches and must also describe suitable items of plant for the different forms of construction.

All working practices must be in line with current building regulations, codes of practice and relevant health and safety legislation.

OUTCOME 2

Describe methods of forming walls to framed structures.

Performance criteria

- (a) Functional requirements of walls to framed structures are described correctly.
- (b) Common types of infill panel are described correctly.
- (c) Common types of wall cladding and fixing systems are described correctly.
- (d) Common types of curtain walling and fixing systems are described correct.

Evidence requirements

Written and/or oral evidence and graphical evidence is required that the candidate has a knowledge of the functional requirements of walls and can describe, with the aid of sketches, infill panel, cladding and curtain walling systems.

All working practices must be in line with current building regulations, codes of practice and relevant health and safety legislation.

National Unit Specification: statement of standards (cont)

UNIT Construction Technology: Industrial/Commercial
Superstructure (Advanced Higher)

OUTCOME 3

Select and describe floor and roof structures.

Performance criteria

- (a) Appropriate floor construction techniques are selected and described correctly.
- (b) The provision of openings in floor construction are described correctly.
- (c) Structural floor finishes to precast and in-situ floors are described correctly.
- (d) Roof construction techniques are selected and justified correctly.
- (e) Roof coverings are selected and justified correctly.

Evidence requirements

Written and/or oral evidence and graphical evidence is required that the candidate can select and describe alternative floor and roof constructions. At least two methods of floor construction and two methods of roof construction should be described with the aid of sketches.

All working practices must be in line with current building regulations, codes of practice and relevant health and safety legislation.

National Unit Specification: support notes

UNIT Construction Technology: Industrial/Commercial Superstructure (Advanced Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT

When delivering the unit as a free-standing unit, refer to the Advanced Higher Building and Architectural Technology course details for further information on the content of the unit.

The purpose of this unit is to enable the candidate to gain a knowledge and understanding of the construction techniques used for medium and large commercial and industrial buildings.

Corresponding to Outcomes 1 to 3

- 1 This outcome should enable the candidate to describe the common forms of superstructure construction used for new medium and large industrial/commercial buildings.
- 2 This outcome should enable the candidate to describe the methods of wall construction used for framed buildings.
- 3 This outcome should enable the candidate to describe the methods of floor and roof construction used for medium and large industrial/commercial buildings.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Delivery of the unit should be within the industrial context. Theory should be related to practice through examination of drawings for real projects. Live projects and site visits to large industrial/commercial buildings will build the candidate's knowledge of modern construction methods.

The use of technical data from British and European Standards, CIOB, CCA and other technical and manufacturing sources will add realism to the learning and teaching.

For further information about learning and teaching, refer to the course details and the Subject Guide for Advanced Higher Building and Architectural Technology (published by HSDU/SCCC/SFEU 1997).

National Unit Specification: support notes (cont)

UNIT	Construction Technology: Industrial/Commercial Superstructure (Advanced Higher)
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GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Centres may use instruments of assessment which they consider to be most appropriate. Examples of suitable instruments are provided below.

Outcome 1 – Question paper (closed book)

The candidate could be presented with a site plan for a project involving the range of structures covered by the outcome. The candidate could be required to answer questions on the alternative methods of superstructure construction and the plant required for construction.

Outcome 2 – Assignment (open book)

The candidate could be issued with the drawing for a project which includes a framed structure and be required to describe, with sketches, three alternative types of wall construction for the building.

Outcome 3 – Question paper (closed book)

The candidate could be presented with a project which includes several structures and various types of floor and roof construction. The candidate could be required to answer questions on a range of construction methods, erection procedures and finishes for precast and in-situ concrete floors and for roofs.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special 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 Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

National Unit Specification: general information

UNIT	Drawing and Design (Advanced Higher)
NUMBER	D32Y 13
COURSE	Building and Architectural Technology (Advanced Higher)

SUMMARY

This unit enables the candidate to develop competence in graphical communication techniques in the field of architectural drawing and sketching. In addition, the candidate will gain a knowledge of basic architectural design concepts and elements along with an understanding of the application of ergonomic and anthropometric data to design.

The unit is an optional component of Advanced Higher Building and Architectural Technology.

OUTCOMES

- 1 Illustrate basic architectural concepts and elements.
- 2 Explain and illustrate the relationship of architectural form, function and mass.
- 3 Apply basic ergonomic and anthropometric data.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Higher Construction and Higher Building and Architectural Technology
- a Higher Scottish Group Award in Construction
- appropriate units from the Design, Engineering and Technology: Construction framework at Higher level

Administrative Information

Superclass:	TD
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National Unit Specification: general information (cont)

UNIT Drawing and Design (Advanced Higher)

CREDIT VALUE

1 credit at Advanced Higher.

CORE SKILLS

Core skills for Advanced Higher remain subject to confirmation and details will be available at a later date.

National Unit Specification: statement of standards

UNIT Drawing and Design (Advanced Higher)

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 the Scottish Qualifications Authority.

OUTCOME 1

Illustrate basic architectural concepts and elements.

Performance criteria

- (a) Illustration of a basic architectural design concept to meet specified objectives is communicated clearly in an appropriate format.
- (b) Illustration of the elements scale, proportion, symmetry, balance and rhythm is communicated clearly in an appropriate format.

Note on range for the outcome

Appropriate format: freehand line drawing, instrument-aided sketches.

Evidence requirements

Graphical evidence is required that the candidate understands architectural design concepts and elements. A minimum of four A4 size sketches should be produced.

OUTCOME 2

Explain and illustrate the relationship of architectural form, function and mass.

Performance criteria

- (a) Explanation of the terms form, function and mass and their inter-relationship with reference to architecture is correct.
- (b) Illustration of the terms form, function and mass as applied to specific buildings is communicated clearly in an appropriate format.

Note on range for the outcome

Appropriate format: freehand line drawing, instrument-aided sketches.

Evidence requirements

Written and/or oral evidence and graphical evidence is required that the candidate understands the terms of form, function and mass and their inter-relationship with reference to architecture. Graphical evidence should be freehand and instrument-aided sketches of three buildings in a medium selected by the candidate.

National Unit Specification: statement of standards (cont)

UNIT Drawing and Design (Advanced Higher)

OUTCOME 3

Apply basic ergonomic and anthropometric data.

Performance criteria

- (a) Application of basic ergonomic and anthropometric design data to a given architectural task is correct.
- (b) Explanation of the basic ergonomic principles and their application to a given architectural task is correct.

Evidence requirements

Written and/or oral evidence and graphical evidence is required that the candidate can interpret and apply ergonomic and anthropometric data to architectural tasks.

National Unit Specification: support notes

UNIT Drawing and Design (Advanced Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT

When delivering the unit as a free-standing unit, refer to the Advanced Higher Building and Architectural Technology course details for further information on the content of the unit.

The purpose of this unit is to enable the candidate to develop skills in graphical communication and in the application of architectural design concepts and ergonomic and anthropometric data to the design of buildings.

Corresponding to Outcomes 1 to 3

- 1 This outcome should enable the candidate to develop skills in freehand drawing and sketching. It should also provide knowledge and understanding of basic architectural design concepts and processes.
- 2 This outcome should provide the candidate with knowledge and understanding of the terms: forms, function and mass as applied to architecture and the inter-relationship between them.
- 3 This outcome should enable the candidate to apply basic ergonomic and anthropometric data to specific design projects.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

It is recommended that the outcomes be completed in the sequence presented. This does not preclude some integration of the outcomes during teaching, tutorial work and assessment. Videos, slides, photographs etc can be used to illustrate the architectural content of the unit. Site visits to buildings of architectural interest will also contribute to the learning process. Sketching exercises may be undertaken in the classroom and in the field, using different techniques and media.

The use of texts and manuals on architecture and related subjects, available from RIAS, RIBA and RICS and other sources, will provide the basis of the information required by candidates to complete the assessment exercises. The publications *New Metric Handbook* and *Neuffer's Architectural Data* are recommended.

For further information about learning and teaching, refer to the course details and the Subject Guide for Advanced Higher Building and Architectural Technology (published by HSDU/SCCC/SFEU 1997).

National Unit Specification: support notes (cont)

UNIT Drawing and Design (Advanced Higher)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Centres may use instruments of assessment which they consider to be most appropriate. Evidence for all outcomes could be generated by a series of assignments. Suggestions for assignments are provided below, along with suggestions for integration of some aspects of assessment. Where appropriate, assessment could be based on a live local project or on a hypothetical project selected each year.

Outcome 1 – Assignment (open book)

The candidate could be set an assignment requiring him or her to:

- i illustrate, by means of a sketch, a basic architectural design concept which meets certain specified objectives;
- ii select a suitable building (or buildings) and illustrate by means of sketches, the elements of: scale, proportion, symmetry, balance and rhythm, as related to architectural design;
- iii generate a minimum of four A4 sketches (minimum size) using freehand and instrument-aided techniques.

Outcome 2 – Assignment (open book)

The candidate could be set an assignment requiring him or her to:

- i explain the terms: form, function and mass and their inter-relationship, as they are applied to architecture;
- ii illustrate, by means of sketches, the terms: form, function and mass, as they are applied to architecture;
- iii generate a minimum of three A4 sketches (minimum size) illustrating three buildings in an appropriate format.

Outcome 3 – Assignment (open book)

The candidate could be set an assignment requiring him or her to:

- i apply basic anthropometric and ergonomic data to a given architectural task. For example, the candidate could be asked to research the principles of kitchen design and illustrate the findings by the production of drawings showing an example of a well-designed kitchen. Alternatively, the candidate could be asked to produce furniture layouts for a domestic house;
- ii explain basic ergonomic principles and their application to the given architectural task;
- iii generate a minimum of four A4 or one A2 drawings (minimum sizes) to appropriate scales. For the exemplars quoted above, the evidence produced would include:
 - a) plans and elevations of a complete kitchen design showing the arrangement of kitchen base units, wall units and common appliances. Power outlets, lighting and switches would also be shown. The ergonomic requirements for the design would be fully illustrated on the drawings;
 - b) floor plans of a domestic house showing furniture arrangements for each room. The ergonomic requirements of the furniture layouts would be fully illustrated on the drawings.

National Unit Specification: support notes (cont)

UNIT Drawing and Design (Advanced Higher)

Integration of some aspects of Outcomes 1 and 2 is possible, providing suitable buildings are conveniently located.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special 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 Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).

National Unit Specification: general information

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

NUMBER D116 13

COURSE Building and Architectural Technology (Advanced Higher)

SUMMARY

This unit introduces the candidate to the methods of preparing technical submissions for the conversion and adaptation of buildings. It includes feasibility assessment of buildings, option analysis, design and the production of working drawings.

The unit is an optional component of Advanced Higher Building and Architectural Technology.

OUTCOMES

- 1 Carry out an assessment of an existing building.
- 2 Explain the process of analysing and choosing between the options of conversion, adaptation and restoration.
- 3 Prepare an outline scheme for an identified change of use for a specified building.
- 4 Prepare production information for a conversion or adaptation project.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following:

- Higher Construction and Higher Building and Architectural Technology
- a Higher Scottish Group Award in Construction
- appropriate units from the Design, Engineering and Technology: Construction framework at Higher level

Administrative Information

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National Unit Specification: general information (cont)

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

CREDIT VALUE

1 credit at Advanced Higher.

CORE SKILLS

Core skills for Advanced Higher remain subject to confirmation and details will be available at a later date.

National Unit Specification: statement of standards

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

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 the Scottish Qualifications Authority.

OUTCOME 1

Carry out an assessment of an existing building.

Performance criteria

- (a) Identification, measurement and recording of the physical dimensions, materials used and the location of services for an existing building are correct.
- (b) The condition of the structure, services and fabric of an existing building is accurately determined and recorded.
- (c) The current uses of the existing property are established and recorded properly.

Evidence requirements

Evidence will predominantly derive from documentation generated by the candidate, related to a survey and an assessment of an existing building. Supporting evidence may derive from:

- direct observation of the candidate
- case studies, role play, simulations, assignments, projects
- oral or written questioning

OUTCOME 2

Explain the process of analysing and choosing between the options of conversion, adaptation and restoration.

Performance criteria

- (a) Identification of the factors affecting conversion, adaptation and restoration is comprehensive.
- (b) Analysis of identified technical problems associated with the reuse of building fabric is accurate.
- (c) Identification of the constraints that may be placed on re-using existing buildings is comprehensive and correct.
- (d) Relevant criteria are identified and applied in making the optimum choice.

Note on range for the outcome

Factors: social, environmental, economic, functional, organisational, technical.

Technical problems: dampness, thermal insulation continuity, structural support and movement, temporary support.

Constraints: current legislation, planning control, building control, restrictions on historic buildings.

Criteria: client's requirements, budget, programme.

National Unit Specification: statement of standards (cont)

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

Evidence requirements

Evidence will predominantly derive from documentation generated by the candidate, related to available options for conversions, adaptation and restoration. Supporting evidence may derive from:

- direct observation of the candidate
- case studies, role play, simulations, assignments, projects
- oral or written questioning

OUTCOME 3

Prepare an outline scheme for an identified change of use for a specified building.

Performance criteria

- (a) Proposals for converting spaces are accurately based on existing areas and identified requirements for the reuse of the building.
- (b) Proposals for upgrading fabric are accurately based on the existing fabric and the identified requirements for the reuse of the building.

Note on range for the outcome

Spaces: activity spaces, circulation areas.

Requirements: spatial parameters, means of escape, illumination, ventilation, access to services.

Fabric: floor loading, thermal insulation, sound insulation, fire safety.

Evidence requirements

Evidence will predominantly derive from documentation and outline graphical evidence generated by the candidate, based on a proposal for a conversion or adaptation. Supporting evidence may derive from:

- direct observation of the candidate
- case studies, role play, simulations, assignments, projects
- oral and written questioning

National Unit Specification: statement of standards (cont)

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

OUTCOME 4

Prepare production information for a conversion or adaptation project.

Performance criteria

- (a) Working drawings produced of specified building elements are correct and annotated with appropriate information.
- (b) 1:5 scale production drawings of selected details clearly illustrate the technology of the building.

Note on range for the outcome

Building elements: floor/wall junctions, roof/wall junctions, beam interconnections.

Annotation: dimensions, materials, performance standards.

Details: making good at dewatering, matching and joining new work and components to existing.

Evidence requirements

Evidence will predominantly derive from documentation and working drawings based on a proposal for conversion or adaptation and generated by the candidate. Supporting evidence may derive from:

- direct observation of the candidate
- case studies, role play, simulations, assignments, projects
- oral or written questioning

National Unit Specification: support notes

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

This part of the unit specification is offered as guidance. The support notes are not mandatory.

While the time allocated to this unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON CONTENT AND CONTEXT FOR THIS UNIT

When delivering the unit as a free-standing unit, refer to the Advanced Higher Building and Architectural Technology course details for further information on the content of the unit.

This unit should be seen in the context of the wide range of skills required for projects beyond normal building maintenance activity but short of demolition and reconstruction. Projects chosen as vehicles for study should reflect more ambitious conversions or adaptations, rather than simple domestic work. Examples may be drawn from:

- conversion of industrial, commercial and public buildings to inner-city housing
- large private houses to hotels
- public buildings and flatted tenements to commercial use
- large industrial units to small enterprise workshops
- any other local project in which the skills encompassed in this unit are reflected

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Whenever possible candidates should be encouraged to relate the outcomes of this unit to the other units of the course and to their own experience. Live projects, simulations and sharing of experience are also useful. A study project in which assignments are aligned with the staged development of a conversion or adaptation project and the sequence of learning outcomes would seem an ideal way to generate much of the evidence required. Such a study project may make reference to candidates' ongoing experience or to a live conversion project for appropriate assignments.

If a suitable live project is not readily available, a hypothetical project should be used.

Candidates should be placed in the role of a technician providing support to the relevant professional at each of the main stages of a conversion or adaptation project. The main stages are:

- preliminary surveys
- feasibility
- design
- site production

National Unit Specification: support notes (cont)

UNIT Conversion and Adaptation of Buildings (Advanced Higher)

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Centres may use instruments of assessment which they consider to be most appropriate. Evidence for all outcomes could be generated by a series of assignments.

An assessment plan should be given to the candidate at the introduction of the unit showing correlation between the assessment requirements for the unit in relation to the other units of the course and the course assessment as a whole. A study assignment, if used, could be given to the candidate at this time for completion by the end of delivery of the unit. Instruments of assessment, such as case studies and assignments, should be identified in the assessment plan and scheduled for delivery at appropriate points in the course. The candidate would be expected to create a portfolio of evidence in which assessment material would be presented in a structured way that demonstrates the integration of the skills developed in the component units.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special 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 Special Assessment and Certification Arrangements for Candidates with Special Needs/Candidates whose First Language is not English* (SQA, 1998).