



## Higher National Graded Unit specification

### General information for centres

This Graded Unit has been validated as part of the HNC Computer Aided Architectural Design and Technology award. Centres are required to develop the assessment instrument in accordance with this validated specification. Centres wishing to use another type of Graded Unit or assessment instrument are required to submit proposals detailing the justification for change for validation.

**Graded Unit title:** Computer Aided Architectural Design and Technology: Graded Unit 1

**Graded Unit code:** F3SV 34

**Type of Graded Unit:** Project

**Assessment Instrument:** Practical Assignment

**Credit points and level:** 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

**Purpose:** This Unit is designed to provide evidence that the candidate has achieved the following principal aims of the HNC Computer Aided Architectural Design and Technology award.

General aims:

- ◆ develop knowledge, understanding and skills across a range of core Architectural CAD principles and technologies at Higher National level
- ◆ develop a range of Communication and Information Technology knowledge and skills relevant to the needs of Architectural CAD specialists
- ◆ develop knowledge, understanding and skills in applying a structured approach to advanced Architectural CAD principles in the production of complex drawings
- ◆ develop an ability to apply analysis and synthesis to the solution of Architectural CAD related problems
- ◆ develop skills of study, research, analysis and resource management
- ◆ develop skills of evaluation, organisation and problem solving
- ◆ develop responsibility for individual learning and progression
- ◆ develop skills, knowledge and motivation towards progression to Higher Education routes

## General information for centres

Specific aims:

- ◆ prepare candidates for employment as Architectural Technicians in private or public practice, working with a range of associated professional disciplines
- ◆ prepare candidates with a range of the most contemporary vocation skills, including the preparation, co-ordination and communication of technical information relevant to the Architectural industry, using the most advanced CAD and IT platforms available
- ◆ prepare candidates with underpinning knowledge and skills contributing to the efficient operation and management of architectural design projects through control of specified regulatory, quality or management standards
- ◆ alert the candidate to the possibility for professional recognition, particularly, but not exclusively, with the Chartered Institute of Architectural Technology (CIAT)

**Recommended prior knowledge and skills:** It is recommended that the candidate should have completed, or be in the process of completing, the following Units relating to the above specific aims prior to undertaking this Graded Unit.

Unit Code	Unit Title
F32A 34	<i>Architectural CADT: Principles and Practice</i>
DW17 34	<i>CAD: User Systems</i>
F329 34	<i>Architectural CADT: Residential Design</i>
F3G5 34	<i>Architectural CADT: Construction Detailing</i>
F39H 34	<i>Architectural Design: Form, Order and Composition</i>
F39F 34	<i>Architectural Professional Practice: Design Management</i>

**Core Skills:** There are opportunities to develop the Core Skills of *Communication, Problem Solving, Numeracy* and *Information Technology* all at SCQF level 6, although there is no automatic certification of Core Skills or Core Skills components.

**Assessment:** This Graded Unit will be assessed by use of a practical assignment. This will take the form of a CAD-centred Architectural design assignment. The developed practical assignment will provide the candidate with the opportunity to provide evidence that demonstrates he/she has met the aims of the Graded Unit that it covers.

## Administrative Information

**Graded Unit code:** F3SV 34

**Graded Unit title:** Computer Aided Architectural Design and Technology:  
Graded Unit 1

**Original date of publication:** August 2008

**Version:** 01

### History of changes:

Version	Description of change	Date

**Source:** SQA

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## **Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates**

**Graded Unit title:** Computer Aided Architectural Design and Technology Project: Graded Unit 1

### **Conditions of Assessment**

The candidate should be given a date for the completion of the Practical Assignment. However, the instructions for the assessment task should be distributed to allow the candidates sufficient time to assimilate the details and carry out the assessment task. During the time between the distribution of the assessment task instructions and the completion date, assessors may answer questions, provide clarification, guidance and reasonable assistance. The assessment task should be marked as soon as possible after the completion date. The final grading given should reflect the quality of the candidate's evidence at the time of the completion date.

The evidence for the project is generated over time and involves three distinct stages, where each stage has to be achieved before the next is undertaken. Thus any reassessment of stages must be undertaken before proceeding to the next stage.

If a candidate fails the project overall or wishes to upgrade, then this must be done using a *substantially different project*, ie all stages are undertaken using a new project, assignment, case study, etc. In this case, a candidate's grade will be based on the achievement in the reassessment, if this results in a higher grade.

At this level, candidates should work independently within the context of a typical working environment. Centres should encourage candidates bring their specialist knowledge and experience to the project. Candidates should be allowed to use appropriate technology within and outwith the college environment.

To ensure authentication of work, candidates must complete a log diary recording progress and tasks completed. There should be regular meetings between the tutor and candidate(s) to review progress and these meetings should be recorded.

The final evaluation should include questioning of each candidates understanding of the evidence submitted. Where possible, the involvement of an employer in the questioning is encouraged.

### **Instruction for designing the assessment task**

The assessment task is a Practical Assignment structured around a building design brief. The project undertaken by the candidate must be a complex task, which involves:

- ◆ variables which are complex or unfamiliar
- ◆ relationships which need to be clarified
- ◆ a context which may be familiar or unfamiliar to the candidate

## Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates (cont)

The assessment task must require the candidate to:

- ◆ analyse the task and decide on a course of action for undertaking the project
- ◆ plan and organise work and carry it through to completion
- ◆ reflect on what has been done and draw conclusions for the future
- ◆ produce evidence of meeting the aims which this Graded Unit has been designed to cover

The assessment task should be a Practical Assignment based upon a design project brief within the context of building development. Such a building project might be that of a small commercial building, or a residential project involving one (or more) houses. The scale of the project should be moderate and the output eventually produced be relative to the scale and extent of the original concept. The project information should be presented in such a way that candidates are presented with principal design criteria, client needs, stylistic influences, accommodation requirements or sustainable imperatives. The issues selected for consideration in the design brief criteria should focus on the principal aims of the HNC award, and the requirement to demonstrate an ability to integrate a positive design response across the mandatory Units in the award.

The range of tasks undertaken by candidates should be defined in relation to original design brief criteria and the context of the building project, and be focused on the design response required at the various stages across the timeline of the project activity. The analysis and synthesis of the project should allow the candidates to demonstrate valid, realistic and interesting responses to the needs of the client group identified. The candidate is required to produce the following evidence types:

- ◆ a timeline action planning document
- ◆ a project brief response document
- ◆ log book recordings
- ◆ a portfolio of solutions with the necessary CAD details
- ◆ responses to questioning about the authenticity of the design choices
- ◆ evaluation of the candidates solutions against the action planning document and the project brief specification

### Guidance on grading candidates

Candidates who meet the minimum Evidence Requirements will have their achievement graded as C — competent, or A — highly competent or B somewhere between A and C. The grade related criteria to be used to judge candidate performance for this Graded Unit is specified in the following table.

## Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates (cont)

Grade A	Grade C
<p>Is a seamless, coherent piece of work which has many more strengths than weaknesses and for a small commercial building, or a residential project involving one (or more) houses:</p> <ul style="list-style-type: none"> <li>◆ provides considerably more than the minimum evidence for each of the three essential phases of the project</li> <li>◆ evidence is produced to a high standard, is clearly inter-related and demonstrates an accurate and particularly insightful interpretation of the project brief</li> <li>◆ has continuously accessed available research/data/trends in arriving at the evidence submitted and this has resulted in solutions which embody non-traditional and innovative solutions</li> <li>◆ has accessed a wide range of available data and design guidance which has incorporated original ideas into proposed solutions</li> <li>◆ drawings and language used are of a high standard in terms of level, accuracy and technical content</li> <li>◆ visual information produced is of a high standard in terms of impact, clarity and expression</li> <li>◆ demonstrates independence in management of project</li> <li>◆ effectively consolidates and integrates required knowledge and skills and considers possible conflicts in integrating solutions in relation to constraints imposed</li> <li>◆ includes rationale and justification and clearly addresses a 'fit for purpose' objective, cost and quality issues in arriving at proposed solutions when answering questions regarding the evidence produced</li> <li>◆ clearly identifies key areas for improvement when undertaking the work to the defined time line action plan and clearly identifies key areas for improvement when reflecting on the technical solutions chosen compared with the initial objectives</li> </ul>	<p>Is a co-ordinated piece of work which has a balance of strengths and weakness and for a small commercial building, or a residential project involving one (or more) houses:</p> <ul style="list-style-type: none"> <li>◆ provides the evidence for each of three essential phases of the project at a basic level</li> <li>◆ evidence is provided demonstrates an acceptable interpretation of the project brief</li> <li>◆ has not amplified the initial project brief in arriving at the evidence submitted and solutions embody only routine and traditional solutions</li> <li>◆ accesses data and design guidance</li> <li>◆ drawings and language used are adequate in terms of level, accuracy and technical content</li> <li>◆ visual information produced is of an acceptable standard</li> <li>◆ seeks additional tutor support to keep project on course</li> <li>◆ consolidates and integrates knowledge and skills proposing system solutions in isolation</li> <li>◆ presents proposed solutions with justification when answering questions regarding the evidence produced</li> <li>◆ achieves Outcomes within time line plan and assumes the technical solutions chosen as the 'most appropriate' with retrospective comparison with initial brief objectives</li> </ul>

## Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates (cont)

The project will be marked out of 100. Assessors will mark each stage of the project, taking into account the criteria outlined. The marks will then be aggregated to arrive at an overall mark for the project. Assessors will then assign an overall grade to the candidate for this Graded Unit based on the following grade boundaries.

- A = 70% — 100%
- B = 60% — 69%
- C = 50% — 59%

**Note:** the candidate must achieve all of the minimum evidence specified below for each stage of the project in order to achieve the Graded Unit.

**Important Note:** Centres **must** complete the included Grading Checklist for each Project. Completed checklists will be used as part of the external moderation process to ensure the accuracy and consistency of grading between candidates in a centre and across centres.

### Evidence Requirements

The project consists of three stages: planning; developing; and evaluating. The following table specifies the minimum evidence required to pass each stage.

**Note:** The candidate must achieve **all of the minimum evidence** specified below for each stage of the project in order to pass the Graded Unit.

Project Stage	Minimum Evidence Requirements
Stage 1 — Planning  <i>Maximum 20 marks</i>	Produce an action plan to include: <ul style="list-style-type: none"> <li>◆ a time line action plan (project schedule)</li> <li>◆ a project brief response document, incorporating:               <ul style="list-style-type: none"> <li>— client requirements, schedule of accommodation</li> <li>— client preferences (stylistic, aesthetic, material)</li> <li>— site information and constraint identification</li> <li>— design influences (stylistic, aesthetic, material)</li> <li>— regulatory constraints (planning, building)</li> <li>— other constraints (environmental, financial, administrative, design)</li> <li>— project aims (output of Stage 2)</li> </ul> </li> </ul> <p>Commencement of recording of processes underpinning the assignment in a log book.</p> <p><i>The candidate must achieve all of the minimum evidence specified above in order to pass the Planning stage.</i></p>

## Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates (cont)

Project Stage	Minimum Evidence Requirements
<p>Stage 2 — Developing</p> <p><i>Maximum 60 marks</i></p> <p><i>50 marks portfolio:</i></p> <p><i>40 design details</i> <i>10 documentation</i></p> <p>+</p> <p><i>10 oral questioning</i></p>	<p>Produce output to include:</p> <ul style="list-style-type: none"> <li>◆ project portfolio for proposed solution, incorporating: <ul style="list-style-type: none"> <li>— executive summary or abstract</li> <li>— rationale and justification for design proposal submitted</li> <li>— justification of processes underpinning the project recommendations</li> <li>— additional supporting evidence (schedules, references, regulations, calculations, specifications)</li> <li>— range of CAD details illustrating the solution(s)</li> <li>— 2-dimensional (floor plans, area plans, elevations and sections)</li> <li>— 3-dimensional (pictorial, axonometric, planometric, hidden detail, shaded details, rendered details, interiors, exteriors)</li> </ul> </li> <li>◆ maintenance of log book recording</li> <li>◆ questioning of design solutions and project summary</li> <li>◆ demonstrated independence in management of project</li> </ul> <p><i>The candidate must achieve all of the minimum evidence specified above in order to pass the Developing stage.</i></p>
<p>Stage 3 — Evaluating</p> <p><i>Maximum 20 marks</i></p>	<p>Produce an evaluation report which should include:</p> <ul style="list-style-type: none"> <li>◆ reflection and analysis of evidence achieved compared with project schedule time lines</li> <li>◆ reflective comparison of submitted solutions against initial brief objectives</li> <li>◆ analysis of decisions in determining project progression</li> <li>◆ action taken to overcome unforeseen circumstances</li> <li>◆ assessment on strength and weakness of practical output</li> <li>◆ evaluation of extent to which project brief and objectives have been overtaken</li> <li>◆ identification of knowledge and skills gained or developed to inform future tasks</li> </ul> <p><i>The candidate must achieve all of the minimum evidence specified above in order to pass the Evaluating stage.</i></p>

**Scottish Qualifications Authority**

**Computer Aided Architectural Design and Technology:  
Graded Unit 1**

**Grading Unit Checklist**

Centre Name: \_\_\_\_\_

Centre Number: \_\_\_\_\_

Candidate Name: \_\_\_\_\_

Candidate Number: \_\_\_\_\_

No	Grade C Criteria	Grade C	Grade B	Grade A	Grade A Criteria
<b>Stage 1 Planning</b>					
	The project brief includes sufficient information to identify the client's principal requirements	Yes	Yes	Yes	The project brief includes all relevant information, is clearly presented meets with the client requirements
	The initial project schedule, or timeline (likely a Gant Chart) shows all essential project activities. Some evidence of monitoring the schedule to inform project development is available	Yes	Yes	Yes	The initial project schedule, or timeline (likely a Gant Chart) contains a comprehensive list of project activities and timings. The information in the initial schedule is used to assess if the project can be completed within timescales. The schedule is monitored on a regular basis to inform ongoing project planning and development
	The project brief includes sufficient information to identify principal design influences	Yes	Yes	Yes	The project brief includes an extensive range of design stimuli appropriate to the preferences of the client
	The project brief considers the range of data and constraints from the site	Yes	Yes	Yes	The project brief develops key design influences from the range of site data constraints
	The project brief outlines principal statutory constraints for the planned project	Yes	Yes	Yes	The project brief identifies and evaluates specific statutory constraints for the planned project
	The log book contains essential details of project development and there is evidence that it is maintained	Yes	Yes	Yes	The log book is regularly maintained and provides a detailed, informal record of the candidate's thinking as the project develops including reflective commentary
	The candidate develops an adequate knowledge base to support the demands of the project	Yes	Yes	Yes	The candidate develops a substantial knowledge base to support the demands of the project
	The candidate assesses a range of hardware and software options to meet the demands of the project	Yes	Yes	Yes	The candidate fully justifies the selection of hardware and software options suitable to the demands of the project
<b>Stage2 Developing</b>					
	The candidate feeds back to his/her supervisor on at least three occasions, providing an indication of progress made	Yes	Yes	Yes	The candidate feeds back to his/her supervisor on a regular basis, updating the supervisor on progress made and actions for the next stage of the project
	The candidate outlines additional design constraints for the planned project	Yes	Yes	Yes	The candidate develops substantial ideas for consideration in the planned project
	Practical activities are carried out to an acceptable level of health and safety	Yes	Yes	Yes	Practical activities are carried out in a totally safe and healthy manner
	The design solutions explored are functional, adequate and sufficient to meet the needs of the client	Yes	Yes	Yes	The design solutions explored are aesthetically and technically well observed, of consistently high quality and exceed the minimum client requirements

No	Grade C Criteria	Grade C	Grade B	Grade A	Grade A Criteria
<b>Stage 2 Developing (cont)</b>					
	The proposed solution meets all the principal objectives laid down by the project brief.	Yes	Yes	Yes	The proposed solution exceeds all the principal objectives laid down by the project brief and considers additional unforeseen factors
	The CAD details produced for the proposed solution are well organised, correctly detailed and adequate to illustrate the principal aims of the solution.	Yes	Yes	Yes	The CAD details produced for the proposed solution are well organised, correctly detailed and referenced and communicate a range of ideas through the production of enhanced details
	The portfolio document meets acceptable standards in terms of structure, use of English and clarity, and has accurate conclusions and recommendations.	Yes	Yes	Yes	The portfolio document is well structured, contains only relevant information, has clear and accurate conclusions and recommendations,
	None	Yes	Yes	Yes	The candidate introduces a significant novel feature into the project
	The candidate demonstrates an acceptable level of motivation throughout the project	Yes	Yes	Yes	The candidate demonstrates a high level of self motivation throughout the project
	None	Yes	Yes	Yes	The candidate undertakes additional research well beyond that demanded by the project
	The project includes an evaluation of the project strategy and activities and includes an evaluation of what the candidate has learnt from undertaking the project	Yes	Yes	Yes	The project report includes a clear and comprehensive evaluation of the project strategy and activities and includes clear evaluation of what the candidate has learnt from undertaking the project
	The question responses contain broad responses	Yes	Yes	Yes	The question responses are well structured, confirm relevance and integrity of information,
	The candidate provides technically correct answers to questions raised	Yes	Yes	Yes	The candidate provides clear, concise and technically correct answers to questions raised
	The candidate includes some reflection of the success, or otherwise, of the project in response to questioning	Yes	Yes	Yes	The candidate includes a clear reflective account of the success, or otherwise, of project activities against project objectives in response to questioning
	The candidate undertakes the project with an acceptable level of supervision	Yes	Yes	Yes	The candidate undertakes the project with the minimum of supervision
	The candidate provides some details of the new knowledge and skills he/she has developed as a result of doing the project	Yes	Yes	Yes	The candidate identifies clear and full details of the new knowledge and skills he/she has developed as a result of doing the project

## Guidance on the Completion of the Checklist

Centre staff are asked to read the following guidance notes before completing the Grading Unit Checklist.

The Checklist for the Practical Assignment has been designed to help the assessor(s) decide what Grade should be awarded to a candidate for Design Project. It will also be used by external moderators as part of the external moderation of project work. **A Grading Unit Checklist form should be completed for each candidate who has been entered for the Computer Aided Architectural Design and Technology: Graded Unit 1 (Design Project).**

In completing the Practical Assignment checklist assessor(s) should take note of the following points:

- 1 For each item shown in the checklist, the 'Yes', which most closely reflects the candidate's performance, should be circled. It can be seen from the checklist that the grade criteria for Grade C and Grade A have been included in the checklist.
- 2 A Grade B should be awarded where the candidate's performance lies approximately mid-way between a Grade C and a Grade A (ie, better than a Grade C (competent), but not good enough to be a Grade A (highly competent)).
- 3 No Grade should be awarded where a candidate's performance is not good enough to satisfy a Grade C pass (ie competent level of performance).
- 4 Once centre assessors have completed the 21 items, they should then apply their own professional judgement to decide what Grade to award a candidate.
- 5 In arriving at the Grade, due account should be taken of the distribution of circles around 'Yes'. For example, if 17 out of 21 items have been circled under the Grade B column and the other four have been circled under the Grade C column, then it is likely that the assessor(s) will award the candidate a Grade B. Professional judgement is much more involved where, for example, if 'Yes' is circled 11 times under the Grade A column, and 10 times under the Grade B column. The assessor's first hand knowledge of the candidate's performance will influence whether the candidate is awarded a Grade A or Grade B. External moderators are unlikely to overturn the grading awarded by the centre assessor(s) unless they are not happy that grading judgements have been awarded in a fair, consistent and rigorous manner.
- 6 Centres may provide additional comments and/or evidence in support of their grading decisions.

## **Higher National Graded Unit Specification: Instruction for designing the assessment task and assessing candidates (cont)**

### **Support Notes**

#### **Candidates with Disabilities and/or Additional Support Needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative assessment arrangements. For information on these, please refer to the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: **[www.sqa.org.uk](http://www.sqa.org.uk)**.

## General Information for Candidates

This Unit has been designed to help you achieve the principal aims of the HNC Computer Aided Architectural Design and Technology award, and to assess your knowledge and skills relative to the mandatory subjects of the course framework. This will be achieved typically by the resolution of an architectural design problem, allowing you to explore a range of solutions, arrive at an appropriate and effective resolution, and communicate the solutions in an effective manner.

The Unit will be taught with your Lecturer in the role of facilitator, and at times, engaging you as Client, Local Authority or other professional routinely involved in an architectural design project. The nature of the project would nominally be that of a residential, or small commercial, building.

There are three distinct phases to the project, Planning, Developing and Evaluating, worth respectively 20%, 60% and 20% of the total marks awarded for the Unit. In the Planning stage of the Project, you will be expected to consider the nature of the design brief set, including factors related to a wide variety of aesthetic, administrative and technical constraints, and in response to these, prepare an Action Plan and a Project Brief setting the parameters of the Project. A word count for brief document 800 words or equivalent should suffice.

- ◆ In the Developing stage of the Project, you will be expected to adhere to the Action Plan, explore and consider possible solutions, and using computer aided technological approaches, arrive at an appropriate design solution for the Project Brief set. The solutions will be communicated visually, pictorially and in hard copy format, and substantiated by clear, support documentation, including the rationale for the solutions reached. Output should be in the form of CAD visuals, details, and or graphics.

A word count for portfolio document 1,200 words or equivalent is suggested.

In the Evaluating stage of the Project, you will be expected to consider the success and efficacy of your solution, providing a presentation of your final solutions and recommendations, and reflect upon the experience.

A word count of 600 words or equivalent is suggested.

The Unit is graded, and this grade (A — C) quantifies and qualifies the quality of your HNC award.

The Unit is largely practical in nature, requiring you to have individual access to a CAD system. A CAD system is defined as hardware and software, which will enable an operator to generate (and regenerate) drawings at an acceptable processor speed. A typical minimum hardware configuration would be a current single user PC fitted with suitable peripherals attached such as a printer/plotter to produce hard copies of your work. Alternatively other configurations such as networked CAD stations are acceptable provided they can satisfy the Unit's criteria.

Additionally, because you will be working continuously with CAD systems and manipulating numerical and graphical data, and responding to a design brief, and liaising with external stimuli, you will have the opportunity within this Unit to develop Core Skills in *Information Technology*, *Numeracy*, *Communication*, *Problem Solving* and *Working with Others*, all at SCQF level 6.