

External Assessment

Structural Engineering Higher C01R 12

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Practical Assignment

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1. Practical Assignment overview

This national project specification provides details of the assessment tasks and the evidence which candidates are expected to produce. It contains a degree of choice in terms of the way the Practical Assignment is taken forward by centres so that it fits available resources and candidates' interests and personal strengths.

The Practical Assignment is not concerned exclusively with practical activity, but is designed to emphasise skills relating to the application of practical skills, and related knowledge and understanding to a situation that involves task management.

Candidates are provided with a brief and are expected to demonstrate attainment relating to:

- interpreting the brief
- gathering information to clarify the brief
- deciding on a product, or activity/event, or performance to develop
- selecting and managing materials/resources
- producing the product, or organising the activity/event or delivering the performance
- evaluating the product or activity/event or performance (through feedback)

Evidence requirements are as follows:

- a plan of action
- evidence of a product or an organised activity/event or a performance
- evidence which documents the processes underpinning the practical hands-on activity
- evidence showing an extended evaluation of the Practical Assignment

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The Scottish Qualifications Authority Helpdesk is available on 0141-242 2214.

Note:

Please note that individual specifications should always be used in conjunction with the relevant *Arrangements for Project-based National Courses*. The *Arrangements* document lays down the overall requirements for project-based National Courses for the given SGA.

This specification forms part of Section F of the above *Arrangements* document.

2. Recommended entry

We strongly advise that candidates should have completed the Units in the National Course prior to embarking on the external assessment. However, there may well be candidates who, for whatever reason, choose to undertake the external assessment on a stand-alone basis. Any such candidates who have not completed or embarked upon the Units of the National Course *prior* to undertaking the external assessment should have demonstrated attainment in (and/or attained) at least one of the following combinations of qualifications:

GSVQ (Level 3) Construction: Civil Engineering

Competency must have been attained in the National Units:

EF2G 04 (4370006)	Structural Mechanics 1
E821 04 (65213)	Structural Drawing and Detailing
E822 04 (65214)	Structural Design and Detailing 1
E823 04 (65215)	Structural Design and Detailing 2
E820 04 (65212)	Structural Mechanics 2

HND Civil Engineering

Competency must have been attained in the following Higher National Units:

D5TB 04 (4670838)	Structural Mechanics
D5TD 04 (4670858)	Structural Drawing and Detailing
D5TH 04 (4670878)	Civil Engineering Design and Detailing

Candidates who achieve the external assessment will not be certificated for the Course until they have successfully completed the component Units.

3. Practical Assignment briefs

The assignment briefs from which candidates may choose are:

Brief 1

Two-storey building

Create two different designs for part of the structural superstructure of a two-storey building, from an agreed specification, and hence critically assess their relative merits.

Location

A two-storey office building to provide a total usable office space of 550m² within a given plan area. A cantilever of given length and projection beyond the building is to be provided above the main entrance. A staircase is to be provided at each end of the building.

Layout

The proposed site dimensions, required heights between floors road and the existing ground levels will be indicated in an outline plan and section.

Foundations

The soil profile will give sufficient information for a bearing capacity to be ascertained and appropriate type of foundation selected.

Construction

No restrictions on access or use of plant.

Design

One design predominantly in reinforced concrete and one design predominantly in steelwork are to be carried out. Wind loading should be discussed but should not be included in the design calculations. The stairways need not be designed but should be shown in all appropriate drawings. The imposed loading should be ascertained from relevant regulations.

Brief 2

Pedestrian footbridge

Create two different designs for a pedestrian footbridge over a dual carriageway, from an agreed specification, and hence critically assess their relative merits.

Location

To serve pedestrian, perambulator and wheelchair traffic crossing between bus bays on opposite carriageways adjacent to two housing estates.

Layout

The plan of the present road and footpath and the existing ground levels will be given in an outline plan and section.

This sketch will also give the following dimensions:

- length of bus bays
- horizontal distance between bus bays on opposite sides of dual carriageway

- width of carriageways and central reservation
- width of footpaths on either side of roadway, on which footbridge is located

Foundations

The soil profile will give sufficient information for a bearing capacity to be ascertained and appropriate type of foundation selected.

Construction

One carriageway must be kept open at all times. This will influence form of bridge adopted.

Footbridge

Width of footbridge, height of balustrade, imposed loading and headroom above carriageway will be found from current regulations.

Design

One design predominantly in reinforced concrete and one design predominantly in steelwork are to be carried out. Wind loading should be discussed but should not be included in the design calculations.

Brief 3

Alteration to existing building

Create the design of the temporary and permanent structural elements in the alteration in the usage of an existing building, from an agreed specification, and hence critically assess its practical and economic merits.

Location

An existing three-storey reinforced concrete framed office building is to be redeveloped, with the first and second floors as a museum/art gallery and with the ground floor being used partly for parking and partly for merchandising. The existing timber first and second floors will be replaced with a precast concrete floor to support the increase in imposed loading. In order to improve the usage of the ground floor, the number of interior columns is to be reduced.

Layout

The existing and proposed layout will be indicated in an outline plan and sections.

Foundations

The soil profile will give sufficient information for a bearing capacity to be ascertained and appropriate type of foundation selected.

Construction

The permanent structure will be in reinforced concrete (in-situ and/or precast), while the temporary supporting structure will be in steelwork.

Design

The temporary supporting structure is designed in steelwork taking into account its erection and dismantling on a restricted site.

The permanent structure is designed in reinforced concrete and should not increase the load of any of the original structure remaining in position.

4. Outcome coverage

Course Structure		
Unit title	Credit value	Unit number
Structural Design and Detailing	1.0	D22V 12
Structural Drawing and Detailing	1.0	D22W 12
Structural Mechanics and Design 2	1.0	D925 12

All external assessments for project-based National Courses cover a minimum of two thirds of the Outcomes from the component Units. For this project these are:

Unit: Structural Design and Detailing

1. Design and detail single span, simply supported, singly reinforced concrete, slabs and rectangular beams.
2. Design and detail short, braced, axially loaded, square, reinforced concrete columns.
3. Design, single span, simply supported, structural steel beams, with fully restrained compression flanges.
4. Design single storey, axially loaded, structural steel stanchions.
5. Use computer packages to illustrate the design of structural elements in reinforced concrete and structural steelwork.

Unit: Structural Drawing and Detailing

1. Apply drawing office practice in civil engineering.
2. Prepare general arrangement drawings.
3. Prepare detail drawings of structural steel beams, stanchions and their associated connections.
4. Prepare detail drawings of reinforced concrete beams, slabs, columns and foundations.
5. Prepare Bar Bending Schedules from reinforced concrete drawings.

Unit: Structural Mechanics and Design

2. Analyse pin-jointed statically determinate plane frames.
5. Evaluate the deflections of statically determinate beams, using standard deflection formulae and check deflections against permissible limits.

Note: Outcomes 1, 3 and 4 may be covered depending upon the approach to a particular brief.

1. Evaluate the resultants of co-planar force systems.
3. Solve problems involving direct stress and strain in structural elements.
4. Solve problems involving combined direct and bending stresses on common structural elements.

It is strongly advised that candidates should have completed the assessments for the individual component Units before undertaking the external assessment.

5. Subject/occupationally-related knowledge and skills

The Practical Assignment allows candidates to develop and apply skills in:

- the planning of a project programme for sequence of stages, time scaling for each stage and method of recording progress
- the preparation (manually) of drawings
- the abstraction of constructional information from prepared drawings
- the development of a given specification into preliminary sketches and hence into working drawings
- the breaking down of complex structures into simpler elements for analysis and design
- the tracing of the load paths through a structural framework in order to evaluate the loading effects on the individual structural elements
- the use of computer software
- the use of practical design aids such as Data Sheets, Safe Load Tables etc
- the organising and planning of structural analysis and design work, including provision of optional designs for comparison
- decision making
- problem solving
- research
- the development of alternative solutions to problems and hence being able to evaluate critically the advantages and disadvantages of each
- the production of a report on the development of a solution to a given problem and the justification of the final solution

It allows candidates to develop and apply related knowledge of:

- the construction process, both off and on site
- the properties and adaptability of construction materials
- structural analysis and design, both manual and computer based
- limit state design of structural steelwork and of reinforced concrete
- the relevant British Standard Codes of Practice and/or their European equivalents
- the interaction between analysis and design
- the design and detailing of structural elements in steelwork and reinforced concrete, both manually and by using computer software

6. Candidate evidence requirements and allocation of marks

General information

The three stages of the Practical Assignment for all project-based National Courses at Higher are:

- planning
- developing
- evaluating

Here we describe evidence requirements which apply to each of the three stages of the Practical Assignment for all project-based National Courses at Higher. Where there are any specific evidence requirements relating to this Course, these are given later in this section.

Planning

Candidates must produce a 500 word (or equivalent) plan of action. The plan should include an introduction and a main body. Centres should ensure that candidates either already have, or are taught, the necessary skills to devise their own plan before they start the project.

For the introduction of the plan, candidates should:

- provide a rationale for selecting a particular brief
- interpret the brief
- gather information to clarify the brief
- define the aims and objectives of the Practical Assignment

For the main body of the plan candidates should:

- identify information sources
- identify materials and resources
- establish timescales for completion of stages of the Practical Assignment

The plan of action should be produced in a supervised environment although candidates may carry out the preparation beforehand. Candidates may communicate with each other when producing their plans of action but each plan must be tailored to the candidate's own project and the action points should relate to the work to be carried out by the individual candidate.

The work produced should always be the candidate's own. However, teachers/lecturers are expected to provide candidates with advice, guidance and constructive criticism as necessary when they are devising their plans. It is important to note that, as the plan underpins the rest of the project, centres should ensure that no candidate proceeds to the development stage until the candidate has devised a plan that is potentially workable. The level of support that candidates needs to devise a viable plan of action will of course vary from candidate to candidate. Centres should indicate the level of support needed for each candidate on the flyleaf for the project provided by the SQA. This should not inhibit centres from providing constructive comment nor the candidate from acting on their own initiative and taking on board the advice. In some cases, however, if the level of support and intervention needed is more than that which would normally be seen as reasonable, the authenticity of the candidate's work may be called into

question. If the level of input needed from the teacher/lecturer is above normal (for example, the quality of the plan is such that it would mean that the project would be unworkable if the plan was not revised) then candidates cannot score more than 20 of the 40 marks allowed for the planning stage.

Developing

Candidates must provide evidence that:

- testifies to the quality of the hands-on practical activity
- documents the processes underpinning the activity

Specific evidence requirements for this Course are given later in this section.

All of the evidence should be produced in a supervised environment. Candidates may communicate with each other but should produce work which can be clearly attributed to the candidate as being his or her own.

Evaluating

Candidates must produce an extended evaluation report which should:

- provide a brief summary of what the assignment was about
- review and update the action plan in the light of experience
- assess the effectiveness of the action plan
- summarise any unforeseen events and how they were handled
- identify knowledge and skills which have been gained and/or developed
- assess the strengths, weaknesses and quality of any hands-on activity
- assess the effectiveness of the research methods used
- determine to what extent the assignment met the original brief

The extended evaluation report should be 1,000 words (or equivalent) at Higher. Candidates may carry out the preparation for the report beforehand.

Candidates at Higher should be allowed up to three hours to complete an extended evaluation (including the summary). This is a generous time allowance and some candidates may require considerably less time — two hours should generally be sufficient.

Candidates should be allowed to take one side of an A4 page of notes (maximum 200 words or equivalent) which they have prepared, into the room with them. They should not be allowed to take a draft of the evaluation report into the room with them. The centre has the responsibility for ensuring that the notes brought in are the candidate's own work.

For this activity the accommodation should be arranged to reflect centre-invigilated conditions and candidates should not be allowed to communicate with each other in any way.

Specific evidence requirements and assessment arrangements for the Practical Assignment for Structural Engineering at Higher

Planning	
Evidence:	Plan of action. 500 words <i>or</i> equivalent (40 marks)
Conditions of external assessment:	Supervised
Who assesses it?	Plan to be sent to SQA for marking

Developing	
Evidence:	<p>For hands-on activity:</p> <p>Analysis and design calculations</p> <p>Drawings and sketches</p> <p>Schedules of reinforcement</p> <p>Log book</p> <p>For processes underpinning the activity:</p> <p>Written (or equivalent) explanations of structural integrity and constructional processes</p> <p>(120 marks in total for this stage)</p>
Conditions of external assessment:	Supervised
	<p><i>Transportable evidence:</i></p> <p>All</p> <p>This is to be sent to SQA for marking</p>

Evaluating	
Evidence:	Extended evaluation report — including summary 1,000 words <i>or</i> equivalent (40 marks)
Conditions of assessment:	Centre-invigilated
Who assesses it?	To be sent to SQA for marking

It is important that candidates know that they will be penalised for submitting evidence that significantly exceeds the stated word count.

Specific additional information and requirements

Structural Engineering: planning stage

The plan of action should include:

	Marks allocated
<ul style="list-style-type: none"> the reasons for the choice of particular assignment brief eg interest in a particular form of structure, presence nearby of a similar structure etc 	5
<ul style="list-style-type: none"> the clarification/interpretation of the brief and the aims of the assignment eg setting down the main aspects of the problem which it is considered have to be solved to produce a satisfactory solution 	15
<ul style="list-style-type: none"> listing peripheral aspects of the problem which may or may not be dealt with in the assignment depending upon time restraints eg Brief 1 — Two-storey building: fire safety, fire escapes, services (stairs and lifts) Brief 2 — Footbridge: road accident prevention, access for disabled, prams etc Brief 3 — Alteration to building: aesthetics of museum/art gallery, services (stairs and lifts), fire safety, fire escapes 	5
<ul style="list-style-type: none"> a reasoned timescale for achieving the above, broken down into elements and having time built in to allow for periods of appraisal and, if found necessary, time to reconsider decisions already made, in the light of results obtained 	10
<ul style="list-style-type: none"> a list of information sources and material resources which initially are considered to be required for the successful completion of the assignment, although these will probably need revising during the assignment (the relevant list should be chosen from sources and resources which a centre possesses but it may be possible for candidates to gain access to additional sources and material — see sections <i>Investigating Tools</i> and <i>Materials and Resources</i> in this specification) 	5

Structural Engineering: developing stage

The hands-on activity is the production of a suitable, practical, structural design solution to a problem. The ‘product’ is thus a series of design calculations and relevant sketches/drawings.

The candidate should produce:

Evidence	Marks allocated
<ul style="list-style-type: none"> A satisfactory explanation of how the various structural elements form a structure with complete structural integrity Brief 1 — two-storey building and Brief 2 — footbridge: this will involve two designs in alternative materials. Brief 3 — alteration to existing building: this will involve the design of both the temporary supporting structure and the permanent structure. 	10

• a satisfactory explanation of how it is assumed the constructional processes will be carried out, with reference to site restrictions, construction plant and safety	15
• analysis and design calculations in a practical form, suitably referenced, such that they can be easily checked, of the main structural elements (a selection of manual and computer calculations should be offered)	40
• drawings and sketches of the structural elements eg general arrangement drawing based on preliminary sketches or written specifications, given with the original brief, detail drawings of the designed structural elements, sketch details of structural joints etc	40
• schedules of reinforcement abstracted from the detail drawings of representative reinforced concrete elements	10
• log book indicating the progress (eg weekly) of the project, regularly checked by the project tutor (see section <i>Ensuring evidence is authentic</i> in this specification)	5

Structural Engineering: evaluating stage

The evaluation report should include:

	Marks allocated
• a discussion of how effective the original action plan was and an explanation of any updating which had to take place during the assignment	5
• a discussion of actual sources of reference, resources and materials used and what changes, if any, were made to those initially considered for the assignment	5
• a discussion of any unforeseen problems which arose eg initial layout of elements leading to excessive or impractical element sizes, initial concepts of the solution leading to difficult or impossible construction methods, inability to access the sources of information thought to be essential and how this was overcome etc	10
• a critical assessment of the final design (Brief 3) or comparison of two designs (Brief 1 and Brief 2), with constructive suggestions for improvement	15
• a summary of skills and knowledge attained and improved by undertaking the assignment, including both skills and knowledge pertaining to the appropriate Units and also those skills and knowledge attained by the candidate having to go beyond the scope of the Units	5

The following checklists could be used to assist in assessing the performance:

Planning (action plan)

Rationale
 Interpretation of brief
 Identification of structural concept
 Aims of assignment
 Timescales for achieving aims

Information sources
Resources and materials
Breakdown into tasks (graphical)

Developing

Structural concept(s) explained
List of drawings required
Content of drawings
General arrangement prepared
Abstraction of information from general arrangement drawing
Design of steelwork elements
Design of reinforced concrete elements
Computer design of elements
Detailing of steelwork elements
Detailing of reinforced concrete elements
Schedules of reinforcement

Evaluating (evaluation report)

Review/update action plan
Assessment of design solution
Handling of unforeseen events
Identification of learning
Identification of skills attained
Identification of skills improved
Suggestions for improvement

7. Marking and grading

The assessment evidence for project-based National Courses is marked externally by SQA.

The total mark for the Practical Assignment is 200, (this large mark allocation makes it easier to discriminate effectively between performances of candidates across the various parts of the assessment). These marks will be allocated to assessment evidence from the three Practical Assignment stages as follows in *Table A*.

Table A

Practical Assignment Stage	Assessment Evidence	Mark Allocation
Planning	Plan of action	40
Developing	Evidence arising from the hands-on practical activity and from documenting the underpinning processes involved	120
Evaluating	Extended evaluation report	40

To underpin this assessment system there are criteria to which marks are pegged, against which the candidate evidence from each of the three Practical Assignment stages is assessed. The use of such mark categories linked to broad criteria, allows for the aggregation of the various parts of the assessment which do not necessarily have the same weighting in the overall grade. *Table B* overleaf outlines the criteria to be used to assess candidate evidence. Assessors in centres will, for each of the three parts, decide firstly on the broad category of mark which is appropriate and secondly on the precise mark to be given. (see *Estimates and appeals* later in this section).

Although it is possible for candidates to be given bands 7, 8 and 9 which are described as ‘fails’, no such categories will appear on candidates’ certificates. This information should help centres agree estimates of candidate performance and provide feedback to candidates for remediation purposes.

All National Courses are subject to external marking. External Markers, Visiting Examiners and Moderators will be trained by SQA to apply national standards. As candidate evidence becomes available exemplars will be issued to centres as guidance.

Practical Assignment

Table B

Higher		Plan of action	Practical activity and documented process evidence	Evaluation report
Levels of performance: broad level-related criteria	Equivalence to	Mark range	Mark range	Mark range
Content and scope: Treatment: appropriate for level excellent	Upper A 85%–100% (Band 1)	34–40	102–120	34–40
Content and scope: Treatment: appropriate for level consistently thorough	Lower A 70–84% (Band 2)	28–33	84–101	28–33
Content and scope: Treatment: appropriate for level thorough in parts	B 60–69% (Bands 3 & 4)	24–27	72–83	24–27
Content and scope: Treatment: appropriate for level adequate	C 50–59% (Bands 5 & 6)	20–23	60–71	20–23
Content and scope: Treatment: appropriate for level adequate only in parts OR Content and scope: Treatment: basic for level thorough	Fail 40–49% (Bands 7 & 8)	16–19	48–59	16–19
Content and scope: Treatment: appropriate for level generally poor OR Content and scope: Treatment: basic for level adequate or poor	Fail Below 40% (Band 9)	<16	<48	<16

Note:

Content and scope: defined as how appropriate or otherwise the candidate interprets the level of demand for the specification

Treatment: defined as how successful or otherwise the candidate tackles the project

Estimates and appeals

Although these project-based National Courses are externally assessed by SQA, candidates will benefit from estimate grades based on accurate internal assessment of their projects, ie the grade assessors judge a candidate should be awarded, based on all the available evidence. The processes for deciding an estimate grade are similar to the processes the external assessors, eg markers, use for the final assessment. The main benefit of an estimate to an individual candidate is that an appeal can be submitted against an external decision where the estimate given the candidate was at grade C or better. An appeal will not normally be considered for candidates for whom no estimate has been received. The SQA will provide a form for submission of estimates.

For the internal marking process for estimates, internal assessors are expected to:

- compare candidate evidence arising from each stage of the Practical Assignment to the criteria outlined in *Table B* and decide on the mark category which most accurately describes it
- decide on a particular mark for the candidate, within that broad mark category for each stage, depending on how marginal was the decision
- maintain a brief record of why a certain mark was given for each of the three Practical Assignment stages (for internal moderation purposes)
- follow the internal moderation processes within their centre (see the section on internal moderation below)
- aggregate the internally moderated marks for each candidate. That gives a total mark out of 200
- divide that total mark by 2 to give a percentage
- convert the overall % mark for each candidate into an estimate grade and band using *Table C*

Table C

% Mark range	Grade	Band (for estimates)
85–100	A (upper)	1
70–84	A (lower)	2
65–69	B (upper)	3
60–64	B (lower)	4
55–59	C (upper)	5
50–54	C (lower)	6
45–49	Fail (near miss)	7
40–44	Fail	8
Less than 40	Fail	9

- check the grade already given to candidates against the grade descriptions tabled below, (*Table D*). This is to ensure that candidates have effectively integrated each stage of the Practical Assignment. Please use the grade descriptions as a touchstone against which grades can be checked
- provide estimates as bands

Grade Descriptions for a Practical Assignment at Higher

Table D

A	B	C
Content and scope appropriate for Higher		
And looking at the evidence as a whole:	And looking at the evidence as a whole:	And looking at the evidence as a whole:
<p>A Practical Assignment at Grade A:</p> <ul style="list-style-type: none"> • produces high quality, clearly inter-related documented and product or process-related evidence for the three essential phases of the Practical Assignment • is an exercise to which candidates have brought an accurate and insightful interpretation of the Practical Assignment brief • is tightly structured, relevant to the content of the Units and displays a high level of subject/occupational expertise • effectively applies integrated and consolidated knowledge, understanding and skills from the Course Units to complex situations and/or design specifications 	<p>A Practical Assignment at Grade B:</p> <ul style="list-style-type: none"> • produces good quality, inter-related documented and product or process-related evidence for the three essential phases of the Practical Assignment • is an exercise to which candidates have brought an accurate interpretation of the Practical Assignment brief • is well structured and displays a good level of subject/occupational expertise • satisfactorily applies integrated and consolidated knowledge, understanding and skills from the Course Units to situations and/or design specifications which include a degree of complexity 	<p>A Practical Assignment at Grade C:</p> <ul style="list-style-type: none"> • produces adequate, fairly well inter-related documented and product or process-related evidence, for the three essential phases of Practical Assignment • an exercise to which candidates have brought an acceptable interpretation of the Practical Assignment brief • is reasonably well structured and displays an adequate level of subject/occupational expertise • applies integrated and consolidated knowledge, understanding and skills from the Course Units with some lack of continuity and consistency

Additional guidance on grade descriptions

Content:

Can be measured by the amount of interaction between the three phases which is demonstrated in the content ie the iterative nature of the content and by the nature, currency and the validity of the evidence used.

Can be measured by how much effort has been made to gather and use relevant material from sources outwith the confines of the centre library/classroom and by how much material, relevant to the solution but more than the minimum required to give a satisfactory design, has been produced.

Can be measured by the ability to apply the knowledge etc gained in the Units of the Course to problems slightly more complex and slightly more practical than those met in the Units themselves and by how much initial or remedial advice is required by the candidate to be able to relate the material met in the Units with that in the assignments.

Presentation:

Can be measured by the ability to:

- clearly and logically lay out the presentation
- give the sources of all the relevant information gathered
- lay out all structural calculations and drawings in a practical manner
- present logical conclusions
- critically assess the end solution or solutions

Internal moderation

The internal moderator oversees:

- The internal moderation process to ensure consistency of judgement or *reliability of assessment*. This process will vary according to the nature of the evidence and the number of assessors and sites. It is likely to involve agreement trials and/or Marker standardisation. The internal moderator should be a specialist in the subject. (It may be helpful in the first few years of these project-based National Courses to do a cross-subject moderation of samples of like parts such as the plans of action and evaluation reports. Such additional cross-subject internal moderation is however not mandatory.)
- A consideration of whether, in some cases, candidates with similar overall marks/bands have been fairly treated. For example, some candidates may have produced more fully integrated projects than others. This may lead to a reconsideration of marking of the individual components for some candidates.
- Finalisation of estimate grades and submission of candidate evidence. A form will be available for this purpose.

(See *Guide to Assessment and Quality Assurance for Colleges of Further Education* or *Guide to Assessment and Quality Assurance for Secondary Schools*, SQA June 1999 for further information relating to internal moderation. A guide to good practice for internal moderation is also under development.)

Submitting candidate evidence to SQA

Specific information on this part of the process will be circulated to centres. Where materials have to be sent to SQA for marking you will be provided with any necessary packaging materials.

The following must be sent to SQA for the Practical Assignment:

- plan of action
- all transportable evidence
- extended evaluation report

Note: In addition, centres will be expected to submit all notes used by candidates during write-up sessions.

8. Ensuring evidence is authentic

The following methods should be used to ensure that the evidence produced by a given candidate is all their own work. These methods are for use outwith any situation where the candidate's work will be produced under supervised or invigilated conditions already stipulated by the SQA (eg the plan of action and the evaluation).

- **Log book:** This would be regularly (eg weekly) checked by the project tutor who would question the candidate on the claims made in such a book.
The book would indicate the progress made in relation to the timescale proposed in the plan of action and in the search and use of information sources and material resources.
The book would also record the work done during any time which had been formally timetabled for the practical assignment ie part of the additional 40 hours (ie the 40 hours allocated to each course in addition to the 120 hours for the Units).
The book would also trace the difficulties met and overcome and any changes required to the original plan for the solution to the design problem.
- **Authorised use of facilities:**
The usage of facilities such as drawing office and computer suites outwith normal class times would be timed and dated by appropriate staff; the candidate would add the actual activity carried out during a particular visit to the facility.

Note: this would depend on the method of management within a centre.
- **Candidate declaration:**
The candidate should sign off their work as their own.
- **Teacher/lecturer declaration:**
The appropriate member of staff, eg project tutor, should sign a declaration that, to the best of their knowledge, the candidate work submitted to SQA for external assessment is the work of the candidate in question.

9. Investigating tools

Candidates are expected to make use of the following information sources during the Practical Assignment:

Information sources

Source	Access Mode	Examples Available (not prescriptive)
Textbooks	CL	<i>Foundation Design & Construction</i> (MJ Tomlinson) <i>Reinforced Concrete Designers Handbook</i> (Reynolds) <i>Reinforced Concrete Design</i> (Mosley, Bungey and Hulse) <i>Design of Structural Steelwork</i> (McKenzie)
Notes	CC	
Professional Journals	CL	<i>Structural Engineer, New Civil Engineer</i>
Trade/Commercial Literature	CL/PS	Purlin suppliers, Precast concrete producers, Construction plant manufacturers
Data Sheets	CC/CL	Section properties & Safe Load Tables of steel sections
Internet	CL/PS	
Site Visits	CC/PS	Appropriate to particular Assignment
Videos	CC/CL	From the catalogues of CITB, HSE, SCI etc
Teaching/Lecturing Staff	CL	
Codes of Practice/Explanatory Handbooks	CL/CC	BS 8110, BS 5950, BS 6399, BS 8004, PP7312 Design Manuals Steelwork and Reinforced Concrete Building Structures (IStruct.E. & ICE), Standard Method of Detailing Structural Concrete (IStruct.E)
Specialist Lectures	PS	
Technical Meetings/Seminars	CC/PS	IStruct.E., ICE
Exhibitions	CC/PS	

CL = available in Centre Library

CC = arranged or provided by teaching/lecturing staff ie class centered

PS = source investigated and accessed by candidate ie personal study

References supplied by candidates

Please note that it is legitimate for candidates to quote from information sources such as articles (in print or stored electronically) or books. Such quotations must be placed within quotation marks followed by the reference, including the chapter and or section and page number. Texts referred to should be included in the bibliography.

The following format for references should be used:

Books

Author's surname, followed by forename or initials, title of book (in italics or underlined), place of publication, name of publisher, year of publication.

For example:

Barton, T, *Fieldwork for Geographers*, London: Edward Arnold, 1985

Articles

Author's surname, followed by forename or initials, title of the article (in inverted commas), title of the periodical (underlined or in italics), volume number, part number, year of publication, page number(s).

For example:

Sugden, DE, 'Perspectives on the Glaciation of Scotland', *SAGT Journal No. 17*, 1988, pp 4–10.

Maps and Diagrams

Sources should be given on each map and diagram and should be stated in the same format as for books and articles, as appropriate.

For example:

Microsoft Encarta 1997

Internet

If a website has been used then the address (URL) must be disclosed.

For example:

www.sqa.org.uk

It is important to note that unacknowledged copying will be penalised, usually by cancellation of the candidate entry.

10. Materials and resources

Candidates are expected to select from the following materials and resources as appropriate:

- British Standard Codes of Practice (or published Student Extracts) in:
 - weights and Building Materials
 - loading
 - structural Steelwork Design
 - reinforced Concrete Design
- handbooks/data sheets on:
 - detailing of Reinforced Concrete
 - section Properties and Safe Load Tables of Standard Steel Sections
 - properties of constructional materials
- computer software on analysis and design eg QSE, CADS, C&SCS etc
- examples of project drawings and calculation sheets
- access to computers outwith scheduled class contact
- access to drawing office facilities outwith scheduled class contact

11. Core Skills

It is possible that successful attainment of this Course would lead to the automatic certification of particular Core Skills or Core Skill components. A final statement will be provided at a later date by the Scottish Qualifications Authority once full validation procedures are complete.

It should be noted that this project, in common with other project-based Courses, follows the planning/developing/evaluating cycle. As a result of this it is likely that successful completion of the project will lead to automatic certification of the Problem Solving Core Skill at Intermediate 2. The final Core Skills statement, as above, will confirm this.