



Higher National Project-based Graded Unit Specification

General Information

This Graded Unit has been validated as part of the HNC Water Operations. Centres are required to develop a project-based assessment in accordance with this validated specification.

Graded Unit title: Water Operations: Graded Unit 1
(SCQF level 7)

Graded Unit code: F5GJ 34

Type of Project: Investigation

Publication date: August 2018

Source: Scottish Qualifications Authority

Version: 03

Graded Unit purpose

This Graded Unit is designed to provide evidence, depending on the Units chosen, that the learner has achieved the following principal aims of the HNC Water Operations:

- ◆ provide an understanding of the knowledge and skills required to manage a water resource
- ◆ develop an understanding of the principles of water treatment processes
- ◆ demonstrate an understanding of the basic principles and components of a water distribution system or sewerage network
- ◆ develop an understanding of the processes involved in the collection, treatment and disposal of wastewater

Credit points and level

1 Higher National Unit credit at SCQF level 7: (8 SCQF credit points at SCQF level 7)

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Recommended entry to the Graded Unit

It is recommended that the learner should have completed or be in the process of completing the following Units relating to the above principal aims prior to undertaking this Graded Unit:

Mandatory

- F53S 34 *Water Operations: Water Resources*
F53M 34 *Water Operations: Waste Water Treatment Processes*

Optional (two from four)

- F53T 34 *Water Operations: Water Treatment Processes*
F53N 34 *Water Operations: Water Distribution*
H7FG 34 *Water Operations: Operation and Maintenance of the Sewerage Network*
H7FF 34 *Water Operations: Activated Sludge and Advanced Waste Water Treatment Processes*

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes of this Graded Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Graded Unit.

Equality and inclusion

This Graded Unit has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website: www.sqa.org.uk/assessmentarrangements

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Assessment

This Graded Unit will be assessed by the use of a project-based investigation developed by centres. The project should provide the learner with the opportunity to produce evidence that demonstrates she/he has met the aims of this Graded Unit.

The project undertaken by the learner must be a complex task which involves:

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

The project must require the learner 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.

Conditions of assessment

The learner should be given a date for completion of the project. However, the instructions for the project should be distributed to allow the learner sufficient time to assimilate the details and carry out the project. During the time between the distribution of the project instructions and the completion date, assessors may answer questions, provide clarification, guidance and reasonable assistance.

Reasonable assistance is the term used by SQA to describe the difference between providing learners with some direction to generate the required evidence for assessment and providing too much support, which would compromise the integrity of the assessment. Reasonable assistance is part of all learning and teaching processes. In relation to the assessment of Higher National Project-based Graded Units, assessors may provide advice, clarification, and guidance during the time between the distribution of the project instructions and the completion date, ie at each stage of the project.

Remediation allows an assessor to clarify learner responses, either by requiring a written amendment or by oral questioning, where there is a minor shortfall or omission in evidence requirements. In either case, such instances must be formally noted by the assessor, either in writing or recording, and be made available to the internal and external verifier. In relation to Higher National Project-based Graded Units, learners must be given the opportunity for remediation at each stage of the project.

The evidence for a Higher National Project-based Graded Unit is generated over time and involves three distinct stages, each of which has to be achieved before the next is undertaken. This means that any re-assessment of stages must be undertaken before

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proceeding to the next stage. The overall grade is derived from the total number of marks *across all* sections, and should reflect the ability of the learner to work autonomously and the amount of support required. In relation to Higher National Project-based Graded Units, learners who have failed any stage of the project and have been unable to provide the necessary evidence through remediation must be given the opportunity for re-assessment of that stage.

Any learner who has failed their graded unit or wishes to upgrade their award must be given a re-assessment opportunity, or in exceptional circumstances, two re-assessment opportunities. In the case of project-based graded units, this must be done using a substantially different project.

The final grading given must reflect the quality of the learner's evidence at the time of the completion of the graded unit. Learners must be awarded the highest grade achieved — whether through first submission or through any re-assessment, remediation, and/or reasonable assistance provided.

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Evidence Requirements for this Graded Unit

The project undertaken by learners will consist of three stages: planning; developing; and evaluating. The following table specifies the minimum evidence required to pass each stage.

Project stage	Minimum Evidence Requirements	% Mark Allocation
Stage 1 — Planning	<p>The learner must produce evidence of:</p> <ul style="list-style-type: none"> ◆ an outline of the general aims of the Investigation ◆ specific objectives for the achievement of the task that take cognisance of the Water Industry's technical operations from source to sea. <p>Alternatively, details of the particular Unit/s under investigation however the learner must demonstrate an understanding of where this fits in relation to the journey from source to sea including:</p> <ul style="list-style-type: none"> — identification of key issues of research — resources required to be effective in the activity — practical issues or perceived barriers which might affect the activity — the rationale for selection of the chosen subject area — timescales for achieving the specific objectives — identification of relevant legislation and regulatory requirements <p><i>The learner must achieve all of the minimum evidence specified above in order to pass the Planning stage.</i></p>	20%

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Project stage	Minimum Evidence Requirements	% Mark Allocation
Stage 2 — Developing	<p>The learner must produce evidence of:</p> <ul style="list-style-type: none"> ◆ a general description of the Water Industry’s technical operations from source to sea. Alternatively, details of the particular Unit/s under investigation however the learner must demonstrate an understanding of where this fits in relation to the journey from source to sea and in particular the specific objectives identified for research in the planning stage ◆ collection and collation of relevant data ◆ interpretation/analysis of key issues identified in the planning stage ◆ providing conclusions and recommendations based on the analysis ◆ providing an action plan based on the conclusions and recommendations ◆ indicating what human resources, non-human resources including financial resources might be needed to implement the action plan ◆ identification of relevant legislation and regulatory requirements, indicating where and when they should be referred to <p>The development stage may also include charts, diagrams, maps and technological data.</p> <p><i>The learner must achieve all of the minimum evidence specified above in order to pass the Developing stage.</i></p>	70%

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Project stage	Minimum Evidence Requirements	% Mark Allocation
Stage 3 — Evaluating	<p>The learner must produce an evaluation of the effectiveness of their approach to the investigation by providing evidence of:</p> <ul style="list-style-type: none"> ◆ identification of knowledge and skills which have been gained and/or developed ◆ an assessment of the extent to which the specific objectives for the investigation have been met ◆ a summary of the planning and implementation activity in terms of which aspects went well and why, which aspects did not go as well and why and which indicates how any practical issues were overcome <p>The evaluation may include references and appendices which are referred to in all three stages.</p>	10%
	<p><i>The learner must achieve all of the minimum evidence specified above in order to pass the Evaluating stage.</i></p>	

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Assessing and grading learners

The overall project will be marked out of **100**. Only whole marks should be used.

The percentage of marks allocated to each stage of the project is outlined in the **Evidence Requirements**.

It is a requirement that learners must meet the minimum *Evidence Requirements* for the *Planning* stage before progressing to the *Developing* stage before progressing to the *Evaluating* stage. Learners may produce evidence over and above that specified in the minimum *Evidence Requirements* and deserve more than half the available marks for that stage. Assessors should use the Grade Related Criteria outlined below to judge learner performance.

Learners are required to work independently to meet the *Evidence Requirements* of the Graded Unit. At the same time, learners need appropriate support. SQA uses the term reasonable assistance to describe the balance between supporting learners in their project and not providing too much assistance.

At the end of *each* stage there should be opportunities for remediation and reassessment of learners for that particular stage. This includes the final *Evaluation* stage. Any reassessment should be carried out in line with the centre's own assessment policy.

Grade Related Criteria	
Grade A	Grade C
<p>Is a seamless, coherent piece of work which:</p> <ul style="list-style-type: none"> ◆ has evidence for, and demonstrates links between, the three phases of the project ◆ presents an insightful interpretation of the project brief ◆ demonstrates an original and imaginative approach to the key tasks of the brief ◆ applies and integrates the knowledge and understanding of the key concepts of the course Units which shows continuity and consistency ◆ includes solutions based on the knowledge and skills gained from the course and from further reading 	<p>Is a co-ordinated piece of work which:</p> <ul style="list-style-type: none"> ◆ has evidence for the three phases of the project ◆ presents an interpretation of the project brief ◆ demonstrates an approach to the key tasks of the brief ◆ applies and integrates knowledge and understanding of the key concepts of the course but lacks continuity and consistency ◆ includes solutions based on the knowledge and skills gained on the course

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The marks allocated to each stage will then be aggregated to arrive at an overall mark for the project. Assessors will then assign an overall grade to the learner for this Graded Unit based on the following grade boundaries.

A = 70%–100%
B = 60%–69%
C = 50%–59%

These grade boundaries are fixed and should **not** be amended.

Higher National Project-based Graded Unit Support Notes

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Guidance on approaches to delivery and assessment of this Graded Unit

The learner is to respond to a project brief set by their tutors. The guidelines given in the brief should give the learner the opportunity to display the knowledge, skills and understanding they have gained over as wide a range of Units as they choose, but should include the mandatory Units of *Water Resources* and *Waste Water Treatment*, together with the two optional Units chosen.

The given brief requires the learner to either analyse the key technical operations involved in the Water Industry from source to sea, or the in-depth investigation of a particular Unit/s to provide detailed information and give conclusions and recommendations. The learner will be required to provide evidence in response to the brief which displays appropriate knowledge of the Water Industry's technical operations from source to sea.

Learners may choose to share research material and discuss and debate the various issues with their colleagues. This will be more common with learners from the same geographical areas. If this approach is taken then it is important to validate that essential elements can be attributable to each individual learner.

It is envisaged that this Graded Unit would be introduced during the first tutorial block, with an increasing amount of time spent towards the end of the course.

As time management is an important aspect of planning developing and evaluating a project such as this, in order to help learners manage their time effectively deadlines will be built into the brief. Failure to adhere to them will affect the final grading of the Unit.

It is envisaged that the total report will be a minimum of 3,000 words, not necessarily equally weighted to each core subject. This will allow learners some degree of autonomy in order to make their reports unique.

Opportunities for developing Core and other essential skills

There are opportunities to develop the Core Skills of *Information Technology (ICT)* at SCQF level 5, *Problem Solving* at SCQF level 6, *Communication* at SCFQ level 6 and *Numeracy* at SCQF level 5 and *Working with Others* at level 6, although there is no automatic certification of Core Skills or Core Skills components.

History of changes to Graded Unit

Version	Description of change	Date
02	Graded Unit transferred to new template and minor amends made to text following validation of new HNC Water Operations qualification (G979 15).	26/08/14
03	Update of Conditions of Assessment	06/08/18

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FURTHER INFORMATION: Call SQA's Customer Contact Centre on 44 (0) 141 500 5030 or 0345 279 1000.

General information for learners

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In order to complete this course you will have to attain your Graded Unit. The purpose of this Unit is to bring together many of the different skills you have learned throughout your course. You will already have studied or be in the process of studying the following Units:

Mandatory

F53S 34 *Water Operations: Water Resources*
F53M 34 *Water Operations: Waste Water Treatment Processes*

Optional (two from four)

F53T 34 *Water Operations: Water Treatment Processes*
F53N 34 *Water Operations: Water Distribution*
H7FG 34 *Water Operations: Operation and Maintenance of the Sewerage Network*
H7FF 34 *Water Operations: Activated Sludge and Advanced Waste Water Treatment Processes*

This Graded Unit also reflects the main aims of the award. Depending on the Units chosen these are:

- ◆ provide an understanding of the knowledge and skills required to manage water from source to sea
- ◆ develop an understanding of the principles of water resources and water treatment
- ◆ equip students with the knowledge and skills required to design a basic water distribution system or sewerage network develop an understanding of the processes involved in the collection, treatment and disposal of wastewater

You will be asked to apply some of the skills and knowledge you have learned into an Investigation. You will be asked to demonstrate how you planned your investigation, how you developed your ideas and how you evaluated what you have done.

At the start of the Unit your tutors will give you a project brief. You will be asked to plan, develop and evaluate an investigation as per the guidelines in the brief.

You must meet the minimum Evidence Requirements. This investigation will be out of 100 and you have to pass each part of the project to pass the Unit. The marks you get for each part will be added up and you will be given a grade for the Unit.

The grade you receive is based on the following:

A = 70%–100%
B = 60%–69%
C = 50%–59%

General information for learners (cont)

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There are opportunities to develop the Core Skills of *Information Technology (ICT)* at SCQF level 5, *Problem Solving* at SCQF level 6, *Communication* at SCFQ level 6 and *Numeracy* at SCQF level 5 and *Working with Others* at level 6, although there is no automatic certification of Core Skills or Core Skills components.

Throughout the Unit you will meet with your tutors who will advise you and make sure that you are on the right track to achieve your Unit within the given time-scale.