

# Unit 9: Understanding Ornamental Pool Design, Installation and Management

**Unit code:** L/601/2102

**QCF Level 2:** BTEC First

**Credit value:** 10

**Guided learning hours:** 60

## ● Aim and purpose

This unit aims to provide learners with an understanding of ground based arboricultural operations and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

## ● Unit introduction

The design, installation and management of garden pools has become an important element of the aquatics industry. Those employed to design, install and manage garden pools must be able to interpret the requirements of the client, understand the planning and design principles and develop the practical skills required to undertake this rewarding, complex and potentially hazardous activity.

This unit provides the knowledge and practical skills required in the design, installation and management of water features and pools used to keep ornamental fish species. It involves the study of the principles of planning and designing ornamental pools, the materials and equipment used and their construction and management. Learners will adopt safe working practices and develop a confident and adaptable approach to working in the aquatics industry.

Learners will consider the factors influencing the planning and design of ornamental pools and review the range of materials and equipment that are currently used in the construction and installation of them. They will become aware of the need to achieve the client's objectives in given situations.

Learners will cover common methods of constructing ornamental pools or water features and develop their understanding of the principles of contracts and tenders as applied to the construction of ornamental pools or water features. They will cover the maintenance of an ornamental pool or water feature and the development of maintenance protocols. Methods of algal and predator control will also be covered.

## ● Learning outcomes

**On completion of this unit a learner should:**

- 1 Understand the principles of planning and designing ornamental pools
- 2 Be able to select appropriate materials and equipment used in the construction and installation of ornamental pools
- 3 Be able to construct an ornamental pool or water feature
- 4 Be able to manage an ornamental pool or water feature.

# Unit content

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## 1 Understand the principles of planning and designing ornamental pools

*Planning and designing ornamental pools:* environmental and physical factors affecting the positioning and design of ornamental pools eg koi pools, natural or wild pools, informal and formal pools; factors affecting the location and design of associated water features eg fountains, waterfalls; interpretation of client briefs; production of designs or plans to meet stated objectives; human health and safety issues eg drowning; animal health and welfare issues eg deoxygenation; plant health issues eg light availability; relevant current legislation and codes of practice

## 2 Be able to select appropriate materials and equipment used in the construction and installation of ornamental pools

*Materials and equipment:* evaluation (types, costs, uses, sources) of the range of materials required to achieve specified design criteria, eg formal and informal pools, sunken and raised pools, flexible lined and rigid lined pools; evaluation (types, costs, uses, sources) of the range of equipment commonly used in the construction of ornamental pools, eg drains, pumps, filters, liners, clarifiers, predator control, water quality monitoring and pipework; estimating the cost of materials and equipment required to achieve stated design criteria; human health and safety issues; animal health and welfare; relevant current legislation and codes of practice, eg Health and safety at Work Act 1974

## 3 Be able to construct an ornamental pool or water feature

*Construction and installation:* construction plans and building schedules from stated design criteria; site surveying, laying out and construction scheduling techniques; construction techniques for flexible and rigid liners, raised and sunken pools; installation of appropriate life support and maintenance equipment; design of contracts and tenders for the construction of ornamental pools and factors affecting them; human health and safety issues; animal health and welfare; relevant current legislation and codes of practice

## 5 Be able to manage an ornamental pool or water feature

*Pool or water feature management:* maintenance programmes for daily, weekly and seasonal management of ornamental pools and water features; fish and plant health monitoring and maintenance; factors influencing feeding schedules, algal and legal predator control measures, eg temperature, light, species; plant husbandry and maintenance; equipment and materials maintenance; costs of maintaining ornamental pools and water features; establishment of contracts and tenders for the management of ornamental pools and water features; human health and safety issues; animal health and welfare; relevant current legislation and codes of practice, eg Environment Act 1995

## Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria			
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:	
<b>P1</b> explain the environmental and physical factors influencing the location of an ornamental pool and water features in a given situation [IE, RL, CT]	<b>M1</b> explain the criteria utilised when designing an ornamental pool to achieve a specified design	<b>D1</b> discuss the human, animal and plant health and welfare issues associated with the design of a selected ornamental pool and associated water feature	
<b>P2</b> outline the criteria utilised when designing an ornamental pool to achieve a specified design			
<b>P3</b> select the equipment and materials required to construct and install an ornamental pool to a specified design	<b>M2</b> explain the selection criteria for the equipment and materials used to construct and install an ornamental pool to a specified design		
<b>P4</b> state the selection criteria for the equipment and materials used			
<b>P5</b> construct an ornamental pool or water feature in a given situation to meet a specified design [TW, EP, SM]	<b>M3</b> explain the process of constructing a flexible lined and rigid lined pool		<b>D2</b> calculate the cost and identify the sources of materials and equipment required to establish an ornamental pool to a specified design.
<b>P6</b> state the process of constructing a lined pool			
<b>P7</b> plan maintenance of a specified ornamental pool or water feature	<b>M4</b> evaluate a maintenance plan for an ornamental pool or water feature in a specified situation.		
<b>P8</b> carry out the maintenance of a specified ornamental pool or water feature to meet given objectives			
<b>P9</b> recommend improvements to maintenance of a specified ornamental pool or water feature.			

**PLTS:** This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

<b>Key</b>	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

# Essential guidance for tutors

## Delivery

Work placements should be monitored regularly in order to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the requirements of this unit prior to any work-related activities so that naturally occurring evidence can be collected at the time. For example, learners will have the opportunity to construct an ornamental pool or water feature and they should be encouraged to ask for observation records and/or witness statements to be provided as evidence of this. Guidance on the use of observation records and witness statements is provided on the Edexcel website.

Visiting expert speakers could add to the relevance of the subject for learners. For example, a professional pool construction engineer could talk about their work, the situations they face and the methods they use.

Whichever delivery methods are used, it is essential that tutors stress the importance of animal welfare, sound environment management and the need to manage the resource using legal methods.

Health and safety issues relating to working in and around water must be stressed and regularly reinforced, and risk assessments must be undertaken prior to practical activities. Adequate personal protective equipment (PPE) must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments learners may also be taking as part of their programme of study.

Learning outcomes 1 and 2 are directly linked. These are likely to be delivered by formal lectures, discussion, site visits and practicals, and independent learner research. Site visits to a range of ornamental pools with or without associated water features and to materials and equipment suppliers would be extremely valuable to the learners.

Learning outcomes 3 and 4 cover the construction and maintenance of ornamental pools and water features. Delivery techniques should be varied and linked to the delivery of learning outcomes 1 and 2. It is expected that formal lectures, discussions, supervised practicals and site visits would form part of the delivery of these learning outcomes.

## Outline Learning Plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction to unit.
<b>Assignment 1: Ornamental Pool Design</b> (P1, P2, M1, M2, M3, D1, D2)
Tutor introduces assignment.
Theory lessons on planning and design factors.

## Topic and suggested assignments/activities and/assessment

Site visits and guest speakers to illustrate application of theory.

Site visits and research into ornamental pool and water feature controls and costs.

### **Assignment 2: Ornamental Pool Installation** (P3, P4, P5, P6)

Practical sessions investigating selection and use of materials and equipment.

Site visits and research into planning and installation of ornamental pools and water features.

Sessions on physical, environmental, human and safety considerations, legal influences in relation to planning and installation.

### **Assignment 3: Ornamental Pool Maintenance** (P7, P8, P9, M4)

Practical sessions investigating daily, weekly and seasonal management techniques of ornamental pools and water features.

Site visits and research into ornamental pool and water feature maintenance required.

Sessions on evaluation of works carried out.

Unit review.

## Assessment

For P1 and P2 learners need to provide information on the planning and design of an ornamental pool in a given situation. Tutors should identify the situation or agree it through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of the ornamental pool should be the same for all learners. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector), or an annotated poster, or a project.

P3 requires learners to select the equipment and materials required to construct and install an ornamental pool to a specified design. Tutors should identify the design of the ornamental pool or agree it through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of the ornamental pool should be the same for all learners. It may be the same ornamental pool that is used to provide evidence for other grading criteria. For P4 learners must state the selection criteria used. Evidence could be in the same form as for P1 and could be linked to it.

For P5 learners must construct an ornamental pool or water feature in a given situation to meet a specified design. Tutors should identify the design and situation of the ornamental pool or agree them through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of the ornamental pool and situation should be the same for all learners. It may be the same ornamental pool that is used to provide evidence for other grading criteria. For P6 learners must state the process used. These criterion could be assessed directly by the tutor during practical activities. If this format is used then suitable evidence from guided activities would be observation records completed by learners and the tutor and accompanied by appropriate worklogs or other relevant learner notes. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor.

For P7 and P8 learners need to plan and carry out the maintenance of a specified ornamental pool or water feature to meet given objectives. Tutors should ensure that the maintenance tasks represent the range of tasks that are commonly associated with the industry. It may be the same ornamental pool that is used to provide evidence for other grading criteria. It is expected that, as a minimum, learners should carry out the maintenance activities for a given period that is decided by the tutor. Ideally this would entail a period of at least four weeks. Evidence could be in the same form as for P5.

For P9 learners could be asked about improvements they would make in the light of pool maintenance carried out, evidence could be captured through a recorded question and answer session.

For M1 they are required to explain the criteria utilised when designing an ornamental pool to achieve a specified design. Tutors should identify the specified design objectives, such as designing a pool or water feature for people with physical disabilities, a visual impairment or young children. Learners will be expected to demonstrate a full understanding of the factors influencing the design of such a pool. The evidence presented must be broad ranging, realistic and feasible. Evidence could be in the same form as for P1.

For M2 learners must explain the selection criteria for the equipment and materials used to construct and install an ornamental pool to a specified design. Tutors should identify the design of the ornamental pool or agree it through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of the ornamental pool should be the same for all learners. This may be the same ornamental pool that is used to provide evidence for other grading criteria. Evidence could be in the same format as for P1.

M3 requires learners to explain the process of constructing a flexible lined and rigid lined pool. The evidence presented must be realistic, sequential and feasible. Evidence could be in the same format as for P1 or could take the form of a sequential series of instructions.

For M4 learners must evaluate a maintenance plan for an ornamental pool or water feature in a specified situation. Tutors should identify the ornamental pool or water feature or agree it through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of these should be the same for all learners. This may be the same ornamental pool or water feature that is used to provide evidence for other grading criteria. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) or a project.

For D1 they must discuss the human, animal and plant health and welfare issues associated with the design of a selected ornamental pool and associated water feature. This may be the same ornamental pool and associated water feature as that used to provide evidence for other grading criteria. Learners' evidence must be broad ranging, realistic and feasible. It should include appropriate methods of rectifying each identified issue. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector), or an annotated poster or leaflet, or a project.

D2 requires learners to calculate the cost and identify the sources of materials and equipment required to establish an ornamental pool to a specified design. Tutors should identify the design or agree it through discussion with the learners. Where possible, to ensure fairness of assessment the size and complexity of the design should be the same for all learners. This may be the same ornamental pool that is used to provide evidence for other grading criteria. Evidence could be in the same form as for D1.

### Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1, M2, M3, D1, D2	Ornamental Pool Design	You are part of a team that has been contracted to install a new ornamental pool for a client. You have been asked to lead the planning and design process and need to provide a report and presentation on how the pool will be presented and the factors involved from physical and environmental perspectives to materials and equipment used.	Presentation. Report.

Criteria covered	Assignment title	Scenario	Assessment method
P3, P4, P5, P6	Ornamental Pool Installation	You are now involved in the installation phase for the ornamental pool and need to demonstrate your skills in selection and use of equipment and materials and the construction process. You must also state the selection criteria for equipment and materials as well as the actual construction process.	Practical evidence records. Project.
P7, P8, P9, M4	Ornamental Pool Maintenance	You need to provide the client with information on how to manage and maintain the ornamental pool once installed. You must demonstrate maintenance techniques and produce an evaluation of the maintenance plan.	Practical evidence records. Project.

## Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Caring for Ornamental Aquatics	Undertake Estate Skills
Participate in Providing Estate Maintenance	Understanding Fish Biology and Behaviour
	Understanding Water Quality
	Undertake an Investigative Project in the Land-based Sector

## Essential resources

Learners will require access to a laboratory, a workshop and to an area with existing ornamental pools and space for the construction of pools and water features.

They will also require appropriate personal protective equipment (PPE) for use in a laboratory, a full range of water testing equipment, a range of materials and equipment needed for the construction and maintenance of ornamental pools or water features, a computer with appropriate software, a library and resource centre, and a calculator.

Tutors delivering this unit should be competent and experienced in the aquatics industry.

## Indicative reading for learners

### Textbooks

Andrews C, Excell A and Carrington N – *The Interpet Manual of Fish Health* (Interpet Publishing, 2002) ISBN 978-1842860670

Holmes K and Pitham T – *Creating a Koi Pond: An Essential Guide to Building and Maintaining a Koi Pond* (Interpet Publishing, 2002) ISBN 978-1842860632

Papworth D – *A Fishkeeper's Guide to Garden Ponds* (Interpet Publishing, 1999) ISBN 978-1902389547



Quick G – *An Essential Guide to Choosing Pond Fish and Aquatic Plants* (Interpet Publishing, 2000)  
ISBN 978-1902389974

Robinson P – *The Royal Horticultural Society Water Gardening* (Dorling Kindersley, 1997) ISBN 0751303046

### **Websites**

<a href="http://www.defra.gov.uk">www.defra.gov.uk</a>	Department of Environment, Food and Rural Affairs
<a href="http://www.gardensit.com">www.gardensit.com</a>	Gardens Guide
<a href="http://www.hse.gov.uk">www.hse.gov.uk</a>	Health and Safety Executive
<a href="http://www.koicarp.org.uk">www.koicarp.org.uk</a>	Koi Water Garden Ltd
<a href="http://www.koicymru.co.uk">www.koicymru.co.uk</a>	Koi Cymru
<a href="http://www.ornamentalfish.org">www.ornamentalfish.org</a>	Ornamental Aquatic Trade Association
<a href="http://www.wildlifeservices.co.uk">www.wildlifeservices.co.uk</a>	Wildlife and Countryside Services

## Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are ...
<b>Independent enquirers</b>	exploring environmental and physical factors influencing the location of an ornamental pool and water features
<b>Creative thinkers</b>	suggesting factors influencing the location of an ornamental pool and water features in a given situation
<b>Reflective learners</b>	considering environmental and physical factors influencing the location of an ornamental pool and water features in a given situation
<b>Team workers</b>	working with others when constructing an ornamental pool
<b>Self-managers</b>	managing own time and resources when constructing an ornamental pool
<b>Effective participators</b>	suggesting adaptations when constructing an ornamental pool.