

Unit 26: Construct and Restore Walls

Unit code	D/600/9950
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit aims to provide learners with an understanding of how to construct and maintain walls 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 landscape sector is now a major employer within the horticultural industry, and employees need to have a range of skills and a sound knowledge of construction techniques as well as good horticultural skills. This unit will help learners develop a sound knowledge of materials and techniques required for the construction of walls on a landscape project. The safe working environment will be emphasised at all times.

Learners will look closely at the skills needed to construct external walls within a variety of landscape settings. Demonstration of the different practical skills required when setting out, excavating, laying foundations, constructing walls and their finishes are also covered. They will develop their understanding of the technical requirements of walls constructed as landscape features. Design requirements for stable structures, calculating material quantities, aesthetic requirements and the range of construction materials are explored in detail.

Learners will investigate the procedures and practices involved in wall restoration and maintenance. They will develop their ability to evaluate existing landscape features and the practical skills required for the maintenance and repair of a range of structures.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to construct outdoor walls
- 2 Understand the construction of outdoor walls
- 3 Be able to restore a wall.

Unit content

1 Be able to construct outdoor walls

Construction of simple walls: working from prepared plan and cross sectional drawings construct simple walls using appropriated materials in keeping with site requirements (timber, brick, block or stone etc); use of the correct construction and component terminology and techniques; adherence to health and safety requirements; risk assessments; personal protective equipment (PPE)

Skills and techniques: required to construct the wall effectively eg setting out establishing line and excavation levels; construction of foundations and footings; using stone, brick or block work to construct a simple wall; use DPC, cut and lay copings; undertake pointing; complete site groundwork.

Health and safety: staff training eg certificates of competence for equipment; risk assessment; site practice; current relevant legislation and codes or practice eg Control of Substances Hazardous to Health (COSHH) Regulations 2002, Health and Safety at Work Act 1974

2 Understand the construction of outdoor walls

Construction techniques: freestanding and retaining walls; mortared walls eg brick, block work; un-mortared walls eg dry stone walling, timber; correct component terminology; mortar mixes; bonds; expansion joints; copings and methods of pointing; methods of testing walls for safety, stability and durability; common faults (settlement of foundations, frost damage to walling units or joints, general weathering and wear, damaged or loose units such as copings, damaged or blocked drainage elements, damage due to thermal expansion or contraction of walling, excessive loading on retaining walls, failure of damp proof course)

Substructures: footings and foundations; weep hole and drainage; temporary site structures: reducing unwanted damage, health and safety; risk assessments; PPE

3 Be able to restore a wall

Planning to restore or maintain walls: working from agreed maintenance plan; checking for stability and fault finding; using appropriated materials in keeping with site requirements; identifying the correct maintenance techniques; adhering to health and safety requirements; risk assessments; PPE

Maintenance and repair techniques: techniques for brick, blockwork, stone walling; general maintenance (eg due to weathering, frost or pollution damage); Safe use of cleaning and cutting equipment; temporary site structures, reducing unwanted damage, health and safety; risk assessments; PPE

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:
P1 prepare effective footings [TW, EP]	M1 construct freestanding walls to agreed specifications	
P2 construct free-standing walls [TW]		
P3 describe the security of the site and protection of the work until it is fit for use		
P4 comply with current legislation during construction work		
P5 evaluate construction techniques and specifications for brick walls, stone walls, dry stone walls and retaining walls	M2 examine typical faults relating to the appearance and stability of given walls	D1 compare construction details for selected freestanding walls
P6 evaluate the uses of different bonds for walls, including stretcher, English, Flemish, Garden Wall, Open and Random		D2 compare construction details for selected retained walls.
P7 identify potential sources of waste, adverse environmental impact and methods to minimise and optimise these [CT]		
P8 explain typical site problems and contingencies for dealing with them [CT]		

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:
P9 assess the condition of a wall	M3 comprehensively assess and recommend restoration for a given wall	
P10 estimate the requirements for restoration		
P11 restore a wall	M4 restore a wall to meet all given objectives.	
P12 describe methods of testing the safety, stability and durability of walls		
P13 summarise the health and safety legislation and codes of practice pertinent to the construction and restoration of walls.		

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.

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

Essential guidance for tutors

Delivery

Tutors are encouraged to use a wide range of techniques in delivering this unit. Lectures, discussions, site visits, supervised landscape practicals should all be used to stimulate and educate learners. Independent study, the use of internet and/or library-based research, and reflection on industry experience would all be suitable.

Learners must have the opportunity to undertake setting out and construction techniques, individually or as part of a small construction team. At all times it is essential that tutors stress the importance of sound construction techniques, environment management and the need to manage the tasks using safe and legal methods.

Health and safety issues relating to working with tools and equipment must be stressed and reinforced regularly, and risk assessments must be undertaken before any practical activities. Adequate PPE must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments learners are taking as part of their programme of study.

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 Tutor introduces the practical activities, work ethics, standards and general health and safety.
Assignment 1: Constructing a Wall 1 (P1, P2, P3, P4, M1) Marking out and preparing foundations and footings.
Practical activity 2 Construction of a freestanding wall in brick to agreed standards and specifications.
Practical activity 3 Construction of a freestanding wall in block or stone to agreed standards and specifications.
Theory session: introduction to the range of walling materials, technical terms and their construction specification.
Assignment 3 (P5, P6, P7, P8, M2, D1, D2). Review and evaluation of constructional requirements for retaining walls using a range of landscape materials. Tutor introduces the assignment brief and provides guidance.
Theory session: introduction to the maintenance requirements and testing of freestanding and retaining walls.
Learner research, reflection on and evaluation of constructional techniques and produce report.

Topic and suggested assignments/activities and/assessment

Assignment 2 : Restoration of Walls (P9, P10, P11, P12, P13, M3, M4)

Plan and undertake maintenance activities to improve the appearance and stability of a freestanding or retaining wall to agreed standards and specifications.

Learner research, reflection on and evaluation of constructional techniques and produce report.

Provide feedback to individuals or construction teams, identifying strengths and areas for improvement in relation to practical skills development.

Theory session: discussion workshops on environmental impact of landscape activities.

Site visits to landscape projects, manufacturers and suppliers.

Unit review.

Assessment

For P1, learners must prepare effective footings. This could link to a project for P2 and must include any associated site preparation within a landscape scheme. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners. P1 could also be linked with P3 and P4 to form an extended practical activity. P2 requires learners to construct vertical features or freestanding walls. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners. Learners should carry out scaling from a plan and setting out and construction of vertical structures. This includes the installation of associated foundations within a landscape scheme. P3 requires learners to demonstrate an understanding of procedures related to site security and protection of work. P4 requires learners to demonstrate compliance with relevant current legislation relating to their construction work. This must include compliance with health and safety issues related to landscape construction projects and practical risk assessments for practical tasks. These criteria could be assessed directly by the tutor during practical activities using observation records, witness statements or supportive questions.

P5, P6, P7 and P8 require learners to provide information on the construction techniques and specifications for different wall types, uses of different bonds commonly used in wall construction, typical problems on site and management of waste and environmental impact. This must cover the importance to the stability and aesthetic requirements of the structure. Evidence for these criteria could be in the form of a presentation, assignment or report based on practical activities carried out for other criteria.

P9, P10, P11, P12 and P13 require learners to carry out restoration on vertical features. These criteria could be assessed directly by the tutor during practical activities using observation records, witness statements or supportive questions.

M1 is an extension of P1 and P2 as learners demonstrate construction that fully meets given objectives based on accuracy, quality of finish and keeping to timescales. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners.

M2 requires learners to investigate faults relating to the appearance and stability of walls. Faults must include settlement of foundations, frost damage to walling units or joints, general weathering and wear, damaged or loose units such as copings, damaged or blocked drainage elements, damage due to thermal expansion or contraction of walling, excessive loading on retaining walls, failure of damp proof course. Evidence could be linked to assessment for P9

M3 requires learners to comprehensively assess the condition and extent of damage to a walling structure and recommend remedial action required to ensure the stability and appearance of the wall. For M4 restoration objectives must include good planning, accuracy, quality of finish and keeping to timescales.

P5 requires learners to compare the construction details for selected freestanding walls. Tutors should identify the range of walling materials or agree them through discussion with learners. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners. This should include

the use of specifications and detail plans, British Standards and the correct use of terminology to show how complex vertical features are constructed.

D2 requires learners to compare the construction details for retaining walls, including methods of enhancing their structural stability. Tutors should identify the range of walling materials or agree them through discussion with learners. Where possible, to ensure assessment is fair the size and complexity of the tasks should be the same for all learners. This should include the use of specifications and detail plans, British Standards and the correct use of terminology to show how complex vertical features are constructed.

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, P3, P4, M1	Constructing a Wall	Mark out and construct a garden or retaining wall.	Practical with supportive reporting evidence.
P9, P10, P11, P12, P13, M3, M4	Restoration of Walls	Examine, plan and undertake a programme of maintenance to a retaining or freestanding wall.	Practical with supportive reporting evidence.
P5, P6, P7, P8, M2, D1, D2	Principles of Wall Construction	Research and produce a detailed report on the construction techniques, methods and materials associated with the construction of walls.	Practical with supportive reporting evidence. Portfolio. Poster. Project. Presentation.

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
Participate in Providing Estate Maintenance	L23 Prepare sites for landscape construction and installation
	L24 Construct hard landscape components
	CU20 Maintain and repair structures and surfaces
	Understand the Principles and Practices of Landscape and Garden Design
	Construct and Maintain Timber Landscape Features
	Construct and Maintain Decorative Landscape Features

Essential resources

Learners will need access to appropriate facilities, tools and landscape materials to undertake the practical activities. These facilities may be within a workshop environment or on actual landscape projects. Site safety signage and equipment and PPE must be available and used throughout the practicals

Employer engagement and vocational contexts

This unit focuses on practical aspects of wall construction and maintenance within a landscape setting and will also give learners the background knowledge relating to a variety of construction skills, techniques, health and safety and legislation requirements. Centres are encouraged to create and develop links with local landscape and building contractors, architects and local authorities, via guest lectures, workshops or visits to see landscape construction in action.

Indicative reading for learners

Textbooks

Blake J – *Introduction to Landscape Design and Construction* (Gower Publishing, 1999) ISBN 978-0566077692

Fortlage C and Phillips E – *Landscape Construction: Earth and Water Retaining Structures, Volume 3* (Ashgate Publishing group, 2001) ISBN 0566090430

Littlewood M – *Landscape Detailing: Structures, Third Edition* (Architectural Press, 1997) ISBN 0750623209

Nash W – *Brickwork, Third Edition* (Nelson Thornes, 1991) ISBN 978-0748703104

Journals

Horticulture Week

Landscape Review

The Landscaper

Websites

www.ced.ltd.uk Civil Engineering Developments Limited

www.hse.gov.uk Health and Safety Executive

www.ibstock.com Ibstock Brick Limited

www.marshalls.co.uk Marshalls

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 ...
Independent enquirers	researching landscape materials and their specifications researching current legislation regarding health and safety, environmental or sustainability issues
Creative thinkers	applying techniques and knowledge while problem solving management issues relating to environmental impact and maintenance requirements
Team workers	undertaking the practical activities of marking out construction and maintenance within a team maintaining the health and safety of others
Effective participators	participating safely in practical team activities and applying the techniques and skills learned from previous activities.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Independent enquirers	researching specification requirements of wall construction legislation regarding on site health and safety rules and regulations investigating the maintenance requirements of walls
Creative thinkers	applying knowledge to solve technical structural or maintenance problems
Reflective learners	analysing their own skills while participating in a group or an individual practical activity and identifying strengths and areas for improvement identifying development targets for improving practical skills and quality of work
Team workers	participating in team activities in the marking out or construction of a wall
Self-managers	meeting assignment deadlines and participating in practical activities within agreed timeframes
Effective participators	participating in practical team activities and applying the techniques, skills and knowledge learned in previous practical sessions.

● Functional Skills — Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching the internet for information on health and safety, material specification, appropriate to the construction of walls
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	calculating quantities of materials for the construction of walls and foundations using mathematical formulae to calculate loadings on retaining walls
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting research findings on key issues relating to the construction of walls to the group, including issues of health and safety, material and design selection, problem solving or repair and maintenance reports participating fully within a team, communicating with other members to ensure the smooth running of a landscape operation.