



# **Agriculture, Environmental and Animal Care: Agriculture, land management and production**

**T Level outline content: draft version**

**June 2020**

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# Introduction

## Outline content

This outline content has been produced by [T Level panels](#) of employers, professional bodies and providers, and is based on the same standards as those used for apprenticeships. The outline content will form the basis of the specifications for T Level Technical Qualifications, which will be developed by awarding organisations for approval by the Institute for Apprenticeships and Technical Education. One awarding organisation will be appointed to develop and deliver each Technical Qualification following a procurement process.

Colleges and other education and training providers will decide how to structure the T Level courses they offer, based on the qualification specifications. This will enable them to deliver the study programme's mandatory components in the most effective way for students.

A T Level programme consists of a Technical Qualification, substantial industry placement, English and maths, and other occupation-specific requirements where essential for entry to skilled employment. This outline content relates solely to the Technical Qualification part of a T Level programme.

Further information about T Levels is available on the website of the Institute for Apprenticeships and Technical Education here: [www.instituteforapprenticeships.org](http://www.instituteforapprenticeships.org), and at [www.education.gov.uk](http://www.education.gov.uk).

# **Agriculture, Environmental and Animal Care: Agriculture, land management and production pathway**

Awarding organisations will need to ensure that students have an up-to-date knowledge of the legal and regulatory obligations relating to employment in the occupations relevant to the T Level and understand the practical implication of these on their work.

Maths, English and digital skills are set out in a separate annex. Awarding organisations should integrate these within the qualification so that they are applied in occupationally relevant contexts.

## **Core content**

The core content relates to the whole route 'route core'. The core knowledge and understanding is assessed through an examination and core skills through a practical employer-set project.

The core knowledge and understanding focuses on the students' knowledge and understanding of contexts, concepts, theories and principles relevant to the T Level. This could include, where appropriate, assessment of knowledge and understanding relevant to the route and the pathway.

The employer-set project provides the opportunity to develop and apply a minimum range of core skills important for employability. The allocation of content to each type of assessment will need to be approved by the Institute for Apprenticeships and Technical Education.

## Core knowledge and understanding across Agriculture, Environmental and Animal Care Route

Element	Content
Sustainability	<p data-bbox="470 338 1125 376">Key requirements of environmental legislation</p> <ul data-bbox="518 405 1348 488" style="list-style-type: none"> <li data-bbox="518 405 1348 488">• associated obligations for businesses, their employees and other stakeholders.</li> </ul> <p data-bbox="470 517 1236 555">Key government environmental policies and initiatives</p> <ul data-bbox="518 584 1316 757" style="list-style-type: none"> <li data-bbox="518 584 1316 667">• the opportunities and risks they bring to agriculture, environmental and animal care sector</li> <li data-bbox="518 674 1316 757">• the associated environmental performance measure e.g. water and energy use.</li> </ul> <p data-bbox="470 786 1053 824">The concept of sustainable development</p> <ul data-bbox="518 853 1364 1115" style="list-style-type: none"> <li data-bbox="518 853 1364 936">• sustainable development goals at a macro (national and international) and micro (business) level</li> <li data-bbox="518 943 1364 1070">• types of sustainable solutions to meet development goals including social, environmental, economic and human</li> <li data-bbox="518 1077 1364 1115">• concerns and expectations of key stakeholders.</li> </ul> <p data-bbox="470 1144 1348 1227">The concept of climate change and scientific views on causes and impacts</p> <ul data-bbox="518 1256 1364 1473" style="list-style-type: none"> <li data-bbox="518 1256 1364 1384">• the impact of increased rainfall and higher temperatures upon environments, conservation practices, habitats, flora, fauna and water levels</li> <li data-bbox="518 1391 1364 1473">• policies and initiatives to manage these changes at national and local level.</li> </ul> <p data-bbox="470 1503 1316 1541">Waste management principles (e.g. recycle, reduce, reuse)</p> <ul data-bbox="518 1570 1316 1787" style="list-style-type: none"> <li data-bbox="518 1570 1316 1608">• key requirements of associated legislation</li> <li data-bbox="518 1615 1316 1697">• types of materials that require specific actions (e.g. asbestos)</li> <li data-bbox="518 1704 1316 1787">• measures in place by the sector and organisation to meet requirements.</li> </ul>

<p>Biosecurity</p>	<p>Principles of biosecurity</p> <ul style="list-style-type: none"> <li>• factors influencing biosecurity e.g. international trade, new technologies</li> <li>• biosecurity risk factors in different types of agriculture, environmental and animal care situations</li> <li>• biosecurity measures including inspection, monitoring, regulation, passports, isolation and their importance in maintaining health production and service environments.</li> </ul>
<p>Working in the agriculture, environmental and animal care sector</p>	<p>Employment rights and responsibilities (e.g. union membership, working hours) of the employer and employee</p> <ul style="list-style-type: none"> <li>• expectations of professional conduct and behaviours in the workplace (including punctuality, cleanliness, respect for own and others work and work area, respect for the land, property and belongings of others (including animals)</li> <li>• typical activities that can lead to disciplinary and grievance procedures</li> <li>• how these expectations are met and demonstrated by employees.</li> </ul> <p>Principles of effective teamwork</p> <ul style="list-style-type: none"> <li>• how teams are developed, including the role of the team leader</li> <li>• team dynamics and how they are managed, and behaviours influenced</li> <li>• qualities of effective team members and team leaders and how these qualities are demonstrated</li> <li>• the importance of team work to team and project performance</li> <li>• techniques used to monitor and manage individual and team performance e.g. goal and objective setting, performance management reviews, providing constructive feedback</li> <li>• techniques used to manage team conflict (e.g. mediation) and when and how they should be applied.</li> </ul>

<p>Working in the agriculture, environmental and animal care sector (continued)</p>	<p>Progression opportunities which exist within the agriculture, environmental and animal care sector</p> <ul style="list-style-type: none"> <li>• the purpose of continuing professional development (CPD) and the benefits it brings to the individual and their employer</li> <li>• methods of personal and professional development (e.g. coaching, independent research) and the types of organisations that can provide this type of support, including professional bodies.</li> <li>• their suitability for achieving planned outcomes.</li> </ul>
<p>Ethics</p>	<p>Ethical principles (e.g. honesty, transparency, justice)</p> <ul style="list-style-type: none"> <li>• how these are used in codes of conduct, employment terms and conditions and workplace policies</li> <li>• how these are represented by ethical behaviours</li> <li>• how these are incorporated into business ethics</li> <li>• how these impact on business operations, including interaction with stakeholders and the supply chain.</li> </ul>
<p>Supply Chain</p>	<p>The supply chain</p> <ul style="list-style-type: none"> <li>• different types of organisations involved and their role</li> <li>• different ways in which the supply chain is sequenced and operates</li> <li>• implications of failing to meet supply chain demands</li> <li>• environmental impact of the supply chain including whole life cycle of a product</li> <li>• types of procurement (e.g. competitive bidding, direct purchase) and their suitability for different situations.</li> </ul> <p>Principles of stock management (including stock rotation, storage, conditions, monitoring stock levels, ordering stock, dealing with deliveries, maintaining records)</p> <ul style="list-style-type: none"> <li>• how they are applied in different types of business</li> <li>• implications to businesses of ineffective processes.</li> </ul>

Business	<p>The types of business organisations e.g. sole trader, partnership, limited company, not for profit</p> <ul style="list-style-type: none"> <li>• common business structures and hierarchies</li> <li>• the financial, legal and commercial implications of type of business</li> <li>• typical organisational policies and their relationship to legislation</li> <li>• types of business objectives and values associated with different business structures.</li> </ul> <p>The principles of enterprise skills e.g. risk taking, innovation, resilience</p> <ul style="list-style-type: none"> <li>• how they are applied to develop business growth and change including sales opportunities and diversification of the business</li> <li>• types of business risk (e.g. financial, reputational) and risk management methods that can be deployed.</li> </ul> <p>How businesses measure success (including Key Performance Indicators (KPIs), Service Level Agreements (SLAs), benchmarking, supply chain requirements)</p> <ul style="list-style-type: none"> <li>• the information used to determine if success measures are met</li> <li>• quality standards, quality control and quality assurance <ul style="list-style-type: none"> <li>○ their purpose, differences and application to organisations quality standards expected by internal and external stakeholders and associated quality assurance requirements e.g. audits.</li> </ul> </li> </ul> <p>The principles of project management (including purpose and scope of the project, milestones and timescales, supply chain, people management, resources, budgeting).</p>
Equality	<p>Factors to consider (including equality legislation, cultural differences, religious needs) when working with people from diverse backgrounds and cultures</p> <ul style="list-style-type: none"> <li>• how to show empathy and respect to those from different backgrounds and cultures to our own</li> <li>• acceptable and unacceptable behaviours and language.</li> </ul> <p>Characteristics protected by equality legislation.</p>



Communication	<p>Different types of communication (including verbal, non-verbal and digital)</p> <ul style="list-style-type: none"> <li>• the formats used for the types of communication (e.g. business reports, emails, letters, websites) and associated business conventions</li> <li>• the types and value of images and visual aids to support written text and oral presentations</li> <li>• their suitability for different purposes and audiences</li> <li>• the importance of spoken language, body language and tone in communication and how each is used to convey different messages to different audiences for different purposes</li> <li>• the benefits and limitations of social media including risk of misuse, promoting the business.</li> </ul>
Relationship Management	<p>Principles of customer care (including first impressions, representing business and self, supporting customers, the difference between customer wants and needs, the importance of accurate knowledge, working to an expected timescale)</p> <ul style="list-style-type: none"> <li>• how these can be applied when dealing with different stakeholders, including internal customers</li> <li>• legal requirements (including legislation relating to consumer protection) when interacting with different types of customers and customer relationships including business to business (B2B)</li> <li>• typical procedures used to deal with customer disputes and complaints, including escalation to relevant individuals and departments</li> <li>• how to apply customer service principles and the benefits to the individual (e.g. increased motivation, positive feedback) and business (e.g. customer loyalty, customer confidence).</li> </ul> <p>Roles of different stakeholders including internal and external customers</p> <ul style="list-style-type: none"> <li>• their expectations</li> <li>• interrelationships between stakeholders.</li> </ul>

Finance	<p>The concept of profit</p> <ul style="list-style-type: none"> <li>• types of profit (including net and gross) and significance of each to business success</li> <li>• types of cost incurred by business (products, ancillary products, types of overheads, labour), their classifications (direct, indirect, fixed, variable)</li> <li>• measures used to reduce costs and implications of using these to profitability, reputation and quality</li> <li>• types of taxation (including payroll, business)</li> <li>• how costs and revenue are forecast</li> <li>• how profit is calculated.</li> </ul>
Health and Safety	<p>Key requirements of health and safety legislation e.g. for lone working, safe manual handling</p> <ul style="list-style-type: none"> <li>• the respective duties imposed on employees and employers</li> <li>• the importance of taking personal responsibility for health and safety of self and others</li> <li>• the techniques and methods used to comply with legislation e.g. use of Personal Protective Equipment (PPE), regular communication with lone workers.</li> </ul> <p>The purpose of risk assessments</p> <ul style="list-style-type: none"> <li>• typical structures and content</li> <li>• how they are developed and used</li> <li>• implications for poor development and application.</li> </ul> <p>Hazards and risks associated with working in the agriculture, environmental and animal care sector (e.g. working with hazardous materials, lone working)</p> <ul style="list-style-type: none"> <li>• typical control measures in place to minimise risks, including the types of PPE used, fatigue and stress management for lone workers.</li> </ul> <p>Procedures to follow when dealing with emergency situations e.g. spilt cleaning materials, slurry exposure, flooding.</p>

Information and data	<p>Key requirements of legislation relating to the security of information and data</p> <ul style="list-style-type: none"><li>• types of information and data protected by legislation including client data, intellectual property</li><li>• methods used by businesses to manage information and data including version control, access controls, indexing, cyber security.</li></ul>
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## Employer-set project

The employer-set project ensures students have the opportunity to combine core knowledge and skills to develop a substantial piece of work in response to an employer-set brief. The employer-set project forms part of the Technical Qualification and is a separate part of the T Level programme to the Industry Placement.

To ensure consistency in project scope and demand, awarding organisations will develop assessment objectives, which require students to:

- plan their approach to meeting the brief
- apply core knowledge and skills as appropriate
- select relevant techniques and resources to meet the brief
- use maths, English and digital skills as appropriate
- realise a project outcome and review how well the outcome meets the brief

The awarding organisation will work with a relevant employer or employers, to devise a set brief that:

- ensures a motivating starting point for students' projects, for example, a real-world problem to solve
- ensures students can generate evidence that covers the assessment objectives
- is manageable for providers to deliver
- is officially approved by the awarding organisation and employer

For Agriculture land management production, in achieving the assessment objectives and meeting the brief, students must demonstrate the following core skills:

- **Analysing**
  - e.g. identifying common features of data obtained on options to improve a business' environmental impact, classifying and organising data into types, discerning patterns.
- **Communicating**
  - e.g. using visual and oral methods to engage an audience with proposals for improving representation and diversity in the sector.
- **Critical thinking**
  - e.g. questioning information and data, evaluating pros and cons of the introduction of new machinery or plant into a business, taking out of the whole life cycle.

- **Decision making**

- e.g. identifying likely impact of skills scarcity in the business and using evidence to substantiate conclusions.

- **Investigating**

- e.g. developing search criteria/queries for secondary research and designing and carrying out tests for primary research into the environmental impact of a business.

- **Working in a team**

- e.g. developing and implementing a communication plan for the introduction of a new lone working policy.

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## Occupational Specialist Content

Specialist content is structured into different occupational specialisms, which correspond to the apprenticeship standards listed on the relevant occupational map. Occupational specialisms ensure students develop the knowledge and skills necessary to achieve a level of competence needed to enter employment in the occupational specialism, and are organised around 'performance outcomes' that indicate what the student will be able to do, as a result of learning and applying the specified knowledge and skills.

There are some content areas that are included in both the Core and Occupational Specialism sections, this is intentional. Where in Core, it is because it is content that is applicable to all Agriculture, Environmental and Animal Care students, regardless of the occupational specialism. If the same content is also in the Occupational Specialism, it is because the knowledge and skills need to be developed within the context of the Performance Outcome. In the occupational specialism, it is therefore likely to require different content to reflect the Performance Outcome.

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# Occupational Specialist Content

## Occupational Specialism: Ornamental and environmental horticulture and landscaping

### Performance Outcome 1: Establish ornamental and environmental horticultural areas

Knowledge	Skills
<p><b>Ornamental and environmental horticulture areas</b></p> <p>Types of ornamental and environmental horticultural areas (including public, amenity, botanical, heritage, private)</p> <ul style="list-style-type: none"> <li>• their characteristics</li> <li>• their purposes</li> <li>• similarities and differences</li> <li>• benefits and limitations (including environmental, health and wellbeing, society and community, economic (e.g. employment GDP).</li> </ul> <p>The physical characteristics of a site (including drainage, aspect, topography, exposure and situation (D.A.T.E.S) and its microclimates including</p> <ul style="list-style-type: none"> <li>• information required to determine characteristics and sources used to acquire the information e.g. observation, maps and plans</li> <li>• implications of site characteristics when establishing ornamental and environmental horticultural areas for different situations e.g. to meet a design brief, for plant selection.</li> </ul> <p>Types of common landscaping features including hard (horizontal (e.g. paving,</p>	<p>Interpret maps and garden design plans.</p> <p>Assess existing physical characteristics, challenges and opportunities for establishment of an ornamental and environmental horticultural area.</p> <p>Identify plants through observation of characteristics.</p> <p>Identify plants through use of research tools (e.g. botanical key, internet).</p> <p>Take a soil sample.</p> <p>Analyse a soil sample.</p> <p>Situate garden features aligned to planned design.</p> <p>Carry out primary soil cultivation using hand tools</p> <ul style="list-style-type: none"> <li>• apply organic matter to the soil using a spade or a fork</li> <li>• distribute organic matter on the soil surface</li> <li>• use a spade to remove a spit depth of soil</li> <li>• use a spade to create a trench</li> <li>• use a wheelbarrow to move soil</li> <li>• turn over the soil with a spade.</li> </ul>

<p>paths), vertical (e.g. walls, fencing), structures) and soft (including planting beds, turf, trees, shrubs, rock gardens, water features)</p> <ul style="list-style-type: none"> <li>• their purposes</li> <li>• different types</li> <li>• their suitability for different sites and horticultural situations including different aesthetic schemes, heritage styles and maintenance requirements</li> <li>• implications for establishing ornamental and environmental horticultural areas.</li> </ul> <p><b>Environmental</b></p> <p>The potential positive and negative impacts of establishing ornamental and environmental horticultural areas including on flora, fauna, habitats (including human)</p> <ul style="list-style-type: none"> <li>• measures used to minimise and mitigate for negative impacts</li> <li>• measures used to maximise positive impacts.</li> </ul> <p>Factors (e.g. objectives for horticultural area, business values, biosecurity) that influence sourcing of plants and related materials</p> <ul style="list-style-type: none"> <li>• how provenance of plants and related materials are verified</li> <li>• the economic, environmental and social importance of responsible plant sourcing.</li> </ul> <p>Plant species protected by legislation</p> <ul style="list-style-type: none"> <li>• the potential impact of establishing ornamental and environmental horticultural areas</li> </ul>	<p>Carry out secondary soil cultivation using hand tools</p> <ul style="list-style-type: none"> <li>• roughly level soil</li> <li>• level soil</li> <li>• create a tilth suitable for purpose.</li> </ul> <p>Identify hazards on site.</p> <p>Set out shapes from a plan including an irregular shape.</p> <p>Use hand tools to remove weeds from cultivated areas.</p> <p>Use a mechanical device to remove weeds from a cultivated area.</p> <p>Sow in open ground using hand tools:</p> <ul style="list-style-type: none"> <li>• set out a straight line with a string or other marker</li> <li>• create a drill (furrow) for continuous sowing</li> <li>• create holes for station sowing</li> <li>• sow seeds, bulbs and/or tubers for determined spacing, depth, orientation</li> <li>• cover seeds with soil</li> <li>• label seed planting</li> <li>• irrigate seeds</li> <li>• erect supports for seedlings and / or plants</li> <li>• apply protection for seedlings / plants</li> <li>• remove weeds from a seed bed</li> <li>• broadcast turf seed for determined rate.</li> </ul> <p>Calculate sowing requirements for seeds / tubers and / or tubers.</p>
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<p>on protected species</p> <ul style="list-style-type: none"> <li>• how to mitigate for negative impacts of establishing ornamental and environmental horticultural areas on protected species</li> <li>• actions required when protected species are identified, including reporting procedures.</li> </ul> <p>Types of invasive plant species established by legislation that can be encountered when establishing ornamental and environmental horticultural areas</p> <ul style="list-style-type: none"> <li>• characteristics that enable identification in an environment</li> <li>• implications of finding invasive species in an environment to establishing ornamental and environmental horticultural areas</li> <li>• how to mitigate for invasive species in an environment when planning for and establishing ornamental and environmental horticultural areas.</li> </ul> <p><b>Plant identification and classification</b></p> <p>Plant classification (including families, genera, species, varieties, cultivars, both botanical and legal)</p> <ul style="list-style-type: none"> <li>• the format for scientific names according to the international code of nomenclature</li> <li>• characteristics and morphology that can be used to classify plants</li> <li>• the techniques (e.g. observation,</li> </ul>	<p>Plant in open ground</p> <ul style="list-style-type: none"> <li>• mark out the site with planting areas</li> <li>• make a hole with a hand tool</li> <li>• insert plant</li> <li>• firm in plants adequately.</li> </ul> <p>Plant a tree in open ground</p> <ul style="list-style-type: none"> <li>• assess the quality of a tree for planting</li> <li>• dig a hole for tree planting</li> <li>• loosen the sides of the planting pit</li> <li>• appropriately loosen the roots of the tree</li> <li>• position the tree in the planting pit</li> <li>• spread out the roots</li> <li>• fill in the hole with soil</li> <li>• firm the tree into the hole</li> <li>• stake the tree</li> <li>• apply a tree tie</li> <li>• apply pest guards to the tree</li> <li>• irrigate the tree</li> <li>• mulch the tree.</li> </ul> <p>Lay turf</p> <ul style="list-style-type: none"> <li>• create a fine soil tilth with hand tools</li> <li>• lay turf onto soil</li> <li>• butt joints together</li> <li>• stagger joints in subsequent rows</li> </ul>
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<p>botanical keys) and information sources (e.g. internet and books) used to identify plants</p> <ul style="list-style-type: none"> <li>• implications for inaccurate classification and use of scientific names</li> <li>• the purpose and uses of plant records.</li> </ul> <p>Types of plants including monoecious, dioecious, evergreen, deciduous, hardy, tender, annuals, biennials, perennials, herbaceous, shrubs, trees</p> <ul style="list-style-type: none"> <li>• their key characteristics including physical characteristics, lifecycle,</li> <li>• their contribution to ornamental and environmental horticultural areas</li> <li>• implications for inclusion in ornamental and environmental horticultural areas.</li> </ul> <p><b>Plant Growth and Development</b></p> <p>The physical structure of plants (including roots, stems, leaves, flowers, buds, bulbs, tubers, fruit, seeds)</p> <ul style="list-style-type: none"> <li>• their functions</li> <li>• their morphology.</li> </ul> <p>Physical processes involved in plant growth</p> <ul style="list-style-type: none"> <li>• including germination, photosynthesis, respiration and transpiration</li> <li>• how these affect plant establishment and growth.</li> </ul> <p>Environmental factors which affect plant growth</p> <ul style="list-style-type: none"> <li>• including microclimate, light,</li> </ul>	<ul style="list-style-type: none"> <li>• firm the turves</li> <li>• fill cracks with top dressing</li> <li>• trim turf with hand tools</li> <li>• cover outer edges of turf with soil</li> <li>• irrigate turf</li> </ul> <p>Assess health and safety risks.</p> <p>Apply health and safety controls to activities.</p> <p>Use rules and formulae to set out shapes and measurements.</p> <p>Measure with precision.</p> <p>Assess biosecurity risks.</p> <p>Model appropriate behaviour.</p>
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irrigation, nutrients, site specific (including boggy, marginal, aquatic, dry, sunny, shady, sheltered, exposed, frost pockets)

- how environmental factors can be applied to the manipulation of indoor and outdoor plant establishment environments
- issues arising in plant establishment and growth as a result of sub-optimal growing environments
- how these issues are identified
- techniques used to remedy these issues.

### **Soils**

Soil types (including loams, clays, silts, sands, organics) and their textures

- their characteristics (including pH, nutrient availability and cation exchange, drainage and water holding capacity, organic matter and living organisms in the soil, colour and heat retention, ease of cultivation, existing pollutants, horizons)
- techniques used to take a soil sample including the W method
- techniques used to determine soil characteristics including texture testing, pH testing, digging a profile pit, a feel test
- how soil characteristics affect suitability for different types of plants in different types of ornamental and environmental horticultural areas

- how previous land use affects characteristics.

Types of soil cultivation (including primary, secondary, no dig)

- their purpose
- manual and mechanical techniques involved
- their suitability and scheduling for different types of soil and pan removal
- and how they are applied for creating different types of tilth required for seeding, turfing and planting.

Soil amelioration methods (e.g. liming, use of hydrogels and mycorrhizae)

- how they are used for structure remediation
- how they are used for pH remediation
- their suitability for the soil and optimum plant establishment.

### **Establishing ornamental and environmental horticultural areas**

How a site operates

- private and public realm considerations
- logistics of transportation, access, delivery, storage, utilities, signage and use of people, materials and equipment
- the importance of keeping a site clear and clean
- implications of exceeding optimum time on cleaning
- implications for the relationship

with client/customer, public and other colleagues.

Techniques (including offsetting, triangulation, electronic plotting) used to set out (including straight lines, curves, circles) an ornamental and environmental horticultural area

- how the techniques are applied accurately, safely and effectively including processes involved, equipment required, information and data required
- suitability of techniques for different environments and landscape features.

Utilities that may be located in the environment

- how they affect establishment plans and activities
- information that can be used to locate them
- legal requirements.

Types of vegetation that can have an adverse effect on plant establishment

- their characteristics and morphology and how these are used to identify species
- method of spread
- implications for the environment and plant establishment activities.

Methods of vegetation clearance including hand clearance, chemical clearance and mechanical clearance, heat and cold treatment

- legal implications of their use

- their suitability for different sites and purposes when establishing ornamental and environmental horticultural areas.

Considerations for planting (space, depth, orientation, soil, environment, condition and format and quality of stock) of plants (including annual, herbaceous, perennial, shrubs) and trees

- sourcing of plants
- plant stock type and production method
- the processes and techniques to be applied when planting
- how they differ in relation to the environment and different plants.

Processes involved in direct sowing annual and perennial mixes.

Different establishment methods (including seed, turf) for grass areas and benefits and limitations of each.

Types of aftercare (nutrition, irrigation, protection) required to support plant and turf establishment until they gain independence in the landscape.

The different types of turf surfaces

- different uses for turf surfaces
- suitability of grass mixes to achieve objectives.

Techniques (manual and mechanical) used to sow grass seeds

- benefits and limitations
- their suitability for different purposes
- types of equipment and materials

required.

Techniques used to establish areas of grass by turf

- processes to be followed
- types of equipment and materials required.

### **Plant health**

Quality characteristics of healthy plants (including vigour, form, balance, root condition, soil condition, turgidity)

- methods used to identify the characteristics (e.g. observation, records)
- how quality affects planting decisions.

Biosecurity measures (including inspection, monitoring, regulation, plant passports, quarantine) and their application when establishing ornamental and environmental horticultural areas.

Typical pests (e.g. insects, vertebrates) and diseases (fungal, viral, bacterial) in ornamental and environmental horticulture areas

- indicators of their existence
- how they enter horticultural areas
- implications of their existence to establishing ornamental and environmental horticultural areas
- control methods that can be used (including tolerance, cultural control, biological controls, chemical controls) and how these are applied
- factors (including Integrated Pest

Management Systems, impact on non-target species and the environment) that affect decisions about the use of control methods.

Typical plant disorders (e.g. wilting, distortion) resulting from poor planting and aftercare and how to mitigate for these.

Techniques used to monitor the establishment of plants, trees and turf in ornamental and environmental horticultural areas against design specification

- methods used to mitigate for problems and issues identified

### **Business**

The principles of project management (including purpose and scope of the project, milestones and timescales, supply chain, people management, resources, budgeting)

- their application when planning the establishment of ornamental and environmental horticultural areas.

Site management considerations including planning, allocating tasks, monitoring, setting timescales, checking quality, monitoring health and safety, teamwork, employment rights and responsibilities

- how they are applied when managing the establishment of ornamental and environmental horticultural areas.

### **Communication**

Types of plans of ornamental and



<p>environmental horticultural areas (including drawings, sketches, digital plans)</p> <ul style="list-style-type: none"><li>• symbols and conventions to be applied</li><li>• suitability of different types for different audiences and purposes.</li></ul> <p><b>Health and Safety</b></p> <p>Typical hazards associated with the establishment of ornamental and environmental horticultural areas and control measures used to minimise associated risks.</p> <p>Types of PPE available for the establishment of ornamental and environmental horticultural areas</p> <ul style="list-style-type: none"><li>• their purpose</li><li>• implications for poor use.</li></ul> <p><b>Tools, equipment and machinery</b></p> <p>Tools (e.g. spade, trowel), equipment (e.g. wheelbarrow, hoses) and machinery (rotary cultivator, tractor) required for establishing ornamental and environmental horticultural areas</p> <ul style="list-style-type: none"><li>• their characteristics and purposes</li><li>• how they are operated and used accurately, efficiently and safely</li><li>• how they are maintained including cleaning and storage</li><li>• their suitability (including limitations) for different tasks involved in establishing ornamental and environmental horticultural areas.</li></ul>	
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**Performance Outcome 2: Maintain ornamental and environmental horticultural areas**

Knowledge	Skills
<p><b>Ornamental and environmental horticultural areas</b></p> <p>Types of ornamental and environmental horticultural areas (including public, amenity, botanical, heritage, private)</p> <ul style="list-style-type: none"> <li>• their characteristics</li> <li>• their purposes e.g. promote and support wellbeing, conservation, economic</li> <li>• similarities and differences</li> <li>• how the type of ornamental and environmental horticultural area affects maintenance requirements.</li> </ul> <p>The characteristics of a site (including drainage, aspect, topography, exposure and situation (D.A.T.E.S.)) and its microclimates including</p> <ul style="list-style-type: none"> <li>• information required to determine characteristics and sources used to acquire the information e.g. observation, maps and plans</li> <li>• implications of site characteristics when maintaining ornamental and environmental horticultural areas for different situations e.g. for different types of ornamental and environment horticultural areas, for different microclimates.</li> </ul> <p>Types of common landscaping features including hard (horizontal (e.g. paving, paths), vertical (e.g. walls, fencing), structures) and soft (including planting beds, turf, trees, shrubs, rock gardens,</p>	<p>Apply mulch to an area.</p> <p>Mow an area of turf in straight lines using a rotary mower.</p> <p>Improve the health of the turf surface mechanically e.g. aerate, scarify.</p> <p>Irrigate plants with a hose.</p> <p>Prune a hedge with a hedge trimmer.</p> <p>Make a clean cut with secateurs.</p> <p>Make a clean cut with pruning shears.</p> <p>Prune a plant to encourage winter stem colour.</p> <p>Prune a plant to maintain its natural form.</p> <p>Remove annual weeds by hoeing.</p> <p>Remove perennial weeds by digging.</p> <p>Assess the health of plants.</p> <p>Assess risks to plant health e.g. pests, environmental conditions.</p> <p>Assess maintenance requirements for hard and soft landscaping features in a given area.</p> <p>Identify discrete steps involved in completing a complex task.</p> <p>Sequence and prioritise steps.</p> <p>Allocate resources (time, equipment, materials) to steps.</p> <p>Optimise work processes.</p> <p>Manage own time to meet objectives.</p>

water features)

- their purposes
- different types
- implications for maintenance of ornamental and environmental horticultural areas.

### **Environmental**

The potential sources of negative impacts of maintaining ornamental and environmental horticultural areas including on flora, fauna, habitats (including human)

- environmental protection measures used to minimise and mitigate for negative impacts when planning and carrying out maintenance activities
- measures used to maximise positive impacts.

Factors (e.g. objectives for horticultural area, business values, biosecurity) that influence sourcing of materials used for maintenance of ornamental and horticultural areas

- how provenance of materials is verified.

Plant species protected by legislation

- the potential impact of maintaining ornamental and environmental horticultural areas on protected species
- how to mitigate for negative impacts of maintaining ornamental and environmental horticultural areas on protected species
- actions required when protected

species are identified, including reporting procedures.

Types of invasive plant species established by legislation that can be encountered when maintaining ornamental and environmental horticultural areas

- characteristics that enable identification in an environment
- implications of finding invasive species in an environment to maintenance of ornamental and environmental horticultural areas
- how to mitigate for invasive species in an environment when maintaining ornamental and environmental horticultural areas.

### **Plant identification and classification**

Plant classification (including families, genera, species, varieties, cultivars, both botanical and legal)

- the format for scientific names according to the international code of nomenclature
- characteristics and morphology that can be used to classify plants
- the techniques (e.g. observation, botanical keys) and information sources (e.g. internet and books) used to identify plants
- implications for inaccurate classification and use of scientific names when maintaining ornamental and environmental horticultural areas.

Types of plants including monoecious, dioecious, evergreen, deciduous, hardy,

tender, annuals, biennials, perennials, herbaceous, shrubs, trees

- their key characteristics including physical characteristics, lifecycle,
- implications for their maintenance in ornamental and environmental horticultural areas.

### **Plant Growth and Development**

The physical structure of plants (including roots, stems, leaves, flowers, buds, bulbs, tubers, fruit, seeds)

- their functions
- their morphology.

Physical processes involved in plant growth

- including photosynthesis, respiration and transpiration
- how these affect plant growth and development
- how maintenance activities affect physical processes.

Environmental factors which affect plant growth

- including microclimate, light, irrigation, nutrients, site specific (including boggy, marginal, aquatic, dry, sunny, shady, sheltered, exposed, frost pockets)
- issues arising in plant establishment and growth as a result of sub-optimal growing environments
- how these issues are identified
- techniques used to remedy these issues and how these are

incorporated into maintenance planning.

### **Soils**

Soil types (including loams, clays, silts, sands, organics) and their textures

- their characteristics (including pH, nutrient availability and cation exchange, drainage and water holding capacity, organic matter and living organisms in the soil, colour and heat retention, ease of cultivation, existing pollutants, horizons)
- techniques used to take a soil sample including the W method
- techniques used to determine soil characteristics including texture testing, pH testing, digging a profile pit, a feel test
- how soil characteristics affect plant health.

Soil enhancement methods including but not limited to mulching

- different types of mulches, their properties, benefits and limitations of use
- how they are used to enhance soil condition and maintain plant health
- their suitability for use with different soils in different seasons.

### **Maintaining ornamental and environmental horticultural areas**

Types of maintenance e.g. planned, reactive and their suitability for different situations and environments

- the purpose of planned maintenance
- the content and formats of planned maintenance programmes
- documentation required for maintenance and verification of maintenance activities
- types of actions required when issues are identified and implications to the environment and the business.

Types of maintenance activities including for

- turf (including mowing, scarification, aeration, repair)
- trees and shrubs (including pruning) to meet specific objectives e.g. winter colour, safety
- plants (including feeding, irrigation)
- hard landscaping (e.g. painting, repairs to fencing)
- the purpose of the activities e.g. aesthetics, to support establishment and growth
- times when activities should be undertaken for different types of features in different types of ornamental and environmental horticultural areas
- how planned maintenance activities differ for low maintenance, limited access, limited resource, high profile areas and different types of ornamental and environmental

horticultural areas

- typical timeframes to complete maintenance activities.

How a site operates

- private and public realm considerations
- logistics of transportation, access, delivery, storage, utilities, signage and use of people, materials and equipment
- the importance of keeping a site clear and clean
- implications of exceeding optimum time on cleaning
- implications for the relationship with client/customer, public and other colleagues.

Key signs that unplanned maintenance is required

- for hard landscaped features e.g. cracked paving, rotting wooden structures
- for soft landscaped features e.g. pest damage in turf, sudden death
- for trees e.g. branches on the ground, fungi in trunks.

The purposes of tree and shrub pruning activities including the removal of dead, diseased, damaged, dangerous and displaced materials, ornamental concerns, formative, to support production of flowers and fruit

- the different pruning requirements and correct pruning times of various common plants



- techniques used for different purposes including hedge cutting, coppicing, pollarding, formative, pruning to natural shape, ornamental specimen
- tools required to carry out pruning activities (including secateurs, loppers, saws) their suitability, use and safety implications.

Types of vegetation that can have an adverse effect on the maintenance of ornamental and environmental horticultural areas

- their characteristics and morphology and how these are used to identify species
- method of spread
- implications for the environment.

Methods of vegetation clearance including hand clearance, chemical clearance and mechanical clearance, heat and cold treatment

- legal implications of their use
- their suitability for different sites and purposes.

The different types of turf surfaces

- different uses for turf surfaces
- maintenance requirements of different turf species.

Nutritional requirements of different types of plants

- nutrients available on a site e.g. from soil
- sources of nutrient supplements
- how to determine the correct

number of nutritional supplements required

- implications of over and underfeeding.

Different types of irrigation e.g. natural, hoses, sprinklers

- irrigation requirements of different types of plants and suitability of sources to plants
- how to apply the use of irrigation equipment without causing harm or damage to the plants and their environments
- implications of inappropriate irrigation including over watering.

Types of protection required by plants and trees including protection against pests, weeds and climate

- the suitability for different types of plants in different locations and seasons.

Techniques used for the maintenance of hard structures including paving, ditches, paths, steps, walls, fences.

### **Plant health**

Quality characteristics of healthy plants (including vigour, form, balance, root condition, soil condition, turgidity)

- methods used to identify the characteristics (e.g. observation, records)
- how quality affects maintenance decisions.

Biosecurity measures (including inspection, monitoring, regulation, plant passports, quarantine) and their application when carrying out

maintenance of ornamental and environmental horticultural areas.

Typical pests (e.g. insects, vertebrates), diseases (fungal, viral, bacterial) and disorders in ornamental and environmental horticulture areas

- indicators of their existence
- how they enter horticultural areas
- implications of their existence to maintaining ornamental and environmental horticultural areas
- control methods that can be used (including tolerance, cultural control, biological controls, chemical controls) and how these are applied
- factors (including Integrated Pest Management Systems, impact on non-target species and the environment) that affect decisions about the use of control methods.

Causes of failure in trees including branch failure, uprooting, summer branch drop

- indicators of failure
- environmental considerations
- actions to be taken
- health and safety issues arising from failure.

### **Business**

Site management considerations including planning, allocating tasks, monitoring, setting timescales, checking quality, monitoring health and safety, teamwork, employment rights and

responsibilities

- how they are applied when maintaining ornamental and environmental horticultural areas.

Factors considered in the development of budgets for maintenance programmes including maintenance options (e.g. low maintenance, high maintenance), business objectives and values, type, purpose and characteristics of ornamental and environmental horticultural area, resources required (human, time, materials, equipment) and available

- the implications of budgets to maintenance activities
- cost implications of decision-making.

### **Communication**

Types of plans of ornamental and environmental horticultural areas (including drawings, sketches, digital plans)

- symbols and conventions to be applied
- suitability of different types for different audiences and purposes.

### **Health and safety**

Typical hazards associated with the maintenance of ornamental and environmental horticultural areas and control measures used to minimise associated risks.

Types of PPE available for the maintenance of ornamental and environmental horticultural areas

- their purpose
- implications for poor use.

### **Tools, equipment and machinery**

Tools, equipment, and machinery required for establishing ornamental and environmental horticultural areas

- their characteristics and purposes
- how they are operated and used accurately, efficiently and safely
- how they are maintained including cleaning and storage
- their suitability (including limitations) for different tasks involved in maintain ornamental and environmental horticultural areas.

### Performance Outcome 3: Install landscape features

Knowledge	Skills
<p><b>Ornamental and environmental horticultural areas</b></p> <p>Types of ornamental and environmental horticultural areas (including public, amenity, botanical, heritage, private)</p> <ul style="list-style-type: none"> <li>• their characteristics</li> <li>• their purposes</li> <li>• similarities and differences</li> <li>• the use of hard landscaping features in the area.</li> </ul> <p>The characteristics of a site (including drainage, aspect, topography, exposure and situation (D.A.T.E.S.)) and its microclimates including</p> <ul style="list-style-type: none"> <li>• information required to determine characteristics and sources used to acquire the information e.g. observation, maps and plans</li> <li>• implications of site characteristics to the installation of hard landscaping features.</li> </ul> <p>Types of common landscaping features including hard (horizontal (e.g. paving, paths), vertical (e.g. walls, fencing), structures) and soft (including planting beds, turf, trees, shrubs, rock gardens, water features)</p> <ul style="list-style-type: none"> <li>• their purposes</li> <li>• different types</li> <li>• implications for installing hard landscaping features.</li> </ul> <p>Types of water environments (e.g. ponds, canals)</p>	<p>Apply health and safety controls to activities.</p> <p>Apply appropriate posture when completing activities.</p> <p>Interpret plans to locate existing features and services e.g. gas, water electricity.</p> <p>Assess existing landscape features, faults and challenges for development.</p> <p>Adapt drawings to reflect actual features and dimensions of a site.</p> <p>Estimate resources required (including time, people, equipment, materials) to complete installation project.</p> <p>Calculate the volumes of materials required for the installation.</p> <p>Instruct others on health and safety practices required for completion of installation project.</p> <p>Allocate resources (including time, people, equipment, materials) to installation tasks.</p> <p>Assess the project for potential risks of realisation.</p> <p>Dynamically assess site for health and safety risks.</p> <p>Use a range of senses (hear, feel, see) whilst excavating to identify when close to utilities and adapt approach when close to utilities.</p> <p>Measure lines, curves and areas on a site.</p>

<ul style="list-style-type: none"> <li>• their function in different ornamental and environmental horticultural areas</li> <li>• their construction</li> <li>• implications for installation of hard landscape features.</li> </ul> <p><b>Environmental</b></p> <p>The positive and negative impacts of installing hard landscaping features including on flora, fauna, habitats (including human)</p> <ul style="list-style-type: none"> <li>• measures used to minimise and mitigate for negative impacts</li> <li>• measures used to maximise positive impacts.</li> </ul> <p>Factors (e.g. objectives for horticultural area, business values, biosecurity) that influence sourcing of materials used for the installation of hard landscaping features</p> <ul style="list-style-type: none"> <li>• how provenance of materials is verified.</li> </ul> <p>Plant species protected by legislation</p> <ul style="list-style-type: none"> <li>• the potential impact of installing hard landscape features on protected species</li> <li>• how to mitigate for negative impacts of installing hard landscape features on protected species</li> <li>• actions required when protected species are identified.</li> </ul> <p><b>Plant identification and classification</b></p> <p>Plant classification (including families, genera, species, varieties, cultivars, both botanical and legal)</p>	<p>Set out installation requirements from information in a construction drawing.</p> <p>Use levelling tools to set out depths, falls and position of features.</p> <p>Compact sub-base / foundation.</p> <p>Dig site area using tools.</p> <p>Apply shovelling techniques e.g. to excavate, to prepare mixes.</p> <p>Confirm alignment of masonry and wood products by sight.</p> <p>Apply mortar to masonry materials.</p> <p>Lay masonry materials to specified configurations.</p> <p>Tap / tamp masonry materials to achieve levels.</p> <p>Point gaps between masonry materials.</p> <p>Mark masonry materials with scribing tools.</p> <p>Cut masonry materials using hand and power tools.</p> <p>Apply manual handling techniques when carrying masonry materials.</p> <p>Remove concrete and debris using hand tools e.g. hammer, bolster.</p> <p>Mix materials (e.g. aggregates, cement, water) for application.</p> <p>Secure timber-based materials for permanent fixing.</p> <p>Cut timber-based materials using hand and power tools.</p> <p>Join timber-based materials with temporary and permanent fixings using hand and power tools.</p>
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<ul style="list-style-type: none"> <li>• the format for scientific names according to the international code of nomenclature</li> <li>• characteristics and morphology that can be used to classify plants</li> <li>• the techniques (e.g. observation, botanical keys) and information sources (e.g. internet and books) used to identify plants</li> <li>• implications for inaccurate classification and use of scientific names when installing hard landscape features.</li> </ul> <p><b>Plant growth and development</b></p> <p>The physical structure of plants (including roots, stems, leaves, flowers, buds, bulbs, tubers, fruit, seeds)</p> <ul style="list-style-type: none"> <li>• their functions</li> <li>• their morphology.</li> </ul> <p>Physical processes involved in plant growth</p> <ul style="list-style-type: none"> <li>• including photosynthesis, respiration and transpiration</li> <li>• how these affect plant growth and development</li> <li>• how hard landscapes affects physical processes and implications for their installation and installation activities.</li> </ul> <p>Biosecurity measures (including inspection, monitoring, regulation, plant passports, quarantine) and their application when installing hard landscape features in ornamental and environmental horticultural areas.</p>	<p>Apply coatings to timber based or masonry materials.</p> <p>Clean tools.</p> <p>Prepare tools for use.</p> <p>Prepare working environment for installation of hard landscape feature(s).</p> <p>Inspect quality of materials e.g. timber based products, masonry.</p> <p>Apply protection to the environment surrounding the installation.</p> <p>Maintain a clean and safe working environment.</p> <p>Represent information and data using mathematical diagrams e.g. maps.</p> <p>Cost an installation project.</p> <p>Apply precise and controlled movements with appropriate application of force.</p>
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## **Soils**

Soil types (including loams, clays, silts, sands, organics) and their textures

- their characteristics
- how soil characteristics affect installation of hard landscape features.

## **Site environment**

How a site operates

- private and public realm considerations
- logistics of transportation, access, delivery, storage, utilities, signage and use of people, materials and equipment
- the importance of keeping a site clear and clean
  - implications of exceeding optimum time on cleaning
  - implications for the relationship with client/customer, public and other colleagues.

Site management considerations including planning, allocating tasks, monitoring, setting timescales, checking quality, monitoring health and safety, teamwork

- how they are applied when managing the delivery of an installation project.

Existing site features including soft landscaping, hard landscaping, utilities, soil condition, drainage, levels of maintenance

- how to assess levels of damage

- associated risks
- implications for installation of hard landscape features.

The use of soft landscape features to provide architectural structure to the landscape including hedges, standards, topiary, avenues, lawns, screens, ha-ha's, focal points.

Utilities likely to be encountered when installing landscape features

- the utilities required for installation and how they are located
- utilities avoidance techniques including chamber inspections, ground exploration with hand tools.

Protection of the site environment when installing landscape features including protection of plants, trees, growing media, building fabric

- including those elements already in place and those that will be introduced to the landscape
- techniques to be applied e.g. protecting existing tree root zones, avoiding soil turning to mud, shielding paths from vehicle damage, 'healing in' plants awaiting their final planting location
- how techniques are applied including the effective and efficient use of tools, equipment, machinery and materials.

**Hard landscape installation**

Different types of excavation (including single digging, double digging, trenches, foundations, tree pits)

- their function
- their suitability for achieving specified outcomes.

Different types of surface treatments for ground level construction (including patios, paths, loose aggregates, concrete, cold asphalt, edging, paving, decking, land formation)

- their suitability for varying locations
- implications for installation of new hard landscape features
- requirements to make good following installation of new landscape features.

Different types of vertical level construction including posts, fences, walls, steps, pergolas, planters, gazebos, seating)

- their purpose
- techniques for their effective implementation into landscapes
- implications for installation of new hard landscape features
- requirements to make good following installation of new landscape features.

Different types of cutting techniques for different types of materials (including wood, masonry, metal)

- the tools and equipment (including abrasive wheels)

required for carrying out the techniques

- how to operate tools and equipment safely and effectively to achieve required outcomes.

Different joining methods for wood, metal, stone and concrete structures

- their effectiveness in differing environmental situations
- the associated bonding materials (including adhesives, mortar, nails, screws)
- mix ratios and consistencies for mortar and concrete required to achieve specific requirements
- how they are mixed
- techniques for application of joining methods for horizontal and vertical surfaces
- the tools and equipment required for carrying out the techniques
- how to operate tools and equipment safely and effectively to achieve required outcomes.

Irrigation equipment used to water plants and create features

- techniques for installation of irrigation equipment.

### **Information and data**

Information and data required for installation activities

- risk assessments and method statements, typical formats and content, implications for use and non-compliance

- symbols, conventions and terminology associated with digitally produced garden designs to aid interpretation and implementation
- the content of manufacturers specifications for tools, equipment and materials and implications for failing to follow instructions and guidance.

### **Health and safety**

Safety hazards associated with working in landscaped environments, including the controls (including PPE) that need to be in place to maintain the safety of self, colleagues and visitors to the site.

Principles of posture and body mechanics and their application for safe and efficient installation of landscape features.

### **Business**

The principles of project management (including purpose and scope of the project, milestones and timescales, supply chain, people management, resources, budgeting)

- their application when planning the installation of hard landscaping features.

### **Measurement**

Standard units of measurement.

Techniques for marking and setting out design requirements, including the use of mathematical rules and formulae.

### **Tools equipment and materials**

Types of tools, equipment and materials used for measuring, marking out,

cutting, joining, levelling, shaping, installing, soil excavations and assembling landscape features

- their characteristics, purpose and suitability for tasks
- operation and handling requirements.

Storage facilities required for different tools, equipment and materials

- security requirements for valuable and dangerous tools, equipment and materials
- protection of valuable and dangerous tools, equipment and materials
- implications of poor storage.

Maintenance of tools equipment and machinery

- methods of maintenance including cleaning, calibration, sharpening, greasing
- implications for poor maintenance to individuals, the landscape and installation tasks.

Movement and transfer tools, equipment and materials across varied terrains and heights

- techniques to be applied and their suitability
- equipment required and their suitability
- implications for inappropriate decisions.

## Performance Outcome 4: Manage existing designed landscapes

Knowledge	Skills
<p><b>Designed Landscapes</b></p> <p>Types of designed landscapes (including public, amenity, botanical, heritage, private)</p> <ul style="list-style-type: none"> <li>• their characteristics</li> <li>• their purposes</li> <li>• benefits and limitations (including environmental, health and wellbeing, society and community, economic (e.g. employment, GDP)).</li> </ul> <p>The ideological characteristics of a designed landscape</p> <ul style="list-style-type: none"> <li>• spirit of place/local distinctiveness (e.g. aesthetic scheme, heritage styles) and what makes the site unique</li> <li>• the relationship (including conflicts) between spirit of place / local distinctiveness and functionality, economics and specific objectives of a designed landscape</li> <li>• how this relationship influences the management of existing designed landscapes.</li> </ul> <p>The relationship between common landscaping features and the spirit of place/local distinctiveness of a site</p> <ul style="list-style-type: none"> <li>• different types of features including historical</li> <li>• their purposes of the features in the landscape</li> <li>• the suitability of existing and</li> </ul>	<p>Define the spirit of place of an area.</p> <p>Assess the management requirements of a horticultural area in a designed landscape.</p> <p>Create texts e.g. a management plan.</p> <p>Present information orally.</p> <p>Plan the management of a designed landscape.</p> <p>Schedule work for an operational plan.</p> <p>Interpret a designed landscape plan.</p> <p>Convey technical information to different audiences e.g. staff, members of the public.</p> <p>Summarise information and ideas.</p> <p>Synthesise information e.g. from different site assessment techniques.</p> <p>Assess the environmental impact of a proposed horticultural activity on a given site.</p> <p>Propagate plants by seed in pots and two different cutting techniques</p> <ul style="list-style-type: none"> <li>• fluff growing media</li> <li>• fill containers</li> <li>• firm growing media in containers</li> <li>• sow seeds</li> <li>• cover seeds</li> <li>• prick out seedlings</li> <li>• collect cutting material</li> <li>• prepare cuttings</li> <li>• insert cuttings.</li> </ul>

<p>proposed features for different types of designed landscapes.</p> <p>Factors which influence the management of designed landscapes</p> <ul style="list-style-type: none"> <li>• legal status and protected status of landscape features e.g. buildings, trees</li> <li>• functionality of the designed landscape e.g. visitor requirements, accessibility</li> <li>• aims and objectives of the space e.g. sustainability, environmental improvement, social wellbeing</li> <li>• maintenance requirements and financial and resource implications</li> <li>• the opportunities and challenges these present for the development of designed landscapes.</li> </ul>	<p>Pot on plants, inserting plants into pots and backfilling growing media.</p> <ul style="list-style-type: none"> <li>• insert plant into pot</li> <li>• backfill growing media.</li> </ul> <p>Apply advanced pruning to meet specified objectives.</p> <p>Prune a trained form of shrub or tree.</p> <p>Assess suitability of provided information and data.</p> <p>Create digital media to enhance work.</p> <p>Make effective use of personal space.</p> <p>Assess a situation for potential adverse effects.</p> <p>Apply precise and controlled movements with delicacy.</p> <p>Apply a logical approach to resolving issues / problems.</p>
<p>Management considerations</p> <ul style="list-style-type: none"> <li>• the maintenance (e.g. replacement of planting schemes, expansion of paths) of an area that supports medium and long-term development</li> <li>• factors that need to be taken into account (e.g. site and situation, public access and wildlife, style and maturity of planting)</li> <li>• the implications for management activities and how these are managed</li> <li>• resources (human, financial, physical) required for development and sustainability including ongoing maintenance</li> </ul>	



- factors that affect long term planning (e.g. climate, funding, unexpected findings and short-term planning (e.g. weather, breakages, staffing) and their impact on implementation of management plans
- timescales involved in operational implementation of a plan
- techniques (including the use of digital software) used to monitor and evaluate progress of the management plan.

### **Environmental**

The potential positive and negative impacts of managing existing designed landscapes including on flora, fauna, habitats (including human)

- the purpose and content of environmental risk assessments and how they are conducted
- how management of the landscape can be used to maximise the positive and the mitigate for the negative impacts.

Factors (e.g. objectives for horticultural area, business values, biosecurity) that influence sourcing of plants and related materials for differing designed landscapes

- how provenance of plants and related materials are verified
- the economic, environmental and social importance of responsible plant sourcing.

Plant species protected by legislation

- the potential impact of developing existing designed landscapes on protected species
- how to mitigate for negative impacts when managing existing designed landscapes on protected species
- actions required when protected species are identified.

Types of invasive plant species established by legislation that can be encountered when managing existing designed landscapes

- characteristics that enable identification in an environment
- implications of finding invasive species in an environment to the management of existing designed landscapes
- how to mitigate for invasive species in an environment when managing existing designed landscapes.

### **Plant identification and classification**

Plant classification (including families, genera, species, varieties, cultivars, both botanical and legal) relating to existing designed landscapes for different purposes

- the format for scientific names according to the international code of nomenclature
- characteristics and morphology that can be used to classify plants
- the techniques (e.g. observation, botanical keys) and information sources (e.g. internet and books)

used to identify plants

- implications for inaccurate classification and use of scientific names
- the purpose and uses of plant records.

Types of plants including monoecious, dioecious, evergreen, deciduous, hardy, tender, annuals, biennials, perennials, herbaceous, shrubs, trees

- their key characteristics including physical characteristics, lifecycle,
- their contribution to existing designed landscapes
- implications for inclusion when managing existing designed landscapes.

### **Plant Growth and Development**

The physical structure of plants (including roots, stems, leaves, flowers, buds, bulbs, tubers, fruit, seeds)

- their functions
- their morphology.

Physical processes involved in plant growth

- including germination, photosynthesis, respiration and transpiration
- how these affect plant establishment and growth in existing designed landscapes.

Environmental factors which affect plant growth in existing designed landscapes

- including microclimate, light, irrigation, nutrients, site specific (including boggy, marginal,

aquatic, dry, sunny, shady, sheltered, exposed, frost pockets)

- the manipulation of microclimates when developing existing designed landscapes (e.g. improving drainage, adding windbreaks)
- issues arising in plant establishment and growth as a result of sub-optimal growing environments
- how these issues are identified
- techniques used to remedy these issues

### **Soils and Growing media**

Different types of growing media including peat, coir, composted bark, loam, green waste, vermiculite, perlite)

- their characteristics and properties
- their suitability for use in different situations when developing existing designed landscapes
- their suitability for use in the propagation of plants when managing existing designed landscapes
- their implications for the environment.

Soil types (including loams, clays, silts, sands, organics) and their textures

- their characteristics (including pH, nutrient availability and cation exchange, drainage and water holding capacity, organic matter and living organisms in

the soil, colour and heat retention, ease of cultivation, existing pollutants, horizons)

- how soil characteristics affect suitability for different types of plants in different types of designed landscapes
- how previous land use affects characteristics.

Soil amelioration methods (e.g. liming, use of hydrogels and mycorrhizae)

- how they are used for structure remediation
- how they are used for pH remediation
- their suitability for the soil and optimum plant establishment.

### **Plant propagation for collections management**

The conditions and environments required for plant propagation

- types of facilities including polytunnels, glasshouses and coldframes, outdoors, their characteristics, benefits and limitations for different purposes
- conditions required for plant propagation (including light, sterility, humidity, irrigation, heat, ventilation)
- techniques and equipment used to monitor and adapt conditions to manipulate growth in protected environments.

Propagation by seed

- the suitability of seed propagation for a range of plants
- timings of propagation by seed including seasons and germination times
- seed treatments (e.g. stratification, scarification), their purpose, their suitability for different seeds, their application
- techniques for sowing seeds (including small, medium and large seed) in containers and their application
- aftercare requirements for sown seeds for different types of seeds (including mist benches, irrigation) to support germination and their application.

#### Propagation by vegetative means

- techniques for different vegetative propagation methods (including cuttings (including soft tip, semi-ripe, leaf, hardwood), ground layering, grafting, division)
- the suitability of the types of vegetative propagation for a range of plants
- timings of propagation by vegetative means including appropriate time of year and rooting periods
- types of propagation material and factors that influence the selection including maturity and provenance

- aftercare requirements of vegetative propagation (e.g. fogging units, heat application)

#### Plant propagation plans

- quantities required to meet management objectives
- scheduling of activities including sequencing, timing, prioritisation
- resource requirements e.g. space, equipment
- legal framework around plant production including plant breeders' rights and restrictions on propagation of wild sourced plants.

#### Process for growing on plants in a production environment

- including potting on, irrigation and feeding
- techniques for potting on including manual, machine based
- techniques for irrigation e.g. hose, overhead
- techniques for feeding in a plant production environment e.g. dosing pump
- tools, equipment and materials required
- the suitability of techniques to meet different management objectives.

#### **Advanced pruning**

Objectives to be achieved by advanced pruning including space, style, functionality, form, propagation, seasonal interest

- suitability of different plants for advanced pruning
- plant responses to pruning events e.g. apical dominance, compartmentalisation
- advanced techniques for creating an ornamental specimen, fruit in trees and bushes, winter colour, topiary, a specified foliage size and inclusion in a planting scheme and how these are applied
- advanced techniques for manipulating, clinging, self-supporting climbing plants and well-trained shrubs including support techniques
- how techniques are applied safely and effectively.

### **Aquatic and marginal areas**

Types of water features and aquatic environments and their use in different landscape contexts

- types of planting areas in aquatic environments e.g. marginal, bog and their suitability for different types of plants
- management requirements of aquatic features including seasonal maintenance, f water quality, safety and aesthetics, plants
- the risk to aquatic environments from horticultural operations.

### **Health and safety**

Typical hazards associated with the management of designed landscapes



<p>ornamental and environmental horticultural areas and control measures used to minimise associated risks.</p> <p>Types of PPE available for the management of established designed landscapes of ornamental and environmental horticultural areas</p> <ul style="list-style-type: none"><li>• their purpose</li><li>• implications for poor use.</li></ul> <p><b>Tools, equipment and machinery</b></p> <p>Tools (e.g. secateurs, pruning saw), equipment (e.g. mist units) and machinery (tractors, computers) required for the development of established designed landscapes</p> <ul style="list-style-type: none"><li>• their characteristics and purposes</li><li>• how they are operated and used accurately, efficiently and safely</li><li>• how they are maintained including cleaning and storage</li><li>• their suitability (including limitations) for different tasks involved in managing ornamental and environmental horticultural areas.</li></ul>	
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