Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture 0174-014/514

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Guide to the examination

Version and date	Change detail	Section
2.0 May 2019	Level 3 third retake opportunity guidance added	1. Details of the exam

Who is this document for?

This document has been produced for centres who offer **City & Guilds Level 3 Advanced Technical Extended Diploma in Forestry and Arboriculture.** It gives all of the essential details of the qualification's external assessment (exam) arrangements and has been produced to support the preparation of candidates to take the exam/s.

The document comprises four sections:

1. **Details of the exam**. This section gives details of the structure, length and timing of the exam.
2. **Content assessed by the exam.** This section gives a summary of the content that will be covered in each exam and information of how marks are allocated to the content.
3. **Guidance.** This section gives guidance on the language of the exam, the types of questions included and examples of these, and links to further resources to support teaching and exam preparation.
4. **Further information.** This section lists other sources of information about this qualification and City & Guilds Technical Qualifications.

1. Details of the exam

External assessment

City & Guilds Technical qualifications have been developed to meet national policy changes designed to raise the rigour and robustness of vocational qualifications. These changes are being made to ensure our qualifications can meet the needs of employers and Higher Education. One of these changes is for the qualifications to have an increased emphasis on external assessment. This is why you will see an external exam in each of our Technical qualifications.

An external assessment is an assessment that is set and/or marked by the awarding organisation (ie externally). All City and Guilds Technical qualifications include an externally set and marked exam. This must be taken at the same time by all candidates who are registered on a particular qualification. We produce an exam timetable each year. This specifies the date and time of the exam so you can plan your delivery, revision and room bookings/PC allocation in plenty of time.

The purpose of this exam is to provide assurance that all candidates achieving the qualification have gained sufficient knowledge and understanding from their programme of study and that they can independently recall and draw their knowledge and understanding together in an integrated way. Whilst this may not be new to you, it is essential that your learners are well prepared and that they have time to revise, reflect and prepare for these exams. We have produced a Teaching, Learning, and Assessment guide that is you should refer to alongside the present document *(Teaching, Learning and Assessment Guide).* If a learner does not pass the exam at their first attempt, there is only one opportunity to resit the exam, so preparation is essential.

Exam requirements of this qualification

Level 3 Forestry and Arboriculture (2) – Theory Exam (2 hours)

The exam is graded and a candidate must achieve at least a Pass grade in order to be to be awarded the qualification. (In addition to the exam, a synoptic assignment must also be completed and passed. You can find full details of the synoptic assignment in the *Qualification Handbook* and the *Synoptic Assessment Guide* - please see the links at the end of this document).

When does the exam take place?
This qualification involves a two year programme of study. Candidates must take the exam at the end of the second year of study. The exam is offered on two fixed dates in March or June. The exact dates will be published at the start of the academic year in the *Assessments and Exam Timetable (http://www.cityandguilds.com/delivering-our-qualifications/exams-and-admin).*

At the start of the programme of study for each of the two years, in order to effectively plan teaching and exam preparation, centres should know when the exam will be taking place and allocate teaching time accordingly. Section 2 of this document gives a summary of the content that needs to be covered in order to

prepare learners for the exam and full details of this are given in the Qualification Handbook.

Form of exam
The exam for this qualification can be taken either on paper or online.

Can candidates resit the exam?
Candidates who have failed an exam or wish to retake it in an attempt to improve their grade, can do so **twice**. The third and final retake opportunity applies to Level 3 only. The best result will count towards the final qualification. If the candidate fails the exam three times then they will fail the qualification.

How the exam is structured

Each exam has a total of 60 marks available.
Each exam is made up of:
- 12 - 14 short answer questions;
- 1 extended response question.

Short answer questions are used to confirm **breadth of knowledge and understanding**.
The extended response question is to allow candidates to demonstrate **higher level and integrated understanding** through written discussion, analysis and evaluation. This question also ensures the exam can differentiate between those learners who are 'just able' and those who are higher achieving.
More details about and examples of question types are given in Section 3 of this document.

Assessment Objectives

The exams are based on the following set of assessment objectives (AOs). These are designed to allow the candidate's responses to be assessed across the following three categories of performance:
- **Recollection** of knowledge.
- **Understanding** of concepts, theories and processes.
- **Integrated application** of knowledge and understanding.

In full, the assessment objectives covered by the exam for this qualification are:

Assessment objective *The candidate..*	Mark allocation (approx %)
AO1 **Recalls knowledge** from across the breadth of the qualification	30%
AO2 **Demonstrates understanding** of concepts, theories and processes from a range of learning outcomes.	50%

AO4 **Applies knowledge, understanding and skills** from across the breadth of the qualification in an integrated and holistic way to achieve specified purposes.   20%

Booking and taking the exam

All assessments for City & Guilds Technical Exams must be booked through Walled Garden. There is a deadline for booking exams, synoptic assessments and any other centre marked assessments, please refer to the time line to check these dates.
The exam must be taken under the supervision of an invigilator who is responsible for ensuring that it is conducted under controlled conditions. Full details of the conditions under which the exam must be taken can be found in the Joint Council for Qualifications (JCQ) document, *Instructions for Conducting Examinations (ICE)*.

Special consideration

Candidates who are unable to sit the exam owing to temporary injury, illness or other indisposition at the scheduled time may qualify for special consideration. This is a post-examination adjustment that can, in certain circumstances, be made to a candidate's final grade. The Joint Council for Qualifications' guide to the special consideration process can be found at www.jcq.org.uk .
To make a request for special consideration, please contact:
policy@cityandguilds.com

Access arrangements

Access arrangements are arrangements that allow candidates with particular requirements, disabilities or temporary illness to take assessments, where appropriate, using their normal way of working. The Joint Council for Qualifications document, *Access Arrangements and Reasonable Adjustments* gives full details and can be downloaded here.
For further information and to apply for access arrangements please see:
Access arrangements - When and how applications need to be made to City & Guilds
Applying for access arrangements on the Walled Garden

2. Content assessed by the exam

Level 3 Forestry and Arboriculture - Theory exam (2)

The exam assesses:
- **Unit 351: Identification, planting, establishment and aftercare of plants for forestry and arboriculture**
- **Unit 354: Undertaking woodland habitat management**
- **Unit 355: Principles of tree science**

Each exam assesses a sample of the content of these units. This means that a single exam will **not** cover 100% of the unit content. The full range of content will be assessed over a number of examination series. Details of the coverage of a particular exam paper will **not** be released in advance of the exam itself. Centres should **not** make assumptions about what will be assessed by a particular exam based on what has been covered on previous occasions. In order to be fully prepared for the exam, learners **must** be ready to answer questions on **any** of the content outlined below.

The table below provides an overview of how the qualification's Learning Outcomes are covered by each exam and the number of **marks** available per Learning Outcome (ie **not** the number of *questions* per Learning Outcome). In preparing candidates for the exam, we recommend that centres take note of the number of marks allocated to Learning Outcomes and to assign teaching and preparation time accordingly.

In preparing candidates for the exam, centres should refer to the Qualification Handbook which gives full details of each Learning Outcome.

The following is a summary of only that qualification content which is assessed by the exam and **not** a summary of the full content of the qualification.

Unit	Learning outcome	Topics	Number of marks
351 Identification, planting, establishment and aftercare of plants for forestry and arboriculture	LO1 Identify plants	1.1 Identifying plants by botanical names 1.2 The nomenclature and taxonomy of plants 1.3 Features that aid identification of plants in all seasons	16

		1.4 Keys and available technology used to identify plants by botanical characteristics	
	LO2 Plant trees and shrubs	2.1 Plant bare-root and containerised stock 2.2 Provide appropriate support and immediate aftercare to trees	
	LO3 Establish trees and shrubs	3.1 The range of nursery stock 3.2 The equipment and methods available for establishing trees 3.3 The use of conditioners and ameliorants in tree establishment 3.4 Establish trees and shrubs	
	LO4 Understand the aftercare requirements of trees and shrubs	4.1 Methods of protection 4.2 Use of supports 4.3 Aftercare requirements	
354 Undertaking woodland habitat management	LO1 Understand the historical development of woodland	1.1 Historical influences that have created the current level of woodland cover in the UK 1.2 The development of woodland types and management systems 1.3 Historic features within woodland	12
	LO2 Survey the structures and features within a woodland ecosystem	2.1 Report on structures and features of a woodland ecosystem 2.2 Carry out woodland survey	
	LO3 Understand the management of woodland habitats	3.1 Different woodland habitats and relevant management techniques 3.2 Equipment and resources for practical management of woodland habitats	

355 Principles of tree science	LO1 Understand how trees respond to changes in environmental condition	1.1 Anatomical features in wood 1.2 Fundamental requirements for tree growth 1.3 How trees adapt their growth and development to their environmental conditions 1.4 How environmental conditions can increase susceptibility of trees to decay and mechanical failure 1.5 How selected environmental conditions can be altered to influence tree growth and development	20
	LO2 Understand decay processes in trees	2.1 Decay in trees 2.2 How decay processes influence structural strength of trees 2.3 How decay detection can be used to assess potential tree failure 2.4 Potential actions to manage decay in trees	
	LO3 Understand wound response in trees	3.1 Growth and defense processes in trees in response to wounding and decay 3.2 How current pruning conventions relate to wound response in trees	
	LO4 Understand tree biomechanics and structural assessment	4.1 Current biomechanical theories explaining mechanical strength and integrity of trees 4.2 How trees are assessed for potential mechanical failure 4.3 Implications of mechanical failure for tree management 4.4 How weak tree structures can be appropriately managed	
		Total marks for sections:	48 marks
		Integration across units*:	12 marks

Total marks for exam: 60 Marks

* Integration across units. These marks relate to Assessment Objective 4). These marks are awarded to differentiate between levels of performance by candidates taking the exam. The marks are given for how well a candidate has applied their knowledge, understanding and skills from across the units that make up the qualification in an integrated way to meet the requirements of the exam questions.

3. Guidance

Vocabulary of the exam: use of 'command' verbs

The exam questions are written using 'command' verbs. These are used to communicate to the candidate the type of answer required. Candidates should be familiarised with these as part of their exam preparation.

The following guidance has been produced on the main command verbs used in City & Guilds Technicals exams.

A more detailed version of this table, which also includes the command verbs used in the assignments is published in *City & Guilds Technical Qualifications Teaching, Learning and Assessment* guide.

Command verb	Explanation and guidance
Analyse	Study or examine a complex issue, subject, event, etc in detail to explain and interpret, elements, causes, characteristics etc
Calculate	Work out the answer to a problem using mathematical operations
Compare (…and contrast) (or ***describe*** the similarities/differences)	Consider and describe the similarities (and differences) between two or more features, systems, ideas, etc
Define	Give the meaning of, technical vocabulary, terms, etc.
Describe	Give a detailed written account of a system, feature, etc **(..the effect of…on…)** the impact, change that has resulted from a cause, event, etc **(..the process..)** give the steps, stages, etc
Differentiate between	Establish and relate the characteristic differences between two or more things, concepts, etc
Discuss	Talk/write about a topic in detail, considering the different issues, ideas, opinions related to it
Distinguish between	Recognise and describe the characteristic differences between two things, or make one thing seem different from another
Evaluate	Analyse and describe the success, quality, benefits, value, etc (of an end product, outcome, etc)
Explain	Make (a situation, idea, process, etc) clear or easier to understand by giving details, **(..how..)** Give the stages or steps, etc in a process, including relationships, connections, etc between these and causes and effects.

Give example(s) illustrate/	Use examples or images to support, clarify or demonstrate, an explanation, argument, theory, etc
Give a rationale	Provide a reason/reasons/basis for actions, decisions, beliefs, etc
Identify	Recognise a feature, usually from a document, image, etc and state what it is
Justify	Give reasons for, make a case for, account for, etc decisions, actions, conclusions, etc, in order to demonstrate why they suitable for or correct or meet the particular circumstances, context
Label	Add names or descriptions, indicating their positions, on an image, drawing, diagram, etc
List	Give as many answers, examples, etc as the question indicates (candidates are not required to write in full sentences)
Name	Give the (technical) name of something
Propose	Present a plan, strategy, etc (for consideration, discussion, acceptance, action, etc).
Select	choose the best, most suitable, etc, by making careful decisions
State	Give the answer, clearly and definitely
Summarise	Give a brief statement of the main points (of something)

Question types

The following explains, and gives examples of, types of questions used in City & Guilds Technical exams. In preparing candidates to take the exam, it is recommended that you familiarise them with the requirements of each question type so that they can be effective and make best use of the time available when sitting the exam.

- An effective candidate will gauge the type and length of response required from the question and the number of marks available (which is given for each question on the exam paper).
- Short answer questions may not require candidates to write in complete sentences. Extended response questions will require a more developed response.
- Candidates should read the exam paper before attempting to answer the questions and should allocate time proportionate to the number of marks available for each question or section.
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Question type:	Example question:	Mark scheme
Short answer questions (restricted response) These are questions which require candidates to give a brief and concise written response. The number of marks available will correspond to the number of pieces of information/examples and the length of response required by the question.	Using correct spelling, state the genus and species of **two** trees from different genera.	Tree 1 Genus (1 mark) Species (1 mark) Tree 2 Genus (1 mark) Species (1 mark
Structured Response Questions These are questions that have more than one part (eg a), b), etc.). The overall question is made up of linked, short answer questions which move the	a) State **two** methods of support which can be used when planting a 'standard' tree in an urban area. (2 marks)	a) One mark for each method up to the maximum of 2 marks: - Stakes/ties. (1 mark) - Underground anchors. (1 mark) - Guy wires. (1 mark)

candidate through the topic in a structured way. For example, the question will usually start with a 'recall'/'state'/ 'describe' question followed by an 'explain' to draw out understanding of the topic. They usually have a shared introductory 'stem', and the number of marks may increase through the question.

b) Describe how the **two** chosen methods of support will benefit the tree. (2 marks)

b) One mark for each description up to the maximum of 2 marks:
- The tree will be more stable and secure in the ground. (1 mark)
- The tree will be less prone to vandalism. (1 mark)
- The tree will have a better chance of survival. (1 mark)
- It will prevent uprooting from high winds. (1 mark)

Extended response questions

Extended response questions are those that require the candidate to write a longer written response using sentences and paragraphs. These usually require candidates to discuss, explain, etc. a topic in some detail. The question is often based on a short case study, scenario or other prompt. The level of detail should be gauged from the question and the number of marks available.

Example question

A forestry consultant has been asked to assess the condition of a mature Oak tree in a built-up urban environment with both vehicular and pedestrian traffic under the crown. There is a visible swelling to the lower stem from 0.5-2m in height.
Discuss methods that could be used to systematically assess the tree for potential mechanical failure and the visual indicators that could be present. (12 marks)

Mark Scheme

Indicative content:
- Assessment methods (e.g. invasive, non-invasive)
- Limitations of decay detection equipment and methods (e.g. cost, manoeuvrability, accuracy)

Band 1 (1-4 marks)

Basic discussion with a limited range of assessment methods, but few links made to the scenario. Discussion is not well-developed or balanced. Limited justification of choice of assessment methods. There will be few or no specialist terms. Limited range of visual indicators. To access the higher marks in the band, discussion is supported with some general examples.

Example Band 1 response

For a forestry consultant assessing a tree in this scenario, they would need to take into consideration:
- invasive and non-invasive assessment methods
- limitations of each assessment method

They would need to assess the tree visually looking for potential damage and failure points. The main things to look for would be cavities, fungi, weak forks, nesting insects or anything that could damage the tree and cause it to fail.

The main method they could use to assess the tree would be visually as this provides a fairly detailed overview of what is on the tree and what bits could fail.

Band 2 (5-8 marks)

Adequate discussion with a good range and depth of assessment methods with good links to the scenario. Good justification of choice of assessment method(s). There will be some use of specialist terms, although they may not always be used appropriately. To access the higher marks in the band, a range of assessment methods and their impact will have been discussed along with

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Example band 2 response

The forestry consultant could assess the tree using Visual Tree Assessment (VTA) in the first instance, looking for potential failure points such as co-dominant stems, included bark, cavities, cracks, root movement and a range of visual indicators which may be present within the crown of the tree and on the stem.

Another method which could be used would be a PICUS which is a form of acoustic tomography. This enables the user to see a 2D slice of the tree with any areas of decay showing up on the computer screen in a different colour. This method is non-invasive unlike an increment borer, which drills out a 'core' of wood from the tree allowing you to see where any points of decay may be.

The method of assessment they could choose in this scenario would be to visually assess the tree using VTA, followed by a climbing aerial inspection to check for hidden indicators such as branch cavities, hazard beams, points of decay etc. This

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justification for choice of assessment method.

Band 3 (9-12 marks)

Comprehensive discussion with extensive range and depth of assessment methods. Clear links to the scenario have been made. Detailed justification of choice of assessment method(s). Specialist terms will be used correctly and appropriately. To access the higher marks in the band, a comprehensive range of assessment methods and their impact will have been discussed along with detailed justification for best choice of assessment method for the scenario.

Example band 3 response

The forestry consultant could carry out a Visual Tree Assessment (VTA). When looking for visual indicators in this tree, they would start from the base and move up to the canopy. This would ensure that no area of the tree is missed. Starting at the base, the indicators to look for are root heave, cracks in the soil/surface material, fungal bodies (subject to time of year), cavities, exudates (oozing). Moving up to the stem you would be looking for flaking bark, cavities, visual swelling, cracks, natural braces and weak forks at co-dominant unions. Within the crown of the tree, the consultant would first inspect the main scaffold branches looking for asymmetry which may indicate damage, dead wood, weak unions, fungi, bud proliferation and/or cavities. After scaffold branches they would move onto smaller branches through to the shoot-tips looking for shoot-tip dieback, extension growth to indicate vitality etc.

Additional methods could be acoustic tomography (PICUS), which is a method of looking within the stem of the tree, possibly in the area of swelling noted in the question, to quantify the extent of any decay which may be present. This is a good tool to use as it is accurate although very expensive to buy. Another method that could be utilised is a resistograph. This involves drilling into the stem of the tree in order to assess the amount of decay present and the level of resistance reflects the residual strength of wood being drilled into. This has the advantage of producing an easy graph to analyse, although it is invasive and creates a wound in the stem. Another method used often is tree pulling. This method involves the use of ropes and mechanical aids to determine how stable the anchorage is.

For this particular scenario it would be best to select, in the first instance, a Visual Tree Assessment (VTA) to ascertain which area or areas of the tree required further inspection using either mechanical or technological aids or a climbing aerial inspection. This method is justified as the tree is adjacent to a road and one of the quickest and cheapest methods to undertake. Following a VTA it may recommended to undertake an aerial tree inspection from a qualified arborist to who can

Examination technique

Candidates with a good understanding of the subject being assessed can often lose marks in exams because they lack experience or confidence in exams or awareness of how to maximise the time available to get the most out of the exam. Here is some suggested guidance for areas that could be covered in advance to help learners improve exam performance.

Before the exam

Although candidates cannot plan the answers they will give in advance, exams for Technical qualifications do follow a common structure and format. In advance of taking the exam, candidates should:
- be familiar with the structure of the exam (ie number and type of questions).
- be aware of the amount of time they have in total to complete the exam.
- have a plan, based on the exam start and finish time for how long to spend on each question/section of the exam.
- be aware of how many marks are available for each question, how much they should expect to write for each question and allow most time for those questions which have the most marks available.

At the start of the exam session

At the start of the exam, candidates:
- should carefully read through the exam paper before answering any questions.
- may find it helpful, where possible, to mark or highlight key information such as command words and number of marks available on the question paper.
- identify questions which require an extended written answer and those questions where all or part of the question may be answered by giving bullets, lists etc rather than full sentences.

Answering the questions

Candidates do not have to answer exam questions in any particular order. They may find it helpful to consider, for example:
- tackling first those questions which they find easiest. This should help them get into the 'flow' of the exam and help confidence by building up marks quickly and at the start of the exam.
- tackling the extended answer question at an early stage of the exam to make sure they spend sufficient time on it and do not run out of time at the end of the exam.

Candidates should avoid wasting time by repeating the question either in full or in part in their answer.

Candidates should **always** attempt every question, even questions where they may be less confident about the answer they are giving. Candidates should be discouraged however, from spending too long on any answer they are less sure about and providing answers that are longer and give more detail than should be

necessary in the hope of picking up marks. This may be mean they have less time to answer questions that they are better prepared to answer.

Extended answer questions

Before writing out in full their answer to extended questions, candidates may find it helpful to identify the key requirements of the question and jot down a brief plan or outline of how they will answer it. This will help clarify their thinking and make sure that they don't get 'bogged down' or provide too much detail for one part of the question at the expense of others.

Towards the end of the exam

Candidates should always set aside time at the end of the exam to read back through and review what they have written in order to make sure this is legible, makes sense and answers the question in full.

If a candidate finds they are running out of time to finish an answer towards the end of the exam, they should attempt to complete the answer in abbreviated or note form. Provided the content is clear and relevant, examiners will consider such answers and award marks where merited.

Further guidance on preparing candidates to take the exam is given in the City & Guilds publication, Technical Qualifications, Teaching, Learning and Assessment which can be downloaded free of charge from City & Guilds website.

4. Further information

For further information to support delivery and exam preparation for this qualification, centres should see:

City & Guilds

Qualification homepage: http://www.cityandguilds.com/qualifications-and-apprenticeships/land-based-services/horticulture/0174-technicals-in-horticulture-and-forestry-arboriculture#tab=information
which includes:
- Qualification handbook
- Synoptic Assignment
- Sample assessments

Technical Qualifications, Resources and Support: cityandguilds.com/techbac/technical-qualifications/resources-and-support

Joint Council for Qualifications
Instructions for Conducting Examinations: www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations