Practice Marking Materials for Technical Qualifications

2019

City & Guilds

Level 3 Advanced Technical Certificate in Forestry & Arboriculture (360) 0174-011

Introduction

The synoptic assignments for the City & Guilds Technical Qualifications are externally set summative assessments which are internally marked by tutors. It is the centre's responsibility to ensure candidates' work is marked in a standard way across the centre, using the specified marking grid, in order to rank performance on a single mark scale.

Practise marking materials are useful to support centre staff with internal standardisation and as a pre-standardisation activity. The materials are produced to support staff in the process of marking including how to effectively use marking grids and assessment objectives (AO).

The marking materials must be considered alongside the Technical qualifications Marking and Moderation Guide

It is recommended that all tutors, including any unlikely to mark, are included in early discussions around the use of the marking grid, as all tutors should understand the basis of marking as it could shape their teaching by helping candidates practise bringing their skills and knowledge together to complete a problem, and helping them learn how to explain and justify their choices in terms of the subject knowledge in preparation for summative assessment. Tutors must study the *Marking and Moderation Guide:* *https://www.cityandguilds.com/techbac/technical-qualifications/resources-and-support* which provides detailed information about generic assessment objectives, and the marking grid, to ensure they are clear about the different AOs and how they may show up in evidence for assignments in the subject area. If there is more than one tutor carrying out marking at the centre, this process should be carried out as part of a group activity to ensure all markers are clear and in agreement about what sorts of evidence are relevant for assessment and which AO they fit into.

The following materials could form the basis for pre-standardisation practice and discussion could take place using evidence from trial runs/formative assessment activities. Standardisation should also take place using the evidence from the actual assignment set for that year, so along with utilising this tool, please ensure that activities surrounding the 2019 assignment also take place.

Within this pack, you will find

- a sample task brief
- a copy of the marking grid used for the synoptic assessment
- a sample of materials responding to either last year's synoptic assignment or a sample set of tasks. This includes learner produced evidence and tutor observations of the practical performance.

And finally, the Principal Moderator has provided a breakdown of the marks for the different assessment objectives along with general hints and tips on the synoptic assessment.

Section 1

Task 1

Using suitable identification aids and/or tools, conduct a site investigation and produce a report on biotic pathogens or abiotic disorders present, including how they may affect trees on the site.

Conditions of assessment:

You may collate the information for your report under supervised conditions.

You must complete your report on your own under supervised conditions.

What you must produce for marking:

- Report

Task 2

Conduct a site-specific pre-felling risk assessment to analyse the hazards and risks, recommend appropriate control measures and emergency planning procedures.

Conditions of assessment

You must carry out your pre-felling site specific risk assessment unsupervised.

Your risk assessment must be in an appropriately detailed and usable format.

Task 3

Carry out Felling and stump and brush removal operations. You are also required to carry out pre and post-use checks on the machinery used.

Conditions of assessment.

You must carry out the task on your own under supervised conditions.

You must deal with all site arisings to site specifications.

The assessment will be stopped if you exhibit unsafe practices that put you or others at risk.

Additional evidence of your performance that must be captured for marking:

- *Your tutor's recording the standard and accuracy of your performance.*
- *Photographic and/or video evidence (optional).*

Task 4

For a specific site investigate the following soil characteristics:

- Soil texture
- Soil structure
- pH
- Drainage and waterlogging
- Compaction and aeration

Using your investigation findings, produce a report that shows how the specific properties and characteristics of the soil could affect plant growth and development.

Conditions of assessment:

You may collect and collate the information required for your report under unsupervised conditions.

You must produce and complete your report on your own under supervised conditions.

What you must produce for marking:

- Your field notes
- Soil report

Section 2 Marking Grid 2019

Marking grid

For any category, 0 marks may be awarded where there is no evidence of achievement

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
15	AO1 Recall of knowledge relating to the qualification LOs • Does the candidate seem to have the full breadth and depth of taught knowledge across the qualification to hand? • How accurate is their knowledge? Are there any gaps or misunderstandings evident? • How confident and secure does their knowledge seem?	(1-3 marks) Recall shows some weaknesses in breadth and/or accuracy. Hesitant, gaps, inaccuracy.	(4-6 marks) Recall is generally accurate and shows reasonable breadth. Inaccuracy and misunderstandings are infrequent and usually minor. Sound, minimal gaps.	(7-9 marks) Consistently strong evidence of accurate and confident recall from the breadth of knowledge. Accurate, confident, complete, fluent.
		Examples of types of knowledge expected: Use of terminology, health and safety, risk assessment, legislation, purpose of land-based machinery, environmental impact, fault finding, soil characteristics, pest and disease identification, machinery use and maintenance, pre and post-use checks, uses of chainsaws, felling methods for problem trees, stump and brush removal methods, function of plant structures and their physiological processes, life cycle of plants, factors that influence plant growth and development, common causes of ill health in trees, diagnosis, monitoring and management of ill health in trees, prevention and control of pathogens, control methods for pests and diseases.		
		Bottom of band: Candidate shows a poor range of knowledge from across the tasks with inaccuracies in several areas. Top of band: Candidate shows a limited range of knowledge from across the tasks with inaccuracies in some areas.	Bottom of band: Candidate shows an appropriate range of knowledge from across the tasks which shows a limited level of detail. Top of band: Candidate shows a broad range of knowledge from across the tasks which is accurate and often detailed.	Bottom of band: The candidate shows strong and detailed knowledge relevant to the tasks showing a moderate degree of competency and accuracy. Top of band: Candidate has excellent knowledge across the tasks, showing a high degree of competency and accuracy.

%	Assessment objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
30	AO2 Understanding of concepts theories and processes relating to the LOs • Does the candidate make connections, show causal links and explain why? • How well theories and concepts are applied to new situations/the assignment? • How well chosen are exemplars – how well do they illustrate the concept?	(1-6 marks) Some evidence of being able to give explanations of concepts and theories. Explanations appear to be recalled, simplistic or incomplete. Misunderstanding, illogical connections, guessing.	(7-12 marks) Explanations are logical. Showing comprehension and generally free from misunderstanding, but may lack depth or connections are incompletely explored. Logical, slightly disjointed, plausible.	(13-18 marks) Consistently strong evidence of clear causal links in explanations generated by the candidate. Candidate uses concepts and theories confidently in explaining decisions taken and application to new situations. Logical reasoning, thoughtful decisions, causal links, justified.
		Examples of understanding expected: Application of legislation and codes of practices, safe work practices and methods, importance of pre and post-use machinery checks, minimising environmental impacts, soil properties and their impacts on plant processes, the function of plant structures, cultural maintenance, evaluation of tree felling and stump and brush removal techniques, machinery use and maintenance, safe tree felling and stump removal procedures, the implications of ill health in trees including diagnosis, monitoring and management, consequences of pests, diseases and disorders for trees, host and pathogen relationships, importance of correctly identifying pathogens, consequences of misidentification of pathogens.		
		Bottom of band: Candidate shows a poor understanding of key concepts and processes. Poor or no justification of the choices and decisions made.	Bottom of band: Candidate shows a fair understanding of key concepts and processes.	Bottom of band: Candidate shows a strong understanding of key concepts and processes.

		Top of band: Candidate shows a limited understanding of key concepts and processes. Limited justification of the choices and decisions made.	Reasonable justification of the choices, decisions and/or recommendations made. Top of band: Candidate shows a good understanding of key concepts and processes. Good justification of the choices, decisions and/or recommendations made.	Strong justification of the choices, decisions and/or recommendations made. Top of band: Candidate shows an excellent understanding of key concepts and processes. Exceptional justification of the choices, decisions and/or recommendations made.

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
30	AO3 Application of practical/ technical skills • How practiced/fluid does hand eye coordination and dexterity seem? • How confidently does the candidate use the breadth of practical skills open to them? • How accurately/ successfully has the candidate been able to	(1-6 marks) Some evidence of familiarity with practical skills. Some awkwardness in implementation, may show frustration out of inability rather than lack of care. Unable to adapt, frustrated, flaws, out of tolerance, imperfect, clumsy.	(7-12 marks) Generally successful application of skills, although areas of complexity may present a challenge. Skills are not yet second nature. Somewhat successful, some inconsistencies, fairly adept/ capable.	(13-18 marks) Consistently high levels of skill and/or dexterity, showing ability to successfully make adjustments to practice; able to deal successfully with complexity. Dextrous, fluid, comes naturally, skilled, practiced.
		Examples of skills expected: Pre and post use machinery checks, safe operation of land based machinery, reporting on safety requirements, risk assessment, minimising environmental impacts, chainsaw inspection, tree felling and cross-cutting methods, stump and brush removal methods, dealing with problem trees, chainsaw use and maintenance, soil testing.		

	use skills/achieve practical outcomes?	Bottom of band: Candidate demonstrates familiarity with some basic practical skills and capability, but may show some awkwardness in implementation and lack confidence. Tools, equipment and machinery used safely, but not always accurately. Top of the band: Candidate demonstrates familiarity with most practical skills and is generally confident in their implementation. Tools, equipment and machinery used safely with few errors.	Bottom of band: Candidate demonstrates effective application of skills, with some complex operations attempted. Candidate is confident in their implementation. Tools, equipment and machinery used safely and accurately. Top of the band: Candidate demonstrates good application of skills, with a range of complex operations attempted. Candidate is competent in their implementation. Tools, equipment and machinery used safely and accurately.	Bottom of band: Candidate demonstrates high levels of skill, shows ability to deal successfully with complexity. Candidate is competent in their implementation and mostly uses their own initiative. Accomplished and safe use of tools, equipment and machinery. Top of the band: Candidate demonstrates consistent high levels of skill, shows ability to successfully make adjustments to practice and is able to deal successfully with complexity. Candidate is highly competent in their implementation, uses their own initiative and double checks their work throughout. Accomplished and safe use of tools, equipment and machinery.

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
15	AO4 Bringing it all together - coherence of the whole subject • Does the candidate draw from the breadth of their knowledge and skills? • Does the candidate remember to reflect on theory when solving practical problems? • How well can the candidate work out solutions to new contexts/ problems on their own?	(1-3 marks) Some evidence of consideration of theory when attempting tasks. Tends to attend to single aspects at a time without considering implication of contextual information. Some random trial and error, new situations are challenging, expects guidance, narrow. May need prompting.	(4-6 marks) Shows good application of theory to practice and new context, some inconsistencies. Remembers to apply theory, somewhat successful at achieving fitness for purpose. Some consolidation of theory and practice.	(7-9 marks) Strong evidence of thorough consideration of the context and use of theory and skills to achieve fitness for purpose. Purposeful experimentation, plausible ideas, guided by theory and experience, fit for purpose, integrated, uses whole toolkit of theory and skills.
		Examples of bringing it all together: Applying and linking knowledge, understanding and practical skills to a particular situation, justifying decisions/ approaches taken, contingencies, reflection and evaluation.		

		Bottom of band: Candidate shows poor interconnectivity between knowledge, understanding and practical skills. Missing or not making connections between theory and practice across all stages of the process. Looks for constant guidance and reassurance. Top of band: Candidate exhibits some interconnectivity between knowledge, understanding and practical skills. Limited connections between theory and practice across all stages of the process. Occasionally looks for guidance and reassurance.	Bottom of band: Candidate shows fair interconnectivity between knowledge, understanding and practical skills. Fair connections made between theory and practice across critical stages of the process. Some guidance required. Top of band: Candidate shows good interconnectivity between knowledge, understanding and practical skills. Good connections made between theory and practice across critical stages of the process. No guidance required.	Bottom of band: Candidate shows strong interconnectivity between knowledge, understanding and practical skills. Candidate demonstrates strong ability to link topic areas across the whole process competently and shows independence. Top of band: Candidate shows excellent interconnectivity between knowledge, understanding and practical skills. Candidate demonstrates excellent ability to link topic areas across the whole process competently and shows a high degree of independence.

%	Assessment Objective	Band 1 descriptor Poor to limited	Band 2 descriptor Fair to good	Band 3 descriptor Strong to excellent
10	AO5 Attending to detail/ perfecting • Does the candidate routinely check on quality, finish etc and attend to imperfections/ omissions? • How much is accuracy a result of persistent care and attention (eg measure twice cut once)? • Would you describe the candidate as a perfectionist and wholly engaged in the subject?	(1-2 marks) Easily distracted or lack of checking. Insufficiently concerned by poor result; little attempt to improve. Gives up too early; focus may be on completion rather than quality of outcome. Careless, imprecise, flawed, uncaring, unfocussed, unobservant, unmotivated.	(3-4 marks) Aims for satisfactory result but may not persist beyond this. Uses feedback methods but perhaps not fully or consistently. Variable/intermittent attention, reasonably conscientious, some imperfections, unremarkable.	(5-6 marks) Alert, focussed on task. Attentive and persistently pursuing excellence. Using feedback to identify problems for correction. Noticing, checking, persistent, perfecting, refining, accurate, focus on quality, precision, refinement, faultless, meticulous.
		Examples of attending to detail: Care of equipment, time management, accuracy in practical tasks, routinely checking on quality, changing work practices in relation to external stimuli.		
		Limited, not always relevant information included. Written work lacks crucial information or coherency. Incorrect or unsafe working techniques used. Little attention to detail across all tasks.	Mostly relevant information included. Written work is coherent. Mostly appropriate working techniques employed, including the use of suitable equipment where needed. Good attention to detail across all tasks.	All relevant information included. Written work is coherent and detailed. Appropriate working techniques employed, including the use and recommendation of suitable equipment where needed. Consistent attention to detail across all tasks.

Section 3 Learner Materials

Good Pass Learner Work Task 1

Pest and Disease report for trees at the South Entrance of [redacted] near the Reception building

This is a P&D report for the trees at [redacted] at the south entrance near the reception, this report will contain the P&D that is found and its location will be marked on a map so that it can be easily found again after reading the report. In the second part of this report there will be management recommendations so that any P&D that are found can be managed to avoid the spread of it or any more damage to happen. The map to the right shows the area that is covered.

To carry out this survey I will go to the site and walk around each tree and inspect it at the base and look into the crowns to see if there are any signs of any P&D within the trees, this will then be written down in table. As the trees on this site are quite small I will not be using any tools to survey as the trees are quite small and can be easily surveyed from the floor. The Trees on this site are all deciduous which means that there are no leaves on them at this time of year which will limit my ability to see any damage on the leaves however there are leaves on the floor which can be looked at for signs of P&D. As I went around the sight I took note of tree locations and marked them on my map highlighting and naming any that have got a form of P&D. To the right is the detailed map after I went around collecting all of my information. After walking around the site I discovered there are 5 trees that have a form of P&D.

To the right is a typed up copy of the survey sheet which I took with me to do my tree surveys this is just an easy way of presenting the trees and what P&D they have.

TREE NUMBER	SPECIES	P&D
1	Walnut	Honey Fungus
2	Horse Chestnut	Horse chestnut leaf minor
3	Tibetan Cherry	Squirrel Damage
4	Tibetan Cherry	Squirrel Damage
5	Rhododendron Ponticum	Rabbit Damage

Walnut

The walnut next to the main reception has been found to have honey fungus (fruiting body has been seen) which is transported in spores which are taken by the wind, water courses or soil and then will infect the tree with the honey fungus. Once the tree is infected with honey fungus the wood will start to decay which is the food source for the honey fungus. Once a tree is infected the fungus can spread at a rate of 1 metre per year through the soil which means that different precautions may need to be taken.

There are a few different ways of preventing the spread of honey fungus however once a tree is infected with it there is no way to remove it. All that can be done its preventing the spread of this can be done firstly by if the tree is unsafe it could be removed but this walnut has not reached a stage that something needs to be done however once the tree is removed this area could be left fallow or planted with grass for a help as this should help to prevent the spread as grass isn't as susceptible to a fungus infection; by doing this the fungus should die out by its self as it won't have any food source. Another way to stop the spread of honey fungus is by putting a plastic sheet barrier in underground this stops the fungus spores spreading through the soil and infecting the root system of another tree. The best way to deal with honey fungus is to remove the infected timber and burn on site to avoid the spread of it, and then the sight should be cultivated roots should be removed and burnt as well and then the site should be left fallow.

Horse Chestnut

The Horse Chestnut next to reception has been seen to have brown blotches on the leaves which are a strong sign of the horse chestnut leaf minor being present. It is quite hard to remove the horse chestnut leaf minor however

there are ways of preventing it attacking the tree. On large crops people have started using pheromone trap which are designed to attract the insect into a box and they then get trapped in it on sticky pads which will then cause the insect to die. Another way of dealing with the leaf minor is to use pesticides however this isn't as effective as using the pheromone traps because the whole tree would have to be sprayed and this is not easy to do from the ground and also may not even kill the population.

A good prevention measure is to burn all the leaves that have fallen on the floor as it stops any of the insects or larvae overwintering and surviving until the next summer. If the tree is attacked too much by the leaf minor it can eventually cause the death of the tree but firstly all that will be seen is early leaf drop and white or brown spots on the leaves.

Tibetan Cherry

Two of the Tibetan cherry trees in front of the college have been damaged by strimmers. This is a problem caused to the tree by humans and this can make the tree more susceptible to picking up other infections or diseases. Strimmer damage can also cause the cambium layer of the tree to be removed this will then cause the tree to die as there will be water or nutrients going around the tree.

There are a couple of different ways to prevent strimmer damage once is to have each tree in an individual tree crate which wouldn't need to be strimmed inside. The easiest way to prevent strimmer damage is to mulch around the base of the newly planted trees this means that the grass will not grow around the base but it will also breakdown over time and turn into plant food for the tree.

Metasequoia Glyptostoboides

One of these trees that are planted as part of an avenue on a path has been damaged by rabbits. Rabbit damage is very similar to strimmer damage as it removes the cambium layer and will stop the flow of water and nutrients around the tree.

Rabbits are a pest that can be removed in a lot of different ways the most humane way of dealing with them would be to either put tree guards around all of the young trees within this area or to rabbit fence all the way around the perimeter of this area however this would be more expensive than tree guarding and a lot of the trees are now too big to be tree guarded.

The rabbits can all be killed by shooting them this is the most effective way of removing them however as this is an entrance to a college shooting them would not be a feasible option. The rabbits could be trapped however which would kill of the rabbits that attack the trees and be a safe way of removing the pest.

Conclusion

With the walnut tree I would not say it needs to be removed at this point however it should be observed closely on a regular basis and if it starts to deteriorate in condition then plans should be made to have it removed. The rabbits can be trapped around their holes so that they are effectively killed and if any new trees are planted they should be guarded so that they are protected against the rabbits. To deal with the leaf minors I would have a couple of pheromone traps near the reception building to attract them away from the horse chestnut tree and keep removing the dead leaves from the floor and disposing of them in a compost bin or on a fire. The best and cheapest way of preventing anymore strimmer damage would be to mulch around the base of the trees to stop the grass growing and then people won't have to strim right up close to the edge of the tree.

Task 2

Site Specific Risk Assessment

Information Required	Details	Information Required	Details
Location name	Redmire	Grid reference (include letters)	NY375301
Site location name	Redmire Forest	Nearest access point	Track off of the road
Designated meeting place (useful in remote areas)	Next to truck	Postcode	CA11 0CB
Type of access (public road/light vehicles, four wheeled drive)	Private track 4x4 needed	Street name / district / address	Mungriezdale
Suitable helicopter landing area	Field next to forest	Location of nearest accident and emergency hospital and phone number	Newtown Road, Carlisle, Cumbria, CA2 7HY
Phone number of nearest doctor	01228 523444	Manager's contact number	01768893400
Your own contact number		Nearest Land line phone	
Work Activity			

Operators on site (name)	Operators on site (sign)	Date

The Hazard	Location of the Hazard	Who could be harmed?	Level of risk	Controls	Implementation/Monitoring	Level of risk after control
Slips And Trips	Forests ground ,boardwalk	All Operators and visitors on site	5	Make sure walk ways are clear Make sure boots with ankle protection are worn		
High water level	Puddles ponds streams	All operators and visitors on site	5	Have ponds clearly marked and supervised site walk arounds for any new people so they know where all ponds are		
Windblown Trees	Sporadically placed through the forest	All operators and visitors on site	8	All ppe to be worn within the sites. Do a walk around of the part of the site to be worked on to check before starting work		
Objects that can fall	Falling branches and hung up trees	All operators and visitors on site	6	Wear helmets in woods.		
Dust Inhalation	Cutting dead wood or chipping	All operators and visitors on sight	5	Keep chains Sharp Keep operators in safe zones		

Assessment by: ……..

Signed……Date……

Task 3

Technical qualifications - Practical Observation Form

Assessment ID	Qualification number
[redacted]	Level 3 Advanced Technical Diploma in Forestry and Arboriculture (0174-38)
Candidate name	**Candidate number**
[redacted]	[redacted]
Centre name	**Centre number**
[redacted]	

Complete the table below referring to the relevant marking grid found in the assessment pack. Do not allocate marks at this stage.

Assessment Objective (AO)	**Notes** – *detailed, accurate and differentiating notes that identify areas of strength and weakness are necessary to distinguish between different qualities of performance, and to facilitate accurate allocation of marks once all evidence has been submitted.*
AO1 Describe how well the candidate shows recall of knowledge e.g. stating facts without explanation / simple descriptions of what they are carrying out / showing aspects of straightforward knowledge through logical sequencing and application of skill etc.	Chipper – Hesitant throughout operations, fast to make a decision but no explanation given, straight forward basic knowledge shown. Felling – Sound recall, Good descriptions, minimal gaps, felling methods identified quickly and a description gaps was provided. Stump Removal – Explanations given but they where limited and completed in a unlogical manner.
AO2 Describe how well the candidate shows understanding when carrying out practical tasks e.g. their explanation of why they are completing a process or how they may change their course of action / are they able to justify their actions etc.	Chipper – disjointed set up of the site for work, chipper was not ideally placed to brash, little explanation given throughout. Felling – Very good knowledge on machine and actions justified and explained logically but was brief. Stump Removal – Explanations given where brief, action where justified, no action changed, problems where over come with a limited explanation.
AO3 Describe how well the candidate demonstrated their practical skills. e.g. how practiced/fluid is hand eye coordination and dexterity / how confident are they / how accurate or 'polished' is the outcome / safe working etc	Chipper – quick with practical, bent back was a consistent, confident with machine and controls, work was not well polished. Felling – Pre start checks completed confidently fluid with felling and processing, snedding efficient some pegs left. Cross cutting was accurate. Stump Removal – Checks to machine completely with some small hesitation, capable on machine, safe operation throughout, post checks briefly completed

Assessment Objective (AO)	**Notes** – *detailed, accurate and differentiating notes that identify areas of strength and weakness are necessary to distinguish between different qualities of performance, and to facilitate accurate allocation of marks once all evidence has been submitted.*
	slowly with little dexterity shown.
AO4 Describe how well the candidate brings it all together – e.g. how coherent are their actions / how well do they draw from the breadth of their knowledge and skills / reflection on theory when solving practical problems / How well can they work out solutions to new contexts/ problems on their own / time management etc.	Chipper – some linking knowledge shown, decisions where made but little justification shown. Felling – Linking knowledge shown strongly between P&D and felling, time management was very good. Stump Removal – Theory was applied and problems such as hard to access site where over come quickly, some links to theory shown when calculating stump removal strain on strops.
AO5 Describe how well the candidate attended to detail e.g. professionalism / perfecting / accuracy / checking / taking care / methodical working etc.	Chipper – Hesitant throughout operations, decisions quickly made to adjust spout direction. Felling – work was well practiced and perfected, cutting was mostly accurate (hinge width was 12%, back quarter undersized). Candidate was quick to complete operation however pegs where left on stem. Stump Removal – imperfections shown, work was methodical, good time management shown.

Tutor signature	Date
[redacted]	11-4-18

Task 4

Soil Report

Intro

This is a soil report for the arboretum at [redacted]. This report is to show soil types within the arboretum at newton and suggest possible trees to plant in the area.

To carry out my report I will

Take a spade down to the arboretum and once I am here I will pick 3 locations in the arboretum.

Once I have picked my 3 locations I will get a 1x1 metre area and dig 3 holes

Within each one of these and then I will look at the texture, soil type, drainage and soil compaction.

I will then repeat this on the other 2 locations I have selected.

What I found out

Sample A (near poly-tunnels) Soil type- Sandy Loam pH - 5.5 Observations- Lots of roots and worms underneath the soil and Organic matter on top
Sample B (near London plane) Soil type- Clay Loam pH - 5.5 Observations- This sample was taken from underneath a track and the soil was moderately compacted due to being walked over by people. Underneath the soil there was lots of tree roots and a bit of grass growing on top
Sample B (in sitka plantation) Soil type - Sandy loam pH - 5.5 Observations- this soil didn't have many roots growing through it or any grass on top. There was a light covering of needles from the spruce trees on top of the soil. The soil was quite crumbly and soft.

Properties

The soil I found was mostly sandy loam which is quite a loose soil that isn't very compacted and has good aeration. As each of my soils were found in the arboretum they all had a good amount of organic matter on top which will get broken down and this will help to feed the plants by making the soil nutrient rich as they decompose. The soil has not got a very high chance of soil erosion as the water will be taken up by the trees and the site is also fairly flat so the water won't be running through it taking out nutrients.

The Clay soil which was found at sample B has lots of minerals in it as it is a clay and this is a tightly structured soil with not a lot of space for aeration and water infiltration this means in summers clay can be quite a hard soil but also in winter it can become quite a sticky and wet soil. If the ground is worked correctly and the soil is broken up this soil is the ideal place for growing as clay is a very nutrient rich soil.

The soil pH is around 5.5 this makes the soil slightly acidic which makes this ideal for growing coniferous trees as they are suited to a more acidic soil and grow better than any other trees in it.

Options for planting

In this soil various species of pine could be planted like scots pine and lodgepole pine. There are not many broadleaf trees that grow well in acidic soils but a few that will grow in this soil are trees like willow , holly and birch.

The soil could be neutralised before planting anymore trees by adding lime to the soil as this is an alkali and will even out the acidity of the ground.

Growth and development

With the results I have collected and the observations I have made of the trees that are currently growing in the arboretum I would expect trees like sitka and pines to grow well in the soil and if sitka was planted a woodland should reach full maturity ready to be harvested within about 30-40 years. If this were to be planted up with broadleaves a much slower growth would be expected from these trees as they are not as suited to the soil and eventually the soil would become neutral naturally without adding lime to the soil however much slower growth would be expected and a higher loss of trees would be expected. In each three of the locations the trees that could be planted would be conifers as they are more suited to the soil pH and therefore will have a higher growth rate than anything else that could be planted.

Candidate Record Form

Technical qualifications

Level 3 Advanced Technical Certificate in Forestry and Arboriculture (0174-35)
Level 3 Forestry and Arboriculture - Synoptic assignment (0174-011)

Candidate name	Candidate number
[redacted]	[redacted]
Centre name	**Centre number**
[redacted]	

Marker Notes *– Please always refer to the relevant marking grid for guidance on allocating marks and make notes that describe the quality of the evidence and justification of marks. Expand boxes as required.*

AO1 – Recall - Breadth, depth, accuracy									
15%	1	2	3	4	5	6	7	8	9
AO1 Mark 4+2+5 / 3 = 3.6	Notes & justification Soil report – 4 marks – concise report, mention soil characteristics, mentioned ground prep and compaction and drainage throughout, a range samples collected – little description of methods. Risk assessment – 2 mark, large gaps and inaccurate information, controls are limited and implementation is scarce. P&D – 5 marks – missed of the trees with rabbit damage / good range of knowledge from across the topics								

AO2 – Understanding - Security of concepts, causal links																	
30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
AO2 Mark 5+2+11 / 3 = 6	Notes & justification Soil report - 5 marks. Key points are disjointed, some understanding of key concepts shown, logical thought shown throughout the report, few points briefly linked to plant growth. Risk assessment – 2 marks, Poor understanding, few hazards ID'd and control measures complete, limited understanding of risks shown. P&D – 11 marks – good understanding of the key concepts / good justification for the tree work and decisions about the trees																

AO3 - Practical skill - Dexterity, fluidity, confidence, ease of application																		
30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

AO3 Mark	Notes & justification
7+4+11 / 3 = 7.3	Soil report – 7 marks, slow with sampling, took time to reach a decision, mostly capable. Risk assessment – 4 marks, unable to adapt to different hazards and risks, familiarity with some hazards, confident with some hazards. P&D – 11 marks – good quality / complex skill used but no key

AO4 – Bringing it together - use of knowledge to apply skills in new context

15%	1	2	3	4	5	6	7	8	9

AO4 Mark	Notes & justification
4+3+6 / 3 = 4.3	Soil report – 4 marks – some linking of knowledge shown, some theory was applied, reflected on soil samples well and linked in current knowledge. Risk assessment – 3 marks, New risks sometimes missed, some interconnectivity shown on obvious hazards and a control measure. P&D – 6 marks – good links between topics and justification of decisions

AO5 - Attending to detail / perfecting - Repeated checking, perfecting, noticing, engaged

10%	1	2	3	4	5	6

AO5 Mark	Notes & justification
3+2+4 / 3 = 3	Soil report – 3 marks – some detail to task, gaps throughout work with imperfections Risk assessment – 2 marks, lack of focus, unmotivated, un observant of many risks and hazards. P&D – 4 marks – mostly appropriate information included / written work is coherent

Tutor signature	Date
[redacted]	11-4-18

Total
24.26

Final moderated mark for this student is 27

Tree 1

A08 Successful and appropriate use of inserted and embedded images.

1. **Location of the tree:** Old main drive at Reaseheath college
2. **Date of Inspection:** Tuesday 9th January 2018
3. **Grid reference:** SJ6479153880 [elevation 42m]
4. **Prepared by:** [redacted]

Terms of reference

5.1 I have been instructed by [redacted] to:

5.2 Inspect the tree from ground level and report on the trees condition.

5.3 Recommend any works thought necessary to enable the continuing health and safety of the tree.

A01, A02, A03 Good range of knowledge from across the qualification. Successful application of skills

6. Findings:

Tree species: Small leafed lime – *Tilia cordata* 'Green Spire'

Age of tree: 8 years old

Height of tree: 4 metres

Diameter at breast height: 250mille metres

Crown spread [radius of crown in meters at the four points of a compass]:

North: 1.5m **East:** 1.5m **South:** 0.5m **West:** 1.5m

Symptoms

The characteristics of this abiotic disorder are that the soil is waterlogged. Water around the base of the tree and around the tree.

AO1, AO2, AO4 Range of knowledge from across the qualification. Applies theory to practice

Impacts

Since the tree is a *Tilia cordata* it means that this particular tree does not like wet soil conditions, therefore the tree will not thrive. Since the soils pour spaces are filled with water there is no space for the oxygen, roots need oxygen to survive so the lack of oxygen means the tree will struggle in growth, also the tree can't get rid of the harmful gasses so in effect the is suffocating itself.

Location of the disorder

In the roots because they are in contact with the waterlogged soil.

Hosts

Trees that have evolved to free draining soils.

Distribution

Any place where there are unsuited trees to waterlogged conditions.

Impacts of the damage caused

The roots don't get the supply's they need such as oxygen. This means that the tree cant used the energy stored in the roots because it needs oxygen to break it down. These soil conditions are anaerobic, because of the lack of oxygen.

AO1, AO4 Applies theory from across the qualification to practical situation

What action is required?

2 options suggest different ways to stop this problem. One way is to put drainage systems in place, they would have to be further away than the drip line. A root barrier should be placed so the roots don't block and get into the drain, the drainage system will lower the water table.

Another way to solve this problem is to put trees that are more suited to the soil conditions. This could reduce the problems of the roots blocking the drainage systems.

AO1, AO2, AO4. Strong evidence of thorough consideration of the context.

Signs and visible symptoms

Water around the base of the tree. Soft rush (*Juncus effusus*) and creeping buttercups (*Ranunculus repens*), these are showing signs of waterlogging because they thrive in wet conditions. Only creeping buttercups are present in this site.

Life cycle and biology

The waterlogging stops the tree roots from getting its vital elements, because the soil is waterlogged. Instead of the pour spaces being filled with air it is taken up with water so the roots can't get any oxygen. Whereas in summer this problem reverses, there is not enough water but a surplus of oxygen. These are all cause by a poor soil structure this means that the tree will not be happy in the soil it has been planted in.

Host & pathogen relationship

Waterlogging does not help the tree at all. It provides problems and disorders to inflict on it. Waterlogging in the soils stops the tree roots from getting oxygen for photosynthesis to provide the tree energy to grow, this case of waterlogging is why the tree has hardly grown since being planted.

AO1, AO2, AO4, AO5 Plant focussed on task. Strong evidence of thorough consideration of the context.

Methods of monitoring

Regular checks of the site could be taken to ensure that the waterlogging hasn't got any worse, another way is to collect a soil sample and test the porosity and permeability in the sample, this will give an idea of what the soil is like and show how it is waterlogged. To test porosity you get half a cupful of soil then pour water in to it until it fills to just over the line of soil then record how much water is left in the test tube, the take that away from 100 then that number will be the pour space percentage. To record the permeability place half a cup full of soil into a cup with a hole in the bottom then pour 100ml of water into it then record how long it took for the water to pass through.

AO1, AO2 Strong evidence of accurate & confident recall from breadth of knowledge.

Prevention measures

Before the tree is planted the soil conditions should be recorded and a suitable list of trees should be made to see which tree would be more suitable to the soil conditions. If limes wanted to be planted in these soil conditions, the land drainage would have to be sorted out so the water table can be lowered mean the soil wouldn't be waterlogged. Also a root barrier should be placed because since it's by a road the roots could potentially breakup the tarmac and disrupt the road.

A02, A04, A05 Wide range of knowledge used to justify and problem solve which more coherent and detailed.

Control measures

If waterlogging does occur then the land drains should be sorted out because if this abiotic disorder is confirmed then you wouldn't want it getting any worse.

Legal & environmental considerations

Tree preservation orders, (TPO) this means the tree is protected and to do work on the tree you would need to contact the local authority and give them 6 weeks' notice of the work you intend to do, this gives them time to either approve or not.

Tree 2

AO1, AO2, AO3.
Strong and detailed knowledge across the range relevant to the task.

Location of the tree: Old main drive at Reaseheath College

Date of inspection: Tuesday 9th January 2018

Grid reference: SJ6480953842 [elevation 39m]

Prepared by: [redacted]

Terms of reference

I have been instructed by [redacted] to:

Inspect the tree from ground level and report on the trees condition.

Recommend any works thought necessary to enable the continuing health and safety of the tree.

Findings:

Tree species: Small leafed lime – *Tilia cordata* 'Green Spire'

Age of tree: 8 years

Height of tree: 6 meters

Diameter at breast height: 500 mille meters

Crown spread [radius of crown in meters at the four points of a compass]:

North: 2m **East:** 2.5m **South:** 1.5m **West:** 2.5m

Symptoms

1. No weed free zone
2. Vandalism, knife damage
3. Winter moth (*Operophtera brumata*)
4. Mower and strimmer damage

AO5. Focused on task
Accurate presentation of information

AO8 Good use of sourced images embedded in the text.

Impacts

1. This means that weeds can grow and it also, stops people from getting to close to the base of the tree with the mower.
2. This damage exposes the cambium.
3. Feed on the leaves in the summer
4. Damages the buttresses and exposes the cambium

Location of the disorder

1. Around the base of the tree.
2. On the trunk.
3. On the leaves.
4. On the buttress roots.

AO1, AO2, AO5
Strong detailed knowledge
Integration of knowledge and understanding.

Hosts

1. On all trees.
2. On all trees
3. On a range of trees such as, limes, beech and ash.
4. On all trees that are being mowed and strimmed close by.

Signs and visible symptoms

1. Weeds around the base of the tree. The weeds around this tree are creeping buttercups. (Ranunculus repens)
2. Stab like marks on the trunk of the tree.
3. The leaves have been fed on.
4. A big gash on the buttress roots at the bottom of the tree.

AO1, AO2 Strong & detailed knowledge across the qualification. Confident & accurate

Life cycle and biology

1. The weeds stop the tree from getting all of the nutrients it needs, and the need for the light so they are competing against each other.
2. The marks expose the cambium, and disrupt the flow of the xylem and phloem leading to the tree not getting the nutrients around the tree.
3. The larvae hatch in the early spring and climb up the tree and feed on the leaves this stops the tree from photosynthesising, to prevent this a grease band can be placed around the trunk of the tree to stop the females from climbing up the tree to mate with the males, this will stop the cycle.
4. People cut the grass in the summer because that is the season it grows in, a meter circle of mulch would show people not to mow or strim there.

AO2 Clear and detailed understanding of key concepts. Justification of recommendations.

Host & pathogen relationship

1. Since the weeds are in competition with the trees they compete for the light so the tree can suffer from weeds getting some of the light.
2. The knife marks disrupt the flow of the xylem and the cambium so the tree will deficit the nutrients because they can't flow round so the tree would not benefit from this happening.
3. The larvae feed on the leaves so in the summer this stops the tree from photosynthesising, this will prevent the tree from getting its energy.
4. When mowers and strimmer's hit the base of the tree they can take out chunks of the buttress roots leading to a big gash on the tree exposing the cambium and the tree to pests and diseases, this will not help the tree because later in life.

Methods of monitoring

1. To do regular checks on the site to see if the weed growing has got any worse or if more have grown.
2. To do regular checks of the site and see if anymore vandalism has taken place.
3. g
4. Do regular checks of the site in the summer to see if the mowers and strimmer's have got close of if there are any fresh gashes in the buttress roots of the tree.

Signs and visible symptoms

1. Weeds around the base of the tree. The weeds around this tree are creeping buttercups. (Ranunculus repens)
2. Stab like marks on the trunk of the tree.
3. The leaves have been fed on.
4. A big gash on the buttress roots at the bottom of the tree.

AO1, AO2 Strong & detailed knowledge across the qualification. Confident & accurate

Life cycle and biology

1. The weeds stop the tree from getting all of the nutrients it needs, and the need for the light so they are competing against each other.
2. The marks expose the cambium, and disrupt the flow of the xylem and phloem leading to the tree not getting the nutrients around the tree.
3. The larvae hatch in the early spring and climb up the tree and feed on the leaves this stops the tree from photosynthesising, to prevent this a grease band can be placed around the trunk of the tree to stop the females from climbing up the tree to mate with the males, this will stop the cycle.
4. People cut the grass in the summer because that is the season it grows in, a meter circle of mulch would show people not to mow or strim there.

AO2 Clear and detailed understanding of key concepts. Justification of recommendations.

Host & pathogen relationship

1. Since the weeds are in competition with the trees they compete for the light so the tree can suffer from weeds getting some of the light.
2. The knife marks disrupt the flow of the xylem and the cambium so the tree will deficit the nutrients because they can't flow round so the tree would not benefit from this happening.
3. The larvae feed on the leaves so in the summer this stops the tree from photosynthesising, this will prevent the tree from getting its energy.
4. When mowers and strimmer's hit the base of the tree they can take out chunks of the buttress roots leading to a big gash on the tree exposing the cambium and the tree to pests and diseases, this will not help the tree because later in life.

Methods of monitoring

1. To do regular checks on the site to see if the weed growing has got any worse or if more have grown.
2. To do regular checks of the site and see if anymore vandalism has taken place.
3. g
4. Do regular checks of the site in the summer to see if the mowers and strimmer's have got close of if there are any fresh gashes in the buttress roots of the tree.

A03, A04, A05 High level of skill & understanding
Wide contexts considered
Written work coherent & accurate

Prevention measures and control measures

1. Placing a meter circle of mulch around the base of the tree, this will slow down the growth of the weeds and overall improve the health of the tree because there would be no competition for the food and light. This will comply with British standard BS4043
2. When planted to comply with BS3998 the aftercare of trees it's recommended to put a cage around the tree to stop people vandalising the tree. This will help the tree grow and thrive within the cage.
3. A grease band can be put around the trunk of the tree this will stop the females from getting to the top of the tree to mate with the males, this will prevent the larvae from eating the leaves. This means the tree will be able to photosynthesise to make energy.
4. A cage or a rabbit guard around the base of the tree, if the mowers and strimmer's get to close it will hit the guard instead of the tree, this will stop the tree from getting damaged and let it grow as it should.

A06 Excellent use of industry standards and terminology

Legal & environmental considerations

The British standard regarding the aftercare of trees BS3998 this will give the tree the best possible outcome.

Tree preservation orders, (TPO) this means the tree is protected and to do work on the tree you would need to contact the local authority and give them 6 weeks' notice of the work you intend to do, this gives them time to either approve or not.

A06 A08 - Appropriate research and information selected.

Sources of information used:

https://www.plantwise.org/KnowledgeBank/PWMap.aspx?speciesID=30353&dsID=37695&loc=global

Task 2

[redacted]

Site Specific Risk assessment

Location of site including postcode:	Delamere Forest WA6 8LH Point A	OS Grid Reference	SJ 36015 71114
		Grid Reff For Air Ambulance	SJ 55 79671053
Meeting point for emergency service:	Point B	Location of nearest Phone Mobile No	point C 07897 505360
Nearest Accident and Emergency Hospital Phone No	Countess of chester Hospital 01244365000 CH2 1HJ	College Main reception	[redacted]
		Site contact No	0380 067 4340

Additional hazards not covered by general risk assessment	Additional control measures required to reduce risks to acceptable level
Stumps left	take stumps down as low as you can · A01 Band 3 (3)
Brash piles	take care when walking A05 Band (3)
log piles	
Hanging Branches above the work area	check around the canopy for hanging branches
site on a slope	never work ~~below~~ on the downside
novice chainsaw users	supervision at all times
Public access	check your surroundings at all times
weather	
Safe working distances	at least 2 tree lengths away from eachother
no fooling about	people getting hurt
noise	
Fuel + oil	General incidents of wed Hazards Band (5)

RISK ASSESSMENT

ACTIVITY: tree Felling

DATE ASSESSED: 26/4/18

ASSESSED BY: [redacted]

HAZARD (potential for harm)	RISK	WHO IS AT RISK	SEVERITY (1 to 3)	LIKELIHOOD (1 TO 3)	RATING (1 to 9) S x L	PRECAUTIONS OR CONTROL MEASURES	Ratings after control measures put in place: SEVERITY (1 to 3)	LIKELIHOOD (1 TO 3)	RATING (1 to 9) S x L
Stumps Sticking up	tripping	workers	2	3	6	when trees are felled take stumps down	1	2	2
Slips/trips/ Falls	people getting hurt	workers	2	3	6	take care when walking	1	1	1
Fuel	spillages + fires	workers	3	2	6	spill kits and have a designated space away from work site	1	2	2
Charp chain components	getting cut	workers	2	2	4	chain guard + turning bar to the back when working around	1	1	1
noise	misunderstanding instructions	workers	2	3	6	turn saw off when instructions are being told	1	1	1
hanging Branches	branch falling and somebody getting hit	workers	3	2	6	Check above and look before you fell	2	1	2
Vibration	white finger	workers	3	3	9	wear gloves + check the mounts ~~of the~~ on the saw	1	1	1
Public	walking to the work site	public + workers	3	2	6	~~Sing~~ Sign posting + cones or tape	1	1	1
Site on Slope	tree falling on user	worker	3	2	6	do take care when walking with saws	1	1	1

REVIEW DATE:

RATING: 1 to 3 = low risk, 4 to 6 = medium risk (take precautions), 7 to 9 = high risk (revise activity/alternative)

UK Grid
Reference Finder

Grid Reference	X (Eastings)	Y (Northings)	Latitude	Longitude	Description (Click to Edit)	Address	Postcode	Link	Center	Zoom
SJ 68015 71114	360015	371114	53.235233	-2.6604484	Point A	Unnamed Road, Frodsham WA6 6LH, UK	WA6 6LH			
SJ 65796 71533	365796	371533	53.234477	-2.6437079	Point B	55152, Frodsham WA6, UK	WA6 6LH			
SJ 68806 70397	368806	370397	53.229751	-2.6484853	Point C	153 Station Rd, Delamere, Northwich CW8 2HZ, UK	CW8 2HZ			

Technical qualifications - Practical Observation Form

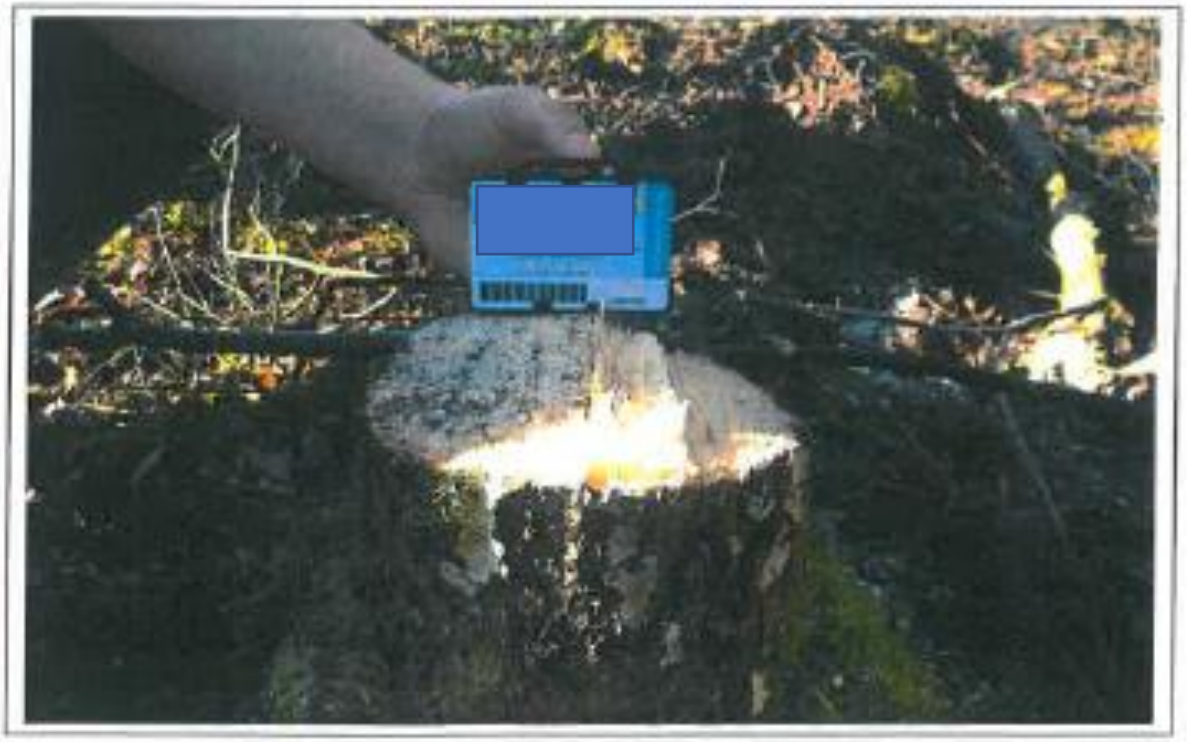
Assessment ID	Qualification number
[redacted]	0174-011
	Candidate number
	[redacted]

Complete the table below referring to the relevant marking grid found in the assessment pack. Do not allocate marks at this stage.

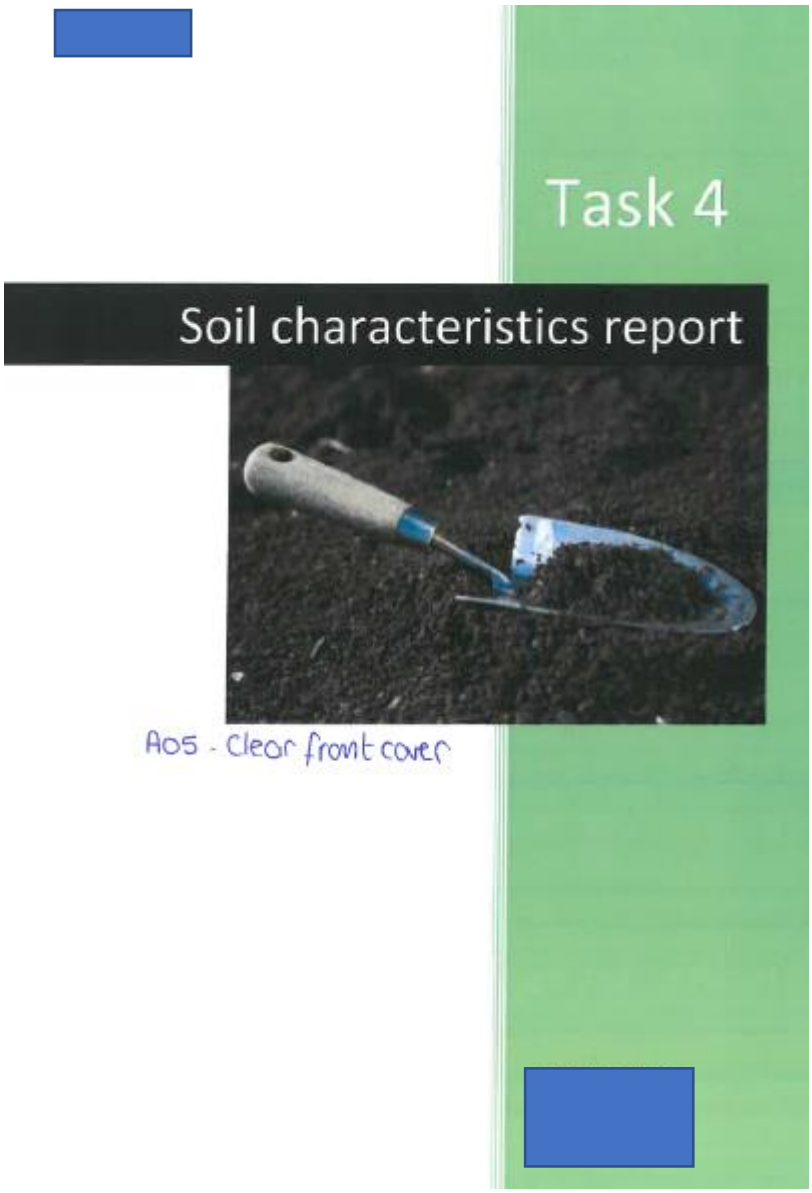
Assessment Objective (AO)	Notes – *detailed, accurate and differentiating notes that identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
AO1 Describe how well the candidate shows recall of knowledge e.g. stating facts without explanation / simple descriptions of what they are carrying out / showing aspects of straightforward knowledge through logical sequencing and application of skill etc.	Declan showed a strong and detailed knowledge which was relevant to the task showing moderate degree of competency. (3)
AO2 Describe how well the candidate shows understanding when carrying out practical tasks e.g. their explanation of why they are completing a process or how they may change their course of action / are they able to justify their actions etc.	Cath used showed an excellent understanding of key concept and process. When questioned on other aspects on getting good knowledge was shown.

Assessment Objective (AO)	Notes – detailed, accurate and differentiating notes that identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.
AO3 Describe how well the candidate demonstrated their practical skills, e.g. how practical/fluid is hand eye coordination and dexterity / how confident are they / how accurate or 'polished' is the outcome / safe working etc.	Haigh level of knowledge was given with good level of skill with falling cuts. was able to deal with a hung up tree (complex) in a safe manner. (3)
AO4 Describe how well the candidate brings it all together – e.g. how coherent are their notions / how well do they draw from the breadth of their knowledge and skills / reflection on theory when solving practical problems / how well can they work out solutions to new contextual problems on their own / time management etc.	Dexter was able to show a good understanding standard in using the saw when felling and during delimbing Showed good knowledge in felling/pruning and skill (3)
AO5 Describe how well the candidate attended to detail e.g. professionalism / perfecting / accuracy / checking / taking care / methodical working etc.	Showed good/strong interconnected between knowledge, understanding and practical skills Showed good competency over the whole task (3)

Tutor signature	Date
A Mott	16/3/18



Task 4



Contents page

- Introduction
- Methodology
- Data presentation
- Description of results
- Comparison of results
- Limitations
- Conclusion
- References

✓ AO5 - clear layout
could have included
page numbers.

Introduction

This report is going to focus on key soil characteristics and the effect they may have on plant or tree growth. ✓ AO1 Clear statement

The site area selected is Reaseheath college. The specific area is along the main drive as there is a noticeable change in tree growth. The samples selected are highlighted with blue dots on the map below ✓

Drone photo

This map was a drone photo taken on the day this gives a more accurate representation of the site, instead of maps that haven't been updated. Below is a map OS map of the site.

Os map

This photo shows an un updated OS map of the site. Because it's a golf course.

The 11 soil samples will be tested for. pH, soil type, soil texture and porosity and permeability. This is because those tests will develop information that is vital to investigating soil characteristics.

✓ AO1/AO2 Clear and correct use of photographs/with description

Methodology

Method for the collection of the soil

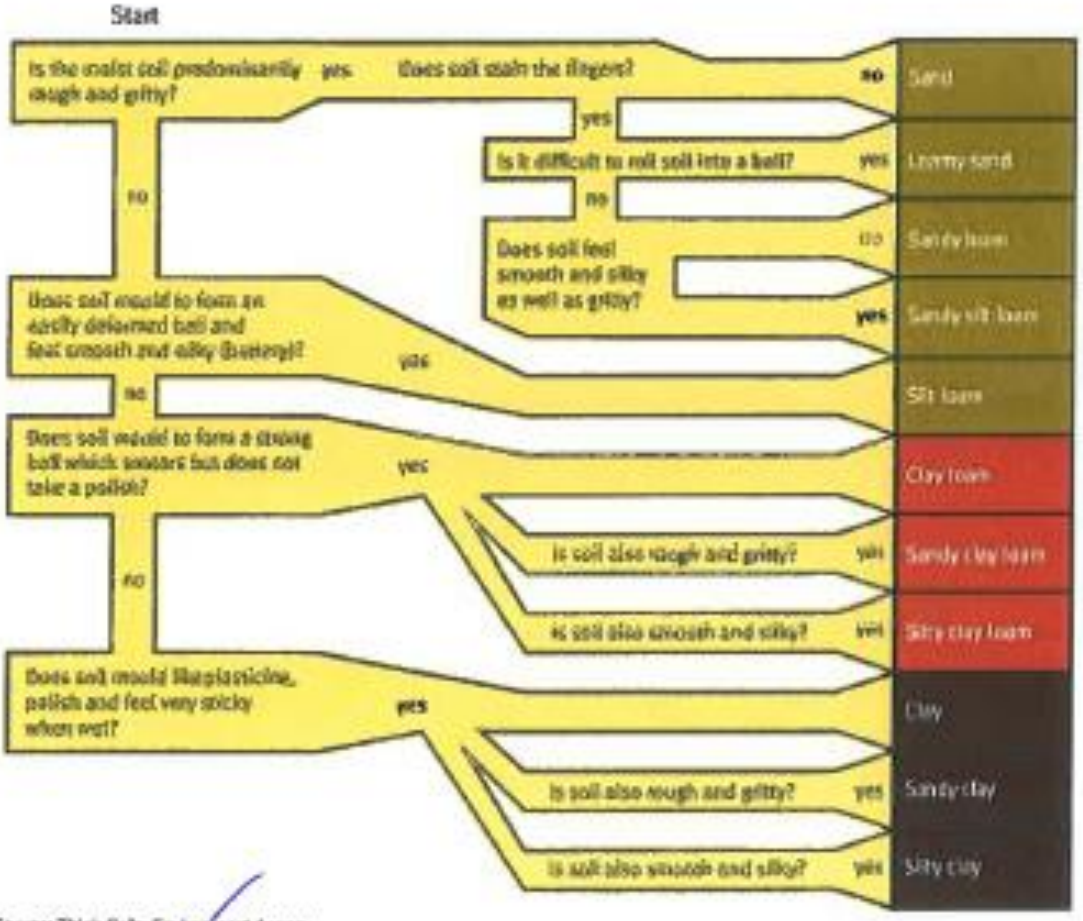
Any Justification of sample

I picked the soil sample sites labelled in the introduction because I wanted an equal range of the sample site. Hence why I picked all the corners and some in the middle. This gave me an equal set of soil samples from different places on the site. Before the soil samples were collected. Sandwich bags and a trowel were needed to start the data collection.

To collect the data, a small hole was dug about the size of a fist. Using the trowel the soil samples were taken out of the ground and put into the sandwich bags ready for testing. This method was repeated 11 times to get all of the samples for the tests.

Method for soil texture and type

To test the soil texture the soil samples that were collected were opened. To do this test the soil is rubbed between the fingers. To determine the soil type refer to the soil type matrix grid in the photo below.



Source: Think Soils, Environment Agency

?Cap

Porosity and permeability method

Measuring porosity of samples:

1. Pour 100ml of water into the cup and draw a line where the water comes up to
2. Fill the cup with the first soil sample up to the line drew
3. Using the graduated cylinder, slowly and carefully pour water into the cup until the water reaches the top of the sample.
4. Subtract the volume remaining from the total volume. This is the amount of water added to your sample
5. To determine the porosity of the sample, divide the pore space volume by the total volume and multiply the result by 100

Measuring of permeability:

1. Hold the empty cup with a hole in it over a jar or an empty cup. Carefully pour the sample into the cup with the hole, allowing the water to drain into the jar.
2. Pour 100ml of water into the cup with the sample. Time how long it takes from when pouring started until when the water drains out of the sample.

Method for the testing of the pH

1. Place a heaped spatula in the bottom of a beaker
2. Add enough distilled water to cover the sample
3. Stir for 30 seconds
4. Place the pH probe in the middle of the beaker and leave for 60 seconds
5. Record the value

AO3/AO2 detailed method

Data presentation

Soil type

Site	1	2	3	4	5	6	7	8	9	10	11
type	Loamy sand	Loamy sand	Loamy sand	Loamy sand	Sandy clay loam	Sandy silt loam	Sandy clay loam	Silty clay	Silt loam	Loamy sand	Loamy sand

Soil texture

Site 1- Rough and gritty and stains the fingers

Site 2- Rough and gritty and stains the fingers

Site 3- Rough and gritty and stains the fingers

Site 4- Rough and gritty and stains the fingers

Site 5- Moulds to a strong ball and rough and gritty

Site 6- Rough and gritty, stains the fingers and is smooth and silky

Site 7- Moulds to a strong ball and rough and gritty

Site 8- Moulds to form a strong ball. Is also smooth and silky

Site 9- Moulds to form a deformed ball whilst feeling smooth and silky

Site 10- Rough and gritty and stains the fingers

Site 11- Rough and gritty and stains the fingers

Soil pH

Site	1	2	3	4	5	6	7	8	9	10	11
pH	6.74	6.61	6.90	6.76	6.12	6.06	5.93	6.44	6.55	6.47	6.65

✓ AO3/AO1 clear results

Porosity and permeability

Sample number	Description of sample	Total volume	Volume remaining in cylinder	Pore space	Porosity % pore space	Time for water to pass through [seconds]
1		100ml	56	44	44%	53
2		100ml	55	45	45%	49
3		100ml	48	52	52%	21
4		100ml	46	54	54%	10
5		100ml	45	55	55%	20
6		100ml	50	50	50%	7
7		100ml	40	60	60%	6
8		100ml	50	50	50%	9
9		100ml	22	78	78%	3
10		100ml	45	55	55%	Went over 3 minuets
11		100ml	60	40	40%	Went over 3 minuets

✓ AO3 clear results.

Site 1-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers.

The soil pH was 6.74 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected

The porosity of this soil was 44% this means that 56% was already taken up by the water in the field. For the permeability it took 53 seconds for the water to infiltrate through the soil.

Site 2-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers.

The soil pH was 6.61, this means that it is a weak acid soil. On this sample area there is only grass vegetation so no other vegetation would be effected.

The porosity of this soil was 45% this means that 55% was already taken up by the water in the field. For the permeability it took 49 seconds for the water to infiltrate through the soil.

Site 3-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers.

The soil pH was 6.90 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected.

The porosity of this soil was 52% this means that 48% was already taken up by the water in the field. For the permeability it took 21 seconds for the water to infiltrate through the soil .

Site 4-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers .

The soil pH was 6.76 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected.

The porosity of this soil was 54% this means that 46% was already taken up by the water in the field. For the permeability it took 10 seconds for the water to infiltrate through the soil.

Site 5-

This sites soil type is sandy clay loam. This soil Moulds to form a strong ball and is also rough and gritty. This soil has a higher mix of clay and sand.

The soil pH was 6.12 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected.

The porosity of this soil was 55% this means that 45% was already taken up by the water in the field. For the permeability it took 20 seconds for the water to infiltrate through the soil.

Site 6-

This sites soil type is sandy silt loam. This soil Moulds to form a strong ball and is also smooth and silky. This soil has a higher mix of silt and sand.

The soil pH was 6.06 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected

The porosity of this soil was 50% this means that 50% was already taken up by the water in the field. For the permeability it took 7 seconds for the water to infiltrate through the soil.

On the site it looks waterlogged but the sample was taken where the bag is when it was not waterlogged.

Site 7-

This sites soil type is sandy clay loam. This soil Moulds to form a strong ball and is also rough and gritty. This soil has a higher mix of clay and sand.

The soil pH was 5.93 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected .

The porosity of this soil was 60% this means that 40% was already taken up by the water in the field. For the permeability it took 6 seconds for the water to infiltrate through the soil .

Site 8-

This sites soil type is silty clay. This soil Moulds to form a strong ball. Is also smooth and silky. This means that this soil is made up of mostly silt and clay.

The soil pH was 6.44 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected

The porosity of this soil was 50% this means that 50% was already taken up by the water in the field. For the permeability it took 9 seconds for the water to infiltrate through the soil

Site 9-

This site soil type is silty loam. Moulds to form a deformed ball whilst feeling smooth and silky.

The soil pH was 6.55 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected.

The porosity of this soil was 78% this means that 28% was already taken up by the water in the field. For the permeability it took 3 seconds for the water to infiltrate through the soil.

Site 10-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers.

The soil pH was 6.47 this means that it is a week acid soil. On this sample area there is no vegetation apart from grass so the grass would not be effected

The porosity of this soil was 55% this means that 45% was already taken up by the water in the field. For the permeability it took over 3 minutes to infiltrate the soil. The minuets was the cut off time for the infiltration.

Overall good description of the sites and results with supporting photographs they could have had a scale.

Site 11-

This site soil type is loamy sand. This soil type is made up of mostly sand. This gives it a rough and gritty feel. The soil texture for this site was Rough and gritty and stains the fingers.

The soil pH was 6.65 this means that it is a week acid soil. on this sample area there is no vegetation apart from grass so the grass would not be effected

The porosity of this soil was 40% this means that 60 was already taken up by the water in the field. For the permeability it took over 3 minutes to infiltrate the soil. The minuets was the cut off time for the infiltration.

Comparison of results

In the pH readings, there a range of results from 5.93 – 6.90. this shows that the sample tested were all crusted together with values that indicate the pH of the soil as a weak acid. In some cases, such as site 3 which had a pH of 6.90, was close to neutral.

On the pour space readings, there are a range of results from 44%-78%. this shows that the results vary because of the soil being waterlogged. The lower results show that water logging has occurred because some of the pour spaces in the soil have already been take up by the water pervious to this test. The higher results show that the pour spaces haven't been filled up prior to the tests.

On the permeability readings, there are a rage of results from 3seconds-over 3 minutes. The lower results such as site 9 which it took 3 seconds for the water to pass through. This shows that there was water space within the soil for the water to infiltrate. Whereas in the higher readings such as site 11 which went over 3 minutes show us that there wasn't enough space for the water to infiltrate. So, this means that the soil was waterlogged.

Limitations

A limitation was that when the soil samples were being collected cross contamination could occur. Cross contamination is where soils from different sample areas can cross together and effect the results of the test. So, a thorough clean after every sample would mean that results would not be contaminated.

Another limitation is that when testing the pH of the soil, the pH probed had to be used for all the soil test samples. This means that without cleaning could cross contaminate the results. So, cleaning thoroughly with distilled water could stop cross contamination happening with in the lab.

Another limitation is the amount of equipment provided. There were only a limited number of trowels, and pH readers. This meant that it took longer for the tests to be recorded.

Conclusion

How does soil characteristics effect tree growth?

This soil investigation was intended to find out how soil characteristics effect tree growth.

The tests carried out were, type and texture, pH, porosity and permeability. These results determined how the characteristics effect the trees growth.

The soil type had a 5 different soil types. Different trees like different types of soils. These soils were Loamy sand, Sandy clay loam, Sandy silt loam, Sandy clay loam, Silty clay, Silt loam. The trees on the sample area was an avenue of lime trees.

The soil pH had a range from 5.93 – 6.90, these results are slightly acidic, but they are close to neutral. Lime trees thrive in these pH conditions, but the limes on the sample site are seen to be struggling, therefore soil pH is not a characteristic contributing to tree growth. So there must be another significant factor.

Soil porosity is how much water the soil can absorb, the air spaces inside can fill up with water these are called pour spaces. With the porosity test, it showed how much space was already filled up by the soil. Different types of soil have different pour spaces and different capacities to hold water. The higher figure of water remaining in the cylinder showed that space had already been taken up by water. Lime trees like to grow in well drained soils, and most of the soil samples were waterlogged. On the site there were signs that buttercups were growing. This is in indication that the soil is waterlogged because buttercups like wet and damp soil conditions. So soil porosity is a characteristic that affects the tree growth.

Soil permeability is how quick the water can infiltrate the soil. On site 11 it took over 3 minutes for the water to infiltrate the soil. This means that pour spaces were already filled up this means that compaction has occurred, compaction is where the soil has been compressed down due to weight that has been on it. On the other side of the road cars can contribute to compaction because they park on the grass. So compaction is a characteristic that affects tree growth.

Overall waterlogging and compaction are leading factors that affect tree growth. These have stunted the trees growth.

References

The photos I have used had been save to my computer file.

City & Guilds

Candidate Record Form

Technical qualifications

Level 3 Advanced Technical Certificate in Forestry and Arboriculture (0174-35)
Level 3 Forestry and Arboriculture - Synoptic assignment (0174-011)

Candidate name	Candidate number
[redacted]	
Centre name	**Centre number**
[redacted]	

***Marker Notes** – Please always refer to the relevant marking grid for guidance on allocating marks and make notes that describe the quality of the evidence and justification of marks. Expand boxes as required.*

AO1 – Recall - Breadth, depth, accuracy

15%	1	2	3	4	5	6	7	8	9

AO1 Mark	Notes & justification
8	[redacted] has shown a strong and detail knowledge of the industry over the task with confidence

AO2 – Understanding - Security of concepts, causal links

30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

AO2 Mark	Notes & justification
14	put into report strong comment which shows understanding of the course with key concepts

AO3 - Practical skill - Dexterity, fluidity, confidence, ease of application

30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

AO3 Mark	Notes & justification
15	[redacted] showed high level of Skill and competence during practical assessment Allways willing to help and learn more Very accomplished use of the saw.

AO4 – Bringing it together - use of knowledge to apply skills in new context

15%	1	2	3	4	5	6	7	8	9

AO4 Mark	Notes & justification
8	Strong evidence was shown over task with good information added in reports.

AO5 - Attending to detail / perfecting - Repeated checking, perfecting, noticing, engaged

10%	1	2	3	4	5	6

AO5 Mark	Notes & justification
5	Some good detail was added which was relevant to the subject matter work is coherent and detailed

Tutor signature	Date
A Mu[illegible]	1/5/18

Total
50.

This learner confirmed at 49 marks

Declaration of Authenticity

Candidate name	Candidate number
Milo Baconburger	TNK 0452
Centre name	**Centre number**
Tottingham Community College	0265889

Candidate: Milo Baconburger

I confirm that all work submitted is my own, and that I have acknowledged all sources I have used.

Candidate signature Milo Baconburger Date 31/02/2019

Tutor:

I confirm that all work was conducted under conditions designed to assure the authenticity of the candidate's work, and am satisfied that, to the best of my knowledge, the work produced is solely that of the candidate.

Tutor signature Barnacle Parp Date 31//02/2019

Has the candidate received any additional support in the production of this work?

Tick Yes ☐ **No** √

If the answer is yes, give details below and on a separate sheet if necessary.

Note:

Where the candidate and/or tutor is unable to, or does not confirm authenticity through signing this declaration form, the work will not be accepted at moderation and a mark of zero will be given. If any question of authenticity arises, the tutor may be contacted for justification of authentication.

Practical Observation Form

Technical Qualifications

Candidate name:	Candidate number:
Milo Baconburger	TNK 0452
Centre number:	**Assessment ID**
0265889	

Please complete the table below with reference to the relevant Assessment Objectives, as indicated in the Assessment Packs. Do not allocate marks at this stage.

Assessment Objective (AO) - refer to the marking grid for additional guidance.	**Notes –** detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different quality of performances and to facilitate accurate allocation of marks once all evidence has been submitted.
AO1 Describe how well the candidate shows **recall** of knowledge e.g. stating facts without explanation / simple descriptions of what they are carrying out / showing aspects of straightforward knowledge through logical sequencing and application of skill etc.	The risk assessment was completed with detailed site-specific information. Candidate demonstrated good recall of relevant Health & Safety legislation, in particular PUWER by pointing out the designed in safety features of the chainsaw and the need for servicing and training. He also stated that maintenance and repairs should be recorded.
AO2 Describe how well the candidate shows **understanding** when carrying out practical tasks e.g. their explanation of why they are completing a process or how they may change their course of action / are they able to justify their actions etc.	Candidate understands why it is important to maintain machinery and equipment on a regular basis and was able to explain how machine 'down time' affects costs and productivity. He was also able to explain how correct servicing and maintenance leads to increased operator safety, stating that blunt cutting chain requires more effort from operator which leads to fatigue and poor productivity. Candidate was also able to explain the correct procedure for dealing with a hung up tree and understood the additional risks associated with a hung tree.

Assessment Objective (AO) - refer to the marking grid for additional guidance.	**Notes –** detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different quality of performances and to facilitate accurate allocation of marks once all evidence has been submitted.
AO3 Describe how well the candidate demonstrated their **practical skills**. e.g. how practiced/fluid is hand eye coordination and dexterity / how confident are they / how accurate or 'polished' is the outcome / safe working etc.	Candidate carried out correct pre-start checks in sequence and prepared the felling site. He was wearing appropriate PPE. (at one point during the assessment his attention had to be drawn to two toggles that were hanging from his hoodie which could have become entangled in the moving chain) Posture and working attitude was good and care was taken when manual handling showing safe technique when moving timber. Candidate undertook two different felling cuts (directional and split level) which were made accurately and at the correct height. The cuts and subsequent snedding was done with confidence and fluidity. He was able to explain when to use the different cuts including the 'dog-tooth' for forward leaning trees. His awareness of his surroundings was good and he stopped working when someone entered his work area. Crosscutting was accurate and thought and attention was given to tension/compression with cuts made in the correct order to avoid trapping the saw. There were some inconsistencies (unsuitable outer clothing-toggles and not tidying the site as work progressed along with leaving the site in an untidy condition). Overall a complex skills set was demonstrated by the candidate and initiative was shown in setting up the site and responding to unforeseen circumstances (person entering area).
AO4 Describe how well the candidate **brings it all together** – e.g. how **coherent** are their actions / how well do they draw from the breadth of their knowledge and skills / reflection on theory when solving practical problems / How well can they work out solutions to new contexts/ problems on their own / time management etc.	Candidate showed good connectivity of taught skills, knowledge and understanding by producing felled trees and cut logs to specification in a smooth and coherent manner. He was able to modify his working technique in response to changes in the task demonstrated by checking and adjusting for tension and compression in crosscutting. The fluidity of the work demonstrated that these skills and knowledge are fully embedded.
AO5 Describe how well the candidate **attended to detail** e.g. professionalism / perfecting / accuracy / checking / taking care / methodical working etc.	Candidate set out the work area correctly and made sure he had felling aids to hand whilst working, however general site tidiness was somewhat lacking. The products were cut to specification and checks were made with a datum rod to ensure spec was maintained. Appropriate working techniques throughout and choice and use of felling aids as required. Adjustment of working technique as circumstances changed.

Tutor / marker signature:	**Date:**
Barnacle Parp	4/3/18

Candidate Record Form

Candidate Name: Milo Baconburger **Assessment ID: 0174-011**

Candidate Number: XB303030 **Centre Number:007007**

Marker Notes – Please always refer to the relevant marking grid for guidance on allocating marks and make notes which describe the quality of the evidence and justification of marks.

AO1 – Recall - Breadth, depth, accuracy									
15%	1	2	3	4	5	6	7	8	9
AO1 Mark:6	Candidate shows a good range of knowledge across the tasks. Recall of facts is broadly accurate although there are some inaccuracies, inconsistencies and a few gaps in knowledge. The candidate was able to demonstrate accurate use of technical terminology throughout in written and practical tasks. A thorough site survey was produced with good quality documentation and a clear supporting plan with very few mistakes or omissions. Good knowledge shown by breaking suggested planting into mixes to suit conditions although this did not always tie up with the written supporting documentation. Some inaccuracies relating to tolerance of species for wet condition for instance recommending *Quercus robur* (which does not thrive in wet conditions) and incorrectly stating that *Corylus avellana* is insect pollinated instead of wind pollenated. There were some omissions and inaccuracies relating to the aftercare of plants particularly around removal of stakes, ties and shelter guards and checking for pests and diseases, however on verbal questioning in task 3 the candidate was able to give more specific information								

AO2 – Understanding - Security of concepts, causal links																		
30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
AO2 Mark:15	Accurate links made between theory and practice with good understanding of concepts and processes demonstrated by the consideration of alternatives within written work and verbal explanations in practical tasks. Some missed opportunities for further expansion and explanation, for example environmental considerations. Understanding of species considerations for various site conditions was generally good but with some slight inaccuracies and not fully understanding or recalling reproductive mechanisms for species. There were some inconsistencies between written information and what was put on the plan for tree planting. The candidate should have linked weather conditions and the drying effect of wind on bare root stock and the damage caused and effects on establishment during task 4. For the most part explanations were logical and well-reasoned but lacked depth and some connections were missed or could have been expanded.																	

AO3 - Practical skill - Dexterity, fluidity, confidence, ease of application																		
30%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
AO3 Mark:16	The candidate's practical skis are strong overall with him being able to confidently and accurately carry out the site survey and the physical planting of 20 whips along a hedge line. Tools and equipment were correctly selected and used effectively. Tree guards were properly installed and the quality of planting was checked as work progressed. Performance was confident and fluid and planting was carried out to a high standard indicating secure theory to practical application of knowledge and understanding. Let down slightly by allowing roots to be exposed to the air for longer than was necessary. A final quality check for straightness was made following planting and tools were gathered and stored correctly.																	

AO4 – Bringing it together - use of knowledge to apply skills in new context									
15%	1	2	3	4	5	6	7	8	9
AO4 Mark:7	Candidate displayed good interconnectivity between knowledge, understanding and practical application of skills. No guidance was required and the candidate regularly checked his work. The fluid nature of completion of the practical task demonstrated clear understanding related to the task and in written work alternatives were given but not always fully explored. Planting decisions were justified verbally during the practical task but not so much in the written work.								

AO5 - Attending to detail / perfecting - Repeated checking, perfecting, noticing, engaged						
10%	1	2	3	4	5	6
AO5 Mark: 5	The candidate demonstrated strong adherence to industry standards and a strong commitment to the completion of tasks with a high level of detail and fair precision (depth of planting notch and ongoing re-checking and adjustments). Documentation completed to a high level of detail with good use of supporting written documentation and information exhibited on the planting plans. Selection of hand tools and attention to detail when gathering them in at the end and the site left tidy and safe shows good attention to the quality of the finished product.					

Tutor/Marker signature:

Section 5 Principal Moderator's guidance, hints and tips

This practise marking material has been produced to be used for standardisation activities and for centre guidance in the early years of the qualification. The marks allocated to each learner are in accordance with the Principal Moderator marks and show the standard set for this qualification.

To make holistic judgments, it is necessary to ensure that all tasks are completed and submitted prior to assigning any final marks. Practical tasks are not marked independently of written submissions so ensure that all tasks have been completed before assigning any marks.

When judging ephemeral performances / practical skills, centres must ensure that the evidence is in a format visible to the marker/moderator and gives sufficient qualitative detail to aid moderation. Observers and markers should ensure their notes are comprehensive, employing key words written in the marking grids and describing how, where or why the work is good or better. For example if you state that a candidate's knowledge of health and safety is good say what it is that makes it good *i.e. the candidate was able to point out all the design safety features of the machine and related the maintenance requirements, including keeping a written record of maintenance, to PUWER(the Provision and Use of Work Equipment regulations)* Along with this they should ensure that any verbal questions are documented and that weaknesses / mistakes as well as strengths / exemplary practice are noted on the PO form. These notes will enable the centre marker and the moderator get a feel for the practical skills shown by each individual on the synoptic assessment day/s and will assist in allocation of marks and rank ordering