

BURGESS HILL CENTRE FOR OUTDOOR SPORT

Arboricultural Impact Assessment



JSL4537_770
The Burgess Hill Centre for
Outdoor Sport
Arboricultural
Impact Assessment
V4
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ARBORICULTURAL IMPACT ASSESSMENT

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1 EXECUTIVE SUMMARY

Scope

- 1.1 An arboricultural survey and Arboricultural Impact Assessment (AIA) has been undertaken in support of the proposed new development of the 'Burgess Hill Centre for Outdoor Sport' with its associated natural and artificial turf pitches and other constructions.
- 1.2 Trees were recorded, and information was gathered, to allow them to be considered using guidance contained within BS5837:2012 - *Trees in Relation to Design, Demolition and Construction – Recommendations*. An AIA identifies any vegetation requiring removal, pruning and how retained trees are to be protected during the implementation of the proposals.

Findings & Recommendations

- 1.3 The principles in BS5837:2012 were used to fully assess the impacts of the proposed works on the trees and other vegetation. By following guidance set out within this report, the retained trees should be protected during the works.
- 1.4 A total of **68 individual trees** and **15 groups** of trees were surveyed during the visit. Of the 68 individuals recorded: **33** were **Category A** (high quality), **5** were **Category B** (moderate quality), **19** were **Category C** (low quality) and the remaining **11** were **Category U** (dead or dying). Of the 15 groups recorded: **9** were **Category A** (high quality), **2** were **Category B** (moderate quality), **2** were **Category C** (low quality) and **2** were **Category U** (dead or dying).
- 1.5 A total of 22 individual **Category A trees** and 6 groups (some in part) will require removal to accommodate the proposed development.
- 1.6 A total of 10 **Category C trees** will require removal.
- 1.7 A total of 10 **Category U trees** and 1 group will require removal. A total of 7 shrub areas will also require either full or partial removal to accommodate the development.
- 1.8 Crown lifting pruning will be required to tree group G6, and likely T35, in order to accommodate footpath construction.
- 1.9 There are instances where new footpaths encroach into the RPA of trees desirable for retention (see T32, T33, T35, T42, T43, T51, T56, T57, G6) and, in order to retain these trees, it will be necessary to implement the use of an appropriate low impact construction solution where these encroachments occur.
- 1.10 All retained trees will be afforded protection by implementing a Construction Exclusion Zone (CEZ) using tree protection fencing (Heras-style). This must be erected in the positions shown on the Tree Removal and Protection Plan attached to this report.

2 INTRODUCTION

- 2.1 RPS were instructed in October 2022, by Mid Sussex District Council (MSDC), to undertake a Tree Survey and then to prepare an Arboricultural Impact Assessment (AIA) in respect of the proposed Burgess Hill Centre for Outdoor Sport, Burgess Hill, West Sussex.
- 2.2 The survey was undertaken in accordance with BS5837:2012 as described within the '*Survey Methodology*' attached to this report at Appendix A.
- 2.3 The purpose of the survey was to gather data on the trees and to prepare a Tree Constraints Plan that has been used in the design of the proposed new sports facilities. Appendix A – '*Survey Methodology*' explains the process of interpreting the plan and how it is used during the design and impact assessment process.
- 2.4 This report should be read in conjunction with the supplied Tree Constraints Plan (see drawing JSL4537_700), Tree Removal and Protection Plan (JSL4537_710) and all other relevant Tables and Appendices as detailed within the table of contents.
- 2.5 Recorded tree positions were plotted using Topographical Survey information and Axciscape 4.02 software. The survey data was then collated and presented using AutoCAD software as the Tree Removal and Protection Plan (JSL4537_710), Tree Constraints Plan (see drawing JSL4537_700) along with their accompanying schedules.
- 2.6 The proposed layout design comprising multiple sports pitches, parking and access arrangements was superimposed onto the Tree Constraints Plan, enabling the arboricultural impact of the development to be assessed.
- 2.7 The site survey was undertaken by RPS Principal Arboriculturist Thomas Flood. Thomas is a Chartered Arboriculturist and Professional Member of Arboricultural Association.
- 2.8 This assessment report has been prepared by RPS Assistant Arboriculturist Zak Goad, Technician Member of the Arboricultural Association.

Limitations

- 2.9 The initial site survey of this site does **NOT** constitute an in-depth 'Tree Condition Survey' and was undertaken to the standards of BS5837:2012.
- 2.10 The findings of this survey are not valid following adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events.
- 2.11 Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.
- 2.12 Trees and woody vegetation were not assessed for their potential impact upon future construction issues such as foundation designs (re: NHBC chapter 4.2). Whilst this report may assist in assessing likely future impacts, it should not be classed as a comprehensive vegetation survey in relation to impact upon future designs or developments.

3 SITE INFORMATION

- 3.1 The site is proposed to accommodate the Burgess Hill Centre for Outdoor Sport and this currently comprises a series of tree lined fields located north of Gatehouse Lane, Burgess Hill.
- 3.2 The site is centred at OS grid reference **TQ 29214 20045** and 'What3Words' **lift.tent.music**.
- 3.3 The development site is situated to the north-western corner of Burgess Hill, a town and civil parish in West Sussex, England, close to the border with East Sussex, on the edge of the South Downs National Park, 39 mi south of London, 10 mi north of Brighton and Hove, and 29 mi northeast of the county town, Chichester.
- 3.4 In terms of the woody vegetation within the site, it contains a number of mature individuals and groups of high quality which form the field boundaries. The most recorded species was pedunculate oak (*Quercus robur*), of which there are a number of mature specimens within the site.
- 3.5 While not recorded during the visit, south of the site on the opposite side of Gatehouse Lane is an ASNW (Ancient & Semi Natural Woodland). The woodland is separated from the south of the site by a road and the site sits approximately 13m from the nearest stems of trees. The standing advice from Natural England is that ASNW should be provided a minimum 15m buffer from development and this has been considered in the design.
- 3.6 A Tree Preservation Order (TPO) check has been made using the online interactive map resource provided by WSDC. This map shows that there are **no** TPOs or Conservation Areas present within the site.

4 TREE QUALITY ASSESSMENT

Retention Values

- 4.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (see drawing JSL4537_700) shows tree positions, numbers, and retention categories. Trees were recorded as individuals and as groups.
- 4.2 Trees have been surveyed as groups where they can be considered as forming a group as they form cohesive features either aerodynamically (i.e. they form a discrete group feature providing companion), culturally (i.e. they are composed of trees of a similar size, age and species subject to the same management) or visually (i.e. where the value of the trees within the group is as a whole rather than individually).
- 4.3 Where trees have been surveyed as groups the details recorded with respect to condition and retention value intend to represent an average tree within the group; however, on occasion, it must be noted that there will be exceptions within any group that do not conform to the typical character of that group.
- 4.4 The initial stage of a tree survey in accordance to BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.
- 4.5 **Category A** trees are those that have been assessed as being of a high quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Green on the Tree Constraints Plan.
- 4.6 **Category B** trees are those that have been assessed as being of a moderate quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Blue on the Tree Constraints Plan.
- 4.7 **Category C** trees are those that have been assessed as being of a low quality and value; the loss of these specimens should not be considered as a constraint to development. These trees are shown in Grey on the Tree Constraints Plan
- 4.8 **Category U** trees are those that have been assessed as being in poor condition and having no retention value; these trees should not be a material consideration in the planning process. These trees are shown in Red on the Tree Constraints Plan.
- 4.9 A total of **68 individual trees** and **15 groups** of trees were surveyed during the visit.
- 4.10 Of the 68 individuals recorded: **33** were **Category A** (high quality), **5** were **Category B** (moderate quality), **19** were **Category C** (low quality) and the remaining **11** were **Category U** (dead or dying).
- 4.11 Of the 15 groups recorded: **9** were **Category A** (high quality), **2** were **Category B** (moderate quality), **2** were **Category C** (low quality) and **2** were **Category U** (dead or dying).

Physiological Condition

- 4.12 Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally, these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally, trees within the good condition class are likely to tolerate changes within their growing environment that occur as a result of development, as such their successful retention will be easier to achieve.
- 4.13 Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.
- 4.14 Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.
- 4.15 Of the 68 individual trees recorded, **32** were considered in **'good'** condition, **25** were found to be in **'fair'** condition, **7** were in **'poor'** condition and the remaining **4** were **'dead'**.
- 4.16 While variations in condition exist within the 15 tree groups, generally speaking, **10** were considered in **'good'** physiological condition, **3** in **'fair'** and **2** in **'poor'** condition.

Structural Condition

- 4.17 There are large variations in the structural condition of the trees surveyed; however individual tree condition is largely consistent with expectations for the age, management, and species of the tree.
- 4.18 The majority of structural defects that were noted across most of the tree stock on the site, such as minor deadwood in tree crown, included bark and squirrel damage were not considered significant and are unlikely to result in the premature failure of the tree.
- 4.19 For a more in-depth study of the structural condition of the trees within the site, a thorough 'Tree Condition Survey' should be undertaken on the tree stock. Refer to the books: *'Visual Tree Assessment'* and *'The Body Language of Trees'* both written by Claus Mattheck, for a detailed analysis of the importance of identifying structural defects in trees.

Age Distribution

- 4.20 Trees assessed as being young (Y) in age are those considered to be less than 10 years old. These trees can generally be considered to have the potential for rapid and significant future growth. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.
- 4.21 Trees assessed as being semi-mature (SM) are those of more than 10 years old but having attained less than 40% of the maximum lifespan expected for the species. As with young trees these specimens will have the potential for rapid and significant future growth.

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- 4.22 Early-mature trees (EM) are those considered to have reached between 40% and 70% of their ultimate life expectancy. These trees are generally not considered to have a significant potential for future growth though they will increase in size at a steadier rate than younger trees.
- 4.23 Mature trees (M) are those considered to have reached between 70% and 100% of their species life expectancy. These trees will have little future growth potential and they have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape character of the site at this time; however, a tree stock over dominated by mature trees will require careful management to ensure that a continuation of canopy cover can be achieved.
- 4.24 Over-mature trees (OM) are those considered to have existed for longer than typical of their species. They do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However, the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.
- 4.25 Veteran trees (V) are those that show features of biological, cultural, or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.
- 4.26 Of the 68 individual trees, their age class distributions are: **4 young (Y)**, **12 semi-mature (SM)**, **17 early-mature (EM)** and **35 mature (M)**.
- 4.27 While variations in age of trees will be present within the 15 tree groups, the maximum age classes were recorded as: **2 young**, **3 semi-mature (SM)**, **5 early-mature (EM)** and **5 mature (M)**.

Species Distribution

- 4.28 The tree species recorded during the survey are listed below:

BOTANICAL NAME	COMMON NAME
<i>Acer campestre</i>	Field Maple
<i>Carpinus betulus</i>	Hornbeam
<i>Crataegus monogyna</i>	Hawthorn
<i>Euonymus europaeus</i>	Spindle
<i>Fraxinus excelsior</i>	Common Ash
<i>Ilex aquifolium</i>	Holly
<i>Malus</i> sp.	Apple species
<i>Populus tremula</i>	Aspen
<i>Prunus spinosa</i>	Blackthorn
<i>Pyrus cordata</i>	Plymouth pear
<i>Quercus robur</i>	Pedunculate Oak
<i>Salix fragilis</i>	Crack willow

5 CONSTRUCTION REQUIREMENTS

5.1 The development consists of the creation of the new 'Burgess Hill Centre for Outdoor Sport'. This development will include the creation of: -

- Natural Turf Football Pitches;
- Non-Turf Pitch Cricket Pitch;
- Adult 3G Football Pitch;
- Adult 3G Rugby Pitch;
- A new car park area;
- New Shared (pedestrian/cycle) routes throughout the site; and
- New site access point to the eastern side of the site, onto a newly constructed road.

4.29 Access will be required for personnel / equipment to:

- Undertake the removals specified;
- Undertake any pruning required;
- Install tree protection fencing;
- Construct the various natural turf playing fields;
- Construct the various artificial turf playing fields;
- Construct the new car parking area;
- Install hard-standing areas for pedestrian access and bridleways, storage areas as well as vehicular access;
- Carry out any final landscaping works.

4.30 Reference to this document should form part of any method statement regarding the proposed construction works. This will show an understanding of the issues and actions required to protect the trees.

4.31 The construction process will need to be monitored during its progress to ensure continued protection of any retained trees.

6 ARBORICULTURAL IMPACT ASSESSMENT - WORKS

Introduction

- 5.1 The construction process will need to be monitored during its progress and this Arboricultural Impact Assessment should be used as the document provided to guide the construction process.
- 5.2 Trees have finite energy reserves, developed each year throughout the growing season, which are utilised for biological processes such as growth and defence against pests or diseases throughout the following year.
- 5.3 Any development in proximity to trees has the potential to cause harm to those trees unless control measures are identified and acted upon; as such it is essential to consider the relationship between the proposed development and the retained trees to identify what precautions are necessary, proportionate and appropriate.
- 5.4 Development has the potential to impact upon the above ground as well as below ground parts of trees.
- 5.5 Whilst some damage that can occur, such as physical damage to the trees stems and branches from machinery movements, is clearly visible the impact from other aspects of work common on development sites which can have a significant effect upon the continued health of trees are not always immediately evident.
- 5.6 Damage that is not immediately evident, but which can cause long term harm to retained trees includes things such as damage to the soil structure by compaction causing root damage and levels changes altering the water table and affecting moisture availability.
- 5.7 To minimise the potential for harm to occur to retained trees all works should be carried out with regard to the tree protection measures detailed within this report.
- 5.8 In general, it can be seen that, by adopting appropriate methods of working, precautionary and protective measures, significant harm to retained trees can be avoided.
- 5.9 In particular, the establishment of a **Construction Exclusion Zone (CEZ)** by erection of tree protection fencing will minimise the potential for harm to occur to retained trees.

Brief Description of Proposed Development

- 5.10 The proposed development is for the creation of the 'Burgess Hill Centre for Outdoor Sport'. This will consist of the installation of a number of natural and artificial turf playing fields as well as new storage areas, spectator areas and a car park. New pedestrian pathways are also proposed throughout the new development.

Tree Removal

- 5.11 The individual trees, tree groups and shrub groups that will require removal to accommodate the proposed development can be seen in the table below. The spatial distribution of these removals can also be seen on the attached Tree Removal and Protection Plan (drawing JSL4537_710).

	Individual Trees	Tree Groups
Category A	T2-T10, T21, T37-T41, T44-T47, T50, T52, T53	G1 (apart from northernmost two trees), G2 (apart from two of the northernmost trees), G3, G5 (apart from two of the westernmost trees), G7 and G8.
Category B	-	-
Category C	T18, T19, T20, T22, T24, T26, T27, T28, T54, T58	-
Category U	T8, T9, T11, T15, T16, T17, T25, T29-T31	G4
Shrubs and Hedgerows		
S1, S2, partial removal of S3, S4, S5, partial removal of S8 and S9		

- 5.12 While the development would result in the loss of no Category B trees, it will require the removal of 22 Category A individuals and the removal or partial removal 6 Category A groups.
- 5.13 New landscape planting will help to offset these losses, and to provide a wide age range of trees on the land. The proposed landscape scheme includes more than 140No. new standard, semi-mature and multi-stemmed trees.
- 5.14 While not a significant constraint to development, it will require the removal of 12 Category C trees.
- 5.15 Category U trees are those that are in poor condition or dead and should be removed for good arboricultural practice and are therefore not a constraint to development.

Root Protection Areas

- 5.16 Root Protection Areas (RPAs) for each tree surveyed have been determined in accordance with BS5837:2012 Section 4.6 Root Protection Area. Initial RPAs for the trees were plotted onto the Tree Constraints Plan (see drawing JSL4537_700) and have been used to produce all relevant tree plans in this statement.
- 5.17 There are instances where new footpaths encroach into the RPA of trees desirable for retention (see T32, T33, T35, T42, T43, T51, T57, G6) and, in order to retain these trees, it will be necessary to implement the use of an appropriate low impact construction solution where these encroachments occur.

- 5.18 Cutting of soils within an RPA is to be avoided as it can destroy a tree's roots and traditional methods of building footpaths will often require excavation. In this instance, it should be feasible to use a 'No-Dig' construction for the sections of path that encroach on RPA. This should comprise a geotextile cellular confinement system with granular infill (no fines) and porous wearing course. This would be built up on existing ground level, thus removing the need for invasive excavation within rooting areas and allowing for water and gas filtration between the surface and underlying roots. An example of a no-dig construction surface is provided at Appendix F.
- 5.19 It is noted that an encroachment into the RPA T43 occurs where there is to be a cut to ground levels on the trees eastern side where it will slope downward to the artificial grass pitch. While this should be avoided, the encroachment amounts to 10% of the total RPA area and is therefore likely within the tolerance of the tree in question.

Existing Canopy Spreads

- 5.20 Where the RPAs for retained trees do not extend to the edge of existing canopy spreads, it is possible that those parts of a tree which extend beyond the CEZ may sustain damage during construction.
- 5.21 A preliminary assessment of the pruning works required, based primarily on recorded crown heights, has been undertaken and there will be a requirement to crown lift particular trees / groups in order to provide clearance for proposed footpaths, to be constructed using no-dig principles where within an RPA (as previously discussed in para.6.14).
- 5.22 The preliminary works identified are the following:
- Crown lift oak group T32 to T35 and G6 by 1m to provide a total of 2m ground clearance where above footpaths.
 - Crown lift field maple T35 by 1m to provide a total of 2m ground clearance where above footpath.
 - Further trees were recorded as having 2m crown heights at the time of survey but should be checked prior to the development commencing for suitable clearance requirements (T35, T36, T42, T43 and T55), where above footpaths and hard paved pedestrian areas.
 - The retained Oak trees within groups G2 (2No. trees) and G5 (2No. trees) may require crown lifting works to provide clear construction space and/or provide clearer views under nether their canopies.
- 5.23 These trees can be seen on the attached Tree Removal and Protective Plan (drawing JSL4537_710).
- 5.24 Any pruning work should be undertaken by an approved, competent contractor complying with BS3998:2010 throughout. Specifically referring to reductions, this means that pruning cuts are made back to 'sap risers', smaller side branches which should be at least 1/3rd of the diameter of the branch removed. Trees should only be reduced by a specified metreage.

Services and Utilities

- 5.25 No machinery will be permitted within the CEZ around these trees during any works of this nature so as to avoid compaction of soils and mechanical damage to tree limbs, stems and roots.

Appropriate contractor Method Statements will be required to ensure these works are undertaken in a sensible and orderly manner.

- 5.26 The Tree Removal and Protection Plan (see drawing JSL4537_710) shows the drainage scheme for the development which consists of a proposed water drainage corridor running along the eastern side of the site to the 'North Attenuation Basin'. General guidance for such works can also be found in NJUG Volume 4 - *Guidelines for the planning, installation and maintenance of utility services in proximity to trees*. (National Joint Utilities Group 2007).
- 5.27 Following the removal of the trees specified above, this drainage layout will not impact any of the remaining retained tree within the site.

Planning of Site Operations

- 5.28 All routes of access should be planned so as to avoid RPA of trees nearby and therefore should have no impact on them.
- 5.29 Planning of site operations will take sufficient account of trees to ensure that no access and movement of material into and around the site impact on trees. Physical damage can result if this is not considered.
- 5.30 Consequently, any movement of plant or materials in proximity to trees will be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is always maintained.
- 5.31 All materials or fluids will not be stored within or near the RPA of retained trees, particularly those whose accidental spillage would cause contamination and damage to a tree. Fluids must be handled well away from the outer edge of the RPA of trees.
- 5.32 Chippings or any other mulching materials should not be piled or stored within the RPA of any retained tree and specifically not over the buttresses and lower stem of any tree.
- 5.33 Correct planning of access routes and storage areas prior to start on site will ensure no impacts from these activities will occur. It is considered that there should be ample space away from trees for purposes of storage.

7 PRE-DEVELOPMENT WORKS

Tree Removal

- 6.1 A total of 22 individual **Category A trees** and 6 groups (some in part) will require removal to accommodate the proposed development: T2-T10, T21, T37-T41, T44-T47, T50, T52, T53 and G1 (apart from northernmost two trees), G2 (apart from two of the northernmost trees), G3, G5 (apart from two of the westernmost trees), G7 and G8.
- 6.2 A total of 10 **Category C trees** will require removal: T18, T19, T20, T22, T24, T26, T27, T28, T54 and T58.
- 6.3 A total of 10 **Category U trees** and 1 group will require removal: T8, T9, T11, T15, T16, T17, T25, T29-T31 and G4. A total of 7 shrub areas will also require either full or partial removal to accommodate the development: S1, S2, partial removal of S3, S4, S5, partial removal of S8 and S9.
- 6.4 Crown lifting pruning will be required to tree group G6, and likely T35, in order to accommodate footpath construction.
- 6.5 There are instances where new footpaths encroach into the RPA of trees desirable for retention (see T32, T33, T35, T42, T43, T51, T56, T57, G6) and, in order to retain these trees, it will be necessary to implement the use of an appropriate low impact construction solution where these encroachments occur.

Predevelopment Tree Pruning Works

- 6.6 Crown lifting pruning will be required to tree group G6, and likely T35, in order to accommodate footpath construction.
- 6.7 These trees can be seen on the attached Tree Removal and Protective Plan (drawing JSL4537_710).

Standard of Work

- 6.8 All tree works should be carried out in accordance with BS3998:2010 *Tree Work - Recommendations* and latest arboricultural best practice.
- 6.9 All tree work should be carried out by suitably qualified, competent and insured arboricultural contractors. Any green and woody waste generated by the tree works shall be removed from site and disposed of in an environmentally sustainable manner.

Timing of Works

- 6.10 All tree works shall be completed prior to commencement of any construction works on the site.
- 6.11 All works shall be timed to have regard to the phenological cycles of protected species that are associated with trees, notably birds and bats.

Tree Protection Barriers

- 6.12 All tree protection fencing should be erected to its position during the pre-development periods of construction. The position is shown on the Tree Removal and Protection Plan (JSL4537_710).
- 6.13 To ensure successful tree protection during this process, all operatives should be briefed on the need to pay regard the existing trees and all operations adjacent to trees be properly supervised. This will help ensure the works do not affect adversely the trees.
- 6.14 Once the protective barriers are in place they must remain in situ throughout the course of the development until the completion of all building works. Copies of the Tree Protection Plans shall be placed in the site office for reference by all site staff.
- 6.15 The protective fencing barrier is to be constructed in accordance with the specification detailed at Appendix C.
- 6.16 Signs (A3 in size) detailing the purpose of the protective fencing shall be attached to the fencing at 10m intervals. Such signs should be weatherproof and shall be substantially in the form of the specimen provided at Appendix D. Signs must be replaced as necessary should they be removed or become illegible.

8 CONSTRUCTION WORKS

Construction Exclusion Zone

- 7.1 The CEZ as defined by the protective fence line shall be regarded as sacrosanct, and the protective fencing shall not be moved or taken down at any time.
- 7.2 Within the CEZ there must be no mechanical digging or scraping, no alteration to existing ground levels including soil stripping, no earthworks, no handling or discharge of any chemical substance, concrete washings or of any fuels.
- 7.3 Furthermore, vehicular or pedestrian access and the storage of any materials is prohibited within the CEZ.
- 7.4 Additionally, no materials that may contaminate the soil such as concrete mixings, diesel oil and vehicle washings shall be discharged within 10m of the stem of any tree and no fires shall be lit within 10m of the maximum extent of a trees crown.

Site Compounds and Materials Stores

- 7.5 Activities related to the establishment of a temporary site compound have the potential to impact upon retained trees by various means. In particular, the storage and mixing of chemicals and materials such as concrete can have a damaging effect on tree health if precautions are not taken.
- 7.6 To prevent harm occurring to trees provision for materials storage, site offices, deliveries and other related activities should be made available in areas away from retained trees.
- 7.7 The offices, parking of site and contractor vehicles, along with secure storage will be provided in an area away from retained trees. This area will be directly controlled by the Site Manager.

Monitoring

- 7.8 Following erection of the protective fencing and prior to commencement of the construction phase an inspection of the site by the Council's Tree Officer, should be arranged to confirm fencing has been installed in accordance with the Tree Removal and Protection Plan (see drawing JSL4537_710) and any relevant conditions that may be attached to a grant of planning consent for the development.
- 7.9 Further monitoring visits should be carried out during implementation of the works on site, ideally on a monthly basis to ensure all planning conditions are being implemented.

Reporting

- 7.10 During the construction phase of the development the Site Manager will be responsible for liaising with the Council Tree Officer on all arboricultural issues.
- 7.11 Should any arboricultural issues become apparent during the works the site manager should immediately contact the appointed Arboricultural Consultant or the Council's Tree Officer for advice upon how to proceed.

ARBORICULTURAL IMPACT ASSESSMENT

Tables

Table 1: Tree Schedule

Table 2: Tree Group Schedule

Table 3: Shrub and Hedgerow Schedule

Key to Inspection Report Form

Species	Genus and variety
Height	Measured Clinometer Reading or Estimated Height in Metres
Girth (dbh @ 1.5m)	Diameter measured in cms, or estimated, Where multi stemmed below 1.5m the diameter is taken as that just above the root flare
Spread (m)	Crown Spread, radius estimated in metres
Canopy height (m)	Canopy height estimated in metres above ground level
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young, SM – Semi mature, EM – Early Mature, M – Mature, OM - Over mature, V – Veteran
Useful Life Expectancy (years)	<10, 10-20, 20-40, 40+
BS Categorization	See Cascade Appendices 2

Table 1: Tree Data Schedule

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
1	Quercus robur	750	12	6.0	6.5	7.0	7.0	2.0	West	3.5	M	Good	40+	Epicormics growth on crown.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
2	Quercus robur	780	12	5.0	7.0	6.0	6.0	3.5	SW	3.5	M	Fair	40+	Epicormics growth on stem & crown.Pruning wounds to crown.Deadwood in the crown of moderate extent.	A1
3	Quercus robur	1010	17	6.5	8.0	9.0	7.5	2.5	SW	3.5	M	Good	40+	Epicormics growth on crown.Pruning wounds to stem and crown.Bifurcated stem formed at 6.0metres.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
4	Quercus robur	1140	16	10.0	11	10.5	8.0	2.5	South	2.5	M	Fair	40+	Epicormics growth on crown.Pruning wounds to crown.Deadwood in the crown of moderate extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	A1
5	Quercus robur	780	12	5.5	6	7	6	2	West	2.5	M	Fair	40+	Epicormics growth on stem & crown.Pruning wounds to crown.Deadwood in the crown of moderate extent.Restricted inspection due to vegetation. Lateral suppression from adjacent larger oak but remains generally good oak.	A1
6	Quercus robur	1040	15	7.5	8	7.5	6	2.5	North	2	M	Good	40+	Epicormics growth on stem & crown.Pruning wounds to stem and crown.Deadwood in the crown of minor extent.	A1
7	Quercus robur	400	9	4	5	5	3	2.5	East	3	EM	Good	40+	Bifurcated stem formed at 5metres.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
8	Quercus robur	300	6	0.5	0.5	0.5	0.5	0.0		0.0	SM	Dead	<10	Deadwood in the crown of major extent.Restricted inspection due to vegetation. Dead oak in hedgerow.	U
9	Quercus robur	710	16	7	7	3	8	4	SW	3.5	M	Dead	<10	Deadwood in the crown of major extent. Large dead oak.	U
10	Quercus robur	370	10	6	3	2	6	2	NW	3	EM	Good	40+	Deadwood in the crown of minor extent.	A1
11	Fraxinus excelsior	330	9	1.5	1.5	1.5	0	5	North	2	EM	Poor	<10	Epicormics growth on crown.Deadwood in the crown of major extent.Branch dieback of major extent.Previous branch failures noted. Mostly dead ash save for couple of live twigs.	U
12	Quercus robur	860	17	7	5	9	7	2	NW	2.5	M	Good	40+	Epicormics growth on crown.Pruning wounds to stem and crown.Bifurcated stem formed at 3.5metres.Hanging branches in the crown.	A1

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
13	Carpinus betulus	450	9	2.0	1.0	1.5	6.5	3.0	West	1.5	M	Fair	<10	Heavily suppressed crown. Deadwood in the crown of moderate extent. Branch dieback of major extent. Hanging branches in the crown. Previous branch failures noted. General poor form to tree. Tree has no long term potential. Twin stemmed hornbeam. Severe bark loss to both remaining stems (third has failed).	U
14	Quercus robur	270	5	3	0.5	1	4	0.0	West	4	SM	Fair	10-20	Epicormics growth on stem & crown. Heavily suppressed crown. Deadwood in the crown of minor extent. Lost leader due to suppression.	C1
15	Crataegus monogyna	160	5	1.0	1.5	1.5	1.5	2.0	SW	1.5	EM	Poor	<10	Epicormics growth on stem. Deadwood in the crown of moderate extent. Branch dieback of major extent. Previous branch failures noted. Restricted inspection due to vegetation. Twin stemmed dying hawthorn.	U
16	Acer campestre	210	6	0.5	0.5	0.0	2.0	0.0		0.0	SM	Dead	<10	Deadwood in the crown of major extent. Dead tree.	U
17	Acer campestre	240	5	2	1	1.5	3	3	NE	2	SM	Poor	<10	Deadwood in the crown of minor extent. Branch dieback of minor extent. Tree has no long term potential. Kept upright by thin strip of remaining bark, stem has mostly decayed away.	U
18	Fraxinus excelsior	470	17	4	4	5	3	9	South	5	M	Fair	10-20	Bifurcated stem formed at 5metres. Deadwood in the crown of minor extent. Tree has no long term potential.	C1
19	Crataegus monogyna	180	4	2.5	2.5	2.5	2.5	1.0	NW	0.0	EM	Fair	10-20	Epicormics growth on base & stem.	C1
20	Crataegus monogyna	140	4	2.5	2.5	3	1.5	2	North	1.5	EM	Fair	10-20	Heavily suppressed crown.	C1
21	Quercus robur	430	16	0	7	7	6	2	SW	3	EM	Good	20-40	Asymmetric formed crown. Heavily suppressed crown. Deadwood in the crown of minor extent.	B1
22	Acer campestre	150	4	4.0	1.0	2.5	1.0	2.0	East	1.5	Y	Fair	10-20	Heavily suppressed crown. Previous branch failures noted.	C2
23	Pyrus cordata	720	17	6.0	7.0	6.0	4.5	2.5	SE	3.0	M	Good	40+	Epicormics growth on stem. Bifurcated stem formed at 2metres. Previous branch failures noted. Significant size/maturity for species.	A1
24	Crataegus monogyna	70	4	3	2	2	2	1	SE	0.0	SM	Fair	10-20	Epicormics growth on base & stem. Deadwood in the crown of minor extent. Branch dieback of minor extent. Previous branch failures noted.	C1
25	Quercus robur	200	4	2	0	1	1.5	2.5	North	3	SM	Poor	<10	Heavily suppressed crown. Deadwood in the crown of moderate extent. Branch dieback of moderate extent. Previous branch failures noted. Kept upright by thin strip of bark, majority of stem decayed away.	U

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
26	Fraxinus excelsior	780	4	10	8	3	5	7	South	5	M	Fair	10-20	Epicormics growth on stem & crown. Deadwood in the crown of moderate extent. Previous branch failures noted. Tree has no long term potential. Twin stemmed ash. Bark damage to buttress. Bark ridge running from approx. 8m down to base on main stem. Woodpecker hole at 8m. Under stress and likely contracted Ash Dieback (Hymenoscyphus fraxinea).	C2
27	Quercus robur	160	4	0.5	5	3	2	2	South	3	Y	Fair	10-20	Heavily suppressed crown. Previous branch failures noted. Tree has no long term potential. Lost leader in past.	C2
28	Acer campestre	300	9	1.0	3.0	3.0	3.0	2.0	SW	2.0	EM	Fair	10-20	Heavily suppressed crown.	C2
29	Acer campestre	120	3	1.0	0.0	0.0	1.5	2.0		0.0	Y	Dead	<10	Dead tree.	U
30	Acer campestre	120	4	1.5	0.5	1	0.5	2	North	2	Y	Poor	<10	Heavily suppressed crown. Deadwood in the crown of moderate extent. Branch dieback of major extent. Dying tree.	U
31	Acer campestre	250	6	3	2.5	2	2	1.5	North	0.0	EM	Poor	<10	Deadwood in the crown of moderate extent. Branch dieback of major extent. Previous branch failures noted.	U
32	Fraxinus excelsior	600	17	7	8	7	7	11	NE	6	M	Fair	10-20	Epicormics growth on stem. Pruning wounds to stem and crown. Deadwood in the crown of minor extent. Restricted inspection due to access and vegetation. Located off site.	C2
33	Quercus robur	500	6	4	6	2	2	2	North	3	M	Poor	10-20	Epicormics growth on stem & crown. Heavily suppressed crown. Deadwood in the crown of minor extent. Branch dieback of minor extent. Previous branch failures noted. Restricted inspection due to access. Located off site.	C2
34	Acer campestre	200	8	3	3	3	3	2	NW	2.5	SM	Fair	10-20	Heavily suppressed crown. Restricted inspection due to access and vegetation. Located off site.	C2
35	Acer campestre	320	7	3	3	3	1	1	North	0.0	EM	Fair	10-20	Heavily suppressed crown. Deadwood in the crown of moderate extent. Branch dieback of moderate extent. Restricted inspection due to access and vegetation.	C2
36	Quercus robur	850	17	8.0	8.0	8.0	7.0	2.0	NE	2.5	M	Good	40+	Epicormics growth on stem & crown. Deadwood in the crown of minor extent.	A1
37	Quercus robur	610	15	5	5	7	5	6	NE	6	M	Fair	40+	Deadwood in the crown of minor extent. Branch dieback of minor extent. Leaf/bud density a little sparse.	A1
38	Quercus robur	760	16	5	7	7	6	4	SE	5	M	Good	40+	Epicormics growth on stem & crown. Pruning wounds to stem. Deadwood in the crown of minor extent.	A1

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
39	Quercus robur	580	16	5	5	6	5	3	SW	3	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of moderate extent.	A1
40	Quercus robur	820	18	7	7	8	5	2	South	2	M	Good	40+	Epicormics growth on crown.Pruning wounds to crown.Deadwood in the crown of minor extent.	A1
41	Quercus robur	730	18	7	7	7.5	8	1.5	East	2	M	Good	40+	Epicormics growth on crown.Deadwood in the crown of minor extent.Previous branch failures noted.	A1
42	Quercus robur	630	15	5	4	6	5	2	NE	2	M	Good	40+	Epicormics growth on stem & crown.Pruning wounds to stem and crown.Deadwood in the crown of minor extent.	A1
43	Quercus robur	520	14	3	3.5	5	4	2	SE	2	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of minor extent.	A1
44	Quercus robur	640	16	6	7.5	8	7	2	SE	2	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of minor extent.	A1
45	Quercus robur	740	16	7	7	7	9	2	NE	3	M	Good	40+	Epicormics growth on crown.Deadwood in the crown of minor extent.	A1
46	Quercus robur	510	14	7	4	6.5	7	1.5	North	2	M	Good	40+	Epicormics growth on crown.Deadwood in the crown of minor extent.	A1
47	Quercus robur	410	13	5	3	6	3	0.0	East	6	M	Fair	20-40	Pruning wounds to stem.Deadwood in the crown of minor extent.Branch dieback of minor extent.	B1
48	Quercus robur	780	13	7.0	7.0	7.0	7.0	2.0	East	2.0	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of minor extent.Located off site.	A1
49	Quercus robur	650	13	7	7	5	7	4	West	3.5	M	Good	40+	Epicormics growth on stem & crown.Bark damage.Deadwood in the crown of minor extent.	A1
50	Quercus robur	470	9	7	3	3	3	4	NW	2	EM	Fair	20-40	Epicormics growth on crown.Asymmetric formed crown.Deadwood in the crown of minor extent.	B1
51	Quercus robur	600	15	8.0	5.0	6.0	2.0	4.0	South	2.0	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
52	Quercus robur	800	17	9	5	6	5	4	South	1.5	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
53	Quercus robur	880	17	9.0	7.0	6.5	6.0	4.0	West	2.0	M	Good	40+	Epicormics growth on stem & crown.Deadwood in the crown of moderate extent.	A1
54	Quercus robur	380	5	6	1	3.5	2	2	NE	2	EM	Fair	10-20	Epicormics growth on crown.Pruning wounds to stem.Heavily suppressed crown.Restricted inspection due to vegetation.General poor form to tree. Crooked stemmed oak.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
55	Quercus robur	820	16	8	7.5	8	8	8	North	5	M	Good	40+	Epicormics growth on stem & crown.Pruning wounds to stem.Deadwood in the crown of minor extent.	A1
56	Quercus robur	750	15	6	7	6	7	5	South	6	M	Good	40+	Epicormics growth on stem & crown.Pruning wounds to crown.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	A1
57	Fraxinus excelsior	350	11	3	4	3	6	3	South	2	EM	Fair	10-20	Epicormics growth on stem.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.Tree has no long term potential.	C1
58	Fraxinus excelsior	320	16	3.5	3	2	3.5	9	West	2	EM	Fair	10-20	Epicormics growth on stem & crown.Stem cavity of majorextent.Deadwood in the crown of minor extent.Restricted inspection due to vegetation.Tree has no long term potential.	C1
59	Quercus robur	220	7	2.5	2.5	2.5	2.5	2.5	NW	2	SM	Good	20-40	Restricted inspection due to vegetation.	B1
60	Fraxinus excelsior	260	9	3	3	3	1	4	North	2	SM	Fair	10-20	Restricted inspection due to access.Located off site.Tree has no long term potential.	C1
61	Fraxinus excelsior	300	10	4	3	4	4	3	NE	2.5	SM	Fair	10-20	Pruning wounds to crown.Restricted inspection due to access.Located off site.Tree has no long term potential.	C1
62	Fraxinus excelsior	280	9	3	3	3	3	4	SE	3	SM	Fair	10-20	Restricted inspection due to access.Located off site.Tree has no long term potential.	C1
63	Quercus robur	320	9	5	5	4	5	2.5	North	3	EM	Good	40+	Pruning wounds to stem.	A1
64	Quercus robur	340	8	4.0	4.0	3.0	2.0	2.5	North	2.5	EM	Good	40+	Deadwood in the crown of minor extent.	A1
65	Quercus robur	510	10	6	5	5	6	2	NW	3	M	Good	40+	Epicormics growth on stem & crown.Pruning wounds to stem.Deadwood in the crown of minor extent.	A1
66	Quercus robur	450	12	6	5	4	6	4	NE	3	EM	Good	40+	Epicormics growth on crown.Deadwood in the crown of minor extent.	A1
67	Quercus robur	340	10	4	3	2	4	6		0.0	SM	Good	20-40	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.Located off site. Crooked stem.	B2
68	Quercus robur	730	12	10	5	7	4	2.0	NE	1.5	M	Good	40+	Epicormics growth on crown.Pruning wounds to crown.Deadwood in the crown of minor extent.Restricted inspection due to access.Located off site.	A1
69	Sorbus aria	100	3	2	2	2	1	1	North	0.5	Y	Good	10-20	Bark damage.Restricted inspection due to vegetation. Young whitebeam.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
70	Sorbus aria	100	3	2.0	2.0	2.0	1.0	1	NE	1	Y	Good	10-20	Restricted inspection due to vegetation. Young whitebeam.	C2
71	Sorbus aria	100	4	2.0	2.0	2.0	1.0	1.5	NE	1.5	Y	Good	10-20	Restricted inspection due to vegetation. Young whitebeam.	C2
72	Sorbus aria	110	4	2	2	2	2	2	East	2	Y	Good	10-20	Restricted inspection due to vegetation. Young whitebeam.	C2
73	Sorbus aria	100	4	2.0	2.0	2.0	2.0	2	North	2	Y	Good	10-20	Restricted inspection due to vegetation. Young whitebeam.	C2
74	Acer platanoides	140	4	3	3	3	3	2	SW	2	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
75	Acer platanoides	140	4	3.0	3.0	3.0	3.0	2	SE	2	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
76	Acer platanoides	140	5	3.0	3.0	3.0	3.0	2.5	West	3	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
77	Acer platanoides	140	5	3.0	3.0	3.0	3.0	3	East	3	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
78	Acer platanoides	140	5	3.0	3.0	3.0	3.0	0.0	East	3	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
79	Acer platanoides	140	5	3.0	3.0	3.0	3.0	3.0	SE	3.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
80	Acer platanoides	140	4	3.0	3.0	3.0	3.0	1.0	North	2.0	Y	Good	10-20	Young maple.	C2
81	Acer platanoides	160	5	3.0	3.0	3.0	3.0	1	North	2	Y	Good	10-20	Young maple.	C2
82	Acer platanoides	160	5	3.0	3.0	3.0	3.0	1	NE	2	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
83	Acer platanoides	160	5	3.0	3.0	3.0	3.0	1	NE	2	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
84	Acer platanoides	160	5	3.0	3.0	3.0	3.0	1	NE	2	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
85	Acer platanoides	130	4	3.0	3.0	3.0	3.0	1.0	NE	2.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
86	Acer platanoides	150	4	3.0	3.0	3.0	3.0	1.0	NE	2.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
87	Sorbus aria	190	6	3	2	3.5	1	2.0	East	2.0	Y	Good	10-20	Pruning wounds to crown. Leaning east.	C2
88	Sorbus aria	190	6	3	2	3	1	2	SE	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Leaning south.	C2
89	Alnus cordata	100	4	1.5	1.5	1.5	1.5	2	NW	2	Y	Good	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	C2
90	Alnus cordata	120	6	2	2	2	2	2	West	3	Y	Good	10-20	Restricted inspection due to vegetation.	C2
91	Fraxinus excelsior	80	6	1.0	1.0	1.0	1.0	3	East	3	Y	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.Tree has no long term potential.	C2
92	Alnus cordata	80	8	2	2	2	2	2	West	2	Y	Good	10-20	Restricted inspection due to vegetation. Twin stemmed alder.	C2
93	Quercus robur	340	6	3.5	4.5	6	6	1	SE	1	SM	Good	20-40	Deadwood in the crown of minor extent.Crossing branches in crown.	B1
94	Alnus cordata	140	8	2.5	2.5	2.5	2.5	2	SW	2	Y	Good	10-20	Restricted inspection due to vegetation.	C2
95	Alnus cordata	100	4	1.5	1.5	1.5	1.5	1.5	NE	1.5	Y	Good	10-20	Restricted inspection due to vegetation.	C2
96	Alnus cordata	140	9	2.5	2.5	2.5	2.5	2	South	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation.	C2
97	Sorbus aria	120	5	2.5	2.5	2.5	2.5	2	East	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation.	C2
98	Sorbus aria	140	4	2.5	1.5	3	0.5	2	NE	1.5	Y	Good	10-20	Pruning wounds to stem and crown.Restricted inspection due to vegetation.	C2
99	Sorbus aria	140	5	2.5	2	2.5	2	2	North	2	Y	Good	10-20	Restricted inspection due to vegetation.	C2
100	Sorbus aria	80	4	2.0	0.0	1.0	1.0	1.5	North	1.5	Y	Fair	10-20	Pruning wounds to stem.Restricted inspection due to vegetation. Leaning north.	C2
101	Sorbus aria	140	6	3	2	2.5	2.5	2	North	2	Y	Good	10-20	Restricted inspection due to vegetation.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
102	Sorbus aria	90	4	2	1	2	2	2	SW	2	Y	Good	10-20	Restricted inspection due to vegetation.	C2
103	Tilia sp.	230	8	3.0	3.0	3.0	3.0	2.0	NE	2.0	SM	Good	20-40	Bark damage.Pruning wounds to crown.	B1
104	Quercus petraea	130	10	2	3	1.5	2	3	South	3.5	Y	Fair	10-20	Restricted inspection due to vegetation. Leggy form.	C2
105	Quercus petraea	130	12	2	2	1.5	1.5	3	South	4	Y	Fair	10-20	Restricted inspection due to vegetation. Leggy form.	C2
106	Acer campestre	200	10	2.5	2.5	2.5	2.5	3	South	0.0	SM	Good	10-20	Restricted inspection due to vegetation. Multi stemmed maple.	C2
107	Acer platanoides	150	4	2.5	2.5	2.5	2.5	2	South	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Young maple.	C2
108	Acer platanoides	150	4	2.5	2.5	2.5	2.5	2	NE	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Young maple.	C2
109	Acer platanoides	150	4	2.5	2.5	2.5	2.5	2	SW	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Young maple.	C2
110	Acer platanoides	150	4	2.5	2.5	2.5	2.5	1.5	South	2	Y	Good	10-20	Pruning wounds to crown. Young maple.	C2
111	Acer platanoides	150	4	2.5	2.5	2.5	2.5	1.5	East	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Young maple.	C2
112	Acer platanoides	150	4	2.5	2.5	2.5	2.5	1.5	East	2	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Young maple.	C2
113	Tilia tomentosa	330	8	5.0	5.0	5.0	5.0	2.0	North	2.0	EM	Good	40+	Pruning wounds to crown.Restricted inspection due to vegetation.	A1
114	Tilia tomentosa	170	5	2	2	2	2	2	SE	2	Y	Good	20-40	Pruning wounds to stem.Restricted inspection due to vegetation.	B1
115	Prunus serrula	260	5	2.5	1.5	3	1.5	1.5	North	1.0	EM	Good	20-40	Pruning wounds to crown.	B1
116	Prunus serrula	240	5	3	2	5	1	1.5	North	2	EM	Good	20-40	Pruning wounds to crown.	B1
117	Tilia tomentosa	380	9	3	3	4	4	2	North	2	EM	Good	40+	Pruning wounds to crown.	A1

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
118	Tilia tomentosa	280	8	3.0	3.0	3.0	3.0	2.0	NW	2.0	EM	Good	40+	Pruning wounds to crown.Restricted inspection due to vegetation.	A1
119	Acer platanoides	140	5	3.0	3.0	3.0	3.0	3.0	SE	3.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
120	Acer platanoides	140	5	3.0	3.0	3.0	3.0	3.0	SE	3.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2
121	Acer platanoides	140	5	3.0	3.0	3.0	3.0	3.0	SE	3.0	Y	Good	10-20	Restricted inspection due to vegetation. Young maple.	C2

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied



Table 1: Group Data Schedule

Group No.	Species	Min/Max Diameter (mm)		Average Height (m)	Average Crown Spread	Ave. Crown Height	Max. Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G1	Quercus robur	300	530	15	8	2	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of moderate extent, Pruning wounds present. Restricted inspection due to vegetation. Linear group of oak of high arboricultural / landscape value.	A2
G2	Quercus robur	200	770	16	8	3	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of moderate extent, Previous branch failure, Pruning wounds present. Group of oak of good arboricultural / landscape value.	A2
G3	Populus tremula	330	370	14	4.5	2	EM	Good	20-40	Deadwood present of moderate extent, 3 x Aspen group.	B2
G4	Fraxinus excelsior	410	550	13	8	2.5	M	Poor	<10	Epicormic growth on stem and crown. Deadwood present of major extent, Previous branch failure, Branch dieback of minor extent, Pruning wounds present. 3 x Ash group, all in severe decline due to Ash Dieback (Hymenoscyphus fraxinea).	U
G5	Quercus robur	680	950	16	10	2	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of moderate extent, Pruning wounds present. Group of 8 x oak. High arboricultural / landscape quality.	A2
G6	Quercus robur	400	600	14	6	1	M	Good	40+	Epicormic growth on crown. Deadwood present of minor extent, Off site tree group. Restricted inspection due to access and vegetation.	A2
G7	Quercus robur	600	720	16	7	5	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of minor extent, Pruning wounds present. 3 x Oak group.	A2
G8	Quercus robur	500	550	13	6	5	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of minor extent, Restricted inspection due to vegetation. 4 x Oak group.	A2

Group No.	Species	Min/Max Diameter (mm)		Average Height (m)	Average Crown Spread	Ave. Crown Height	Max. Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G9	Quercus robur	100	550	16	6	3	M	Good	40+	Epicormic growth on stem and crown.Included stem unions present. Deadwood present of moderate extent,Previous branch failure, Pruning wounds present. Off site tree group. Restricted inspection due to access.	A2
	Fraxinus excelsior									Predominantly oak woodland bordering the site.	
	Acer campestre										
	Crataegus monogyna										
	Prunus spinosa										
G10	Quercus robur	320	550	0	5	2.5	M	Good	40+	Epicormic growth on stem and crown.Deadwood present of minor extent,Pruning wounds present. Restricted inspection due to vegetation.	A2
										3 x Oak group.	
G11	Quercus robur	400	570	12	7	3	M	Good	40+	Epicormic growth on stem and crown.Deadwood present of minor extent,Pruning wounds present.	A2
	Salix fragilis									Predominantly oak group.	
G12	Acer campestre	100	200	7	3	2	SM	Fair	10-20	Epicormic growth on stem and crown.Heavily suppressed form. Deadwood present of minor extent,Previous branch failure, Pruning wounds present. Off site tree group. Restricted inspection due to vegetation.	C2
	Fraxinus excelsior										
	Malus sp.										
	Prunus spinosa										
	Crataegus monogyna										
G13	Quercus robur	380	420	8	3.5	2.5	EM	Fair	10-20	Epicormic growth on stem and crown.Deadwood present of minor extent,Previous branch failure, Branch dieback of minor extent, Pruning wounds present. Restricted inspection due to vegetation.	C2
										2 x Oak group.	
G14	Quercus robur	250	400	8	3	3	EM	Poor	<10	Epicormic growth on stem and crown.Deadwood present of moderate extent,Previous branch failure, Branch dieback of major extent, Restricted inspection due to vegetation.	U
	Fraxinus excelsior									Dying group.	
G15	Quercus robur	250	500	10	5	2	M	Fair	20-40	Epicormic growth on stem and crown.Deadwood present of moderate extent,Previous branch failure, Pruning wounds present. Restricted inspection due to vegetation.	B2
	Fraxinus excelsior									Group of predominantly oak growing either side of ditch.	

Group No.	Species	Min/Max Diameter (mm)		Average Height (m)	Average Crown Spread	Ave. Crown Height	Max. Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G16	Sorbus aria	120	160	6	2.5	2	Y	Good	10-20	Pruning wounds present. Restricted inspection due to vegetation. 4 x Whitebeam group. Some trees leaning.	C2
G17	Sorbus aria	700	100	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 3 x Whitebeam group.	C2
G18	Sorbus aria	700	100	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 6 x Whitebeam group.	C2
G19	Sorbus aria	700	100	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 5 x Whitebeam group.	C2
G20	Sorbus aria	700	110	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 4 x Whitebeam group.	C2
G21	Sorbus aria	700	110	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 5 x Whitebeam group.	C2
G22	Alnus cordata	260	300	11	3	1.5	SM	Good	20-40	Pruning wounds present. Restricted inspection due to vegetation. 3 x Italian alder.	B2
G23	Sorbus aria	90	110	4	2	2	Y	Fair	10-20	Pruning wounds present. Restricted inspection due to vegetation. 4 x Whitebeam group.	C2
G24	Quercus robur	540	540	16	8	5	M	Good	40+	Epicormic growth on stem and crown. Deadwood present of moderate extent, Pruning wounds present. Pair of oak.	A2

Group No.	Species	Min/Max Diameter (mm)		Average Height (m)	Average Crown Spread	Ave. Crown Height	Max. Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G25	Quercus petraea	100	300	13	3.5	3	SM	Good	20-40	Deadwood present of minor extent, Pruning wounds present. Restricted inspection due to vegetation.	B2
	Acer campestre									Mixed deciduous group.	
	Fraxinus excelsior										
	Crataegus monogyna										
G26	Alnus cordata	400	430	19	5	2	M	Good	40+	Deadwood present of minor extent, Restricted inspection due to vegetation. 3 x Italian alder group.	A2
G27	Quercus robur	100	200	5	4	0	Y	Good	20-40	Epicormic growth on crown.	B2
	Fraxinus excelsior									Spindly group of mixed species.	
G28	Quercus robur	150	250	8	4	0	Y	Good	20-40	Restricted inspection due to vegetation.	B2
	Alnus cordata									Spindly group of mixed species.	
	Acer campestre										
G29	Fraxinus excelsior										B2
	Quercus robur	250	300	10	3	0	Y	Good	20-40	Group of general poor form,	
	Fraxinus excelsior									Spindly group of mixed species.	
G30	Acer campestre										B2
	Fraxinus excelsior	350	400	11	4	1	EM	Good	20-40	Deadwood present of minor extent, A pair of ash trees within the boundary group.	
G31	Quercus robur	200	200	7	4	1	Y	Good	20-40	Restricted inspection due to ivy.	B2
	Alnus cordata									Alder and oak group, heavily clad in ivy.	

Table 3: Scrub / Shrubs / Hedge Schedule

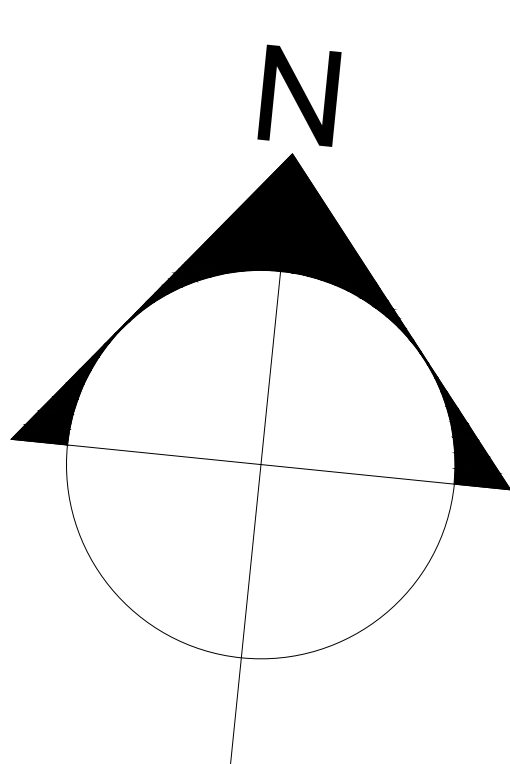
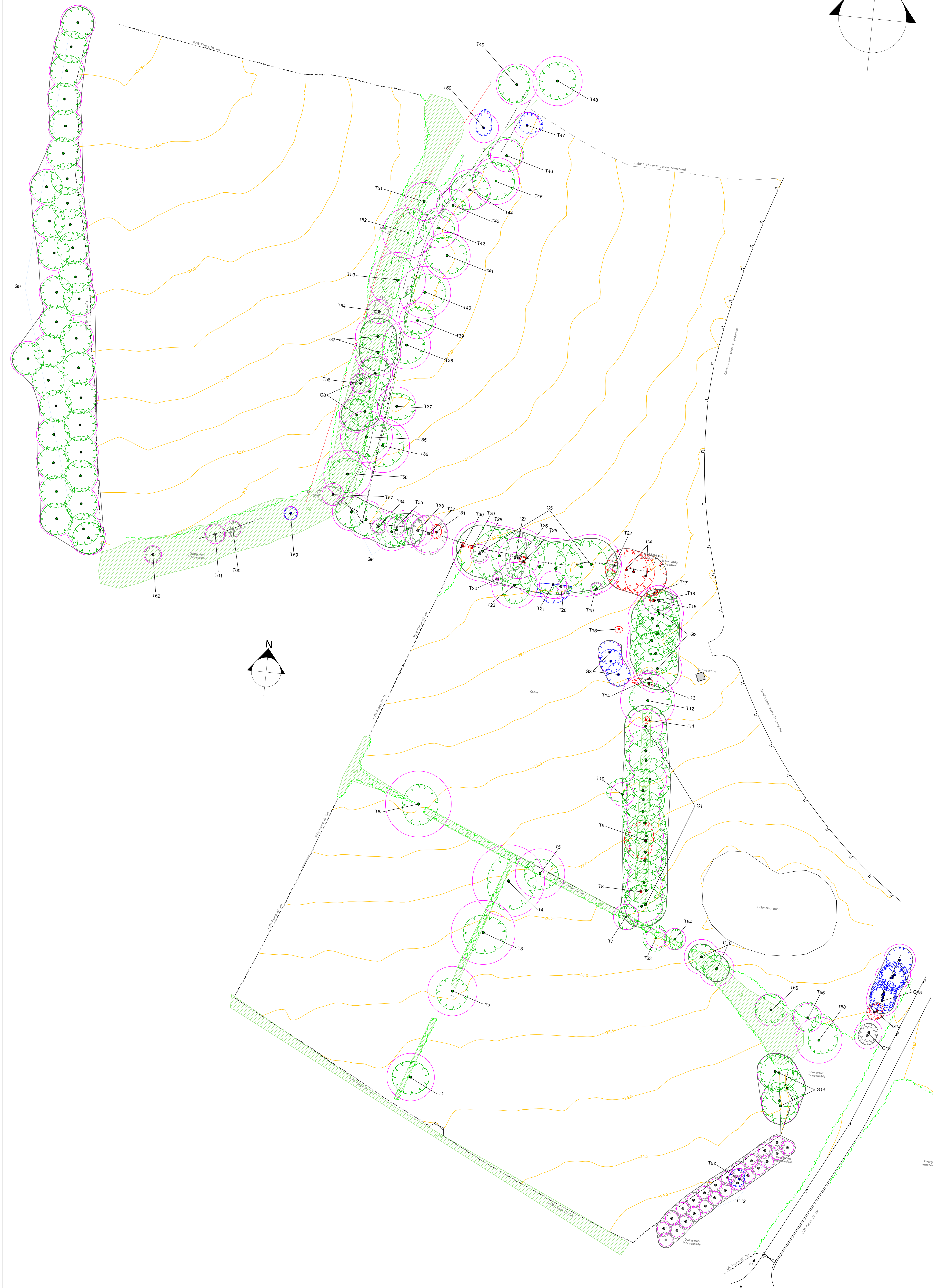
Section No.	Species		Height (m)	Comments
S1	Prunus spinosa	Rosa canina	3	Hedgerow section. Regularly trimmed.
S2	Prunus spinosa Rosa canina	Crataegus monogyna	3.0	Hedgerow section. Regularly trimmed.
S3	Prunus spinosa	Crataegus monogyna	3.0	Hedgerow section. Regularly trimmed.
S4	Prunus spinosa Rosa canina	Crataegus monogyna Salix caprea	3.5	Hedgerow section. Regularly trimmed.
S5	Prunus spinosa Rosa canina	Crataegus monogyna	3.0	Hedgerow section. Regularly trimmed.
S6	Prunus spinosa Rosa canina	Crataegus monogyna	3	Hedgerow section below trees. Gaps in places. Occasionally trimmed.
S7	Ilex aquifolium		3.5	Young holly stems.
S8	Prunus spinosa Quercus robur	Crataegus monogyna Fraxinus excelsior	3	Hedgerow section. Little recent management.
S9	Prunus spinosa Rosa canina	Crataegus monogyna	3.0	Hedgerow section. Occasionally trimmed.
S10	Prunus spinosa Euonymus europaeus Rosa canina	Acer campestre Crataegus monogyna	3	Hedgerow section. Gaps in places. Regularly trimmed.
S11	Pyracantha		2	Shrubs.
S12	Photinia	Eleagnus	5	Shrubs.
S13	Lonicera nitida		1.0	Shrubs.
S14	Lonicera nitida		1.0	Shrubs.
S15	Pyracantha		1.5	Shrubs.
S16	Pyracantha Photinia	Cornus sp.	3	Shrubs.
S17	Pyracantha		2	Shrubs.
S18	Pyracantha		2.0	Shrubs.
S19	Eleagnus	Viburnum opulus	2	Shrubs.

Section No.	Species		Height (m)	Comments
S20	Eleagnus	Viburnum opulus	2.0	Shrubs.
S21	Pyracantha	Acer campestre	2	Shrubs.
S22	Pyracantha Rosa canina Cornus sp.	Acer campestre Photinia	2.0	Shrubs.
S23	Eleagnus	Cotoneaster horizontalis	1.5	Shrubs.
S24	Eleagnus	Cotoneaster horizontalis	1.5	Shrubs.
S25	Lonicera nitida		1.5	Shrubs.
S26	Lonicera nitida		1.5	Shrubs.
S27	Cotoneaster horizontalis Acer campestre Salix cinerea	Rosa canina Cornus sp.	5	Dense mass of shrubs/young trees.
S28	Lonicera nitida		1.0	Shrubs.
S29	Pyracantha	Eleagnus	3	Hedge section. Regularly trimmed.
S30	Ligustrum sp.		2.5	Hedge section. Regularly trimmed.
S31	Pyracantha		2	Shrubs.

Figures

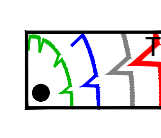
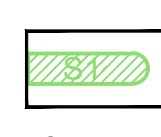
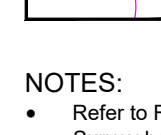
JSL4537_700: TREE CONSTRAINTS PLAN

JSL4537_710: TREE REMOVAL AND PROTECTION PLAN

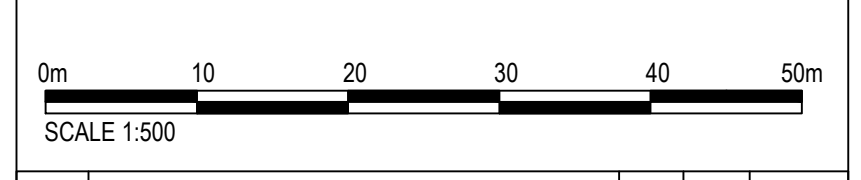


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Key

-  Tree with numbered reference.
Canopy spread and BS5837:2012 tree quality category as shown below.
-  Vegetation group with numbered reference.
Average canopy extent and BS5837:2012 tree quality category as shown below.
-  Scrub/Hedge/Shrubs/Saplings with numbered reference.
- BS 5837:2012 Tree Quality Categories - Table 1
 -  Category A - High quality
 -  Category B - Moderate quality
 -  Category C - Low quality
 -  Category U - Unsuitable for retention
-  Root protection area (RPA) calculated in accordance with Section 4.6 - BS5837:2012

NOTES:
• Refer to RPS Tree Schedule for further details.
• Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
• Plan produced in accordance with recommendations set out in BS 5837:2012 - "Trees in Relation to design, demolition and construction".
• Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period, generally, although not restricted to, March - August inclusive.
• Survey carried out using sub metre GPS survey device and Topographical Survey information provided by Client.



B	Additional sections surveyed	TF	BW	21.12.22
A	First issue	TF	BW	Nov 22



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Client MID SUSSEX DISTRICT COUNCIL

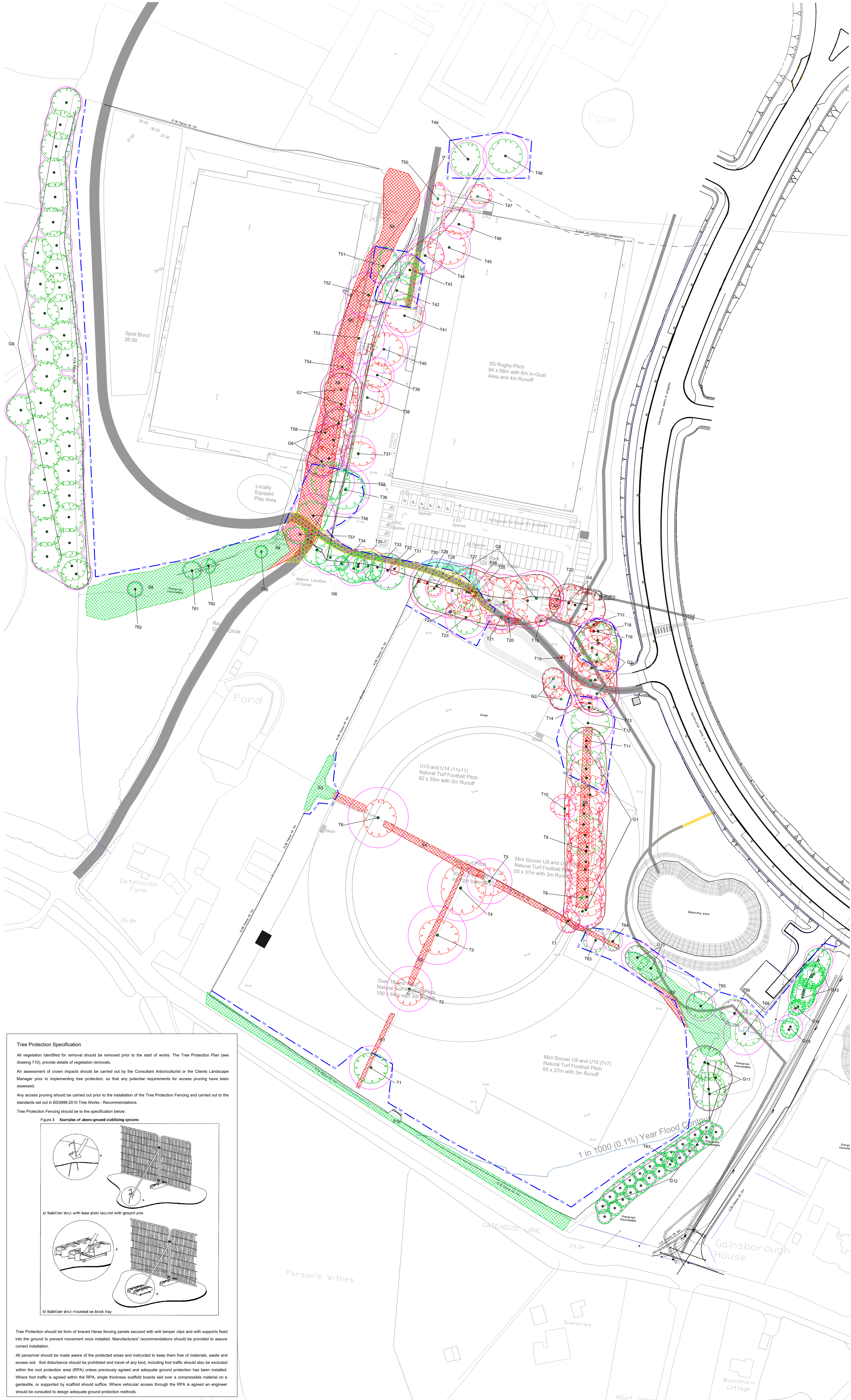
Project BURGESS HILL CENTRE FOR
OUTDOOR SPORT
& THE TRIANGLE
Title TREE CONSTRAINTS PLAN

Status	Drawn By	PM/Checked by
For Information	TF	BW

Job Ref	Scale @ A0	Date Created
JSL4537	1:500	December 2022

RPS Drawing / Figure Number	Rev
700	B

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Tree Protection Specification

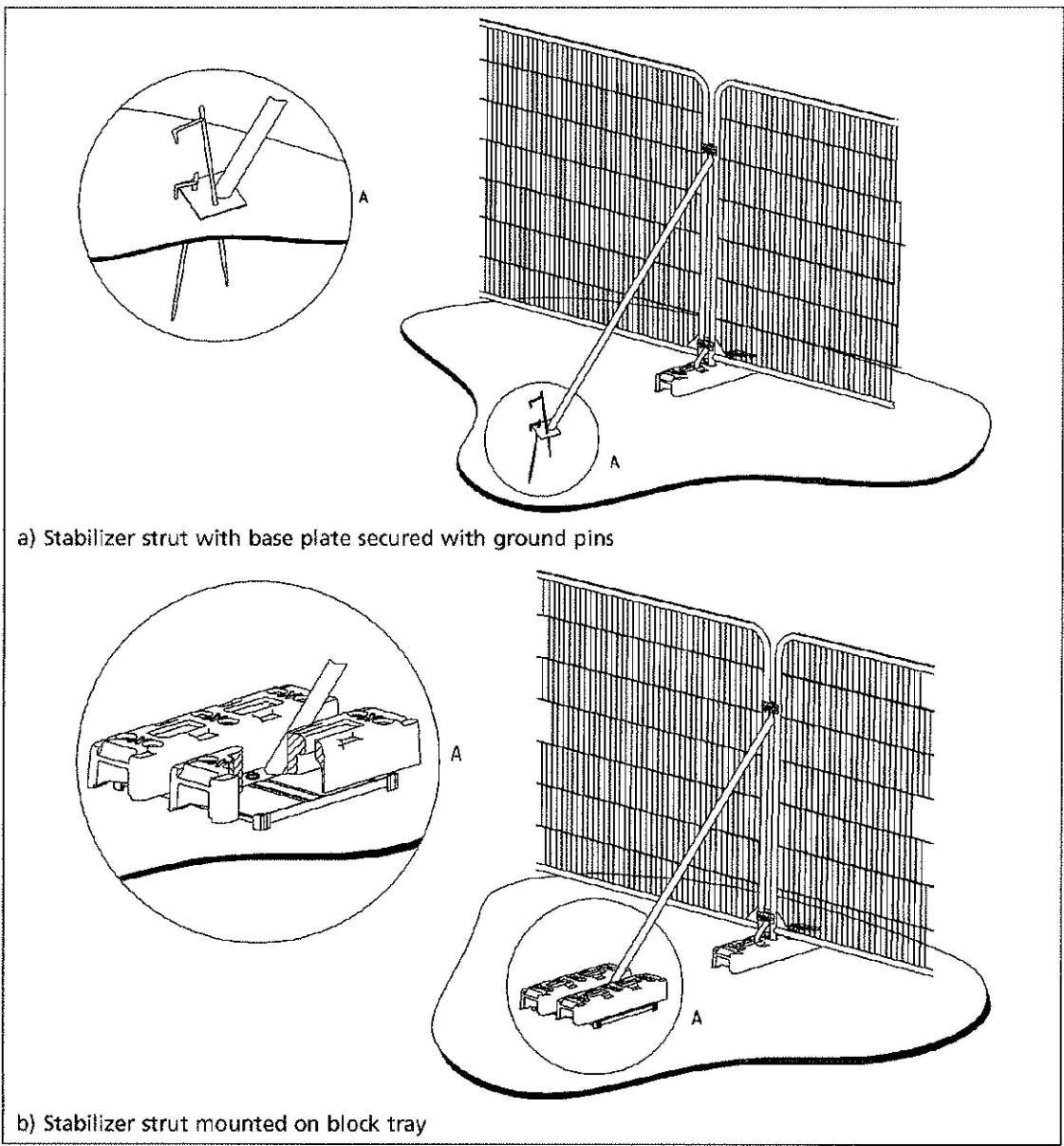
All vegetation identified for removal should be removed prior to the start of works. The Tree Protection Plan (see drawing 710), provide details of vegetation removals.

An assessment of crown impacts should be carried out by the Consultant Arboriculturist or the Clients Landscape Manager prior to implementing tree protection, so that any potential requirements for access pruning have been assessed.

Any access pruning should be carried out prior to the installation of the Tree Protection Fencing and carried out to the standards set out in BS3998:2010 Tree Works - Recommendations.

Tree Protection Fencing should be to the specification below:

Figure 3 Examples of above-ground stabilizing systems



Tree Protection should be form of braced Heras fencing panels secured with anti tamper clips and with supports fixed into the ground to prevent movement once installed. Manufacturers' recommendations should be provided to assure correct installation.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed.

Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile, or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

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Key

- T1/G1 Trees and tree groups to be removed.
- T1/G1 Trees and tree groups to be retained.
- S Hedge/Shrubs/Saplings with numbered reference to be removed.
- S Hedge/Shrubs/Saplings with numbered reference to be retained.

BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
- Category B - Moderate quality
- Category C - Low quality
- Category U - Unsuitable for retention

- Root protection area (RPA) calculated in accordance with Section 4.6 - BS5837:2012
- CEZ - Protective fencing (e.g. Heras style.) To be assembled in accordance with Section 6.2 - BS5837:2012 (see inset for example barriers)
- Footpaths to be built using 'no-dig' construction methods e.g. Cellular confinement system built on top of existing ground level.
- Excavation within RPA to be completed with caution, any roots >25mm diameter to be retained, and reviewed by an arboriculturalist.

NOTES:
• Refer to RPS Tree Schedule for further details.
• Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
• Plan produced in accordance with recommendations set out in BS 5837:2012 - Trees in Relation to design, demolition and construction.
• Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period, generally, although not restricted to, March - August inclusive.
• Survey carried out using Topographical Survey information produced by the Client.

C	Tree retention updated	DC	DC	30.11.23
B	Updated layout	TF	BM	18.07.23
A	First issue	ZG	TF	13.03.23
Rev	Description	By	CB	Date

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Client MID SUSSEX DISTRICT COUNCIL

Project BURGESS HILL CENTRE FOR OUTDOOR SPORT

Title TREE REMOVAL AND PROTECTION PLAN

Status Drawn By PM/Checked by
First Issue ZG TF

Job Ref Scale @ A0 Date Created
JSL4537 1:500 March 2023

RPS Drawing / Figure Number Rev
710 C

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Appendix A

Survey Methodology

General

This report was authored by Zak Goad, Assistant Arboriculturist and Thomas Flood, Principal Arboriculturist, of RPS.

The report and survey were carried out in general accordance with the requirements set out in BS 5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations".

Trees were inspected from ground level during a site visit. All data was recorded electronically within a Axciscape 4.02 project and then upon return to the office it was imported into an MS Access database. Individual tree numbers and locations were plotted by eye on to a drawing at the time of the survey. Tree positions were then related to a Topographical survey of the site provided, where not shown on the topographical survey tree positions have been plotted by eye only and require confirmation.

Trees were not climbed or inspected below ground level and inaccessible trees will have best estimates made about the location, physical dimensions and characteristics.

The locations of the trees were based upon topographic survey of the site provided by the client.

The survey assesses individual trees and groups of trees for quality and benefits within the context of proposed development. The quality of each tree or group of trees has been recorded by allocating it to one of four categories as described in the table below. These categories have been differentiated on the Tree Constraints Plan (JSL4537_700).

The survey information was recorded on the attached schedule (Table 1) in general accordance with the guidance contained within Section 4 of BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations".

Tree Constraints Plan

The Tree Constraints Plan (see drawing JSL4537_700) is designed to show the influence that the trees have upon the site by virtue of their size and position. The plan seeks to act as a design tool that shows both the above and below ground constraints presented by the trees.

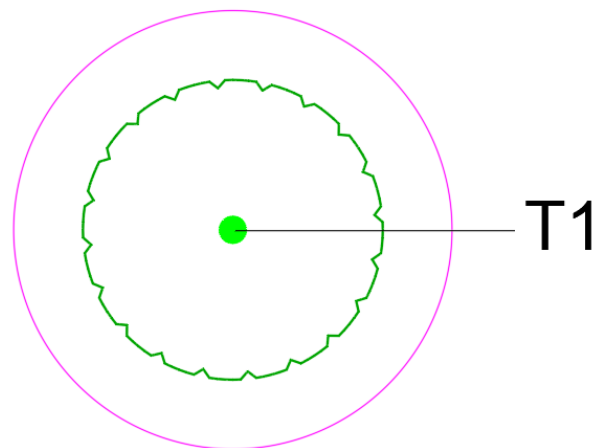
The information provided within this section of the report is to assist in the interpretation of the Tree Constraints Plan and aims to ensure that those trees selected for retention can be successfully integrated within the proposed development.

It should be noted that some of the tree positions shown on the plan have been plotted using the provided topographical survey and others by eye to an Ordnance Survey base map and as such should be considered to be of a provisional nature.

Root Protection Areas

Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2012 and a schedule of Root Protection Areas is attached to this report as Table 2.

As shown to the right, Root Protection Areas (RPA's) for the trees, where no significant constraints to root development are considered to be present, have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, required for protection.

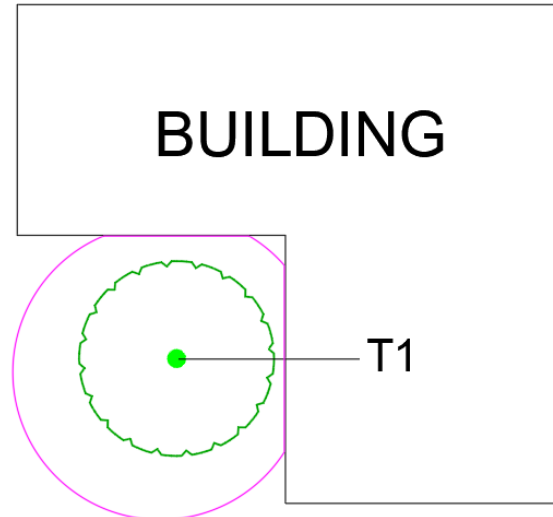


REPORT

Where tree root spread is considered to have been influenced by site conditions the trees RPA's have been plotted to the Tree Constraints Plan as a polygon. The plotted polygon is of the **same area** as it would be as a circle and its shape reflects an arboricultural assessment of likely root distribution.

An example of a polygonal RPA, considered appropriate due to the presence of a building in close proximity to a tree, is shown to the right.

Where possible all development, including new hard landscaping, shall be situated outside of the retained trees designated Root Protection Areas.



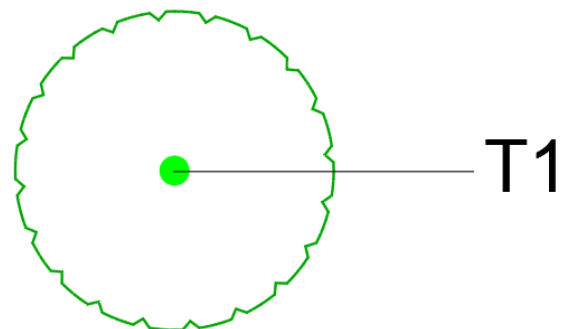
Existing Canopy Spreads

The existing canopy spreads of the trees on site are shown on the Tree Constraints Plan as depicted here.

The current spread of the tree is a constraint due to its dominance, size and movement in strong winds.

It will typically be unacceptable to design any built development within the current spread of a tree.

Where built development is proposed in close proximity to existing trees consideration should be given to the amount of working space required to allow its construction.

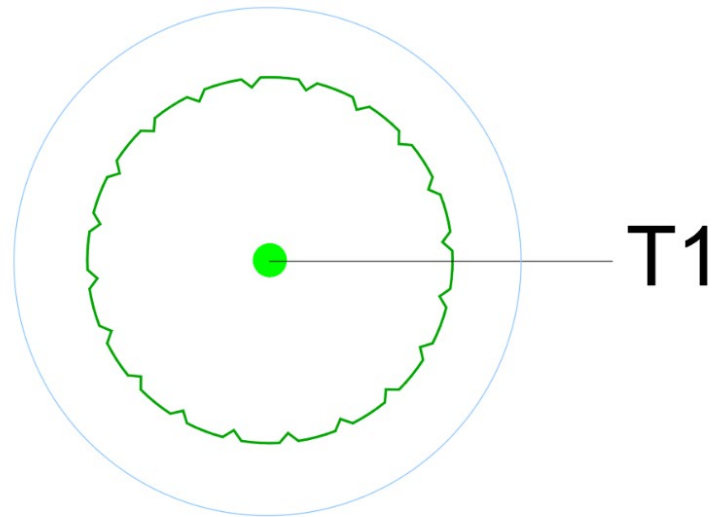


REPORT

Future Tree Growth

Some of the trees surveyed are not yet mature and they have the potential for future growth. Where these are to be retained consideration to their ultimate crown spread should be given as future branch growth may result in interference with proposed development, damage to branches and the need for a tree pruning regime.

To facilitate assessment of future tree growth maximum expected canopy spreads have been marked on the Tree Constraints Plan (see drawing JSL4537_700) as shown here.



The area of mature tree spread is estimated by the arboriculturist and is their best judgement of mature crown spread based on experience and with regard to the current tree growth observed on the site.

Within the area of maximum branch spread construction activities should be restricted for the long-term health and vigour of the trees.

In this respect it is considered that within the area of maximum branch the construction of utility buildings, such as single storey garages or sheds and the installation of hard surfaces would generally be an appropriate form of construction, however, should car parking be proposed beneath the ultimate spread of trees the likelihood of fruit fall, leaf litter or sap exudate causing a nuisance must be considered.

In addition, it is important to consider the likelihood of damage to trees or structures that may be caused by continuous whipping of branches in windy conditions. In such circumstance's branches may have to be repeatedly cut back which will introduce wounds in the tree and may spoil its form or shape. In general terms trees should not be retained upon the basis that their ultimate branch spread can be significantly controlled by periodic pruning.

Canopy Height / Clearance

The height and growth direction of the lowest branch of each tree is recorded in the Tree Data Schedule contained within this report as Table 1, the lowest branch height of a tree is shown on the Tree Constraints Plan. Additionally, the vertical clearance of the trees canopy above ground level is recorded within the Tree Data Schedule.

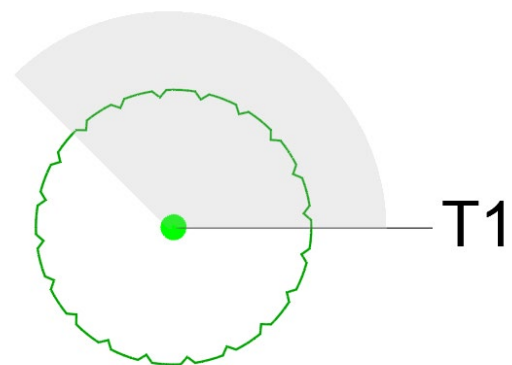
The two figures can be used to inform the extent to which a trees crown may be at risk of damage during development as a result of vehicular or plant movements within the site and to assess the need for additional protective measures to be implemented to protect low branches.

In particular it should also be noted that where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA fencing may sustain damage during construction. Where this occurs, there are two primary options available to manage and minimise the potential for damage to tree canopies to occur during development and these may be used singularly or in combination. The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the trees. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.

Shading

It should be appreciated during the design of the development that trees can cause shading and obstruction of daylight and sunlight. It should be recognised that the extent of shading likely will vary with tree species, canopy shape and size, foliage density, time of year and sun elevation and that such shading will often be seasonal and diffuse.

Shading has been shown on the constraints plan, but this is a very basic shade pattern and it should not be considered as a definitive pattern. Shade and it affects/benefits to residential buildings should be considered by the designers within the overall site appraisal for the building layout. Shade cast by plotted trees will be displayed as seen here on the Tree Constraints Plan.



Appendix B

BS5837 Cascade Chart for Tree Quality Assessment

REPORT

Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	☐ Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) ☐ Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline ☐ Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			Dark Red
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Light Green
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Mid Blue
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey

Appendix C

Tree Protection Barriers

Root Protection Area Barrier Details

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.

The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2012 Trees in Relation to Design, Demolition and Construction. Barriers should be braced and constructed to resist impacts; see Figures 1 & 2 below for barrier specifications. Barriers can be of an alternative specification to that within the BS5837:2012 provided it is approved by the Local Planning Authority Tree Officer.

Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed.

Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.

Suggested Barrier Specification (as per BS5837: 2012)

Figure 1

Figure 2 Default specification for protective barrier

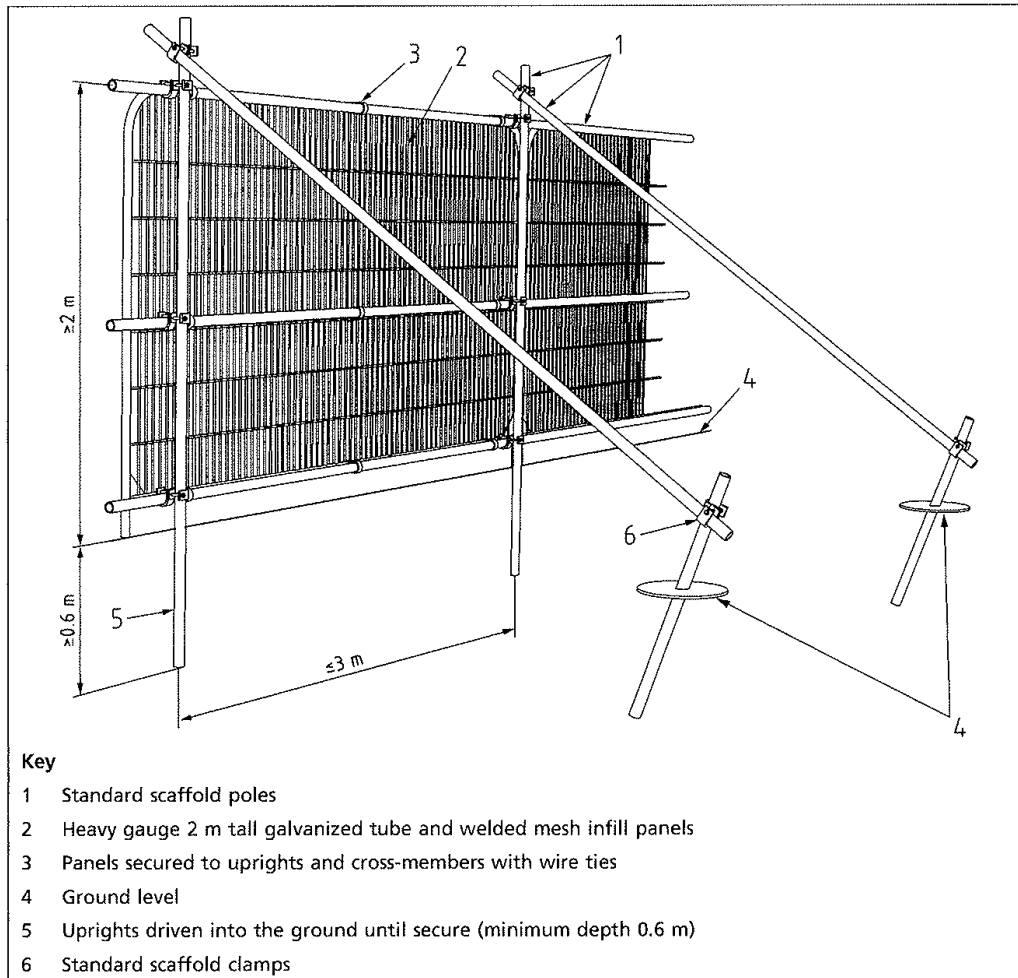
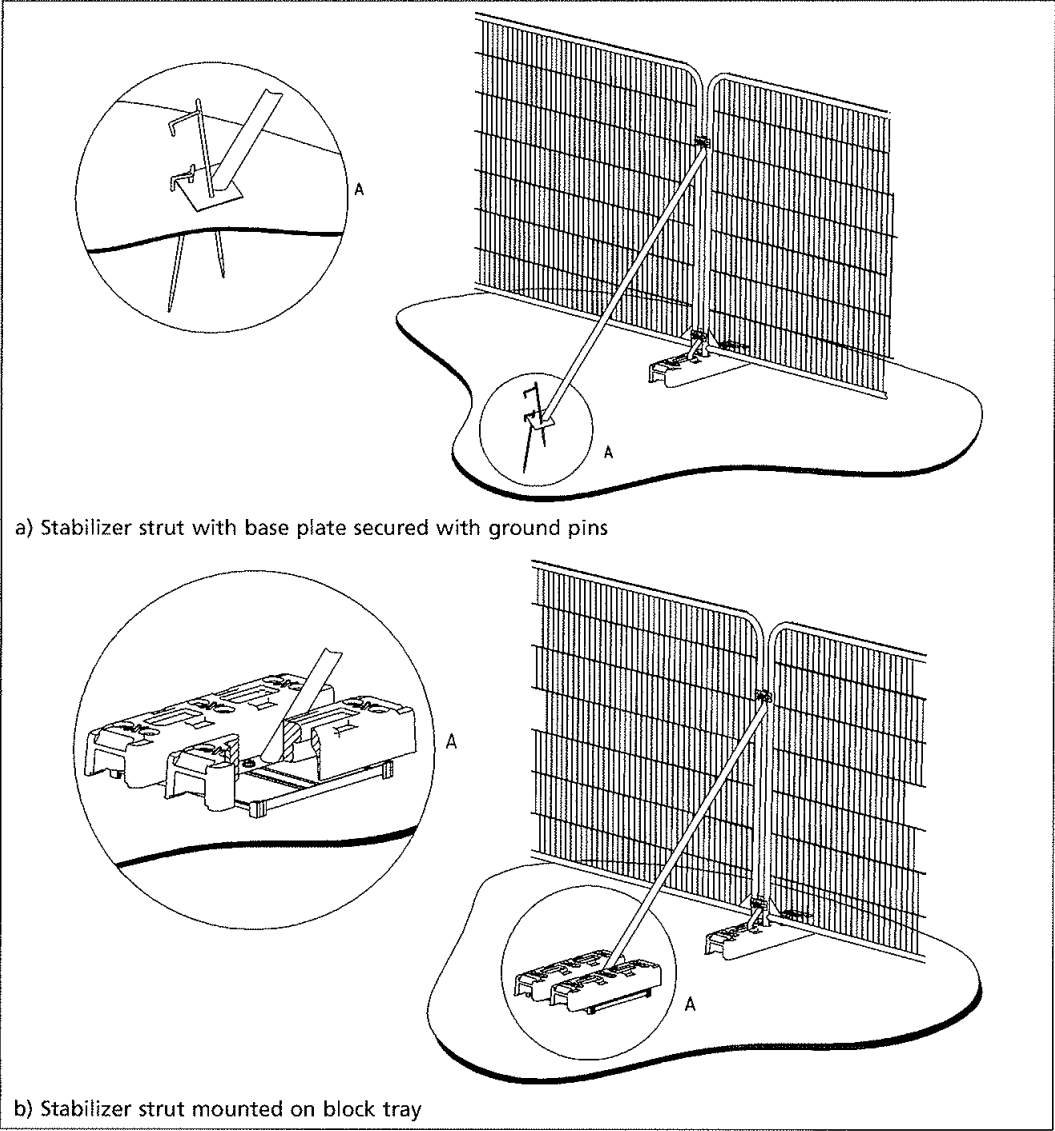


Figure 2.

Figure 3 Examples of above-ground stabilizing systems



Appendix D

Construction Exclusion Signage – Example



Appendix E

Site Photographs



Photo A: Cat A Plymouth pear T23 (foreground) with Cat A oak group G5 behind.

B



Photo B: Cat A Aspen group G3 (left) with Cat A T12 (right)

C



Photo C: Cat B G15 (left) and Cat U G13 (right)

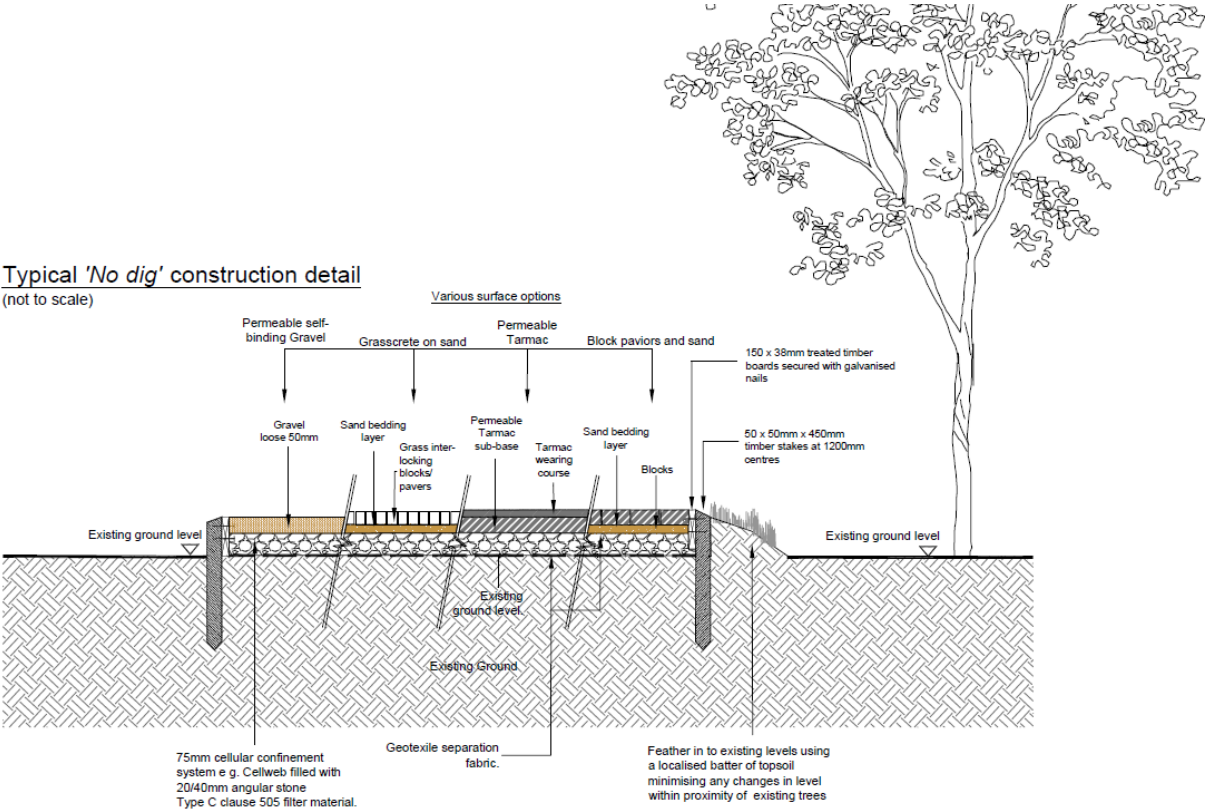


Photo D: View looking north along existing track at Cat A T36 (right) and Cat A G8 (left)

Appendix F

No-Dig Construction Example

Typical 'No dig' construction detail
(not to scale)



Appendix G

Arboricultural Glossary

Abiotic Factors - Non-living factors of the environment, including temperature & wind.

Age-class - A general classification of the tree into either - young, semi-mature/maturing, mature, over-mature, or senescent.

Apical Bud/Shoot – The apical bud, also known as the leading shoot, is responsible for shoot extension and is dominant.

Apical Dominance – A singular, leading shoot remains dominant.

Arboreal - In connection with, or in relation to, trees.

Arboriculturist – Person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.

Arboricultural Implications Assessment (AIA) – Study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

Arboricultural Method Statement (AMS) – Methodology for the implementation of any aspect of development that has the potential to result in the loss of or damage to a tree. Note The AMS is likely to include details of an on-site tree protection monitoring regime.

Biotic factors - Living factors. For example, animals and pathogens.

Branch union/junction - The point at which a branch joins a larger stem. Can be a point of weakness, especially in certain species.

Cambium - A lateral meristem (see below) in vascular plants located just beneath the bark responsible for secondary growth, e.g. production of annual growth rings.

Canker – A clearly defined area of dead and sunken or malformed bark, caused by bacteria or fungi. Can have a bearing on structural integrity of infected limb(s) depending on size and location.

Chlorosis/Chlorotic – Abnormal yellow or yellow-green coloration of usually green leaves. Essentially a reduction of chlorophyll levels often as a result disease or nutrient deficiency.

Co-dominant stems - A growth characteristic, where two or more stems of similar size grow from the same point. Can create an inherent weakness.

Compaction - The compressing & hardening of soil around tree root systems, due to vehicular/pedestrian use etc. Loss of pore space between soil granules limits water movement and gaseous exchange, and inhibits root growth.

Competent person – Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached

Note 1 A competent person understands the hazards and the methods to be implemented to eliminate or reduce the risks that can arise. For example, when on site, a competent person is able to recognise at all times whether it is safe to proceed.

Note 2 A competent person is able to advise on the best means by which the recommendations of this British Standard may be implemented.

Condition – Assessment based on a visual and professional view giving consideration to many factors such as tree health, structural integrity and suitability of its position.

Construction Exclusion Zone – Area based on the RPA (in m²), identified by an arboriculturist, to be protected by development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

Coppice - The method of managing trees by cutting the stems at between 1.0 inch and 1.0 foot from the ground level on a regular cycle, the cut stumps of the trees or shrubs are allowed to re-grow many new stems.

Crown spread - Gives distances between extreme limits of the crown and the stem, usually along the four compass points. Helps to show crown symmetry.

Crown Reduction – The removal of branch ends to reduce the extreme limits of a trees branch spread and height.

Crown Thin – The removal of selected branches within the crown to thin the internal branch structure.

D.B.H. - 'Diameter at Breast Height', an industry standard to gauge tree stem size and development. Within arboriculture, breast height is taken to be 1.5m above ground level.

Dieback - The reduction in crown vigour and extension growth progressing to death of distal parts; often associated with decline.

Epicormic/adventitious growth - New growth from dormant buds that can often form tenuous attachments. Although some species readily form such shoots, it can be an indication of stress.

Feathered Whip – Size of tree for planting, usually ranging from 1.25m to 2.5m in height.

Form - A general assessment of the shape and position of the tree within its' environment.

Frass – Debris such as bore dust left by wood boring insects.

Hanger – Term used to describe a branch that has become detached and is being supported by other branches. Can be a hazard to persons and property below.

Hazard Beam – After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.

Heavy Standard – Size of tree for planting, usually above 3.5m in height.

Included bark – Growth characteristic usually caused when two or more stems/branches growing in close proximity 'fuse' together entrapping the bark from when the parts were separate in the middle, creating a structural weakness.

Meristem - The undifferentiated plant tissue from which new cells are formed, such as that at the tip of a stem or root.

Meristematic Disorder – A growth disorder caused by a disruption of the meristem (see above) from any of a number of biotic factors (see above). Manifests as growths such as 'Witches Brooms' & 'Galls'.

Necrosis/Necrotic – Death of tissues usually characterised by a blackening in colour.

Occlusion/Occluded – Normally used to describe the overgrowth of a wound. Also, immovable foreign objects in contact with a tree part can become encased or 'occluded' by the tree as it grows incrementally.

Pathogen - An agent that causes disease, especially a living microorganism such as a bacterium or fungus.

Plasticity index - The table used to calibrate the shrinkability of a clay soil.

Pollard – The removal and subsequent regular re-removal of the crown of a tree above animal browsing height. Can be an effective method of controlling the size of trees in urban areas. This is ideally begun in the trees early stages and maintained throughout its life.

Reaction wood - Essentially additional wood laid down by the tree to compensate for structural defects such as cavities.

Ring barking/Girdling – the removal of bark around the entire circumference of a stem or branch, causing the death of all distal parts.

Root Protection Area (RPA) – Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m².

Saprophyte – An organism which exists on dead plant material.

Scaffold branches - The main structural branches within the crown.

Services – Any above ground and piped and/or ducted underground infrastructure including water main, electricity supply, gas supply, fibre optic utilities, telecommunications cabling, storm and foul water drainage, including temporary storage for run-off, pumping stations, interceptors and other allied buried structures.

Shrinkable clay – Clay soil which alters in volume depending on moisture content. Property sited on shrinkable clay can suffer subsidence damage due to soil desiccation; this can be due to the water uptake of nearby vegetation, including trees.

Special engineering – design of a structure with the physiological requirements of trees as the priority.

Standard – Size of tree for planting, usually ranging from 2m to 3.5m in height.

Structure – Man-made object, such as a building, carriageway, path, wall, services, and built and excavated earthworks.

Transplant – (1) size of tree for planting, usually ranges from 0.2m to 0.9m in height (2) the relocation of a tree or shrub including a given portion of the root system.

Tree Constraints Plan (TCP) – Plan prepared by an arboriculturist for the purposes of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade, dominance, etc.

Tree protection plan – scale drawing prepared by an arboriculturist showing the finalised layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

U.L.E – ‘Useful Life Expectancy’ is an estimate based on currently known factors of the possible remaining life of the tree as an asset.

Veteran tree – Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Vigour - A general classification, as to the present and future potential growth and development of a tree. A comment regarding the health status of the tree specific to its species.