

# THURROCK FLEXIBLE GENERATION PLANT ARBORICULTURAL IMPACT ASSESSMENT

Application document A8.1

APFP Regulations ref. 5(2)(q)




JSL3537\_770  
Thurrock Flexible Generation  
Plant  
Arboricultural Impact  
Assessment

19<sup>th</sup> February 2020

## A8.1 ARBORICULTURAL IMPACT ASSESSMENT

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# 1 INTRODUCTION

## Purpose of this Document

- 1.1 This Arboricultural Impact Assessment has been prepared as part of the application by Thurrock Power Ltd (the Applicant) for a Development Consent Order (a DCO), that has been submitted to the Secretary of State (the SoS) for Business, Energy and Industrial Strategy (BEIS), under section 37 of the Planning Act 2008 (as amended) (the PA 2008), in respect of the proposed development (the Application).
- 1.2 Thurrock Power proposes to develop a flexible generation plant on land north of Tilbury Substation in Thurrock. The flexible generation plant will provide up to 600 megawatts (MW) of electrical generation capacity on a fast response basis, together with up to 150 MW of battery storage capacity.
- 1.3 Schedule 1 of the draft DCO (application document A3.1) identifies the development for which development consent is being applied for and for which this Arboricultural Impact Assessment has been prepared.
- 1.4 A DCO is required for the proposed development as it falls within the definition and thresholds for a Nationally Significant Infrastructure Project (an NSIP) under sections 14 and 15(2) of the PA 2008.
- 1.5 Regulation 5(q) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 states that applications must be accompanied by any other documents considered necessary to support the application.
- 1.6 This Arboricultural Impact Assessment is based on information gathered during a tree survey undertaken in accordance with BS5837:2012, as described within the survey methodology attached to this report at Appendix A.
- 1.7 The purpose of the survey was to gather data on trees within the site and to prepare a Tree Constraints Plan (see drawings JSL3537-700 – 712), that has been used to assess likely impacts of the proposals. The Tree Constraints Plan guidance at Appendix B explains the process of interpreting the plan and how it is used during the design and impact assessment process.

- 1.8 This report has been prepared to support and expand upon the data presented on the Tree Constraints Plan in addition to summarising the quality and condition of the tree stock present on the site.
- 1.9 This report should be read in conjunction with the supplied Tree Constraints Plan (see drawings JSL3537-700 - 712) and Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720 - 732) and all other relevant Tables and Appendices as detailed within the table of contents.
- 1.10 The following documents and drawings were considered during the production of this report:
- Beacon Land Surveys – Roadway Survey – Dwg. No19-099-01 – September 2019
  - Survey Solutions – Topographical Survey – Dwg. No. 21360se -1-10 – February 2019
  - RPS – Work Plans – application document A2.3
- 1.11 The tree positions were plotted using a combination of Topographical Survey and OS landline data. Where tree positions were not shown, a sub metre GPS laser plotting device (Trimble Geo 7x) was used.
- 1.12 The survey and this assessment were carried out by RPS Principal Arboriculturist, Thomas Flood, who is a Chartered Arboriculturist with the Institute of Chartered Foresters and a Full Member of the Arboricultural Association.

### **Thurrock Power Ltd**

- 1.13 Thurrock Power is a subsidiary of Statera Energy Limited, a private British company that develops, builds and operates flexible electricity generating plant in the UK.
- 1.14 Statera Energy was established with the aim of delivering increased flexibility for the UK electricity system to assist in the transition to a low carbon economy in the expectation that renewable energy sources, such as solar and wind, will become the dominant form of generation of the future.
- 1.15 Thurrock Power will be a fully integrated developer, owner, and operator of the proposed Thurrock Flexible Generation Plant.

## 2 SITE INFORMATION

### Site Description

- 2.1 The proposed development site is located on land south west of Station Road near Tilbury, Essex. The British National Grid coordinates are TQ662766 and the nearest existing postcode is RM18 8UL. It is within the administrative area of Thurrock Borough Council and lies in the Thurrock Green Belt.
- 2.2 The application boundary and location of the proposed development are shown in the Location and Order Limits Plans, application document A2.1.
- 2.3 The main development site for the generating plant and battery storage facility currently comprises open fields crossed by drainage ditches and three overhead power lines with steel lattice electricity pylons. Land for access routes (including causeway for barge deliveries during construction) and connections to the gas and electricity grid within the Order Limits comprises farmland, previously developed industrial sites, and the north bank of the River Thames.

### Tree Preservation Orders & Conservation Areas

- 2.4 A check was made online via the Thurrock Council planning constraints mapping service on 3<sup>rd</sup> October 2019 and it was confirmed that none of the trees recorded are subject of a TPO, but some do fall within the boundary of the West Tilbury Conservation Area (Low Street). The vegetation included within the boundary of the Conservation Area comprise one Category C group (G13), two Category U items (T50 and G14) and two hedgerow sections (S83 and S84).



### 3 THE PROPOSED DEVELOPMENT

3.1 In overview, the proposed development comprises the construction and operation of:

- reciprocating gas engines with electrical output totalling 600 MW;
- batteries with electrical output of 150 MW and storage capacity of up to 600 MWh;
- gas and electricity connections;
- creation of temporary and permanent private access routes for construction haul and access in operation, including a causeway for barge deliveries; and
- creation of exchange Common Land and habitat creation or enhancement for protected species translocation and biodiversity gain.

## 4 TREE QUALITY ASSESSMENT

### Retention Values

- 4.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (TCP), see drawings JSL3537-700 - 712, shows tree positions, numbers and retention categories. Trees have been 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 A full breakdown of how trees are graded in terms of retention category can be found at Appendix C – BS5837 Cascade Table for Tree Quality Assessment. A summary of the retention categories can be found below along with the specific colours they are represented by on the Tree Constraints Plan (see drawings JSL3537-700 - 712).
- 4.6 **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 TCP.
- 4.7 **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.
- 4.8 **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.



- 4.9 **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.
- 4.10 A total of 152 individuals and 32 groups of trees were recorded during the survey. In accordance with BS5837:2012 guidance on retention categories, the individual trees were distributed as seven Category A, 30 Category B, 96 Category C and 19 Category U. The 32 groups of trees were distributed as five Category B, 23 Category C and four Category U.

### Physiological Condition

- 4.11 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.
- 4.12 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 because of development as well as those in the good condition class.
- 4.13 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.
- 4.14 Of the 152 individual trees, 75 were deemed to be in good condition, 56 in fair condition, 18 in poor condition and three which were dead. Groups were recorded as being distributed as eight in good condition, 20 in fair condition, two in poor condition and two groups of dead trees.

### Structural Condition

- 4.14 There are 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.

- 4.15 The majority of structural defects that were noted across much of the tree stock on the site, such as minor deadwood in tree crowns, suppressed crowns and poor form, were not considered significant enough to result in the failure of the tree or merit remedial works.
- 4.16 A small number of particularly structurally poor trees do exist and therefore caution would be required if working adjacent them and these relate to T7, a hybrid black poplar (*Populus x canadensis*) with numerous previous limb failures and major deadwood / dieback of the crown. The white willow (*Salix alba*) T59 was also safety concern, again with major deadwood / dieback and past limb failures. The group G15, also white willow, has a fallen stem hung-up in the canopy which could be potentially dangerous should any works be undertaken near to it.
- 4.17 Two schedules of preliminary tree work recommendations are provided at Table 6 and 7 attached to this report.

### Age Class Distribution

- 4.18 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.
- 4.19 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. These trees will generally make some contribution to the current landscape character and appearance of the site and their retention will provide more immediate succession of mature trees. As with young trees these specimens will have the potential for rapid and significant future growth.
- 4.20 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 slower rate than young and semi-mature trees.
- 4.21 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 continuation of canopy cover can be achieved.

- 4.22 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.
- 4.23 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.
- 4.24 The 152 individual trees comprise 20 mature, 38 early-mature, 43 semi-mature and 51 young age classes. The 32 groups of trees ranged between young and mature.

### Species Distribution

- 4.25 The species recorded during the survey are listed below:

<b><i>Botanical Name</i></b>	<b>Common Name</b>
<i>Acer campestre</i>	Field maple
<i>Acer pseudoplatanus</i>	Sycamore
<i>Ailanthus altissima</i>	Tree of Heaven
<i>Crataegus crusgali</i>	Cockspur thorn
<i>Crataegus monogyna</i>	Hawthorn
<i>Cupressus macrocarpa</i>	Monterey cypress
<i>Elaeagnus angustifolia</i>	Russian olive

<b>Botanical Name</b>	<b>Common Name</b>
<i>Fraxinus excelsior</i>	Ash
<i>Malus</i> sp.	Apple species
<i>Populus nigra</i> 'Italica'	Lombardy poplar
<i>Populus x canadensis</i>	Hybrid black poplar
<i>Prunus avium</i>	Wild cherry
<i>Prunus domestica</i>	Plum
<i>Prunus spinosa</i>	Blackthorn
<i>Quercus robur</i>	Pedunculate oak
<i>Salix alba</i>	White willow
<i>Salix caprea</i>	Goat willow
<i>Salix cinerea</i>	Grey willow
<i>Salix fragilis</i>	Crack willow
<i>Salix</i> sp.	Willow species

## 5 BELOW GROUND CONSTRAINTS

- 5.1 Tree roots require moisture and nutrients to grow successfully, if these are not available then they will not be able to colonise the area surrounding the main stem. The tree will form a root system and exploit any water and nutrient resources that are available to them. Roots do not form in hostile environments and the tree will adapt its size and shape if any of these items are in limited supply.
- 5.2 Sealed surfaces and good urban drainage are bad for root and tree growth. The soil becomes desiccated in these situations and available moisture is greatly reduced. This along with the high levels of compaction found associated with hard surfaces restrict rooting.
- 5.3 The majority of roots are found in the upper 60cm of soft surfaces adjacent to the trees and the adoption of sensible and considerate construction techniques should be used to minimise any root damage through the development process.
- 5.4 Alterations to levels within the site are not to be permitted within the root zones of any retained trees as this will invariably result in either root severance (cutting) or suffocation (filling) and this is a common cause for the decline/death of trees during and post construction.
- 5.5 New hard surfaces have the potential to severely damage roots of nearby trees and should therefore be avoided. If it is unfeasible to do this, it may be possible to use low impact construction methods (also known as 'No-dig' solutions) which provide load bearing systems above ground level thus removing the need to excavate. As well as removing the need to excavate, these surfaces prevent compaction and are permeable so allow free flow of moisture and air to and from the soils.
- 5.6 Construction method statements should be fully specified before any works adjacent to trees are carried out. Where they are likely to be adjacent to the rootable area, supervision by a qualified Arboriculturist should be considered. The specifications should be a combination of current best practice and relevant British Standards relating to demolition and construction adjacent to trees.

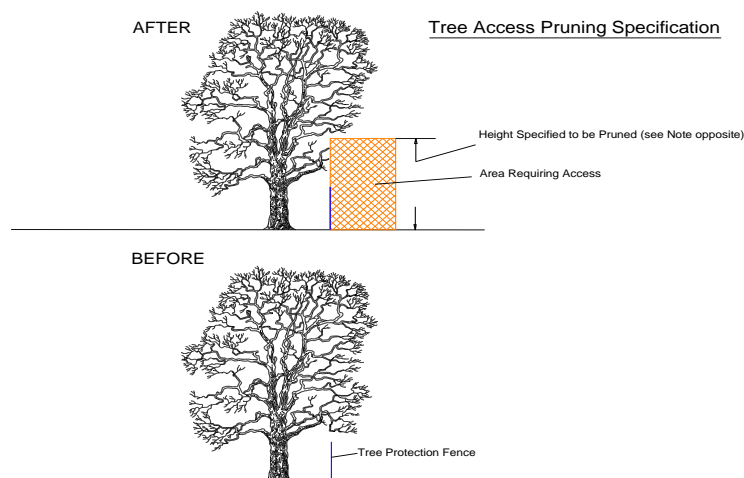
## 6 ABOVE GROUND CONSTRAINTS

- 6.1 The above ground constraints that trees provide are largely concerned with their mass (crown and main stem) and these constraints are usually abated by pruning or removal. Pruning is used to allow access and prevent damage to the tree during development.
- 6.2 Removal is considered when the tree is in a poor condition and would fail in a reasonable time scale or the development could not be achieved with the tree in its current position and its removal is agreed as part of the planning application.
- 6.3 In certain instances, there may not be suitable ground clearance to allow for easy installation of tree protection fencing or clearance of proposed footpaths and therefore there will be a need to prune in order to remedy this issue.
- 6.4 Where crown pruning works are required, following approval for the works they would need to be carried out to the specifications contained within BS3998:2010 Tree Work – Recommendations and the guidance below. They should be carried out sensitively and maintain or improve the crowns balance and form for each individual tree.

### Tree Access Pruning Specification

- All works shall be carried out by suitably qualified and professional contractors who are clear in the understanding of the specification below and their requirements.
- All works shall be carried out using suitable handsaws and these saws should be sharp and in a serviceable condition. The use of chainsaws shall only be used with the agreement of the supervising officer (SO).
- All risk assessments shall be carried out by the contractor prior to works commencing and they should be fully satisfied to the conditions and any hazards within the working area. Any concerns should be reported to the SO.
- The clearance height should be agreed and included in the schedule of works.
- Works beyond this dimension are not to be part of the works unless it involves additional health and safety works to the tree.

- The works are designed to provide access to the working area during the construction period and if the access is to be required beyond this period then a tree management programme with the provision for cyclical pruning be agreed.
- The guidance and main document providing the recommended guidance is BS3998:2010 Tree Work - Recommendations and this should be followed if any doubt exists with the requirements of the work. Particular sections for reference are Section 7 Pruning and related work, and within this section, 7.2 Minimizing the potentially undesirable effects of pruning, 7.6 Crown lifting, 7.8 Selective pruning and 7.9 Pruning for infrastructure. This is not an exclusive list.
- The aim of the pruning should be to provide a natural appearance within the crown and should not be to leave an acute side to the crown of the tree. Final pruning cuts should be considered and where possible to natural target pruning points such as branch unions where branch bark ridges can be used to guide the pruning cuts. Where these points are not available the exposed stub should be as small as possible and an assessment of each individual branch taken by the operative before making the cut.
- All cuts should be made so that they do not provide future structural issues such as weak forks and loss of structural integrity. If there is any concerns regarding the above then this shall be raised prior to works commencing. Branch reductions should be used to eliminate bark rips and tears; they will not be accepted by the client.
- All debris should be removed from site and disposed of in an environmentally sensitive way agreed with the SO.





## 7 ARBORICULTURAL IMPACT ASSESSMENT - WORKS

### Introduction

- 7.1 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.
- 7.2 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.
- 7.3 Development has the potential to impact upon the above ground and below ground parts of trees.
- 7.4 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.
- 7.5 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.
- 7.6 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.
- 7.7 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.
- 7.8 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

- 7.9 The proposals are for the development a flexible generation plant on land north of Tilbury Substation in Thurrock. The flexible generation plant will provide up to 600 megawatts (MW) of electrical generation capacity on a fast response basis, together with up to 150 MW of battery storage capacity.

7.10 The development also includes construction of an underground gas pipeline, gas connection compound, electricity export cables, private access roads and a causeway in the River Thames.

## Tree Removal

7.10 At this current stage, there are some trees that can be identified positively as those which will almost certainly be retained or removed; however, there are also those which are at risk of removal due to required works, predominantly along the route of the gas pipeline at road crossings, which have not been finalised as there is flexibility in the final route to be determined within a proposed works corridor. The trees and vegetation identified as at risk will be referred to below but will require confirmation regarding removal or retention once the detailed layout is produced prior to construction, so as to be more specific on potential losses.

7.11 In order to facilitate the proposals, it will require the removal of:

- Category B tree – T11, T119
- Category C trees – T3-5, T10, T120, T121, T134, T152 & G1

7.12 Trees and other vegetation which has been classed as *at risk* are:

- Category A trees – T106 and T108
- Category B tree – T107
- Category C groups - G19, G20, G22 and G25

7.13 Dead / dying trees and other low-level vegetation (not a constraint to development) requiring removal are:

- Category U trees – T6, T7 and T122
- Full removal of S2, S3, S21-26, S29-31, S33, S35-39, S119, S137-139 and partial removal of S1, S8, S9, S20, S32, S34, S129, S133, S140 and S151-153

7.14 It can be seen from the items recorded above that the vast majority of trees to be removed are of low quality. Trees at risk of removal are, in the main, also low quality and it is understood that at-risk trees of good quality, such as T106 and T108, will be avoided if at all possible.

7.15 All vegetation removals are shown on the Preliminary Tree Retention / Removal & Protection Plan attached to this report (see drawings JSL3537-720 - 732).

## Arboricultural Implications

7.16 To ensure that the trees selected for retention can be successfully integrated within the proposed development the following factors have been considered or require consideration.

## Root Protection Areas

- 7.17 Root Protection Areas (RPAs) for each tree surveyed have been determined in accordance with BS5837:2012, Section 4.6 - Root Protection Area, and a schedule of RPAs is attached to this report as Table 2.
- 7.18 RPAs for the trees were plotted onto the Tree Constraints Plan (see drawings JSL3537-700 - 712) and has been used to produce all relevant tree plans in this statement.
- 7.19 Areas where trees are to be retained have been shown and their RPA information used in the design of the tree protection. It should be noted that the provided preliminary tree protection scheme (see drawings JSL3537-720–732) will be updated when a more detailed layout becomes available prior to construction. The benefit to the current flexibility of the proposals is that elements of the development, such as access road and gas pipeline crossings of Station Road, can be designed insofar as possible in a manner that avoids any significant trees following consultation with the LPA.
- 7.20 A consideration in the development design to date has been the avoidance of RPAs and any unnecessary removal of trees of value. An example of where this is reflected is in the proposed use of horizontal directional drilling (HDD) for small sections of gas pipeline which bisect areas of vegetation, as indicated on the Preliminary Tree Retention / Removal & Protection Plan. Provided launch/receive pits for the HDD can be sited outside of existing tree RPAs, there should be no impact on nearby trees.
- 7.21 Additional arboricultural guidance regarding pipeline installation can be found within Appendix F, Arboricultural Impact Guidance - Pipeline Installation, should be read and implemented where applicable to ensure the safe retention of trees.
- 7.22 It should be noted that a number of trees have been marked on the Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720 - 732) as being at risk due to two proposed crossings of open-cut pipeline installation across Station Road (see drawing JSL3537\_726) as well as the proposed access for the gas connection compound (see drawing JSL3537\_727). While all trees have been marked that could potentially be affected by these works, the actual footprint of

the works will be limited and therefore only a small number of trees are likely to require removal. Effort will be made during detailed design of these elements to avoid impacting trees of significance.

- 7.23 The remainder of the trees within the site will either require a Construction Exclusion Zone (CEZ) using Heras fence panels in the positions shown on the Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720-732) or are remote from the area of works so as not to require protection.
- 7.24 Given the scale of this development, it is considered appropriate that a phased approach to tree protection be implemented during the various work stages. The reason for this is that parts of the development, for example gas pipeline installation, will be a swiftly progressive element of the works and would therefore benefit from tree protection being erected in position and moved along as the works progress.

### Existing Canopy Spreads

- 7.25 Where the RPAs 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.
- 7.26 To minimise the potential for harm to occur to retained vegetation, a CEZ will be created by the erection of protective fencing as detailed on the Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720 - 732).
- 7.27 Having assessed the tree survey data and crown spreads of retained trees on the Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720 - 732), it is considered unlikely that there should be a need to prune canopies of retained trees following the necessary tree removal. This will, however, require further assessment by the Site Manager closer the time of implementation.
- 7.28 Again, the current flexibility of the scheme allows for future avoidance of tree crowns when a detailed layout is produced.

### Level Changes

- 7.29 Trees can be profoundly impacted by changes to ground levels, both cutting and filling, and this is a factor that has been considered in this assessment. There appears at this stage to be very little potential for damage to occur to retained trees due to level alterations as the main area of development will be largely devoid of trees following removal of the small number of trees. Trees,

areas of hedge and scrub which are to be protected around the ditches near to the development should not be overburdened by any spoil or level alterations.

- 7.30 It is therefore imperative that unnecessary damage is not caused to tree roots through the deposition of spoil from any excavations into retained tree RPAs as this can suffocate underlying roots and cause them to die off, thus impacting tree health and even causing death.
- 7.31 Unless otherwise stipulated, levels within any of the retained trees RPAs must remain undisturbed and any excavated material must either be backfilled into the excavation, taken away from site or deposited in a location away from tree RPAs. It will be up to the Site Manager to ensure that there is suitable prior planning for the deposition of excavated material.

### **Planning of Site Operations**

- 7.32 Planning of site operations will take sufficient account of retained 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. 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.
- 7.33 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.
- 7.34 Correct planning of access routes and storage areas prior to start on site will ensure no impacts from these activities will occur

## 8 PRE DEVELOPMENT WORKS

### Tree Removal

- 8.1 To facilitate the proposals at their current stage, it will likely require the removal of two Category B trees (T11 and T119) and eight Category C trees (T3-5, T10, T120, T121, T134 and T152), and one Category C group (G1).
- 8.2 It will also likely be necessary to remove three Category U trees (T6, T7 and T122), full removal of 21 areas of hedge / scrub / young trees (S2, S3, S21-26, S29-31, S33, S35-39, S119, S137-139) and partial removal of a further 12 areas of similar vegetation (S1, S8, S9, S20, S32, S34, S129, S133, S140 and S151-153). These are all of poor quality and are therefore not a significant constraint to any development.
- 8.3 Further assessment will be required in order to ascertain which, if any, of two Category A trees (T106 and T108), one Category B tree (T107) and four Category C groups (G19, G20, G22 and G25) will be affected by works.

### Tree Pruning

- 8.4 It is considered unlikely that any trees will require pruning but this will need to be considered when more detailed drawings are available and closer the time of implementation.
- 8.5 If light tree pruning does become a requirement this should be undertaken using the guidance provided at Appendix E – Tree & Root Pruning.

### Standard of Work (if Required)

- 8.6 All tree works should be carried out in accordance with BS3998:2010 Tree Work - Recommendations and latest arboricultural best practice.
- 8.7 All tree work should be carried out by suitably qualified, competent and insured arboricultural contractors.
- 8.8 All 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

- 8.9 All tree works shall be completed prior to commencement of any construction works on the site.
- 8.10 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

- 8.11 Following completion of any tree removal works and prior to the commencement of any site works, the protective fencing is to be erected in accordance with the locations set out on the Preliminary Tree Retention / Removal & Protection Plan (see drawings JSL3537-720 - 732). This will, however, be subject to further assessment as the planning process progresses.
- 8.12 To ensure successful tree protection during the implementation of the development proposals, 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 ensure the works will not affect adversely the trees.
- 8.13 In general, 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 however there will be elements of the development, such as pipeline installation, where a phased approach would be appropriate. The finer details of where this will be applicable will be finalised at a later stage.
- 8.14 Copies of the final Tree Retention / Removal & Protection Plan shall be placed in the site office for reference by all site staff.
- 8.15 The protective fencing barrier is to be constructed in accordance with the specification detailed at Appendix D.
- 8.16 Signs 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 E. Signs must be replaced as necessary should they be removed or become illegible.



## 9 CONSTRUCTION WORKS

### Construction Exclusion Zone

- 9.1 The Construction Exclusion Zone (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.
- 9.2 Within the Construction Exclusion Zone 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.
- 9.3 Furthermore, vehicular or pedestrian access and the storage of any materials is prohibited within the Construction Exclusion Zone.
- 9.4 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

- 9.5 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.
- 9.6 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.
- 9.7 The offices, parking of site and contractor vehicles, along with secure storage will be provided in an area away from retained trees and this area will be directly controlled by the site manager who will seek advice from the site landscape manager before allocating the area for these purposes.

### Monitoring

- 9.8 The site monitoring with regard to arboricultural issues will be part of the established environmental site audit process.

## Completion

- 9.9 The protective fencing will remain in situ until its use is considered unnecessary and any risk of damage to the retained trees and/or their respective RPAs e.g. soil compaction from vehicular plant or machinery, has passed.
- 9.10 Upon completion of the project, the coordination of the removal of the protective fencing will be the responsibility of the Site Manager and, if necessary, a survey of the retained trees for signs or symptoms of damage and/or stress that the construction might have caused should be instructed.

## 10 CONCLUSION

- 10.1 A tree survey and preliminary arboricultural assessment has been carried out at the site on land south west of Station Road near Tilbury, Essex.
- 10.2 A total of 152 individuals and 32 groups of trees were recorded during the survey. In accordance with BS5837:2012 guidance on retention categories, the individual trees were distributed as seven Category A, 30 Category B, 96 Category C and 19 Category U. The 32 groups of trees were distributed as five Category B, 23 Category C and four Category U.
- 10.3 A check was made online via the Thurrock Council planning constraints mapping service on 3<sup>rd</sup> October 2019 and it was confirmed that none of the trees recorded are subject of a TPO, but some do fall within the boundary of the West Tilbury Conservation Area (Low Street). The vegetation included within the boundary of the Conservation Area comprise one Category C group (G13), two Category U items (T50 and G14) and two hedgerow sections (S83 and S84).
- 10.4 To facilitate the proposals at their current stage, it will likely require the removal of removal of two Category B tree (T11 and T119) and eight Category C trees (T3-5, T10, T120, T121, T134 and T152), and one Category C group (G1). It will also likely be necessary to remove three Category U trees (T6, T7 and T122), full removal of 21 areas of hedge / scrub / young trees (S2, S3, S21-26, S29-31, S33, S35-39, S119, S137-139) and partial removal of a further 12 areas of similar vegetation (S1, S8, S9, S20, S32, S34, S129, S133, S140 and S151-153). These are all of poor quality and are therefore not a significant constraint to any development.
- 10.5 Further assessment will be required with regard to impacts on trees deemed to be at risk of development, please see Sections 7 and 8, as well as the Preliminary Tree Retention / Removal & Protection Plan, for further information.
- 10.6 It is not believed that there should be a requirement to carry out any significant pruning works to facilitate the works and to erect tree protection fencing at this stage. However, this will need to be assessed in greater detail at a later stage and prior to erecting the tree protection fencing.
- 10.7 Through the establishment of a CEZ (Construction Exclusion Zone) via installation of tree protection fencing in the locations shown on the Preliminary Tree Retention / Removal & Protection Plan, the trees to be retained, unless stipulated, should not be impacted.
- 10.8 If any arboricultural issues relating from works being carried out occurs, then they should be reported to the Arboricultural Consultant or Tree Officer immediately.

## Tables

**Table 1: Tree Survey Data**

### 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)	Canopy height estimated in metres above ground level
Canopy height (m)	Crown Spread, radius estimated in metres
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young MA – Maturing (Middle Aged) 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 above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
1	Crataegus monogyna	200	5	2.5	2.5	2.5	2.5	0.0	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
2	Crataegus monogyna	180	5	2.0	2.5	2.0	2.5	0.0	North	0.0	EM	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Restricted inspection due to vegetation. In severe decline.	U
3	Crataegus monogyna	180	5	3	2.5	2.5	2.5	0.0	North	0.0	EM	Good	10-20	Restricted inspection due to vegetation.	C1
4	Crataegus monogyna	180	5	2	2	2.5	2.5	0.0	West	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
5	Crataegus monogyna	190	5	2	1.5	2.5	2.5	0.0	North	0.0	EM	Good	10-20	Hanging branches in the crown.Restricted inspection due to vegetation.	C1
6	Crataegus monogyna	150	5	1.5	1.5	2	2	0.0	North	0.0	SM	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Restricted inspection due to vegetation. Sparse crown. In decline.	U

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
7	Populus x canadensis	435	5	3	4	5	5	3	SW	2	SM	Poor	<10	Deadwood in the crown of major extent.Branch dieback of major extent.Previous branch failures noted.Restricted inspection due to vegetation. Mostly dead.	U
8	Crataegus monogyna	170	5	2.5	2	2.0	2.0	0.0	North	0.0	SM	Good	10-20	Restricted inspection due to vegetation.	C1
9	Crataegus monogyna	150	5	2.5	2	2.0	2.5	0.5	NE	0.5	EM	Good	10-20	Restricted inspection due to vegetation.	C1
10	Crataegus monogyna	245	5	2.5	2.5	2.5	2.5	0.5	North	0.0	M	Good	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	C1
11	Cricket bat willow	250	10	2.5	2.5	2.5	2.5	1	NE	1	SM	Good	20-40	Restricted inspection due to access and vegetation.  Reasonably good specimen growing just outside sub station perimeter fence.	B1
12	Crataegus monogyna	200	5	2.5	2.5	3.0	3	1.0	North	0.5	M	Good	10-20	Restricted inspection due to access and vegetation.	C1
13	Crataegus monogyna	100	5	2	1.5	1.5	1.5	1	NE	0.5	Y	Good	10-20	Restricted inspection due to access.	C1

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
14	Crataegus monogyna	250	7	3.0	3.5	2.5	2.5	0.5	South	0.0	M	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to access.	C1
15	Quercus robur	140	5	1	2	1.5	1	3	West	1.0	Y	Poor	10-20	Pruning wounds to stem and crown.Deadwood in the crown of minor extent.Restricted inspection due to no access.Tree has no long term potential. Located on rail side.	C1
16	Fraxinus excelsior	470	13	2	6.0	4.0	4.0	7	West	2.5	M	Fair	10-20	Stem cavity of moderate extent.Pruning wounds to stem and crown.Deadwood in the crown of minor extent.Hanging branches in the crown.Previous branch failures noted.Restricted inspection due to no access. Located on rail side. Polyporus squamosis fungal bracket from stem cavity. Large pruning wounds.	C1
17	Crataegus monogyna	100	5	1	1.0	1.0	1.0	0.0	South	0.0	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Restricted inspection due to vegetation.Tree has no long term potential.	U
18	Crataegus monogyna	180	5	3	3	1.5	1.5	0.5	South	0.5	EM	Good	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	C1
19	Quercus robur	190	5	3.5	2.5	2.5	2.5	0.5	North	0.5	Y	Fair	20-40	Restricted inspection due to access.  Located beneath power lines.	B1

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
20	Crataegus monogyna	100	5	2	1	1	1	0.5	North	0.5	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Restricted inspection due to vegetation.Tree has no long term potential.	U
21	Crataegus monogyna	90	4	2.5	2.0	2.0	1.5	0.5	South	0.5	Y	Good	20-40	Restricted inspection due to vegetation.	C1
22	Crataegus monogyna	100	5	1.5	1.5	1.5	1.5	0.5	NE	0.5	Y	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
23	Sambucus nigra	100	4	1.0	1.0	0.0	1.5	3.0	West	2.0	Y	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Previous branch failures noted.Restricted inspection due to access and vegetation.Tree has no long term potential. Off site tree but overhangs site.	C1
24	Unknown	300	7	1.0	1.0	0.0	1	0.0	West	0.0	SM	Dead	<10	Restricted inspection due to vegetation.  Not able to identify due to extreme ivy encroachment.	U
25	Crataegus monogyna	120	5	1.0	1.0	2.0	2.0	0.5	West	0.5	Y	Good	10-20	Pruning wounds to crown.Restricted inspection due to vegetation. Growing on fence line.	C1

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

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
26	Crataegus monogyna	180	8	2	2	4	3	4		2	EM	Fair	10-20	Pruning wounds to crown.Restricted inspection due to access. Off site tree with overhang and potential RPA in site.	C1
27	Crataegus monogyna	90	4	2	2	1.0	1.5	0.0	North	0.0	Y	Good	20-40	Restricted inspection due to access and vegetation.  Growing on ditch bank.	C1
28	Prunus spinosa	175	4	3	2	2	2	0.5	NE	0.5	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation. Growing from within ditch.	C1
29	Sambucus nigra	205	4	2.5	2.0	3.0	1.5	0.5	NW	0.5	EM	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.Located off site.	C2
30	Crataegus monogyna	130	5	2.0	2.0	2.0	2.0	0.0	East	0.5	EM	Good	10-20	Restricted inspection due to access and vegetation.Located off site.	C1
31	Crataegus monogyna	200	7	4.0	2.0	2.0	2.0	0.0	North	0.5	M	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation.Located off site. Chlorotic leaves.	C1
32	Crataegus monogyna	220	7	3.0	2.0	3.0	3	3	East	1.5	M	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.Located off site.	C2

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

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
33	Prunus spinosa	100	4	2.0	1.0	1.0	1	0.5	North	0.5	SM	Fair	10-20	Restricted inspection due to access and vegetation. Located off site. Severe bramble encroachment.	C1
34	Crataegus monogyna	90	5	1	1.0	2	2	1	NE	1	Y	Poor	<10	Deadwood in the crown of minor extent. Branch dieback of minor extent. Restricted inspection due to access and vegetation. In decline with sparse crown.	U
35	Sambucus nigra	210	7	3	3.0	2.5	3	2	NW	1.0	M	Good	10-20	Deadwood in the crown of minor extent. Restricted inspection due to access and vegetation. Located off site.	C2
36	Quercus robur	320	9	5.5	4.0	5.0	3.0	2.0	West	2.0	SM	Good	20-40	Restricted inspection due to access and vegetation. Located off site. Growing in mass of vegetation. Crown close to rail power lines and therefore limited future growth potential.	B1
37	Crataegus monogyna	160	5	2.5	2.5	3.0	3.0	0.5	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent. Branch dieback of minor extent. Restricted inspection due to access and vegetation.	C1
38	Crataegus monogyna	200	8	3.5	3.0	3.0	2.5	0.5	North	0.5	M	Good	10-20	Restricted inspection due to access and vegetation. Located on field boundary fence line.	C2
39	Crataegus monogyna	170	7	3.0	3.0	2.5	2.0	2.0	North	0.0	M	Fair	10-20	Deadwood in the crown of minor extent. Branch dieback of minor extent. Restricted inspection due to access and vegetation. Located on field boundary fence line.	C2

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

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
40	Crataegus monogyna	160	7	2.0	2.0	2.5	2.0	0.0	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation. Located on field boundary fence line.	C2
41	Crataegus monogyna	160	7	2.0	2.0	2.0	2.0	2.0	NW	1.5	SM	Fair	10-20	Restricted inspection due to access and vegetation. Located on field boundary fence line.	C2
42	Crataegus monogyna	160	7	2.0	2.0	2.5	2.0	2.0	NE	2.0	SM	Fair	10-20	Restricted inspection due to access and vegetation. Located on field boundary fence line.	C2
43	Quercus robur	250	9	3.5	3.0	3.5	4	4	NE	3	M	Good	20-40	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation. Located on field boundary fence line. Crown close to rail power lines so has limited future growth potential.	B2
44	Crataegus monogyna	170	5	2.5	2.5	2.5	2.5	0.5	North	0.5	SM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation. Located on field boundary.	C2
45	Crataegus monogyna	170	7	2.5	2.5	2.5	2.5	1	NE	0.5	SM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to access and vegetation. Located outside field boundary fence.	C2
46	Crataegus monogyna	250	7	4	2.5	3	3	1	North	0.5	M	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation. Located outside field boundary fence.	C2

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
47	Crataegus monogyna	180	5	2	2	3	2.5	2.5	NE	1	EM	Good	10-20	Restricted inspection due to vegetation.  Located on field boundary in bramble mass.	C2
48	Quercus robur	220	9	4	1	3.0	3.0	3	NE	2	SM	Fair	10-20	Pruning wounds to crown. Deadwood in the crown of minor extent. Restricted inspection due to vegetation.  Located on field boundary in bramble mass. Crown lopsided due to rail pruning.	C2
49	Quercus robur	295	8	6	1	5	5	0.5	North	0.5	EM	Fair	20-40	Pruning wounds to stem and crown. Restricted inspection due to vegetation.  Lopsided crown due to rail pruning.	B1
50	Sambucus nigra	135	5	1	1.0	1.5	1	2	North	1	SM	Fair	10-20	Deadwood in the crown of minor extent.	C1
51	Quercus robur	390	9	6.0	1.0	4.0	5.0	1.0	NE	0.0	EM	Fair	20-40	Pruning wounds to stem and crown. Deadwood in the crown of minor extent. Restricted inspection due to access. Located off site.  Multiple stem tree. Lopsided crown due to rail pruning.	B1
52	Fraxinus excelsior	210	9	5	1.0	4.0	3	1	NW	1.5	SM	Fair	10-20	Tree is leaning at a 10angle in a NWdirection. Deadwood in the crown of minor extent. Branch dieback of minor extent. Restricted inspection due to vegetation.	C1
53	Prunus domestica	200	7	3.0	3.0	3.0	3.0	1	North	2.0	EM	Good	20-40	Restricted inspection due to vegetation.  Multiple stem plum.	B1

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
54	Fraxinus excelsior	270	10	4.0	2	4.0	4.0	1	North	0.5	SM	Good	20-40	Pruning wounds to crown.Restricted inspection due to vegetation. Multiple stem ash on field boundary.	B1
55	Crataegus monogyna	130	6	1	1	1	1	1.0	North	0.0	SM	Fair	10-20	Restricted inspection due to ivy and vegetation.Located off site.	C1
56	Crataegus monogyna	190	5	2	2	2.5	2.5	1	NE	1	EM	Fair	10-20	Restricted inspection due to access and vegetation.Located off site. Crown a little sparse.	C1
57	Sambucus nigra	120	4	1.5	1.0	2.0	1.0	0.5	North	0.5	SM	Poor	<10	Included main stem union.Deadwood in the crown of minor extent.Branch dieback of moderate extent.	U
58	Fraxinus excelsior	180	9	2.0	2.5	2.0	2.0	2	North	1.0	Y	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
59	Salix alba	710	15	6.0	5	7	5	4	SW	5	M	Poor	<10	Growing off old stump.Deadwood in the crown of major extent.Branch dieback of major extent.Hanging branches in the crown.Previous branch failures noted.Restricted inspection due to vegetation. Phoenix growth from large fallen stem.	U

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

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
60	Crataegus monogyna	190	5	2.0	2.0	2.5	2.0	1.0	East	1.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
61	Crataegus monogyna	190	5	2.5	2.0	2.5	2.5	0.5	North	0.0	EM	Fair	10-20	Restricted inspection due to vegetation.	C1
62	Crataegus monogyna	160	5	1.5	1	2	1	1	NE	1	EM	Dead	<10	Deadwood in the crown of moderate extent.Restricted inspection due to vegetation. Dead hawthorn.	U
63	Crataegus monogyna	120	5	2.5	2.5	2.5	2.5	0.0	North	0.0	EM	Good	10-20	Restricted inspection due to vegetation.	C1
64	Crataegus monogyna	180	5	2	2	2	2	1	North	0.5	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
65	Crataegus monogyna	180	5	2.0	2.0	2.0	2.0	0.0	North	0.0	EM	Good	10-20	Restricted inspection due to vegetation.	C1
66	Crataegus monogyna	180	5	2.0	2.0	2.0	2.0	0.0	North	0.0	EM	Good	10-20	Restricted inspection due to vegetation.	C1

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



Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
67	Crataegus monogyna	160	5	2.5	2.5	2.0	2.5	0.0	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
68	Crataegus monogyna	160	5	2.5	1.5	2.5	1.5	0.0	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	C1
69	Crataegus monogyna	100	4	1.0	1.5	1.5	1.0	0.0	North	0.0	SM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
70	Crataegus monogyna	100	4	2	2	1.5	1.5	0.0	North	0.0	SM	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.	C1
71	Crataegus monogyna	100	4	1.5	1.5	1.5	1.0	0.0	North	0.0	EM	Poor	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
72	Crataegus monogyna	140	4	2	2	1.5	2.5	0.0	North	0.0	EM	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to vegetation.	C1
73	Ulmus sp.	200	7	2	1	2	2	2	West	2	SM	Dead	<10	Deadwood in the crown of moderate extent.Restricted inspection due to vegetation. Dead elm on field boundary.	U

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
74	Quercus robur	220	7	4	4	1.5	5	1.5	SW	1	SM	Fair	10-20	Restricted inspection due to access and vegetation. General poor form to tree. Growing under power lines, limited future growth potential.	C2
75	Crataegus monogyna	120	5	2.0	0.5	1.0	1.0	1.0	North	1.5	Y	Poor	<10	Deadwood in the crown of minor extent. Branch dieback of moderate extent. Restricted inspection due to vegetation. Tree has no long term potential. Dying hawthorn on ditch edge.	U
76	Quercus robur	270	11	6	4	3	5	3	NW	2.5	SM	Good	20-40	Included main stem union. Restricted inspection due to access and vegetation. Twin stemmed oak on opposite side of ditch to site.	B2
77	Salix cinerea	100	5	5	1.0	0.0	5	0.5	SW	1.5	Y	Good	10-20	Tree is leaning at a 30 angle in a West direction. Heavily suppressed crown. Restricted inspection due to vegetation. General poor form to tree.	C2
78	Quercus robur	550	13	8	6	5	7	3	NW	3.5	EM	Good	40+	Epicormics growth on crown. Deadwood in the crown of minor extent. Restricted inspection due to access. Located on opposite side of ditch to site.	A2
79	Salix cinerea	100	5	4	3	0	4	0.0	SW	0.0	Y	Good	10-20	Tree is leaning at a 25 angle in a NW direction. Heavily suppressed crown. Restricted inspection due to vegetation. General poor form to tree.	C2
80	Quercus robur	350	9	4.0	1.0	4.0	5.0	3.0	North	3.0	SM	Good	20-40	Restricted inspection due to access and vegetation.  Located on opposite side of ditch to site. Lateral suppression from adjacent oak.	B2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
81	Quercus robur	450	11	4	3	6	7	3	NW	3	EM	Good	40+	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation. Located on opposite side of ditch to site.	A2
82	Quercus robur	350	11	3.5	2	4.5	4	8	NE	4	SM	Fair	20-40	Epicormics growth on stem.Restricted inspection due to access and vegetation. Located on opposite side of ditch to site.	B2
83	Salix caprea	185	7	4	1	1	5	0.0	West	0.5	SM	Good	10-20	Tree is leaning at a 20angle in a NWdirection.Heavily suppressed crown.Previous branch failures noted.Restricted inspection due to vegetation.	C2
84	Quercus robur	190	9	3	3	2	3	0.0	West	1	SM	Good	20-40	Restricted inspection due to vegetation.	B2
85	Salix caprea	110	6	4	0.5	0	4	1.5	East	2	Y	Good	10-20	Tree is leaning at a 20angle in a NWdirection.Heavily suppressed crown.Restricted inspection due to vegetation.	C2
86	Quercus robur	300	10	4	4	5	6	4	East	4	SM	Good	40+	Restricted inspection due to access and vegetation. Located on opposite side of ditch to site.	A2
87	Salix caprea	100	7	2	2	2	3	0.5	West	0.5	Y	Good	10-20	Heavily suppressed crown.Restricted inspection due to vegetation.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
88	Salix caprea	170	9	3	5	3	3	0.5	SE	0.5	SM	Good	10-20	Previous branch failures noted.Restricted inspection due to vegetation.	C2
89	Quercus robur	350	12	5	5	5	5	1	SW	2	SM	Good	40+	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation. Growing in mass of vegetation.	A1
90	Salix fragilis	300	10	5.0	4.0	5.0	5.0	0.0	NW	0.0	SM	Fair	20-40	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to access and vegetation.	B2
91	Salix fragilis	200	9	5.0	4.0	4	4	3	SW	2	SM	Good	20-40	Restricted inspection due to access and vegetation.	B2
92	Quercus robur	350	12	4	4	3	5	1	West	2	SM	Good	20-40	Epicormics growth on stem.Restricted inspection due to vegetation. Lateral suppression from adjacent tree.	B2
93	Fraxinus excelsior	355	12	4	6	3	5	2.0	West	3	SM	Good	20-40	Deadwood in the crown of minor extent.Restricted inspection due to vegetation. Twin stemmed ash.	B2
94	Salix alba	170	10	1	3	2	2.5	2	South	1	Y	Fair	10-20	Epicormics growth on stem.Restricted inspection due to vegetation.General poor form to tree. Twin stemmed willow.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
95	Fraxinus excelsior	400	13	5	5	6	4.0	1	SW	1.5	EM	Good	20-40	Deadwood in the crown of minor extent.  Twin stemmed ash.	B2
96	Ulmus sp.	130	4	1.5	1.5	1.5	2.0	1.0	West	0.5	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Tree has no long term potential. Dying of DED.	U
97	Ulmus sp.	110	5	1.5	1.0	1.5	1.0	0.5	NE	0.5	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Tree has no long term potential. Dying of DED.	U
98	Ulmus sp.	115	4	1.5	1.5	1.5	2.0	0.5	SE	0.5	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of minor extent.Tree has no long term potential. Dying of DED.	U
99	Ulmus sp.	130	4	1	1	2.0	1	0.5	South	0.0	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of minor extent.Tree has no long term potential. Dying of DED.	U
100	Quercus robur	800	14	8	7	8	8	2	South	3	M	Good	40+	Deadwood in the crown of minor extent.Restricted inspection due to ivy and vegetation.	A1
101	Ulmus sp.	80	4	1	1.0	1.0	1.0	0.5	East	0.5	Y	Fair	<10	Deadwood in the crown of minor extent.Branch dieback of minor extent.Tree has no long term potential. Showing signs of DED.	U

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
102	Ulmus sp.	120	4	1.0	1.0	2	1.0	1	SE	1	Y	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of minor extent.Tree has no long term potential. Dying of DED.	U
103	Acer pseudoplatanus	530	15	3.0	4.5	3.0	4.0	6	NE	1	M	Fair	10-20	Deadwood in the crown of moderate extent.Branch dieback of moderate extent.Previous branch failures noted.Restricted inspection due to ivy and vegetation.Tree has no long term potential.	C2
104	Quercus robur	480	10	2	6	6	2	4	SE	2.5	EM	Fair	20-40	Asymmetric formed crown.Restricted inspection due to ivy and vegetation.General poor form to tree.	B2
105	Acer pseudoplatanus	600	11	6	5	6	6	4.5	NW	2	M	Good	20-40	Restricted inspection due to ivy and vegetation.  Multiple stem tree on field boundary. Phone line through crown.	B2
106	Quercus robur	380	11	5	4	4	4	5	West	4	EM	Good	40+	Deadwood in the crown of minor extent.Restricted inspection due to ivy and vegetation. Phone line through crown.	A2
107	Quercus robur	430	12	4.5	4.0	3	5	4	North	2	EM	Fair	20-40	Deadwood in the crown of moderate extent.Branch dieback of minor extent.Previous branch failures noted.Restricted inspection due to vegetation. Phone line through crown.	B2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
108	Quercus robur	500	12	5	5	5	5.0	5	North	5	M	Good	40+	Deadwood in the crown of minor extent.Restricted inspection due to ivy and vegetation. Phone line through crown.	A2
109	Acer pseudoplatanus	980	14	5.5	5.5	6	5	2	South	2	M	Fair	20-40	Deadwood in the crown of moderate extent.Branch dieback of moderate extent. In decline but with ecological potential. Stags headed.	B1
110	Prunus domestica	190	6	4	1	3	3	0.5	NW	0.0	SM	Fair	10-20	Heavily suppressed crown.Deadwood in the crown of minor extent.	C2
111	Ailanthus altissima	185	7	3.0	3.0	1.0	3.5	4.0	North	4.0	Y	Fair	10-20	Bark damage.Heavily suppressed crown.	C2
112	Ailanthus altissima	480	10	5.0	6.0	5	5	3	West	1.5	EM	Good	20-40	Pruning wounds to stem.Deadwood in the crown of minor extent.Restricted inspection due to ivy.	B2
113	Acer pseudoplatanus	175	5	2.0	2.5	2.5	2.0	0.5	SE	0.5	Y	Good	10-20	General poor form to tree.  Tri-stemmed tree.	C1
114	Acer pseudoplatanus	445	11	5	6	6.5	4.5	1.5	North	3	EM	Good	20-40	Epicormics growth on stem.Included main stem union.	B1

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
115	Ulmus sp.	120	5	2	2.0	2.0	2.0	1.0	West	0.5	Y	Fair	10-20	Tree has no long term potential.	C1
116	Crataegus monogyna	190	4	3.5	1.5	1.5	2.0	0.5	North	0.5	M	Fair	10-20	Pruning wounds to crown. Deadwood in the crown of minor extent. Restricted inspection due to vegetation.	C2
117	Acer campestre	170	4	1	1	3	1	0.0	East	0.0	EM	Fair	10-20	Growing off old stump.	C2
118	Ulmus sp.	170	7	1	1.0	2.0	2.0	1	NW	1	SM	Fair	10-20	Deadwood in the crown of minor extent. Branch dieback of minor extent. Restricted inspection due to vegetation. Tree has no long term potential.	C2
119	Tilia x europaea	350	6	3.5	3.5	3.5	3.5	2.5	North	2	SM	Good	20-40	Restricted inspection due to ivy and vegetation.	B1
120	Crataegus crusgali	110	5	1.0	2.0	1.5	1.5	0.5	East	0.5	SM	Good	10-20	Epicormics growth on stem.	C2
121	Crataegus crusgali	100	5	1.5	1.5	1.5	1.5	2.0	NE	0.0	SM	Fair	10-20	Epicormics growth on stem.  Sparse crown.	C2

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
122	Crataegus crusgali	100	5	2	1	1.5	1.5	1.5	SE	2	SM	Poor	<10	Deadwood in the crown of minor extent.Branch dieback of moderate extent.Tree has no long term potential.	U
123	Fraxinus excelsior	140	5	2.0	2	2	2	0.5	SE	1.5	Y	Fair	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to access.	C1
124	Fraxinus excelsior	100	5	1.5	1.5	1.5	1.5	1.0	North	2.0	Y	Good	20-40	Restricted inspection due to access.	C1
125	Fraxinus excelsior	200	8	3	3	3	3	0.5	North	0.5	SM	Good	20-40	Restricted inspection due to access.	B1
126	Fraxinus excelsior	100	3	1	1.0	1.0	1	0.5	SE	1	Y	Good	20-40	Restricted inspection due to access.	C1
127	Fraxinus excelsior	110	4	2	2	2	2	1.5	South	1.5	Y	Poor	10-20	Deadwood in the crown of minor extent.Branch dieback of minor extent.Restricted inspection due to access.General poor form to tree.	C1
128	Fraxinus excelsior	130	5	1.5	1.5	2	2.0	0.5	NW	1	Y	Fair	10-20	Restricted inspection due to access.	C1

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
129	Fraxinus excelsior	80	3	1	1	1	1	0.5	NW	0.5	Y	Fair	20-40	Restricted inspection due to access.	C1
130	Fraxinus excelsior	100	4	1.5	1.5	1.5	1.5	0.5	SW	1	Y	Good	20-40	Restricted inspection due to access.	C1
131	Malus sp.	120	4	2	2.0	2.0	2.0	0.0	NE	0.0	Y	Good	20-40	General poor form to tree. Multiple stem tree in scrub.	C1
132	Malus sp.	140	5	2	2	2	2	0.5	South	0.0	Y	Good	20-40	Restricted inspection due to vegetation. Multiple stem tree growing in scrub.	C1
133	Prunus domestica	145	4	2.0	2.0	2.0	2.0	0.0	South	0.0	Y	Good	20-40	Restricted inspection due to vegetation. Multiple stem tree growing in scrub.	C1
134	Prunus domestica	145	4	2	2	2	2	0.5	East	0.0	Y	Good	20-40	Young self seeded plum.	C1
135	Prunus domestica	90	3	1.5	1.5	1.5	1.5	0.5	NW	0.5	Y	Good	20-40	Included main stem union. Young plum.	C1

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
136	Prunus domestica	120	5	2.0	2.0	2.0	2.0	0.5	South	0.0	Y	Good	20-40	Restricted inspection due to vegetation.General poor form to tree. Multiple stem tree growing in scrub.	C1
137	Prunus domestica	145	5	2	2	2	2	0.0	North	0.0	Y	Good	10-20	Restricted inspection due to vegetation.General poor form to tree. Multiple stem tree growing in scrub.	C1
138	Salix sp.	135	5	3.0	2.5	2.5	2.5	0.0	North	0.0	Y	Good	10-20	Restricted inspection due to vegetation.  Growing on ash mound.	C1
139	Elaeagnus angustifolia	100	5	2.5	2.5	2.5	2.5	0.0	North	0.0	Y	Good	20-40	Restricted inspection due to vegetation.	C1
140	Elaeagnus angustifolia	100	5	2	2.0	2.0	2.0	0.0	SW	0.0	Y	Good	20-40	Restricted inspection due to vegetation.  Young olive tree on top of ash mound.	C1
141	Prunus domestica	110	4	2.0	2	2	2.0	0.0	East	0.5	Y	Good	20-40	Restricted inspection due to vegetation.  Young plum growing on embankment of ash mound.	C1
142	Elaeagnus angustifolia	140	6	4	2	5	2	0.0	South	0.5	Y	Good	20-40	Restricted inspection due to vegetation.  Olive tree growing in scrub.	C1

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
143	Elaeagnus angustifolia	180	7	4.0	4	4	4	0.0	South	0.0	SM	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	B1
144	Elaeagnus angustifolia	120	4	2	2	2	2	0.0	South	0.0	Y	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	C1
145	Elaeagnus angustifolia	100	5	2	2	2.5	2	0.0	South	0.0	Y	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	C1
146	Elaeagnus angustifolia	100	4	1.5	2.0	2	2.0	0.0	South	0.0	Y	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	C1
147	Elaeagnus angustifolia	140	6	2	2.0	2.0	2.0	0.0	South	0.0	Y	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	C1
148	Elaeagnus angustifolia	180	7	3.0	3.0	3.0	3.0	0.0	South	0.0	SM	Good	20-40	Deadwood in the crown of minor extent.Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	B1
149	Elaeagnus angustifolia	160	7	3.0	3.0	3.0	3.0	0.0	South	0.0	SM	Good	20-40	Restricted inspection due to access and vegetation.  Olive tree growing in scrub.	B1

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Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height above Ground	First Major Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
150	Salix sp.	920	5	6.0	4.0	3.0	5.0	4.0	SE	2.5	M	Good	20-40	Epicormics growth on stem & crown. Pruning wounds to stem and crown. Deadwood in the crown of minor extent. Previous branch failures noted. Restricted inspection due to vegetation.	B1
151	Salix sp.	475	12	3.5	3.0	3.0	3.0	3	North	2	M	Good	20-40	Restricted inspection due to vegetation.  Beneath hv power lines.	B1
152	Elaeagnus angustifolia	180	7	3.0	3.0	3.0	3.0	0.0	North	0.0	Y	Good	10-20	Restricted inspection due to access and vegetation.	C1

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## Table 2: Group Data Schedule

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Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G1	Crataegus monogyna	15	16	5	2.5	0	SM	Good	10-20	Restricted inspection due to vegetation.	C2
G2	Crataegus monogyna	12	18	7	2.5	2	EM	Fair	10-20	Deadwood present of minor extent, Previous branch failure,	C2
G3	Quercus robur	20	26	8	3	4	SM	Fair	20-40	Epicormic growth on stem. Deadwood present of minor extent, Pruning wounds present. Restricted inspection due to no access. Row of oak on rail side with one on site side of fence.	B2
G4	Ulmus sp.	80	15	5	1	1.5	Y	Dead	<10	Deadwood present of minor extent, Row of dead elm on roadside.	U
G5	Prunus spinosa	8	12	5	2.5	0.5	SM	Fair	10-20	Deadwood present of minor extent, Previous branch failure, Off site tree group. Restricted inspection due to vegetation. Growing in and around ditch.	C2

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G6	Prunus spinosa	5	11	5	2	0.5	EM	Good	10-20	Off site tree group. Restricted inspection due to vegetation. Dense group of blackthorn growing in and around ditch.	C2
G7	Crataegus monogyna	8	13	7	2.5	0.5	EM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Off site tree group. Restricted inspection due to vegetation.	C2
	Sambucus nigra									Dense group of predominantly hawthorn growing in and around ditch.	
G8	Crataegus monogyna	10	18	6	2	0.5	EM	Fair	10-20	Deadwood present of minor extent, Branch dieback of minor extent, Off site tree group. Restricted inspection due to vegetation.	C2
	Sambucus nigra									Group of predominantly hawthorn with severe bramble encroachment, growing in and around ditch.	
G9	Prunus spinosa	10	17	6	1.5	2	EM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Hanging branches, Previous branch failure, Off site tree group. Restricted inspection due to vegetation.	C2
	Sambucus nigra									Dense group of predominantly blackthorn.	
	Crataegus monogyna										
G10	Crataegus monogyna	9	16	5	2	0.5	EM	Fair	10-20	Deadwood present of minor extent, Previous branch failure, Pruning wounds present. Off site tree group. Restricted inspection due to vegetation.	C2
	Sambucus nigra									Some trees dead/dying on west side.	

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G11	Crataegus monogyna	10	15	5	1.5	1	SM	Fair	10-20	Deadwood present of minor extent, Branch dieback of minor extent, Restricted inspection due to vegetation.	C2
G12	Crataegus monogyna	10	15	5	1.5	1	SM	Poor	<10	Deadwood present of minor extent, Branch dieback of moderate extent, Restricted inspection due to vegetation. Two declining hawthorn.	U
G13	Salix alba	30	50	15	5	3	M	Fair	10-20	Deadwood present of moderate extent, Previous branch failure, Branch dieback of minor extent, Restricted inspection due to vegetation.  Unable to access due to dense undergrowth, thus tree positions estimated where out of laser range. Fallen stems present.	C2
G14	Ulmus sp.	18	25	8	2.5	3	EM	Dead	<10	Deadwood present of moderate extent, Hanging branches, Previous branch failure, Restricted inspection due to vegetation.  Elm which have succumbed to DED.	U
G15	Salix alba	35	60	15	4.5	0	EM	Good	10-20	Deadwood present of minor extent, Hanging branches, Previous branch failure, Restricted inspection due to vegetation.  Fallen stem hung up in crown. Fungal brackets present at base of two trees.	C2



Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G16	Fraxinus excelsior	12	35	13	4	5	SM	Good	20-40	Heavily suppressed form. Deadwood present of minor extent, Restricted inspection due to vegetation.	B2
	Quercus robur									Predominantly ash group in and around overgrown ditch/hollow area.	
	Crataegus monogyna										
G17	Fraxinus excelsior	45	65	13	5	2	M	Fair	20-40	Deadwood present of moderate extent, Previous branch failure, Branch dieback of minor extent, Pruning wounds present. Restricted inspection due to ivy.  Inonotus hispidus fungal bracket on limb on west side of larger tree.	B2
G18	Fraxinus excelsior	25	29	12	4	2	SM	Good	20-40	Deadwood present of minor extent,  Bark wound on stem of main tree.	B2
G19	Ulmus sp.	6	11	7	1	0.5	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Branch dieback of moderate extent, Pruning wounds present. Restricted inspection due to vegetation.  Hedgerow section. Some elm dead/dying from DED.	C2
G20	Ulmus sp.	6	12	7	1	0.5	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Hanging branches, Previous branch failure, Branch dieback of moderate extent, Pruning wounds present. Restricted inspection due to vegetation.  Hedgerow section. Some elm dead/dying from DED.	C2

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G21	Ulmus sp.	18	20	8	1.5	1	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Branch dieback of extent, Group is of no long term potential. Restricted inspection due to ivy.	C2
G22	Ulmus sp.	7	11	7	1.5	2	SM	Fair	10-20	Heavily suppressed form. Deadwood present of moderate extent, Hanging branches, Previous branch failure, Branch dieback of moderate extent, Pruning wounds present. Group is of no long term potential. Restricted inspection due to vegetation.  Some elm dead/dying of DED.	C2
G23	Ulmus sp.	8	12	7	1	0	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Branch dieback of moderate extent, Group is of no long term potential. Restricted inspection due to vegetation.  Hedgerow section. Dead/dying elm present.	C2
G24	Ulmus sp.	8	12	7	1	0	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Branch dieback of moderate extent, Restricted inspection due to vegetation.  Hedgerow section. Dead/dying elm present.	C2
G25	Ulmus sp.	8	12	7	1	0	SM	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Branch dieback of moderate extent, Restricted inspection due to vegetation.  Hedgerow section. Dead/dying elm present.	C2

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G26	Cupressus macrocarpa	20	30	9	3	2	SM	Poor	<10	Deadwood present of moderate extent, Branch dieback of moderate extent, Group is of no long term potential. Restricted inspection due to vegetation.	U
G27	Ulmus sp.	6	12	6	1.5	0.5	Y	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Branch dieback of minor extent, Group is of no long term potential. Restricted inspection due to vegetation.  Hedgerow section. Some elm beginning to decline due to DED.	C2
G28	Ulmus sp.	5	10	5	1.5	0.5	Y	Fair	10-20	Heavily suppressed form. Deadwood present of minor extent, Previous branch failure, Branch dieback of minor extent, Group is of no long term potential. Restricted inspection due to vegetation.  Hedgerow section. Some elm beginning to decline due to DED.	C2
G29	Ulmus sp.	80	14	8	1.5	0.5	SM	Good	10-20	Heavily suppressed form. Deadwood present of minor extent, Branch dieback of minor extent, Pruning wounds present. Restricted inspection due to vegetation.  Hedgerow section. Predominantly elm.	C2
	Crataegus monogyna										
	Acer campestre										

Group No.	Species	Min/Max Diameter (cm)*		Average Height (m)	Average Crown Spread	Ave. Crown Height	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G30	Ulmus sp.	8	14	8	1.5	0.5	SM	Good	10-20	Heavily suppressed form. Deadwood present of minor extent, Branch dieback of minor extent, Pruning wounds present. Restricted inspection due to vegetation.	C2
	Crataegus monogyna									Hedgerow section. Predominantly elm.	
	Acer campestre										
G31	Fraxinus excelsior	10	13	9	4	1	SM	Good	20-40	Heavily suppressed form. Restricted inspection due to no access. Self seeded ash.	C2
G32	Populus nigra 'Italica'	15	40	16	3	1	EM	Fair	20-40	Heavily suppressed form. Deadwood present of minor extent, Restricted inspection due to vegetation.	B2
	x Cupressocyparis leylandii									Scattered trees growing on previously demolished area and formal planting.	
	Fraxinus excelsior Prunus avium										

**Table 3: Hedge/Scrub/Shrub/Sapling Schedule**

## Table 3: Hedge/Scrub/Shrub/Sapling Schedule

Section No.	Species	Height (m)	Comments
S1	Rubus fruticosus	2	Bramble scrub.
S2	Prunus spinosa	3	Blackthorn mass.
S3	Crataegus monogyna	4	Hawthorn mass.
S4	Rubus fruticosus Prunus spinosa Crataegus monogyna	3	Predominantly bramble mass.
S5	Crataegus monogyna	3.0	Young hawthorn.
S6	Crataegus monogyna	3.5	Hawthorn hedgerow section. Some trees showing signs of stress.
S7	Crataegus monogyna Rubus fruticosus	4	Hawthorn hedgerow section. Some trees showing signs of stress.
S8	Rubus fruticosus	2.5	Bramble mass.
S9	Crataegus monogyna	4	Hawthorn hedgerow section.
S10	Rubus fruticosus Crataegus monogyna	4.0	Predominantly bramble mass.
S11	Prunus spinosa Rubus fruticosus	4.0	Predominantly blackthorn mass around base of HV pylon.

Section No.	Species	Height (m)	Comments
S12	Prunus spinosa Crataegus monogyna	4.0	Predominantly blackthorn mass.
S13	Rubus fruticosus Crataegus monogyna	3	Predominantly bramble mass.
S14	Crataegus monogyna	4	Hawthorn mass..
S15	Crataegus monogyna	4.0	Hawthorn mass..
S16	Rubus fruticosus Crataegus monogyna	3.5	Predominantly bramble mass.
S17	Crataegus monogyna	3.5	Hawthorn mass.
S18	Crataegus monogyna	4.5	Hawthorn mass.
S19	Crataegus monogyna	3	Young hawthorn.
S20	Crataegus monogyna	4	Hawthorn mass.
S21	Crataegus monogyna	3.5	Hawthorn mass.
S22	Crataegus monogyna	3.5	Young hawthorn.
S23	Crataegus monogyna	3	Young hawthorn.

Section No.	Species	Height (m)	Comments
S24	Crataegus monogyna	2.5	Young hawthorn.
S25	Crataegus monogyna Rubus fruticosus	5	Mass of declining hawthorn and bramble.
S26	Rubus fruticosus Crataegus monogyna	4	Mass of predominantly bramble.
S27	Crataegus monogyna	4	Hawthorn mass.
S28	Rubus fruticosus	2	Bramble mass.
S29	Crataegus monogyna	4.5	Hawthorn hedgerow section. Minimal past management.
S30	Sambucus nigra	3	Elder on ditch bank.
S31	Crataegus monogyna	4	Young hawthorn.
S32	Crataegus monogyna Rubus fruticosus	5	Mass of hawthorn and bramble.
S33	Crataegus monogyna	5.0	Mass of hawthorn.
S34	Crataegus monogyna Rubus fruticosus	5.0	Hawthorn hedgerow with bramble encroachment.
S35	Rubus fruticosus Crataegus monogyna	3.5	Predominantly bramble mass.



Section No.	Species	Height (m)	Comments
S36	Crataegus monogyna	4	Young hawthorn mass.
S37	Buddleia davidii Prunus spinosa  Rubus fruticosus	4.0	Vegetation growing along perimeter of sub station. Inaccessible due to ditch and undergrowth.
S38	Crataegus monogyna Prunus spinosa	4	Mass of predominantly hawthorn.
S39	Crataegus monogyna Prunus spinosa	4	Mass of hawthorn and blackthorn. No access to area.
S40	Prunus spinosa	4.0	Clump of vegetation. No access to area.
S41	Crataegus monogyna Prunus spinosa	3	Poor quality young trees.
S42	Buddleia davidii	4.0	Clump of butterfly bush.
S43	Crataegus monogyna	4.0	Off site hedgerow section. Overhangs site.
S44	Prunus spinosa	3.5	Off site hedgerow section. Overhangs site.
S45	Prunus spinosa	2.5	Blackthorn scrub on trackside.
S46	Prunus spinosa	2.5	Blackthorn scrub on trackside.
S47	Rubus fruticosus	1.5	Bramble mass.

Section No.	Species	Height (m)	Comments
S48	Crataegus monogyna Prunus spinosa	5	Predominantly hawthorn hedgerow section.
S49	Crataegus monogyna	3	Hawthorn hedgerow remnant.
S50	Crataegus monogyna	3	Hawthorn hedgerow remnant.
S51	Crataegus monogyna	5.0	Hawthorn hedgerow section.
S52	Sambucus nigra	4	Elder mass beneath pylon.
S53	Crataegus monogyna	3	Young hawthorn.
S54	Crataegus monogyna	3	Young hawthorn. Severe bramble encroachment.
S55	Crataegus monogyna	3.5	Hawthorn hedgerow remnant.
S56	Crataegus monogyna	4	Hawthorn hedgerow remnant.
S57	Crataegus monogyna	3	Young hawthorn.
S58	Sambucus nigra	3.5	Off site young elder. Slight overhang into site,
S59	Prunus spinosa	2.5	Clump of blackthorn growing in ditch.

Section No.	Species	Height (m)	Comments
S60	Prunus spinosa Rubus fruticosus	5	Mass predominantly blackthorn with severe bramble encroachment.
S61	Rubus fruticosus	1.5	Bramble mass.
S62	Prunus spinosa Rubus fruticosus	4	Predominantly blackthorn mass with severe bramble encroachment.
S63	Prunus spinosa Rubus fruticosus	4	Predominantly blackthorn mass with severe bramble encroachment.
S64	Prunus spinosa Rubus fruticosus	3	Predominantly blackthorn mass with severe bramble encroachment.
S65	Rubus fruticosus Sambucus nigra	4	Mass of predominantly bramble.
S66	Rubus fruticosus Prunus spinosa	3	Predominantly bramble mass.
S67	Prunus spinosa Rubus fruticosus	4	Mass of predominantly small diameter stemmed blackthorn with severe bramble encroachment.
S68	Rubus fruticosus Crataegus monogyna	3	Mass of predominantly bramble.
S69	Prunus spinosa	5	Mass of small diameter stemmed blackthorn.
S70	Prunus spinosa Crataegus monogyna	4	Mass of small diameter stemmed blackthorn and hawthorn.
S71	Prunus spinosa Crataegus monogyna Rubus fruticosus	3	Hedgerow section. Predominantly blackthorn with severe bramble encroachment.

Section No.	Species	Height (m)	Comments
S72	Crataegus monogyna	4	Clump of dying hawthorn.
S73	Rubus fruticosus Prunus spinosa	4	Mass of predominantly bramble.
S74	Rubus fruticosus	1	Bramble mass.
S75	Prunus spinosa Rubus fruticosus Crataegus monogyna	4	Predominantly blackthorn in wedge shaped mass. Severe bramble encroachment.
S76	Prunus spinosa Rubus fruticosus	4.0	Hedgerow section of poor quality. Predominantly blackthorn with severe bramble encroachment.
S77	Crataegus monogyna Quercus robur Rubus fruticosus Sambucus nigra	4.0	Hedgerow section. Small diameter stemmed trees with bramble encroachment.
S78	Rubus fruticosus Sambucus nigra	2.5	Mass of predominantly bramble.
S79	Rubus fruticosus Prunus spinosa	4	Mass of predominantly bramble.
S80	Crataegus monogyna Rubus fruticosus	4.0	Mass of vegetation.
S81	Sambucus nigra	3	Small diameter stemmed elder on field boundary.
S82	Rubus fruticosus Crataegus monogyna Sambucus nigra	m 3	Predominantly bramble mass on field boundary.
S83	Rubus fruticosus Sambucus nigra Fraxinus excelsior	4	Dense mass of predominantly bramble.

Section No.	Species	Height (m)	Comments
S84	Ulmus sp. Crataegus monogyna	4	Hedgerow section. Predominantly suckers from dead/dying elm. Large tree hung up.
S85	Prunus spinosa Crataegus monogyna Sambucus nigra	4.0	Hedgerow section. Predominantly blackthorn.
S86	Prunus spinosa Crataegus monogyna	4	Hedgerow section. Predominantly blackthorn.
S87	Crataegus monogyna	3	Clump of hawthorn.
S88	Prunus spinosa Crataegus monogyna Rubus fruticosus Ulmus sp.	5	Hedgerow section of predominantly blackthorn and hawthorn. Occasional dead/dying elm.
S89	Prunus spinosa Rubus fruticosus Sambucus nigra	4	Hedgerow section growing along ditch bank.
S90	Crataegus monogyna Prunus spinosa	4.0	Hedgerow section. Located on opposite side of ditch to site. Some dead/dying trees.
S91	Crataegus monogyna	3	Small diameter stemmed hawthorn.
S92	Crataegus monogyna Rubus fruticosus	3.0	Mass of small diameter stemmed hawthorn. Severe bramble encroachment.
S93	Crataegus monogyna Rubus fruticosus	3.0	Mass of small diameter stemmed hawthorn. Bramble encroachment.
S94	Sambucus nigra Rubus fruticosus	3.0	Mass of small diameter stemmed elder. Bramble encroachment.
S95	Rosa canina	4	Mass of dog rose.

Section No.	Species	Height (m)	Comments
S96	Rubus fruticosus Prunus domestica Fraxinus excelsior Salix sp.	8	Innaccessible mass of predominantly bramble with occasional young trees interspersed.
S97	Crataegus monogyna Prunus spinosa	3	Area of small diameter stemmed hawthorn and blackthorn.
S98	Prunus spinosa	3	Clump of small diameter stemmed blackthorn.
S99	Prunus spinosa	3.0	Hedgerow section of small diameter stemmed blackthorn.
S100	Ulmus sp. Crataegus monogyna Prunus spinosa Rubus fruticosus	4	Hedgerow section. Predominantly elm with some dead/dying.
S101	Ulmus sp.	3	Small diameter stemmed elm.
S102	Ulmus sp.	4	Group of small diameter stemmed elm. Dead/dying.
S103	Sambucus nigra Urtica dioica Hedera helix	4	Dense mass of elder, nettles and ivy.
S104	Ulmus sp.	4.0	Row of small diameter stemmed dead/dying elm.
S105	Ulmus sp.	4.0	Row of small diameter stemmed dead/dying elm.
S106	Ulmus sp.	4.0	Hedgerow section. Small diameter stemmed with numerous dead/dying trees.
S107	Hedera helix Ulmus sp. Sambucus nigra	5	Gappy hedgerow section. Dead/dying elm towards southern end.

Section No.	Species	Height (m)	Comments
S108	Sambucus nigra Ligustrum vulgare Ulmus sp. Hedera helix	4	Hedgerow section. Poor quality.
S109	Ulmus sp.	5	Hedgerow section. Small diameter stemmed elm.
S110	Crataegus monogyna Prunus spinosa	3	Clumps of young hawthorn and blackthorn.
S111	Ulmus sp. Sambucus nigra Rubus fruticosus	7	Overgrown mass of predominantly elm suckers. Severe bramble encroachment.
S112	Crataegus monogyna	3	Young hawthorn hedgerow section.
S113	Unknown shrub	3	Dense mass of vegetation.
S114	Ulmus sp.	3.0	Hedgerow section. Young elm trees.
S115	Crataegus monogyna Sambucus nigra	4	Hedgerow section. Predominantly hawthorn. Gaps in places.
S116	Crataegus monogyna Sambucus nigra	4.0	Hedgerow section. Predominantly hawthorn. Gaps in places.
S117	Crataegus monogyna Sambucus nigra	4.0	Hedgerow section. Predominantly hawthorn. Gaps in places.
S118	Crataegus monogyna	4.0	Hedgerow section. Gaps in places.
S119	Amelanchier lamarkii Hedera helix	4	Shrubs along border.

Section No.	Species	Height (m)	Comments
S120	Prunus spinosa Rosa canina	3	Young trees/shrubs growing in scrub.
S121	Crataegus monogyna	3.0	Young tree growing in scrub.
S122	Fraxinus excelsior	3.0	Young tree growing in scrub.
S123	Fraxinus excelsior Rosa canina	3.0	Young tree/shrubs growing in scrub.
S124	Elaeagnus angustifolia Crataegus monogyna	4	Young tree/shrubs growing in scrub.
S125	Prunus spinosa	2	Young tree growing in scrub.
S126	Prunus domestica	4	Young trees growing in scrub.
S127	Rubus fruticosus	3	Mass of predominantly bramble.
S128	Crataegus monogyna	3.0	Young tree growing in scrub.
S129	Rubus fruticosus Prunus spinosa Crataegus monogyna Rosa canina	3.0	Dense mass of predominantly bramble with occasional young trees..
S130	Crataegus monogyna Rosa canina	3	Area of young trees / shrubs in scrub.
S131	Rubus fruticosus Crataegus monogyna Prunus spinosa Rosa canina	3.0	Mass of predominantly bramble with young trees / shrubs in scrub.



Section No.	Species	Height (m)	Comments
S132	<i>Crataegus monogyna</i>	4	Young hawthorn growing in scrub.
S133	<i>Rubus fruticosus</i> <i>Buddleia davidii</i> <i>Sambucus nigra</i> <i>Crataegus monogyna</i>	4.0	Mass of predominantly bramble growing between facility fence and ditch.
S134	<i>Rubus fruticosus</i> <i>Prunus spinosa</i>	2	Mass of predominantly bramble growing in scrub.
S135	<i>Rubus fruticosus</i> <i>Sambucus nigra</i> <i>Rosa canina</i>	3	Mass of predominantly bramble growing in scrub.
S136	<i>Crataegus monogyna</i>	2	Young hawthorn growing in scrub.
S137	<i>Prunus spinosa</i>	4	Mass of blackthorn.
S138	<i>Rubus fruticosus</i>	2	Mass of bramble adjacent sea wall.
S139	<i>Crataegus monogyna</i>	3	Mass of young hawthorn adjacent sea wall.
S140	<i>Prunus spinosa</i>	2.0	Mass of blackthorn adjacent sea wall.
S141	<i>Prunus spinosa</i> <i>Crataegus monogyna</i> <i>Rosa canina</i>	3	Young trees/shrubs adjacent sea wall.
S142	<i>Crataegus monogyna</i>	2	Young hawthorn.
S143	<i>Crataegus monogyna</i>	1.5	Young hawthorn.

Section No.	Species	Height (m)	Comments
S144	Rubus fruticosus Rosa canina	2.0	Mass of bramble adjacent sea wall.
S145	Rubus fruticosus Buddleia davidii Salix sp.	3	Mass of predominantly bramble on top of ash mound.
S146	Elaeagnus angustifolia	3.0	Young olive tree.
S147	Elaeagnus angustifolia	3.0	Young olive tree.
S148	Elaeagnus angustifolia	2.5	Clump of young olive. Dieback.
S149	Prunus domestica	3	Young plum growing on embankment of ash mound.
S150	Rubus fruticosus	1.5	Mass of predominantly bramble on embankment of ash mound.
S151	Rubus fruticosus Buddleia davidii Crataegus monogyna Prunus spinosa	4	Dense mass of predominantly bramble. Largely inaccessible.
S152	Rubus fruticosus Buddleia davidii Fraxinus excelsior Elaeagnus angustifolia	4	Dense mass of predominantly blackthorn.
S153	Crataegus monogyna Prunus spinosa Rosa canina Rubus fruticosus	3	Large mass of scrubby vegetation, patchy in places.

**Table 4: Tree Root Protection Areas**

## Table 4: Tree Root Protection Areas

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
1	Crataegus monogyna	C1	2	12.6	3.5
3	Crataegus monogyna	C1	2.16	14.7	3.8
4	Crataegus monogyna	C1	1.8	10.2	3.2
5	Crataegus monogyna	C1	2.28	16.3	4
8	Crataegus monogyna	C1	1.7	9.1	3
9	Crataegus monogyna	C1	1.8	10.2	3.2
10	Crataegus monogyna	C1	2.45	18.9	4.3
11	Salix alba 'Caerulea'	B1	3	28.3	5.3
12	Crataegus monogyna	C1	2.4	18.1	4.3
13	Crataegus monogyna	C1	1.2	4.5	2.1
14	Crataegus monogyna	C1	3	28.3	5.3
15	Quercus robur	C1	1.68	8.9	3
16	Fraxinus excelsior	C1	5.64	99.9	10
18	Crataegus monogyna	C1	2.16	14.7	3.8
19	Quercus robur	B1	2.28	16.3	4

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
21	Crataegus monogyna	C1	1.08	3.7	1.9
22	Crataegus monogyna	C1	1.2	4.5	2.1
23	Sambucus nigra	C1	1.2	4.5	2.1
25	Crataegus monogyna	C1	1.44	6.5	2.5
26	Crataegus monogyna	C1	2.16	14.7	3.8
27	Crataegus monogyna	C1	1.08	3.7	1.9
28	Prunus spinosa	C1	1.75	9.6	3.1
29	Sambucus nigra	C2	2.05	13.2	3.6
30	Crataegus monogyna	C1	1.56	7.6	2.8
31	Crataegus monogyna	C1	2.4	18.1	4.3
32	Crataegus monogyna	C2	2.64	21.9	4.7
33	Prunus spinosa	C1	1.2	4.5	2.1
35	Sambucus nigra	C2	2.52	20	4.5
36	Quercus robur	B1	3.84	46.3	6.8
37	Crataegus monogyna	C1	1.92	11.6	3.4
38	Crataegus monogyna	C2	2.4	18.1	4.3

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
39	Crataegus monogyna	C2	2.04	13.1	3.6
40	Crataegus monogyna	C2	1.92	11.6	3.4
41	Crataegus monogyna	C2	1.92	11.6	3.4
42	Crataegus monogyna	C2	1.92	11.6	3.4
43	Quercus robur	B2	3	28.3	5.3
44	Crataegus monogyna	C2	2.04	13.1	3.6
45	Crataegus monogyna	C2	2.04	13.1	3.6
46	Crataegus monogyna	C2	3	28.3	5.3
47	Crataegus monogyna	C2	2.16	14.7	3.8
48	Quercus robur	C2	2.64	21.9	4.7
49	Quercus robur	B1	2.95	27.3	5.2
50	Sambucus nigra	C1	1.35	5.7	2.4
51	Quercus robur	B1	3.9	47.8	6.9
52	Fraxinus excelsior	C1	2.52	20	4.5
53	Prunus domestica	B1	2.4	18.1	4.3
54	Fraxinus excelsior	B1	2.7	22.9	4.8

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
55	Crataegus monogyna	C1	1.56	7.6	2.8
56	Crataegus monogyna	C1	1.9	11.3	3.4
58	Fraxinus excelsior	C1	2.16	14.7	3.8
60	Crataegus monogyna	C1	2.28	16.3	4
61	Crataegus monogyna	C1	2.28	16.3	4
63	Crataegus monogyna	C1	1.44	6.5	2.5
64	Crataegus monogyna	C1	2.16	14.7	3.8
65	Crataegus monogyna	C1	2.16	14.7	3.8
66	Crataegus monogyna	C1	2.16	14.7	3.8
67	Crataegus monogyna	C1	1.92	11.6	3.4
68	Crataegus monogyna	C1	1.92	11.6	3.4
69	Crataegus monogyna	C1	1.2	4.5	2.1
70	Crataegus monogyna	C1	1.2	4.5	2.1
71	Crataegus monogyna	C1	1.2	4.5	2.1
72	Crataegus monogyna	C1	1.68	8.9	3
74	Quercus robur	C2	2.64	21.9	4.7

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
76	Quercus robur	B2	2.7	22.9	4.8
77	Salix cinerea	C2	1.2	4.5	2.1
78	Quercus robur	A2	6.6	136.8	11.7
79	Salix cinerea	C2	1.2	4.5	2.1
80	Quercus robur	B2	4.2	55.4	7.4
81	Quercus robur	A2	5.4	91.6	9.6
82	Quercus robur	B2	4.2	55.4	7.4
83	Salix caprea	C2	1.85	10.8	3.3
84	Quercus robur	B2	2.28	16.3	4
85	Salix caprea	C2	1.32	5.5	2.3
86	Quercus robur	A2	3.6	40.7	6.4
87	Salix caprea	C2	1.2	4.5	2.1
88	Salix caprea	C2	2.04	13.1	3.6
89	Quercus robur	A1	4.2	55.4	7.4
90	Salix fragilis	B2	3.6	40.7	6.4
91	Salix fragilis	B2	2.4	18.1	4.3



Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
92	Quercus robur	B2	4.2	55.4	7.4
93	Fraxinus excelsior	B2	3.55	39.6	6.3
94	Salix alba	C2	1.7	9.1	3
95	Fraxinus excelsior	B2	4	50.3	7.1
100	Quercus robur	A1	9.6	289.5	17
103	Acer pseudoplatanus	C2	6.36	127.1	11.3
104	Quercus robur	B2	5.76	104.2	10.2
105	Acer pseudoplatanus	B2	6	113.1	10.6
106	Quercus robur	A2	4.56	65.3	8.1
107	Quercus robur	B2	5.16	83.6	9.1
108	Quercus robur	A2	6	113.1	10.6
109	Acer pseudoplatanus	B1	11.76	434.5	20.8
110	Prunus domestica	C2	2.28	16.3	4
111	Ailanthus altissima	C2	1.85	10.8	3.3
112	Ailanthus altissima	B2	5.76	104.2	10.2
113	Acer pseudoplatanus	C1	1.75	9.6	3.1

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
114	Acer pseudoplatanus	B1	4.45	62.2	7.9
115	Ulmus sp.	C1	1.44	6.5	2.5
116	Crataegus monogyna	C2	2.28	16.3	4
117	Acer campestre	C2	1.7	9.1	3
118	Ulmus sp.	C2	1.7	9.1	3
119	Tilia x europaea	B1	4.2	55.4	7.4
120	Crataegus crusgali	C2	1.32	5.5	2.3
121	Crataegus crusgali	C2	1.2	4.5	2.1
123	Fraxinus excelsior	C1	1.68	8.9	3
124	Fraxinus excelsior	C1	1.2	4.5	2.1
125	Fraxinus excelsior	B1	2.4	18.1	4.3
126	Fraxinus excelsior	C1	1.2	4.5	2.1
127	Fraxinus excelsior	C1	1.32	5.5	2.3
128	Fraxinus excelsior	C1	1.56	7.6	2.8
129	Fraxinus excelsior	C1	0.96	2.9	1.7
130	Fraxinus excelsior	C1	1.2	4.5	2.1

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
131	Malus sp.	C1	1.2	4.5	2.1
132	Malus sp.	C1	1.4	6.2	2.5
133	Prunus domestica	C1	1.45	6.6	2.6
134	Prunus domestica	C1	0.72	1.6	1.3
135	Prunus domestica	C1	0.9	2.5	1.6
136	Prunus domestica	C1	1.2	4.5	2.1
137	Prunus domestica	C1	1.45	6.6	2.6
138	Salix sp.	C1	1.35	5.7	2.4
139	Elaeagnus angustifolia	C1	1.2	4.5	2.1
140	Elaeagnus angustifolia	C1	1.2	4.5	2.1
141	Prunus domestica	C1	1.32	5.5	2.3
142	Elaeagnus angustifolia	C1	1.68	8.9	3
143	Elaeagnus angustifolia	B1	2.16	14.7	3.8
144	Elaeagnus angustifolia	C1	1.44	6.5	2.5
145	Elaeagnus angustifolia	C1	1.2	4.5	2.1
146	Elaeagnus angustifolia	C1	1.2	4.5	2.1

Tree No.	Species	BS5837 Category	RPA Radius (m)	RPA Area (m2)	RPA Square Side Length (m)
147	Elaeagnus angustifolia	C1	1.68	8.9	3
148	Elaeagnus angustifolia	B1	2.16	14.7	3.8
149	Elaeagnus angustifolia	B1	1.92	11.6	3.4
150	Salix sp.	B1	9.2	265.9	16.3
151	Salix sp.	B1	4.75	70.9	8.4
152	Elaeagnus angustifolia	C1	2.16	14.7	3.8

**Table 5: Group Root Protection Areas**

## Table 5: Group Root Protection Areas

Tree No.	Species	BS5837 Category	RPA Radius (m)
G1	Crataegus monogyna	C2	1.92
G2	Crataegus monogyna	C2	2.16
G3	Quercus robur	B2	3.12
G4	Ulmus sp.	U	1.8
G5	Prunus spinosa	C2	1.44
G6	Prunus spinosa	C2	1.32
G7	Crataegus monogyna Sambucus nigra	C2	1.56
G8	Crataegus monogyna Sambucus nigra	C2	2.16
G9	Prunus spinosa Sambucus nigra Crataegus monogyna	C2	2.04
G10	Crataegus monogyna Sambucus nigra	C2	1.92
G11	Crataegus monogyna	C2	1.8

Tree No.	Species	BS5837 Category	RPA Radius (m)
G12	Crataegus monogyna	U	1.8
G13	Salix alba	C2	6
G14	Ulmus sp.	U	3
G15	Salix alba	C2	7.2
G16	Fraxinus excelsior Quercus robur Crataegus monogyna	B2	4.2
G17	Fraxinus excelsior	B2	7.8
G18	Fraxinus excelsior	B2	3.48
G19	Ulmus sp.	C2	1.32
G20	Ulmus sp.	C2	1.44
G21	Ulmus sp.	C2	2.4
G22	Ulmus sp.	C2	1.32
G23	Ulmus sp.	C2	1.44

Tree No.	Species	BS5837 Category	RPA Radius (m)
G24	Ulmus sp.	C2	1.44
G25	Ulmus sp.	C2	1.44
G26	Cupressus macrocarpa	U	3.6
G27	Ulmus sp.	C2	1.44
G28	Ulmus sp.	C2	1.2
G29	Ulmus sp. Crataegus monogyna Acer campestre	C2	1.68
G30	Ulmus sp. Crataegus monogyna Acer campestre	C2	1.68
G31	Fraxinus excelsior	C2	1.56
G32	Populus nigra 'Italica' x Cupressocyparis leylandii Fraxinus excelsior Prunus avium	B2	4.8



**Table 6: Preliminary Individual Tree Works**

## Table 6: Preliminary Individual Tree Works

Tree No.	Species	Diameter (mm)*	Height	Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
7	Populus x canadensis	435	5	SM	Poor	Poor	<10	Deadwood in the crown of major extent.Branch dieback of major extent.Previous branch failures noted.Restricted inspection due to vegetation.	U	Fell the tree.
59	Salix alba	710	15	M	Poor	Poor	<10	Growing off old stump.Deadwood in the crown of major extent.Branch dieback of major extent.Hanging branches in the crown.Previous branch failures noted.Restricted inspection due to vegetation.	U	Fell the tree. Safety risk if working nearby.

## Table 7: Preliminary Group Tree Works

Table 7: Preliminary Group Tree Works

Tree No.	Species	Diameter (mm)*	Height	Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
G15	Salix alba	60	15	EM	Good	Poor	10-20	Deadwood present of minor extent, Hanging branches, Previous branch failure, Restricted inspection due to vegetation.  Fallen stem hung up in crown. Fungal brackets present at base of two trees.	C2	Remove hanging branches in the crown,

## Figures

**JSL3537-700 - 712: TREE CONSTRAINTS PLAN**

**JSL3537-720 - 732: PRELIMINARY TREE RETENTION / REMOVAL & PROTECTION PLAN**

## Appendix A

### Methodology

#### General

Trees were inspected from ground level during a site visit. All data was recorded electronically within a ESRI ArcPad 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. Colour coded versions of the drawings form part of this report. (Figure 1).

The data recorded includes:

- Height - data gathered using a Suunto optical clinometer PM - 5/1520. Where access to the tree was not possible the Heights were estimated.
- Diameter - measurements taken at 1.5 metres above ground level (or where multiple stems exist complying with requirements for BS5837).
- Tree crown spread – estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
- Tree Crown Clearance – crown height above ground level
- Tree Condition - judged visually using the guidelines produced in the report. The condition is indicated with the appropriate colour on the map found in the report. (see Figure 1)
- Age class - estimated from an examination of the tree in question.

#### Age Classification

The following classification is employed:

Y - Young: Saplings and young trees under 10 years of age

SM – Semi-Mature: Trees older than 10 years but less than 40% of the life expectancy of their species.

EM – Early-Mature: Trees between 40% and 70% of the life expectancy of their species.

M - Mature: Trees between 70% and 100 of the life expectancy of their species.

OM - Over mature: Trees considered being beyond the normal life expectancy of their species.

V – Veteran: Trees that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

### **Estimated Remaining Contribution in Years**

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances. The following classification is employed:

- Death or removal is likely within less than 10 years
- Death or removal is likely within 10+ years.
- Death or removal is likely within 20+ years.
- Death or removal is likely beyond 40 years

The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

### **Tree Condition.**

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.

The categories considered for Physiological Condition are good, fair, poor and dead.

Structural Condition is also commented on and this will include such items of presence of decay and physical defects.

Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

### **Preliminary Management Recommendations**

Recommendations are given where it is felt by the arborist that further investigations are required due to suspected defects and work recommendations for pre-construction tree work.

## Tree Categorisation Using BS 5837 Methodology

The trees surveyed were categorised using the method explained in BS5837:2012. This method categorizes individual trees, groups and woodlands in a systematic way. Each tree, group or woodland is identified on an attached plan.

Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural.

Initially the surveyor will determine if the tree should be regarded as a U category tree. U category trees are those that are low value trees that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflex the trees value in making an important contribution to the amenity of the site over a period of time. The higher the category the longer the perceived time period.

A sub category is included 1, 2 or 3. This sub category reflects the type of value the surveyor feels the tree presents in regards its value to 1 – arboricultural, 2 – landscape, 3 – cultural or conservation.

The cascade chart used is included as Appendix C of this report.



## Appendix B

### The Tree Constraints Plan

The Tree Constraints Plan (see drawings JSL3537-700 - 712) 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.

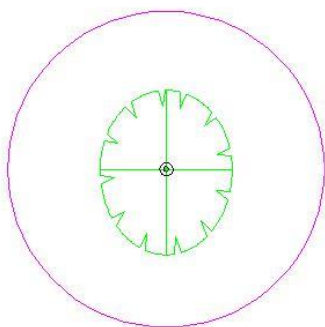
It should be noted that some of the tree positions shown on the plan have been plotted by eye to an Ordnance Survey base map and as such should be considered to be of a provisional nature.

#### Below Ground Constraints

##### 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 below 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.

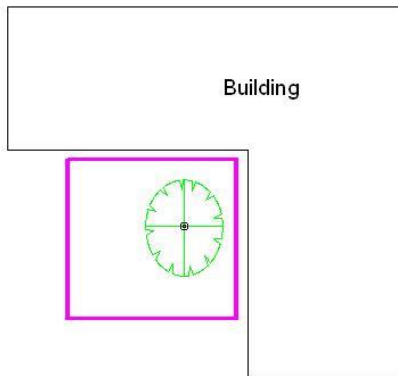


Where tree root spread is considered to have been influenced by site conditions the trees RPA's have been plotted to the Tree Constraints Plan as a polygon. The plotted polygon is of the same area as it would be as a circle and its shape reflects an arboricultural assessment of likely root distribution.

## REPORT

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

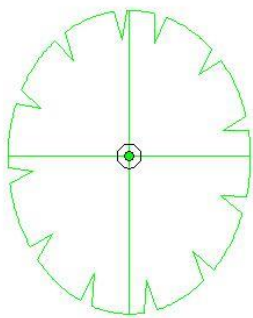


Where possible all development, including new hard landscaping, shall be situated outside of the retained trees designated Root Protection Areas.

### **Above Ground Constraints**

#### **Existing Canopy Spreads**

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



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

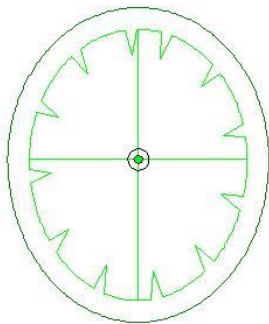
It will typically be unacceptable to design any built development within the current spread of a tree.

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

### 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 (Figure 1) as shown below.



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. 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.

## Appendix C

### 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																									
<b>Trees unsuitable for retention</b> (see Note)																													
<b>Category U</b> 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	<input type="checkbox"/> 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) <input type="checkbox"/> Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline <input type="checkbox"/> 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																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:33%;"></th> <th style="width:33%;">1 Mainly arboricultural qualities</th> <th style="width:33%;">2 Mainly landscape qualities</th> <th style="width:33%;">3 Mainly cultural values, including conservation</th> <th style="width:33%;"></th> </tr> </thead> <tbody> <tr> <td colspan="5"><b>Trees to be considered for retention</b></td> </tr> <tr> <td> <b>Category A</b>            Trees of high quality with an estimated remaining life expectancy of at least 40 years         </td> <td>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)</td> <td>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features</td> <td>Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)</td> <td>Light Green</td> </tr> <tr> <td> <b>Category B</b>            Trees of moderate quality with an estimated remaining life expectancy of at least 20 years         </td> <td>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</td> <td>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</td> <td>Trees with material conservation or other cultural value</td> <td>Mid Blue</td> </tr> <tr> <td> <b>Category C</b>            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         </td> <td>Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories</td> <td>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</td> <td>Trees with no material conservation or other cultural value</td> <td>Grey</td> </tr> </tbody> </table>						1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation		<b>Trees to be considered for retention</b>					<b>Category A</b> 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	<b>Category B</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	<b>Category C</b> 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
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation																										
<b>Trees to be considered for retention</b>																													
<b>Category A</b> 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																									
<b>Category B</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																									
<b>Category C</b> 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 D

### Tree Protection Barriers

#### Root Protection Area Barrier Details

##### Protective Barrier Specifications

Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that tree's 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 except for 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**

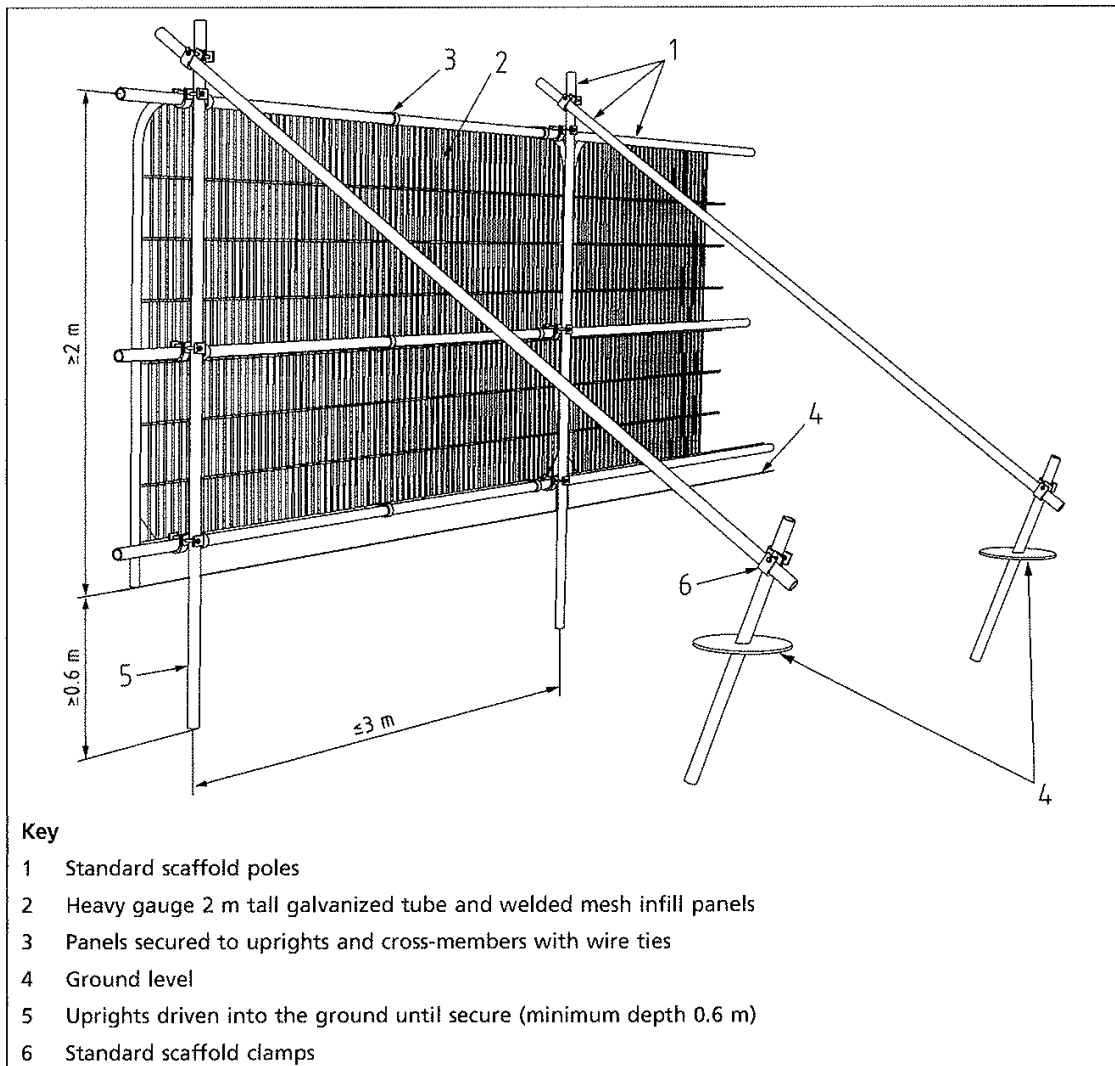
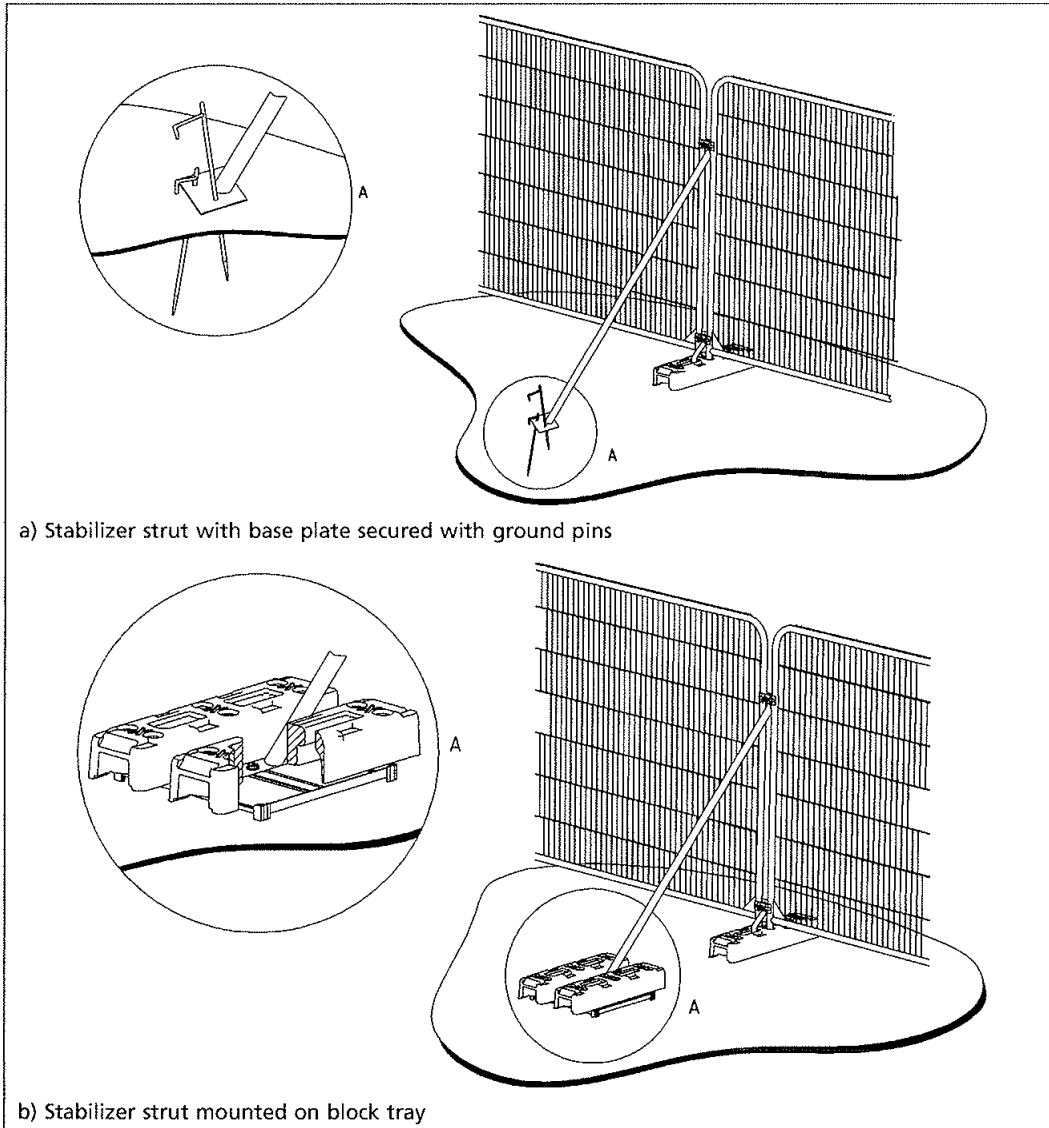




Figure 2.

Figure 3 Examples of above-ground stabilizing systems



## Appendix E

### Construction Exclusion Signage – Example



**PROTECTIVE FENCING. THIS  
FENCING MUST BE  
MAINTAINED IN ACCORDANCE  
WITH THE APPROVED PLANS  
AND DRAWINGS FOR THIS  
DEVELOPMENT.**



**TREE PROTECTION AREA  
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)  
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY  
PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A  
TREE PRESERVATION ORDER.  
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY  
LEAD TO CRIMINAL PROSECUTION**

**ANY INCURSION INTO THE PROTECTED AREA MUST BE  
WITH THE WRITTEN PERMISSION OF THE LOCAL  
PLANNING AUTHORITY**

## Appendix F

### Tree and Root Pruning Specification

#### Tree Access Pruning Specification

All works shall be carried out by suitably qualified and professional contractors who are clear in the understanding of the specification below and their requirements.

All works shall be carried out using suitable handsaws and these saws will be sharp and in a serviceable condition. The use of chainsaws shall only be used with the agreement of the supervising officer (SO).

All risk assessments shall be carried out by the contractor prior to works commencing and they will be fully satisfied to the conditions and any hazards within the working area. Any concerns will be reported to the SO.

The clearance height will be agreed and included in the schedule of works.

Works beyond this dimension are not to be part of the works unless it involves additional health and safety works to the tree.

The works are designed to provide access to the working area during the construction period and if the access is to be required beyond this period then a tree management programme with the provision for cyclical pruning be agreed.

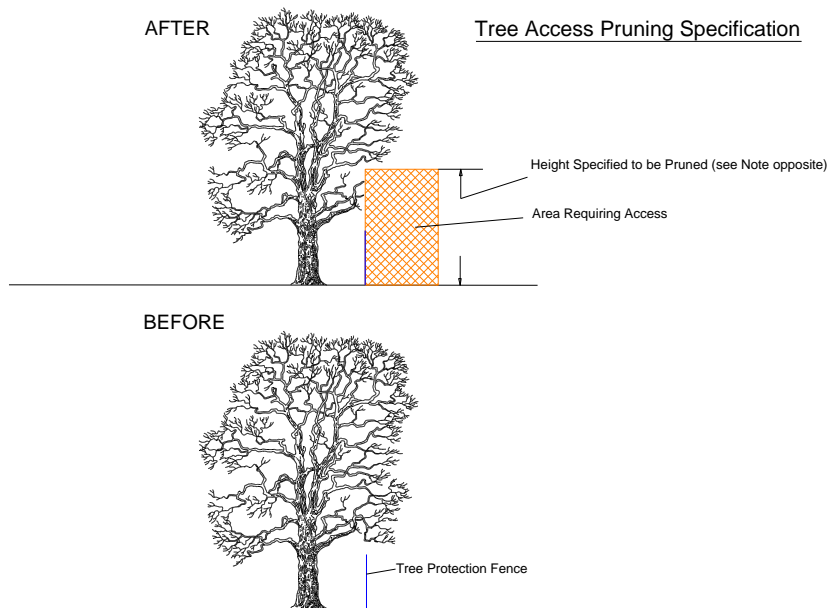
The guidance and main document providing the recommended guidance is BS3998:2010 Tree Work - Recommendations and this will be followed if any doubt exists with the requirements of the work. Particular sections for reference are Section 7 Pruning and related work, and within this section, 7.2 Minimizing the potentially undesirable effects of pruning, 7.6 Crown lifting, 7.8 Selective pruning and 7.9 Pruning for infrastructure. This is not an exclusive list.

The aim of the pruning will be to provide a natural appearance within the crown and will not be to leave a acute side to the crown of the tree. Final pruning cuts will be considered and where possible to natural target pruning points such as branch unions where branch bark ridges can be used to guide the pruning cuts. Where these points are not available the exposed stub will be as small as possible, and an assessment of each individual branch taken by the operative before making the cut.

All cuts will be made so that they do not provide future structural issues such as weak forks and loss of structural integrity. If there is any concerns regarding the above then this shall be raised prior to works commencing. Branch reductions will be used to eliminate bark rips and tears, they will not be accepted by the client.

REPORT

All debris will be removed from site and disposed of in an environmentally sensitive way agreed with the SO.



## Root Pruning Specification

If roots are damaged or exposed then guidance found in BS5837:2012, Section 7, Demolition and construction in proximity to existing trees, should be followed.

7.2.2 Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

7.2.3 Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability.

7.2.4 Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

## Appendix G

# Arboricultural Impact Guidance – Pipeline Installation

### Tree Retention / Removal

The prioritisation for tree retention will be based upon the guidance contained within BS5837:2012. Category A trees will be the highest priority for retention and category C the lowest.

Category U trees have no retention value and in most circumstances such specimens will not be considered for retention within new development.

When considering the extent of tree retention on site with respect to category C trees priority will be given to the trees that have been included within this category due to their having stem diameters of less than 150mm at 1.5m above ground level, as these specimens are relatively young trees with future potential.

### Tree Replacement

Where tree replacement is proposed to mitigate for tree removal size and position of the mature specimen will be considered, along with suitability of the site. New tree planting will be measured and provide greater species diversity and be resilient and sustainable going forward. Consideration for initial maintenance through establishment will form part of the mitigation specification.

New guidance provided in BS8545:2014 Trees: from nursery to independence in the landscape will also be considered and its recommendations followed.

### Considerations for Demolition

Where pipelines are proposed in areas where demolition may be requiring the following factors require consideration prior to demolition if damage to retained trees is to be prevented.

### Removal of Existing Buildings

The presence of existing buildings or built structures in close proximity to trees requires consideration as in such areas access to undertake demolition may be restricted by the trees.

Additionally, there may be a higher potential for damage to occur to tree branches where they are in close proximity to a building to be demolished.

Where access to demolish a building is restricted due to the spread of a trees crown it may be possible to undertake access facilitation pruning to prevent injurious contact between demolition plant and the tree(s).

Alternatively, it may be possible to provide working space by temporarily tying back tree branches in accordance with a specification prepared by an arboriculturist.

In all cases to minimise the potential for damage to occur to aerial parts of a tree during demolition all works in proximity to trees will be undertaken from within the footprint of the existing building with walls being pulled back away from the trees.

Where access to demolish a building is restricted due to the presence of a tree's Root Protection Area it may be possible to install ground protection to allow temporary access.

In most cases however the RPA for retained trees will not spread beneath the footprint of the building to be demolished; as root growth will have been limited in these areas. As such and given that works in proximity to trees will be undertaken from within the footprint of the building being demolished significant conflict will not occur.

Where the removal of underground structures in proximity to trees is required the advice of an arboriculturist will be sought. In general, it is preferable, where possible, to leave redundant underground structures in situ as their removal could damage tree roots.

### **Removal of Existing Hard Surfaces**

As with the demolition of existing buildings in areas where hard surfaces are present within the initial Root Protection Areas of trees care must be taken in their removal.

Where existing hard surfaces are located within the Root Protection Areas of retained trees care will be taken to prevent disruption to tree roots that may be growing beneath it.

In this respect their removal will generally be undertaken using hand held tools though, under arboricultural supervision, appropriate machinery could be used.

Where machinery is used to remove a hard surface in close proximity to a retained tree works will progress away from the tree so that at no time the machine moves over newly exposed ground.

If a new hard surface is to be constructed it may be preferable to leave any existing sub-base in situ, augmenting it where required.

### **Factors to Consider during New Pipeline Installation**

#### **Working Within or Near the RPA of Retained Trees**

Where possible all pipeline installation shall be situated outside of the retained trees designated Root Protection Areas as the installation has the potential to cause soil compaction, root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.

However, where there is an overriding justification for installation within the RPA of a retained tree technical solutions might be available that prevent damage to the tree.

In this respect it can be noted that the use of traditional trench within the RPA could result in extensive root loss and will be avoided.

In order to arrive at a suitable solution site specific advice will be sought from the project arboriculturist and an engineer.

Should new buildings be proposed within the RPA of an existing tree it will be necessary to take steps to minimise the potential impact to the tree to allow construction.

In this respect where it is intended to undertake construction operations within the root protection area, precautions will be taken to maintain the condition and health of the root system and in particular to:

- a) prevent physical damage to the roots during demolition or construction (such as by soil compaction or severing);
- b) make provision for water and oxygen to reach the roots;
- c) Allow for the future growth of the root system;
- d) preserve the soil structure at a suitable bulk density for root growth and function (in particular for soils of a high fines content).

To achieve the above criteria a number of solutions can be considered as set out below.

#### **Prevention of physical damage to roots**

To prevent physical damage occurring to roots as a result of pipeline installation directional drilling will be considered as a method to be used. Directional Drilling allows for the pipeline to be formed under trees using trenchless technology. It has the benefits of limited ground disturbance, no loss in the majority of soil structure and root mass. The depth of the directional drilling would ideally be below 1m as 90% of the root mass is formed in to this depth (Tree Roots in the Built Environment Chapter 3, section 3.2.2.2 Root system depth). Due to the size of the drilling and localised disturbance, likely root damage will be considered as insignificant below this depth.

To prevent physical damage of roots occurring as a result of soil compaction it may be necessary to protect the ground within the Root Protection Area during the installation of the pipeline and throughout the course of the works.

Methods for ground protection are identified within BS5837:2012 and where vehicle movements are required it will be necessary for ground protection measures to be designed by an engineer.

To minimise the extent of ground protection necessary it will be necessary to plan the operations involving the pipeline installation to minimise vehicle movements.

#### **New Hard Surfaces Within RPA**

If there is a requirement for new hard surfacing to be located inside of the RPA of any retained tree the construction of these surfaces will be designed using the principles set out within BS5837:2012 regarding 'no dig' surfacing. Site specific and specialist arboricultural and construction design advice will be sought to determine if it is achievable without significant adverse impact upon trees to be retained.

Hard surfacing within the RPA of veteran trees will not be acceptable.



### **Proximity of Structures to Trees**

Where new structures are proposed as part of the pipeline works and are to be located in proximity to existing trees the need for working space to construct the proposed development will be considered.

The construction of new structures in close proximity to trees can result in damage to trees and structures by the continuous whipping of branches against the fabric of a building. Therefore, structures will usually be located with due consideration to a trees ultimate growth so as to reduce the need for frequent pruning or other maintenance.

Where large old trees are to be retained it is important that adequate space is allowed for their long-term physical retention and for future maintenance.

## Appendix H

### 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.

**Bottle Butt** – Term used to describe shape of stem base, usually associated with an internal defect – refer to 'Reaction Wood' below.

**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 m<sup>2</sup>), 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.

## REPORT

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**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 m<sup>2</sup>.

**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.

**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.

**Preliminary Tree Retention / Removal & 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.

**Water Demand** - A generic classification of the water demand of specific species as outlined by the NHBC (National House Building Council).