LAND AT NEW CLOSE LANE, WITNEY
Arboricultural Impact Assessment/Method Statement
# QUALITY MANAGEMENT

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<tr>
<td>Date:</td>
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<tr>
<td>Project Number/Document Reference:</td>
<td>JMK10093 – Land at New Close Lane, Witney – Arboricultural Impact Assessment/Method Statement</td>
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1  INTRODUCTION

1.1 RPS were instructed in June 2018, by Lidl UK GmbH, to undertake a Tree Survey and prepare an Arboricultural Impact Assessment in relation to the proposed development of a Lidl retail store at land at New Close, Witney, Oxfordshire.

1.2 The survey was undertaken in accordance with BS5837:2012 as described within the survey methodology attached to this report at Appendix 1.

1.3 The purpose of the survey was to gather data on the trees and to prepare a Tree Constraints Plan that has been used in the design of the proposed new retail store. Appendix 2 – The Tree Constraints Plan explains the process of interrupting the plan and how it is used during the design and impact assessment process.

1.4 This report has been prepared to support and expand upon the data presented on the Tree Constraints Plan and, in addition to summarising the quality and condition of the tree stock present on the site.

1.5 This report should be read in conjunction with the supplied Tree Constraints Plan (Figure 01.01), Tree Protection Plan (Figure 02.01) and all other relevant Tables and Appendices as detailed within the table of contents.

1.6 The following documents and drawings were considered during the production of this report:

- 17099_Topographic and Services Survey_Final.dwg – showing position of proposed store, car parking and infrastructure

- B6552(PA)02B Proposed Site Plan (with tree survey) -a1L.pdf – nicol thomas Architects

1.7 The tree positions appeared on the topographical plan provided by the client.

1.8 The survey and assessment was undertaken by Brian Wallis, Technical Director, a Chartered Forester, Chartered Environmentalist, Fellow of the Arboricultural Association and holder of the Professional Diploma in Arboriculture, Member of the Landscape Institute, of RPS Group PLC.
2 SITE INFORMATION

2.1 The site under consideration is an existing brownfield site, with old access road and various fencing to the boundary. The site has spoil heaps throughout and is fairly overgrown. At the time of the survey the site had occupied tents and caravans on the site.

2.2 The development site extends to 0.85 Hectares in size and it is located at Ordnance Survey Grid Reference SP 35087 08423. The site is border to the north by New Close Road and to the east by the A415 trunk road and by an open green field site to the west and south by an Allotment site.

2.3 The site has three distinct tree groups; these are located to the boundaries of the site. The northern group is formed by large mature and over mature horse chestnut trees that formally lined the sides of an old track. To the east, a line of tall unmanaged Leyland cypress trees, and a roadside line of broadleaved shrubs and trees form a close grown group. These most likely intended to be an external boundary hedge, however are now beyond that type of management. Finally a line of field maple are located to part of the southern boundary, they form part of a now unmanaged hedgerow on a raised bank.

2.4 The line of cypress trees that has been planted as hedges/screens are of general poor form and condition and have little arboricultural merit.

2.5 The site has been disturbed and has a derelict appearance. Recently the felling of a area of self set sycamore trees was noted to the northern section of the site, only stumps remain of these trees.

2.6 A check was made with West Oxfordshire District Council and the site is not within a Conservation Area, but there is a Tree Preservation Orders affecting trees adjacent to the site. This order has a reference number TPO2/95 Land adj. Ducklington Service Station and is managed by the Council. When viewing the information the Order covers 15 individual trees forming the northern site boundaries, This relates to T3 to T7 and G6 covered in the survey these all lie outside the ownership of Lidl UK GmbH.
3 TREE QUALITY ASSESSMENT

Retention Values

3.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (Figure 01.01) shows tree positions, numbers and retention categories. Trees have been recorded as individuals and as groups.

3.2 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).

3.3 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.

3.4 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.

3.5 Category A trees are those that have been assessed as being of a high quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Green on the Tree Constraints Plan.

3.6 Category B trees are those that have been assessed as being of a moderate quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Blue on the Tree Constraints Plan.

3.7 Category C trees are those that have been assessed as being of a low quality and value; the loss of these specimens should not be considered as a constraint to development. These trees are shown in Grey on the Tree Constraints Plan.

3.8 Category U trees are those that have been assessed as 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.

3.9 A total of seven individuals trees recorded during the survey. Of the individual trees, one was Category U, two were Category B and four Category C.

3.10 There were six groups recorded during the survey. Most were considered to be of low retention quality. Four were recorded as being C category and two as category B.

Physiological Condition

3.11 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.

3.12 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 as a result of development as well as those in the good condition class.

3.13 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.

3.14 Two individual trees were considered to be of a poor, four fair and one good physiological condition.

Structural Condition

3.15 The trees had variations in their structural condition but these were largely consistent with expectations for the age, management and species of the tree.

3.16 The majority of structural defects that were noted across most of the tree stock on the site, such as minor deadwood in tree crowns, were not considered significant and are unlikely to result in the premature failure of trees’ main stem. However, it should be noted that some of the trees surveyed adjacent to the site are in extremely poor condition and have suffered from major limb failures in recent time. The extent of ivy on these trees made structural assessments extremely difficult, but large failed limbs were noted at the base of some trees. T3 is of particular concern and the owners responsible for the tree should be informed of its poor condition so appropriate action can be taken to remove the current hazards posed by the tree.

3.17 The close spacing and multi stemmed form of the field maple has made the structural assessment difficult, particularly the dense and overgrown vegetation found around the bases of the trees. Further surveys of these trees are recommended to provide a better overview of their structural integrity and appropriate management could then be recommended.

3.18 Ivy and adjacent dense scrub did restrict some of the structural inspections and management of these landscape elements is recommended to allow for more comprehensive inspections and management.

Age Class Distribution

3.19 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.

3.20 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.

3.21 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.

3.22 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.

3.23 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.

3.24 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.

3.25 The majority of the individual trees surveyed were considered to be of mature/over mature age class for their species and location. These trees will generally not respond as well to changes in their growing environment that may occur as a result of development, but is dependent on vigour and condition.

Species Distribution

3.26 The species recorded during the survey are listed in Appendix 4 of this report.
4 DEMOLITION/CONSTRUCTION REQUIREMENTS

4.1 The re-development of the site at New Close Road, Witney will require the removal of the existing hard surfaces within the site. These surfaces are generally away from retained trees and no special tree protection is foreseen during this part of the development outside of creating exclusion zones based on existing hard surfacing.

4.2 It is intended to carry out the re-development throughout the site, providing a new retail store and associated parking and infrastructure.

4.3 Access will be required for equipment to:

- Remove and break out of redundant hard surfacing
- Construct the access road layout and close of other point of access
- Install up graded services and facilities
- Foundation construction will be required
- Erect scaffolding
- Construct the new car parking layout
- Install boundary structures
- Develop new landscape features

4.4 The construction process will need to be monitored during its progress and this Arboricultural Method Statement should be used as the document provided to guide the demolition and construction process.

4.5 During the development of the site tree protection will need to be considered and this will form part of this Arboricultural Method Statement. Some tree pruning may be require for access to install tree protection fencing and these, if required, should be provided following assessment by the site manager before any works are undertaken. All tree works should be completed prior to start of construction work.

4.6 The following sections detail the below and above ground constraints concerning trees that will be encountered during the development.
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 Trees in many urban areas are limited by the harsh conditions that the tree finds itself in. They are woodland species that find themselves severely limited in some urban situations. The older trees within the site have been able to establish themselves and have achieved what should be considered a maximum size for their species and location.

5.3 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.

5.4 Although the Root Protection Areas of the trees extend into hard surfaces and under built structures within the site it is clear that little of the root mass that is needed to sustain the trees is located in these areas. The majority of roots are found in 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.

5.5 All activities that could directly affect the roots to the trees within the site have been considered and the works to achieve the proposed development considered. Construction method statements should be fully specified before any works adjacent to tree is carried out. Where they are likely to be adjacent to the rootable area supervision by a qualified arboriculturalist 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.

5.6 The proposed services margin drawings were not available and will need to be considered as this may have some impacts on retained trees. Existing services will already be provided for the existing site but these will need upgrading under the proposed scheme. Due to the position of the trees currently found on the site it is clear that the service provision can be designed away from retained 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 in a site development. 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. The trees assessed as part of this application will be discussed below and their above ground constraints identified.

6.2 The trees material to the planning application are located almost exclusive to the boundary and certainly the current layout shows retained trees away from built structures and the majority of hard surfacing.

6.3 The access point off New Close Road has a group of mature horse chestnut trees adjacent and these are unlikely to need crown pruning during the construction period to allow for high sided vehicle access. The new access point is shown on the Tree Protection Plan (Figure 02.01).

6.4 It maybe that a few trees will require crown pruning to allow the erection of tree protection fencing. If pruning is required to erect the fencing this should be carried out with the agreement of the site manager and arboricultural specialist. The pruning requirement may also be used to allow access for site vehicles and works equipment to be used adjacent to tree protection fencing and ensure no physical damage to the crowns of each tree occurs whilst the construction works are being carried out.

6.5 All crown pruning works should 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 provide a natural appearance within the crown and should not be to leave a 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 a 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 ANALYSIS OF CONSTRAINTS

7.1 The constraints that have been identified above are the ones that apply to the trees found at the site at New Close Road, Witney, Oxfordshire.

7.2 The above ground constraints will require professional arboricultural management and specification. Crown lifting and pruning may be required to accommodate some of the tree protection fencing and possible vehicle access. Beyond the construction period a programme of regular tree work to reduce the deadwood and control the crown extents will provide adequate management in the future. It would also allow the trees to have their crowns and main stems inspected by the arborist, which would identify structural issues early and reduce the likelihood of major crown failures.

7.3 The below ground constraints will be offset by site management during construction. Respect to the current RPA’s within the designed layout and supervision through the construction periods will enable all arboricultural impacts to be fully considered.

7.4 The section below sets out the impacts to retained tree and details the recommended control measures to ensure the works to develop the site under the current design layout are achieved with minimal impact on the trees.
8  ARBORICULTURAL IMPACT ASSESSMENT - WORKS

Introduction

8.1 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.

8.2 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.

8.3 Development has the potential to impact upon the above ground and below ground parts of trees.

8.4 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.

8.5 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.

8.6 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.

8.7 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.

8.8 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

8.9 The proposed development to the site is the construction of a new retail store and associated parking and infrastructure, including hard and soft landscaping.

Tree Removal

8.10 One tree (T3) was identified on the Tree Constraints Plan as having no retention value during the survey of the site; it was therefore classified within the remove (U) category in accordance with BS5837:2012.

8.11 These types of tree are those likely to die or become dangerous within a period of ten years irrespective of any development proposal. As such they were not considered to be a material consideration in the planning process. Therefore its removal is a matter of good husbandry. This tree is off site and should be reported to the land owner responsible.
8.12 In total two individual trees (T1 and T2) and three tree groups (G1, G3 and G5) have been recommended as requiring removal. All the tree groups and one of the individual trees were categorised as C when considered using Table 1 of BS5837:2012 the remaining tree was categorised as B. A section of shrubs and hedges have also been identified for removal, shown on the Tree Protection Plan.

8.13 Whilst the loss of these trees is unfortunate they will be compensated by landscape planting throughout the site providing greater species diversity and improving the species diversity.

8.14 The removal of G1 will reveal the shrub planting to the eastern boundary that has up to now been suppressed and will be of poor form. The removal of G1 will allow for the group G2 to be formed into a boundary hedge feature by either coppicing, crown pruning or if appropriate laying. This will need to be undertaken with the agreement of the landowner.

Arboricultural Implications

8.15 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

8.16 Root Protection Areas for each tree surveyed have been determined in accordance with BS5837:2012 Section 4.6 Root protection area (RPA) in the Standard and a schedule of Root Protection Areas is attached to this report as Table 2.

8.17 Initial Root Protection Areas for the trees were plotted onto the Tree Constraints Plan - (Figure 01.01) and has been used to produce all relevant tree plans in this statement.

8.18 It has been noted that some areas of hard surface are located within the RPA of trees and where this will be require they should be installed in accordance with no-dig principles. A methodology for new hard surface construction in proximity to trees will be provided form the manufacturer including details of installation and site preparation. This will be approved by the Local Authority Tree Officer prior to commencement on site. A guide to the hard surface removal and installation process can be found in Appendix 7 of this statement.

8.19 Some trees have small sections of their estimated RPA’s (G4) within the building footprint. Ideally these areas should be assessed by the use of trial pits to fully understand the significance of the impacts of the proposed construction works. Protection of the ground within these areas will be required during the construction phase as there is likely to be a requirement for scaffolding, etc.

Existing Canopy Spreads

8.20 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.

8.21 To minimise the potential for harm to occur to retained vegetation a Construction Exclusion Zone (CEZ) will be created, by the erection of protective fencing as detailed on the Tree Protection Plans.

8.22 It is clear that the canopies of G4 may require some pruning away from the proposed building and this work should follow the specification contained in this report.
**Level Changes**

8.23 The effect of level changes across the site will need to be assessed prior to the start of any works. This will prevent harm occurring to retained trees due to level changes. When this occurs within the Construction Exclusion Zone (CEZ) works should be identified and discussed with the Local Authority Tree Officer prior to commencement.

8.24 At this time no such changes would appear to being proposed.

**Building Foundations**

8.25 Any structures built on the site should comply with the foundation depths for buildings near or adjacent to trees and allow for the potential size of the trees at maturity. The soil types throughout the site will need investigating and appropriate measures taken.

8.26 Appropriate foundation designs should be adopted.

8.27 If trees are removed across the site the potential for soil heave should be assessed and foundations designed accordingly. (NHBC Chapter 4.2, 2007)

**Service Runs**

8.28 All service runs, utilities and similar infrastructure should take note of trees and allow for working methods that will minimise damage to trees by referring to documents such as NJUG Volume 4 - Guidelines for the planning, installation and maintenance of utility services in proximity to trees. (National Joint Utilities Group 2007).

8.29 Due to the nature of the site and layout no such issues are envisaged.
9 PRE DEVELOPMENT WORKS – CONSTRUCTION PHASE

Tree Removal

9.1 Two individual trees and three tree groups will require removal due to the impacts construction of the proposed development. These removals are shown on the Tree Protection Plan (Figure 02.01).

9.2 An arborist will be present on site during the site clearances to ensure that they comply with the approved works.

Predevelopment Tree Pruning Works

9.3 Any specified tree pruning works should be undertaken prior to commencement of the proposed development.

Standard of Work

9.4 All tree works should be carried out in accordance with BS3998:2010 Tree Work - Recommendations and latest arboricultural best practice.

9.5 All tree work should be carried out by suitably qualified, competent and insured arboricultural contractors.

9.6 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

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

9.8 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

9.9 All tree protection fencing should be erected to its final position during the pre-development periods of construction. Protective fencing shall be erected as shown on the Tree Protection Plan (Figures 02.01). To ensure successful tree protection during this process all operatives should be briefed on the need to pay regard the existing trees and all operations adjacent to trees be properly supervised. This will ensure the works will not affect adversely the trees.

9.10 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.

9.11 Copies of the Tree Protection Plans shall be placed in the site office for reference by all site staff.

9.12 The protective fencing barrier is to be constructed in accordance with the specification detailed at Appendix 5.
9.13 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 6. Signs must be replaced as necessary should they be removed or become illegible.

9.14 Following erection of the protective fencing and prior to commencement of the development it is recommended that an inspection of the site, by either the Council's Tree Officer or the Arboricultural Consultant, is arranged to confirm fencing has been installed in accordance with the Tree Protection Plan and any relevant conditions that may be attached to a grant of planning consent for the development.
10 CONSTRUCTION WORKS

**Construction Exclusion Zone**

10.1 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.

10.2 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.

10.3 Furthermore vehicular or pedestrian access and the storage of any materials is prohibited within the Construction Exclusion Zone.

10.4 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 tree’s crown.

**Tree Protection Barriers**

10.5 See sections 9.10 to 9.14 above.

**Site Compounds and Materials Stores**

10.6 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.

10.7 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.

10.8 The offices, parking of site and contractor vehicles, along with secure storage will be provided in various areas away from retained trees and these areas 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**

10.9 Following erection of the protective fencing and prior to commencement of the construction phase an inspection of the site, by either the Council’s Tree Officer or the Arboricultural Consultant, should be arranged to confirm fencing has been installed in accordance with the Tree Protection Plan (Figure 02.01) and any relevant conditions that may be attached to a grant of planning consent for the development.

10.10 Further monitoring visits shall be carried out following implementation of the works on site, ideally on at least a monthly basis.

10.11 It is envisaged that following a period of four successive inspections finding no non compliances that the frequency of inspections can be reduced to a bi-monthly basis.
Reporting

10.12 The Client Site Manager will be responsible for providing copies of the tree protection inspection reports to the Council if required and for notifying the Council of any issues with the trees should they occur.

10.13 During the construction phase of the development the Site Manager will be responsible for liaising with the Council Tree Officer on all arboricultural issues.

10.14 Should any arboricultural issues become apparent during the works the site manager should immediately contact the appointed Arboricultural Consultant or the Council's Tree Officer for advice upon how to proceed.
11 CONCLUSIONS

11.1 A tree survey and arboricultural assessment has been carried out at the site located on land off New Close Road, Witney, Oxfordshire, to consider the impacts of the proposed construction of a new Lidl store.

11.2 During the survey some as trees on the northern boundary were assessed as having structural issues and these trees should be reported to the land owner so that they can take appropriate actions to remove any hazards that they pose.

11.3 Two individual trees and three tree groups will require removal due to the impacts construction of the proposed development. These removals are shown on the Tree Protection Plan (Figure 02.01). The loss of these trees will be mitigated by additional tree planting as part of the Landscape Plan for the development.

11.4 The removal of G1 will reveal the shrub planting to the eastern boundary that has up to now been suppressed and will be of poor form. The removal of G1 will allow for the group G2 to be formed into a boundary hedge feature by either coppicing, crown pruning or if appropriate laying. This will need to be undertaken with the agreement of the landowner.

11.5 A Tree Protection Plan (figure 02.01) has been produced to provide guidance on the protection of trees during the development and to indicate where tree protection fencing should be located to protect the retained trees and to create construction exclusion zones.

11.6 Guidelines contained within BS5837:2012 Trees in Relation to Design, Demolition and Construction should be followed when dealing with trees in these situations. Working methods and specifications should be followed to limit potential damage to trees throughout the works proposed.

11.7 If any arboricultural issues relating from works being carried out occurs, then they should be reported to the main contractor immediately.
# Table 1: Tree Survey Data

## Key to Inspection Report Form

<table>
<thead>
<tr>
<th>Species</th>
<th>Genus and variety</th>
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<tbody>
<tr>
<td>Height</td>
<td>Measured Clinometer Reading or Estimated Height in Metres</td>
</tr>
<tr>
<td>Girth (dbh @ 1.5m)</td>
<td>Diameter measured in cms, or estimated, Where multi stemmed below 1.5m the diameter is taken as that just above the root flare</td>
</tr>
<tr>
<td>Spread (m)</td>
<td>Canopy height estimated in metres above ground level</td>
</tr>
<tr>
<td>Canopy height (m)</td>
<td>Crown Spread, radius estimated in metres</td>
</tr>
<tr>
<td>Physiological Condition</td>
<td>Good, Fair, Poor, Dead</td>
</tr>
<tr>
<td>Age Class</td>
<td>Y – Young</td>
</tr>
<tr>
<td>Useful Life Expectancy (years)</td>
<td>10, 10-20, 20-40, 40+</td>
</tr>
<tr>
<td>BS Categorization</td>
<td>See Cascade Appendices 2</td>
</tr>
<tr>
<td>Tree No.</td>
<td>Species</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Acer campestre</td>
</tr>
<tr>
<td>2</td>
<td>Acer campestre</td>
</tr>
<tr>
<td>3</td>
<td>Aesculus hippocastanum</td>
</tr>
<tr>
<td>4</td>
<td>Aesculus hippocastanum</td>
</tr>
<tr>
<td>5</td>
<td>Aesculus hippocastanum</td>
</tr>
</tbody>
</table>

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied
<table>
<thead>
<tr>
<th>Tree No.</th>
<th>Species</th>
<th>Diameter (mm)*</th>
<th>Height</th>
<th>Crown Spread N</th>
<th>S</th>
<th>E</th>
<th>W</th>
<th>Crown Height above Ground</th>
<th>First Major Branch Direction</th>
<th>Branch Height above Ground</th>
<th>Age Class</th>
<th>Vigour</th>
<th>Life Expectancy</th>
<th>Structural Condition/Comments</th>
<th>BS5837 Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Aesculus hippocastanum</td>
<td>800</td>
<td>18</td>
<td>6.0</td>
<td>1.0</td>
<td>4.0</td>
<td>1.0</td>
<td>1.0</td>
<td>East</td>
<td>3.0</td>
<td>M</td>
<td>Poor</td>
<td>10-20</td>
<td>Asymmetric formed crown. Heavily suppressed crown. Deadwood in the crown of moderate extent. Previous branch failures noted. Restricted inspection due to ivy.</td>
<td>C2</td>
</tr>
<tr>
<td>7</td>
<td>Aesculus hippocastanum</td>
<td>900</td>
<td>20</td>
<td>8.0</td>
<td>6.0</td>
<td>5.0</td>
<td>7.0</td>
<td>0.5</td>
<td>NW</td>
<td>1.5</td>
<td>M</td>
<td>Fair</td>
<td>20-40</td>
<td>Deadwood in the crown of moderate extent. Restricted inspection due to ivy.</td>
<td>B2</td>
</tr>
</tbody>
</table>

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied
<table>
<thead>
<tr>
<th>Group No.</th>
<th>Species</th>
<th>Min/Max Diameter (cm)*</th>
<th>Average Height (m)</th>
<th>Average Crown Spread</th>
<th>Ave. Crown Height</th>
<th>Age Class</th>
<th>Vigour</th>
<th>Life Expectancy</th>
<th>Structural Condition/Comments</th>
<th>BS5837 Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>x Cupressocyparis leylandii</td>
<td>30 50</td>
<td>15</td>
<td>5</td>
<td>0</td>
<td>EM</td>
<td>Fair</td>
<td>10-20</td>
<td>Included stem unions present. Deadwood present of minor extent, Included bark at branch unions, Cypress screen planting, allowed to grow current size.</td>
<td>C2</td>
</tr>
<tr>
<td>G2</td>
<td>Crataegus monogyna</td>
<td>10 20</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>M</td>
<td>Fair</td>
<td>10-20</td>
<td>Heavily suppressed form. Deadwood present of minor extent, Restricted inspection due to vegetation.</td>
<td>C2</td>
</tr>
<tr>
<td></td>
<td>Acer campestre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Planted as boundary. Hedge allowed to grow to current size.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prunus spinosa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>Prunus spinosa</td>
<td>10 15</td>
<td>10</td>
<td>2.5</td>
<td>0.5</td>
<td>EM</td>
<td>Good</td>
<td>20-40</td>
<td>Included stem unions present. Deadwood present of minor extent, Restricted inspection due to no access. Dense overgrown mass of stems, tent in centre.</td>
<td>C2</td>
</tr>
<tr>
<td></td>
<td>Acer pseudoplatanus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crataegus monogyna</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Acer campestre</td>
<td>30 60</td>
<td>15</td>
<td>5</td>
<td>0.5</td>
<td>OM</td>
<td>Fair</td>
<td>20-40</td>
<td>Deadwood present of moderate extent, Pruning wounds present. Restricted inspection due to vegetation. Ivy on stems and crown, estimated values due to traveller camp and access.</td>
<td>B2</td>
</tr>
</tbody>
</table>

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied
<table>
<thead>
<tr>
<th>Group No.</th>
<th>Species</th>
<th>Min/Max Diameter (cm)*</th>
<th>Average Height (m)</th>
<th>Average Crown Spread</th>
<th>Ave. Crown Height</th>
<th>Age Class</th>
<th>Vigour</th>
<th>Life Expectancy</th>
<th>Structural Condition/Comments</th>
</tr>
</thead>
</table>
| G5       | Acer pseudoplatanus     | 10                     | 20                 | 7                    | 3.5               | 1         | SM     | Fair            | 40+  
Tree not plotted on topographical survey. Restricted inspection due to vegetation.  
Group of self set trees.                                                                 |
| G6       | Aesculus hippocastanum  | 70                     | 90                 | 18                   | 6                 | 1         | M      | Fair            | 20-40  
Epicormic growth on crown. Asymmetrical formed crowns. Deadwood present of moderate extent, Previous branch failure, Restricted inspection due to ivy.  
Single ash roadside leaning towards road.  |
|          | Fraxinus excelsior      |                        |                    |                      |                   |           |        |                 |                                                                                                 |

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied
### Table 1: Woody Scrub / Individual / Hedge Areas

<table>
<thead>
<tr>
<th>Section No.</th>
<th>Species</th>
<th>Height (m)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Crataegus monogyna</td>
<td>5.5</td>
<td>Unmanaged scrub.</td>
</tr>
<tr>
<td></td>
<td>Prunus spinosa</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Root Protection Areas
<table>
<thead>
<tr>
<th>Tree No.</th>
<th>Species</th>
<th>BS5837 Category</th>
<th>RPA Radius (m)</th>
<th>RPA Area (m²)</th>
<th>RPA Square Side Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acer campestre</td>
<td>B2</td>
<td>6</td>
<td>113.1</td>
<td>10.6</td>
</tr>
<tr>
<td>2</td>
<td>Acer campestre</td>
<td>C1</td>
<td>4.2</td>
<td>55.4</td>
<td>7.4</td>
</tr>
<tr>
<td>4</td>
<td>Aesculus hippocastanum</td>
<td>C2</td>
<td>8.52</td>
<td>228</td>
<td>15.1</td>
</tr>
<tr>
<td>5</td>
<td>Aesculus hippocastanum</td>
<td>C2</td>
<td>10.2</td>
<td>326.9</td>
<td>18.1</td>
</tr>
<tr>
<td>6</td>
<td>Aesculus hippocastanum</td>
<td>C2</td>
<td>9.6</td>
<td>289.5</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>Aesculus hippocastanum</td>
<td>B2</td>
<td>10.8</td>
<td>366.4</td>
<td>19.1</td>
</tr>
<tr>
<td>Tree No.</td>
<td>Species</td>
<td>BS5837 Category</td>
<td>RPA Radius (m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------</td>
<td>-----------------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>x Cupressocyparis leylandii</td>
<td>C2</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Crataegus monogyna</td>
<td>C2</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acer campestre</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prunus spinosa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>Prunus spinosa</td>
<td>C2</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acer pseudoplatanus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crataegus monogyna</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Acer campestre</td>
<td>B2</td>
<td>7.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Acer pseudoplatanus</td>
<td>C2</td>
<td>2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G6</td>
<td>Aesculus hippocastanum</td>
<td>B2</td>
<td>10.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fraxinus excelsior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 1: Tree Constraints Plan
Figure 2: Tree Protection Plan
APPENDIX

Appendix 1 - 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 - Overmature: Trees considered to be 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 reflect 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 3 of this report.
Appendix 2 - The Tree Constraints Plan

4.1 The Tree Constraints Plan (Figure 1) 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.

4.2 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.

4.3 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

4.4 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.

4.5 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.

4.6 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.

4.7 An example of a polygonal RPA, considered appropriate due to the presence of a building in close proximity to a tree, is shown below.
4.8 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**

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

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

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

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

**Future Tree Growth**

4.13 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 arboriculturalist 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 circumstances 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.
4.22 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.

4.23 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**

4.24 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.

4.25 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 3 - BS5837 Cascade Chart for Tree Quality Assessment
# Table 1  Cascade chart for tree quality assessment

<table>
<thead>
<tr>
<th>Category and definition</th>
<th>Criteria (including subcategories where appropriate)</th>
<th>Identification on plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trees unsuitable for retention</strong> (see Note)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category U</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 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)</td>
<td></td>
<td>Dark Red</td>
</tr>
<tr>
<td>□ Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 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</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NOTE</strong> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trees to be considered for retention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Category A</strong></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>Light Green</td>
</tr>
<tr>
<td>Trees of high quality with an estimated remaining life expectancy of at least 40 years</td>
<td>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features</td>
<td></td>
</tr>
<tr>
<td><strong>Category B</strong></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>Mid Blue</td>
</tr>
<tr>
<td>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</td>
<td>Trees with material conservation or other cultural value</td>
<td></td>
</tr>
<tr>
<td></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>Grey</td>
</tr>
<tr>
<td><strong>Category C</strong></td>
<td>Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories</td>
<td></td>
</tr>
<tr>
<td>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>Trees with no material conservation or other cultural value</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX

### Appendix 4 - Botanical and Common Names of Trees on Site

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acer campestre</em></td>
<td>Field Maple</td>
</tr>
<tr>
<td><em>Acer pseudoplatanus</em></td>
<td>Sycamore</td>
</tr>
<tr>
<td><em>Aesculus hippocastanum</em></td>
<td>Horse Chestnut</td>
</tr>
<tr>
<td><em>Crataegus monogyna</em></td>
<td>Hawthorn</td>
</tr>
<tr>
<td><em>Fraxinus excelsior</em></td>
<td>Ash</td>
</tr>
<tr>
<td><em>Prunus spinosa</em></td>
<td>Blackthorn</td>
</tr>
<tr>
<td><em>X Cupressocyparis Leylandii</em></td>
<td>Leyland Cypress</td>
</tr>
</tbody>
</table>
APPENDIX

Appendix 5 - 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 trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.

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

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

All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile, or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.
Suggested Barrier Specification (as per BS5837: 2012)

Figure 1

Figure 2  Default specification for protective barrier

Key
1  Standard scaffold poles
2  Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3  Panels secured to uprights and cross-members with wire ties
4  Ground level
5  Uprights driven into the ground until secure (minimum depth 0.6 m)
6  Standard scaffold clamps
Figure 3  Examples of above-ground stabilizing systems

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray
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Appendix 6 – Construction Exclusion Signage - Example
PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.

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 7 - Hard Surface Installation Methodology

The following methodology sets out the requirements and stages in construction of new hard surfaces in relation to existing trees.

This methodology is not meant to be considered as a specification and whilst examples of products that meet the arboricultural requirements for the installation of hard surfacing adjacent to trees are given the final construction detail must be designed by a suitably qualified and experienced engineer, whilst ensuring the arboricultural requirements are met, to ensure that the finished surface is fit for purpose.

In this respect it should be noted that Geosynthetics Limited, who supply cellular confinement systems, offer a design service to develop site specific solutions.

Arboricultural Requirements

Wherever it is intended to undertake demolition or construction operations within the Root Protection Areas of trees precautions must be taken to maintain the condition and health of trees root systems.

In particular:

- Works shall be conducted in such a manner as to prevent physical damage to roots during demolition or construction, such as soil compaction or root severance.
- Provision for water and oxygen to reach the roots must be made and the soil structure must not be disturbed.
- Provision must be made for future root growth and precautions taken to ensure that such root growth does not cause unacceptable levels of damage to the finished construction.
- The soil must not be compacted and soil bulk density must be maintained at suitable levels for tree root growth and function. In this respect a soil bulk density of over 1.8g/cm$^3$ will impede root growth and function.

To achieve the above requirements for tree root growth and function the surface shall be designed so that:

- No excavation is required for their installation; to ensure that physical root damage does not occur.
- The surface can be installed without compaction of the existing soils; thus ensuring damage to the soil structure does not occur.
- The surface is permeable; thus ensuring that oxygen and water can reach the root system and that CO$_2$ can diffuse vertically out of the soil as high concentrations can cause root suffocation.

There are various methods of creating such a surface however one that is commonly in use and is therefore recommended here is the use of a three dimensional cellular confinement system to provide for load suspension above the existing soil grade and reducing vertical loads on the underlying soils. One such product is CellWeb produced by Geosynthetics.
Prior to installation of any new surfacing the following factors shall be considered:

- The exact location of the area to receive the special surfacing shall be determined.
- The area should be investigated to identify any existing services.
- The area shall be fenced off with tree protection fencing until installation of the special surfacing is to take place. Such installation should generally be phased to occur following substantial completion of the development.
- The final surface shall be decided upon, the surface must be permeable and several options for final surfacing are considered in the following section.

**Methodology for Surface Installation**

Prior to the installation of the new surface, existing ground cover and surface vegetation should be killed using an appropriate herbicide.

Specialist advice should be sought in order to determine the most appropriate herbicide to use due to the potential for leaching through soils and the potential impacts that this will have on retained vegetation.

As an alternative or addition to herbicide treatment the existing surface vegetation may be carefully removed by using hand tools.

All dead organic matter is to be removed by hand following herbicide treatment to prevent anaerobic conditions, as a result of the decomposition of dead vegetation, occurring.

All major protrusions such as rocks shall be removed by hand and all tree or shrub stumps from removed vegetation shall be ground out to minimise ground disturbance.

The soil surface must not be skimmed or stripped to achieve a level surface and where necessary major hollows shall be filled using a granular fill, such as no-fines gravel, washed aggregate or cobbles, to achieve a level surface.

In some cases it may be appropriate to consider the removal of the top layers of soil by non mechanical means to achieve desired levels, establish rooting patterns and potentially provide for some embedding of the new surfacing into the existing ground level. Such works shall be completed using pneumatic soil excavation techniques and the works must be supervised by an Arboricultural consultant. The need for such works to occur shall be considered during the detailed design of the surface.

Following surface preparation the soil shall be covered by a permeable geotextile to prevent the cellular confinement fill from migrating into the existing soils.

The geotextile layer shall be laid with overlaps of 300mm beyond the edge of the proposed construction and shall be temporarily retained with pins, stakes or weights.

The cellular confinement system shall then be installed and fixed in position in accordance with the manufacturer’s recommendations.
The cellular confinement system shall then be filled with the specified aggregate in accordance with the manufacturer’s recommendations. All works involved in the filling of the system with aggregate must be completed by hand and be supervised by the site supervisor.

The infill aggregate shall then be rolled or whacked to ensure cohesion of the granular fill with the cellular confinement system.

The desired finished surface shall then be installed. This shall be permeable and gas porous. Options for the type of finished surface are:

- **Washed gravel** – This retains porosity unless excessively consolidated and will be particularly useful where the final surface is not level. However, it may not be suitable in areas with high pedestrian and vehicular passage. If gravel is used, this shall be distributed in a 75mm layer over the exposed infill aggregate.

- **Paving slabs / brick paviours** – These shall be laid dry jointed on a bed of sharp sand to allow air and moisture to permeate. Specialist slabs and paviours with inbuilt infiltration holes may be used.

- **Tarmacadam** – This shall not be used where it will cover over 20% of a tree’s Root Protection Area.

Following completion of the hard surface protective fencing shall be erected around the trees until the completion of development.
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Appendix 8 - Arboricultural Glossary

**Abiotic Factors** - Nonliving 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.

**Arboriculturalist** – 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 arboriculturalist, 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 m²), identified by an arboriculturalist, to be protected by development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

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

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

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

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

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

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

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

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

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

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

Hanger – Term used to describe a branch that has become detached and is being supported by other branches. Can be a hazard to persons and property below.
**Hazard Beam** – After the loss of a distal part, a limb concentrates growth upwards creating adverse end weights that can render the limb susceptible to failure.

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

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

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

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

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

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

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

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

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

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

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

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

**Saprophyte** – An organism which exists on dead plant material.

**Scaffold branches** - The main structural branches within the crown.

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

**Shrinkable clay** – Clay soil which alters in volume depending on moisture content. Property sited on shrinkable clay can suffer subsidence damage due to soil desiccation; this can be due to the water uptake of nearby vegetation, including trees.
**Special engineering** – design of a structure with the physiological requirements of trees as the priority.

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

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

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

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

**Tree protection plan** – scale drawing prepared by an arboriculturalist 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).

**Whip** – Size of tree for planting, usually ranging from 1m to 1.75m in height.