Landmark Trees

ARBORICULTURAL IMPACT ASSESSMENT REPORT:

Proposed Lidl Store

Former Hayes Swimming Pool Site

Botwell Lane

Hayes

Middlesex

REPORT PREPARED FOR:

Lidl UK

London North Property Office

4-14 Blackbird Hill

Wembley

London NW9 8SD

REPORT PREPARED BY

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MSc ARB MICFor FArbor A MRICS C Env

Ref: LUK/BLH/AIA/01d

Date: 23rd July 2014

APPENDICES

Caveats

This report is primarily an arboricultural report. Whilst comments relating to matters involving built structures or soil data may appear, any opinion thus expressed should be viewed as qualified, and confirmation from an appropriately qualified professional sought. Such points are usually clearly identified within the body of the report. It is not a full safety survey or subsidence risk assessment survey. These services can be provided but a further fee would be payable. Where matters of tree condition with a safety implication are noted during a survey they will of course appear in the report.

A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

Tree works recommendations are found in the Appendices to this report. It is assumed, unless otherwise stated ("ASAP" or "Option to") that all husbandry recommendations will be carried out within 6 months of the report's first issue. Clearly, works required to facilitate development will not be required if the application is shelved or refused. However, necessary husbandry work should not be shelved with the application and should be brought to the attention of the person responsible, by the applicant, if different. Under the Occupiers Liability Act of 1957, the owner (or his agent) of a tree is charged with the due care of protecting persons and property from foreseeable damage and injury.' He is responsible for damage and/or nuisance arising from all parts of the tree, including roots and branches, regardless of the property on which they occur. He also has a duty under The Health and Safety at Work Act 1974 to provide a safe place of work, during construction. Tree works should only be carried out with local authority consent, where applicable.

Inherent in a tree survey is assessment of the risk associated with trees close to people and their property. Most human activities involve a degree of risk, such risks being commonly accepted if the associated benefits are perceived to be commensurate.

Risks associated with trees tend to increase with the age of the trees concerned, but so do many of the benefits. It will be appreciated, and deemed to be accepted by the client, that the formulation of recommendations for all management of trees will be guided by the cost-benefit analysis (in terms of amenity), of tree work that would remove all risk of tree related damage.

Prior to the commencement of any tree works, an ecological assessment of specific trees may be required to ascertain whether protected species (e.g. bats, badgers and invertebrates etc.) may be affected.

Tree Constraints & Protection Overview

Client:	Lidl UK	**Case Ref:**	LUK/BLH/AIA/01d
Local Authority:	LB Hillingdon	**Date:**	23/07/2014

Site Address: Proposed Lidl Store, Former Hayes Swimming Pool Site, Botwell Lane, Hayes, Middlesex

Proposal: Construction of a new neighbourhood food store along with a new access, 62 car parking spaces and associated landscaping.

Report Checklist	**Y/N**		**Y/N**
Arboricultural constraints on site	Y	Trees removal proposed	Y
Tree Survey	Y	Topographical Survey	Y
BS5837 Report	Y	Conservation Area	N
Tree Preservation Orders	N		
Tree Protection Plan:	N/a	(Include in future method statement)	
Tree Constraints Plan:	Y		
Arboricultural Impact Assessment:	Y		

Site Layout				
Site Visit	Y	Date: 09/10/13	Access Full/Partial/None	F
Trees on Site	Y		Off-site Trees	Y
Trees affected by development	Y		O/s trees affected by development	Y
Tree replacement proposed:	Y		On or off-site trees indirectly affected by development	N

Trees with the potential to be affected

Fell 6 trees for built development: T28 (category B); T21, T22, T23, T24 and T29 (category C).

Fell 1 tree for new access: T10

Also felling category U trees T26 & T27(hazardous) on grounds of good husbandry

All remaining primary impacts relate to new hardstanding/lowering of pavement to provide new access, removal of old hardstanding and lighting: low impacts to category A tree T20; potentially high impacts to category B trees T5, T7, T9 and T11; medium impacts to category B trees T3, T9, T13, T15 & T17, low impacts to T4, T6, & T32, very low impacts to T14 & T33; further very low impacts to category C trees T8 and 12.

Comments

Urgent recommendation to fell T27 (hazardous condition) and also to fell T26 as decayed/unsuitable for retention.

Recommendations		
1	Proposal will mean the loss of important trees (TPO/CA)	N/a
2	Proposal has sufficient amelioration for tree loss	Y
3	Proposals provide adequate tree protection measures	Y
4	Proposal will mean retained trees are too close to buildings	N
5	Specialist demolition / construction techniques required	Y
6	The Proposal will result in significant root damage to retained trees	N
7	Further investigation of tree condition recommended	Y

RPA= Root Protection Area
TPP= Tree Protection Plan
AMS= Arboricultural Method Statement
AIA = Arboricultural Implication Assessment
BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations'

1. SUMMARY

1.1 This report comprises an arboricultural impact assessment of the proposals for a Lidl Store on the former Hayes swimming pool site, Botwell Lane, Hayes, Middlesex, reviewing any conflicts between the proposals and material tree constraints identified in our survey.

1.2 There are 31 trees surveyed on or around the site, of which 2 are category A (High Quality), 18 are B category *(Moderate Quality), 8 are C category *(Low Quality), 1 is C/u category *(Low Quality/Unsuitable for Retention) and 2 are U category *(Unsuitable for Retention). In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate. In this instance, no such collective impact is proposed.

1.3 The principal primary impacts in the current proposals are the felling of 7 trees, comprising 2 category B trees (T10 and T28), 5 category C trees; 2 further category U trees are also to be felled under the proposals, although are already recommended for felling under good arboricultural practice, therefore the removal of these dead/poor quality trees should not be rated an impact. Subject to a replacement planting scheme, the overall loss of these trees is rated as a low impact, with no significant effect on the visual character of the local area. As part of this mitigation, two additional off-site trees will be provided, subject to local authority approval of siting.

1.4 All remaining primary impacts relate to new hardstanding/removal of old hardstanding and the new access, where mitigation is available to reduce the theoretical potential. The most significant impacts relate to the potentially high impacts to category B trees T9 and T11, resulting mainly from the removal/replacement of hard landscaping, combined with the lowering of the existing pavement to create the proposed access within the theoretical RPAs. With careful supervision and mitigation, these significant theoretical impacts can be mitigated; the lowering of the pavement should be undertaken with arboricultural supervision, allowing any significant roots to be pre-emptively pruned. All new surfaces should be porous to promote healthy soil water relations for future root growth. Other significant impacts relate to the removal/replacement of existing hard surfaces, with potentially high theoretical impacts to category B trees T5 and T7, in addition to medium impacts to T3, T13, T15 & T17 (see Table 1 and summary Table 2 below). These will require the careful removal of existing hard surfaces, with the use of no-dig construction either using the existing sub-base or with a construction technique such as 'Cellweb'. The remaining impacts are either low (T4, T6, T20 & T32) or very low impacts (T8, T12, T14, T16 & T33). These too can be mitigated further as above. Further impacts to retained trees comprise the potential need to crown-lift T11, T15, T32 and T33 to facilitate development.

1.5 In general, the proposals have low/very low impacts on the off-site street trees, with T4, T6, T8, T12, T14, T20, T32 and T33 noted above with very low/low impacts only. The proposed access has the potential to have significant cumulative impacts to the category B trees T9 and T11 by requiring the lowering of the existing surfaces, in addition to requiring the felling of T10. However, the construction of the access alone will affect 3.6 – 11.6 % of the theoretical RPAs of T9/T11, with the remaining cumulative impacts mitigated by no-dig construction with porous surfaces. The mitigated impact is therefore likely to be low/medium.

1.6 Details of the proposed lighting have been provided, with lampposts potentially located within the RPA's of T3, T4, T5, T9, T11 and T17. These will be positioned with trial pits excavated by hand, with pre-emptive root pruning under arboricultural supervision. Where a mass of significant roots are found within a pit, it will be relocated to minimise the potential impact.

1.6 Secondary impacts comprise minor organic deposition (including leaves/honey dew) on to cars and car parking spaces, with some shading. Given that car parking should be short term only, the impact should be minimal; some shading may be beneficial.

1.7 The site has potential for development without impacting significantly on the wider tree population or local landscape. Thus, with suitable mitigation and supervision the scheme is recommended to planning.

* British Standards Institute: Trees in relation to design, demolition and construction BS 5837: 2012 HMSO, London

2. INTRODUCTION

2.1 Terms of reference

2.1.1 LANDMARK TREES were asked by Lidl UK to provide a survey and an updated arboricultural impact assessment of proposals for the site: former Hayes swimming pool, Botwell Lane, Hayes, Middlesex. The report has been updated to include recent amendments to the access proposals and will accompany a planning application.

2.1.2 The proposals are for the construction of a new neighbourhood food store along with 62 car parking spaces and associated landscaping. This report will assess the impact on the trees and their constraints, identified in our survey. Although the proposals were known at the time of the survey, Landmark Trees endeavour to survey each site blind, working from a topographical survey, wherever possible, with the constraints plan informing their evolution.

2.1.3 I am a Registered Consultant and Fellow of the Arboricultural Association and a Chartered Forester, with a Masters Degree in Arboriculture and 25 years experience of the landscape industry - including the Forestry Commission and Agricultural Development and Advisory Service. I am a UK Registered Expert Witness, trained in single joint expert witness duties. I am also Chairman of the UK & I Regional Plant Appraisal Committee, inaugurated to promote international standards of valuation in arboriculture.

2.2 Drawings supplied

2.2.1 The drawings supplied by the client and relied upon by Landmark Trees in the formulation of our survey plans are:

Existing site survey: 03 Topographical Survey

Proposals: 3176 108K Site layout 1407

2.3 Scope of survey

2.3.1 As Landmark Trees' (LT) arboricultural consultant, I surveyed the trees on site on 9th October 2013, recording relevant qualitative data in order to assess both their suitability for retention and their constraints upon the site, in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations [BS5837:2012].

2.3.2 Our survey of the trees, the soils and any other factors, is of a preliminary nature. The trees were SURVEYED on the basis of the Visual Tree Assessment method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994). LT have not taken any samples for analysis and the trees were not climbed, but inspected from ground level.

2.3.3 A tree survey is generally considered invalid in planning terms after 2 years, but changes in tree condition may occur at any time, particularly after acute (e.g. storm events) or prolonged (e.g. drought) environmental stresses or injuries (e.g. root severance). Routine surveys at different times of the year and within two - three years of each other (subject to the incidence of the above stresses) are recommended for the health and safety management of trees remote from highways or busy access routes. Annual surveys are recommended for the latter.

2.3.4 The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

2.4 Survey data & report layout

2.4.1 Detailed records of individual trees are given in the survey schedule in Appendix 1 to this report.

2.4.2 A site plan identifying the surveyed trees, based on the client's drawings / topographical survey is provided in Appendix 5.

2.4.3 This plan also serves as the Tree Constraints Plan with the theoretical Recommended Protection Areas (RPA's), tree canopies and shade constraints, (from BS5837: 2012) overlain onto it. These constraints are then overlain in turn onto the client's proposals to create an Arboricultural Impact Assessment Plan in Appendix 6. General observations and discussion follow, below.

3.0 OBSERVATIONS

3.1 Site description

Photograph 1: Former Hayes Swimming Pool Site, Botwell Lane, Hayes, Middlesex

3.1.1	The site is located within the defined town centre boundary of Hayes. It is bordered to the south by Botwell Lane and Central Avenue to the east.
3.1.2	The site is relatively level.
3.1.3	In terms of the British Geological Survey, the site overlies the London Clay Formation, with superficial deposits of Langley Silt Member (see indicated location on Fig.1 plan extract below). The associated soils are generally, highly shrinkable clay; e.g. slowly permeable seasonally waterlogged fine silt over clay. Such highly plastic soils are prone to movement: subsidence and heave. The actual distribution of the soil series are not as clearly defined on the ground as on plan and there may be anomalies in the actual composition of clay, silt and sand content.
3.1.4	Clay soils are prone to compaction during development with damage to soil structure potentially having a serious impact on tree health. The design of foundations near problematic tree species will also need to take into consideration subsidence risk. Further advice from the relevant experts on the specific soil properties can be sought as necessary.

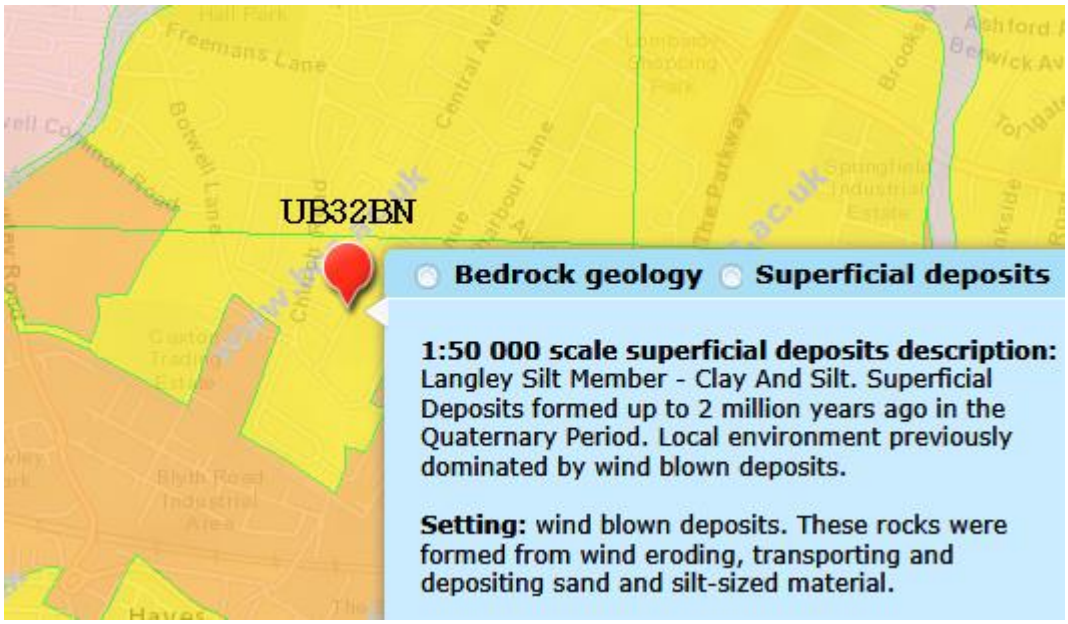

Figure 1: Extract from the BGS Geology of Britain Viewer

3.2 Subject trees

3.2.1	Of the 31 surveyed trees 2 are category A (High Quality), 18 are B category *(Moderate Quality), 8 are C category *(Low Quality), 1 is C/u category *(Low Quality/Unsuitable for Retention) and 2 are U category *(Unsuitable for Retention).
3.2.2	The tree species found on site comprise mainly London plane, with some oak, horse chestnut, field maple, silver and Himalayan birch, common ash, plum, wild cherry, whitebeam and lime.
3.2.3	In terms of age demographics there is a preponderance of mature trees on the site with few younger, early mature trees in the population.

3.2.4	Full details of the surveyed trees can be found in Appendix 1 of this report.
3.2.5	There are some arboricultural works required within the existing tree population. These are listed in Appendix 2. It is important to note that urgent works are required to T27, which is considered hazardous.

3.3 Planning Status

3.3.1	There are no Tree Preservation Orders and site stands outside any conservation areas: it is a criminal offence to prune, damage or fell TPO trees or trees in a conservation area without permission from the local authority.

4.0 DEVELOPMENT CONSTRAINTS

4.1 Primary constraints

4.1.1 BS5837: 2012 gives Recommended Protection Areas (RPA's) for any given tree size. The individual RPA's are calculated in the Tree Schedule in Appendix 1 to this report, or rather the notional radius of that RPA, based on a circular protection zone. The prescribed radius is 12-x stem diameter at 1.5m above ground level, except where composite formulae are used in the case of multi-stemmed trees.

4.1.2 Circular RPA's are appropriate for individual specimen trees grown freely, but where there is ground disturbance, the morphology of the RPA can be modified to an alternative polygon, as shown in the diagram below (Figure 2). Alternatively, one need principally remember that RPA's are area-based and not linear – notional rather than fixed entities. **No modifications have been made in this instance (please see overleaf).**

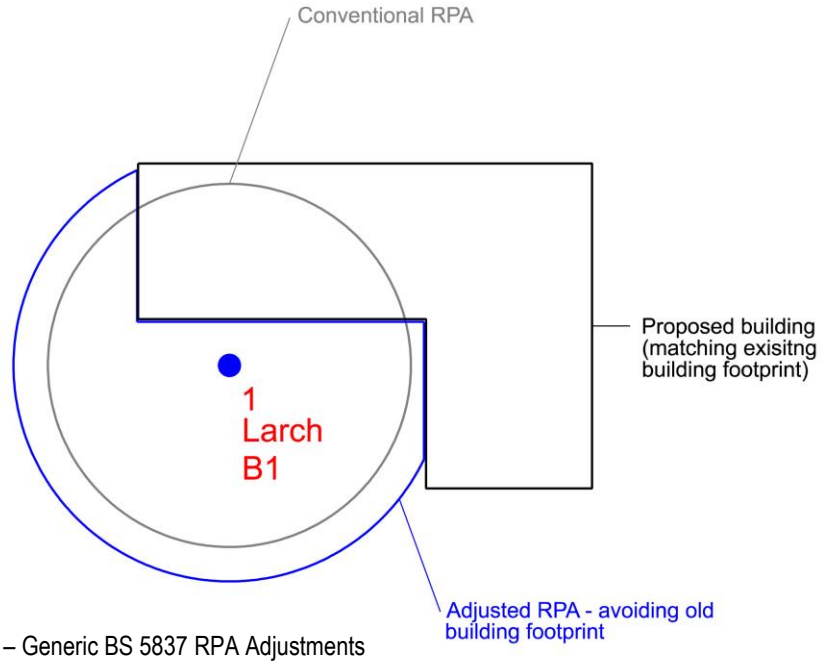

Figure 2 – Generic BS 5837 RPA Adjustments

4.1.3 In BS5837, paragraph 4.6.2 states that RPA's should reflect the morphology and disposition of the roots; where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution. Not infrequently, LT are requested by LPA Tree Officers to modify the RPA's to reflect their assumptions that e.g. a road will have drastically limited root growth.

4.1.4 Such assumptions cannot be proved without prior site investigations / trial pits. Where it is not always possible to conduct site investigations (e.g. below busy roads), we can always look to the published science. There seems little support for the popular myth that roads and services will curb root growth: research for the International Society of Arboriculture by Kopinga J (ISA 1994), found that "a constant high moisture content of the soil directly underneath the pavement surface can be considered as a major soil factor in attracting the trees' roots to develop there." By contrast, grass in lawns may actively antagonise tree roots with natural pathogens. Similarly, Professor F Miller (ISA 1994) found that service trenches at > 3m distances from trees had minimal impact on growth or crown shape.

4.1.5 A key misunderstanding, even among professionals, is that we conflate the RPA with the actual root system: RPA's are *prima facie* a notion / convention / treaty and almost entirely theoretical, but readily calculable. Conversely roots are a "known unknown," spatial entity that we predict at our folly. Yet, many are quick to do so.

4.1.6 LT favour the neutrality of a circular RPA, because in a difference of opinion, the tree officer will always have the prerogative to dictate the final modification of shape. With the best will in the world, the free allowance of modifications will tend to lead to inequitable outcomes, prejudicing the applicant and the practice is in our view, best avoided. The neutral circle dispenses with this inequity.

4.1.7 Ultimately, the point of the circular RPA is to illustrate areas of concern. The purpose of this report is to consider areas of concern (not to modify them to suit our argument or findings). Therefore, no modifications are made here to the RPA's, regardless of roads etc.

4.1.8 The quality of trees will also be a consideration: U Category trees are discounted from the planning process in view of their limited service life. Again, Category-C trees would not normally constrain development individually, unless they provide some external screening function.

4.1.9 At paragraph 5.1.1. BS5837: 2012 notes that "Care should be exercised over misplaced tree preservation; attempts to retain too many or unsuitable trees on a site are liable to result in excessive pressure on the trees during demolition or construction work, or post-completion demands on their removal."

4.1.10 In theory, only moderate quality trees and above are significant material constraints on development. However, the low quality trees would comprise a constraint in aggregate, in terms of any collective loss / removal, where replacement planting would be appropriate. In this instance, no such collective impact is proposed.

4.1.11 In this instance, 20 out of the 31 trees surveyed are graded category A and B, therefore could potentially provide significant constraints to development. However, the majority of these trees are located around the boundaries of the site; therefore the potential primary constraints upon development could be minimised, provided it will not be necessary to build right up to the boundaries.

4.2 Secondary Constraints

4.2.1 The second type of constraint produced by trees that are to be retained is that the proximity of the proposed development to the trees should not threaten their future with ever increasing demands for tree surgery or felling to remove nuisance shading (Figure 3), honeydew deposition or perceived risk of harm.

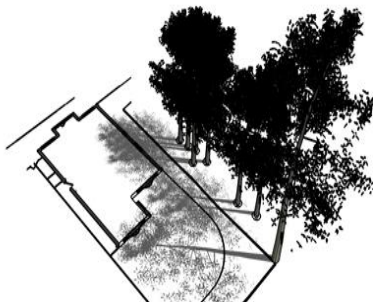

Figure 3 –
Generic Shading Constraints

4.2.2 The shading constraints are crudely determined from BS5837 by drawing an arc from northwest to east of the stem base at a distance equal to the height of the tree, as shown in the diagram opposite. Shade is less of a constraint on non-residential developments, particularly where rooms are only ever temporarily occupied.

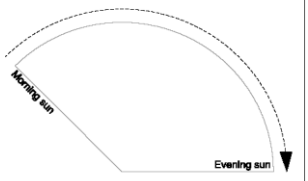

Figure 4 – Shading Arc

4.2.3 This arc (see Figure 4) represents the effects that a tree will have on layout through shade, based on shadow patterns of 1x tree height for a period May to Sept inclusive 10.00-18.00 hrs daily.

4.2.4	Assuming that they will be retained, the orientation of the on and off-site trees in the southern corner of the site will provide some potential shading constraints. All of the trees surveyed have the potential to provide varying degrees of organic deposition. The significance of these constraints will vary depending on the location and proximity to the proposed re-development.

Note: Sections 5 & 6 will now assess the impacts upon constraints identified in Section 4. Table 1 in Section 5 presents the impacts in tabular form (drawing upon survey data presented in Appendices 1 & 2). Impacts are presented in terms of whole tree removal and the effect on the landscape or partial encroachment (% of RPA) and its effect on individual tree health. Section 6 discusses the table data, elaborating upon the impacts' significance and mitigation.

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

Ref: LUK/BLH/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	3	Plane, London	New HS: 64m2 of which 21.5m2 is existing Lifting of existing HS > soft ground: 39m2. Lamppost	42.5 m^2 19.17 %	Mature	Normal	Good	Medium	N/A	Manual removal of existing HS in RPA. No-dig construction Airspade / manual removal in RPA. Trial pits
B	4	Plane, London	New Hard Standing: 13m2 Lamppost	13 m^2 10.63 %	Mature	Normal	Good	Low	N/A	No-dig construction Trial pits / pre-emptive root pruning
B	5	Plane, London	New Hard Standing: 68m2 Lamppost	68 m^2 44.68 %	Mature	Normal	Good	High	N/A	No-dig construction with porous surface Trial pits / pre-emptive root pruning
B	6	Plane, London	New Hard Standing: 7.5m2	7.5 m^2 6.63 %	Mature	Normal	Good	Low	N/A	No-dig construction
B	7	Plane, London	New Hard Standing: 59m2	59 m^2 40.14 %	Mature	Normal	Good	High	N/A	No-dig construction with porous surface
C	8	Plane, London	New Hard Standing: 2m2	2 m^2 2.18 %	Mature	Normal	Good	Very Low	N/A	No-dig construction

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

Ref: LUK/BLH/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	9	Plane, London	New Hard Standing: 74m2 of which 23.5m2 is existing (net 50.5m2 - 27.3%) Lifting of existing HS > soft ground: 10m2 - positive; New access 21.6m2 (11.6%); lamppost	72.1 m^2 38.91 %	Mature	Normal	Good	High	N/A	Manual removal of all existing HS in RPA. No-dig con/porous surface to mitigate high impact Manual lowering of pavement/ lowering road - pre-emptive root pruning; trial pits
B	10	Plane, London	Fell to facilitate new access	m^2 N/A %	Mature	Normal	N/A	N/A	Medium	New planting / landscaping
B	11	Plane, London	New Hard Standing: 80m2 of which 5m2 is existing (net 75m2/34.8%) Lifting of existing HS > soft ground: 4m2; Ground clearance 2m; New access 7.8m2/3.6%; Lamppost	82.8 m^2 38.44 %	Mature	Normal	Good	High	N/A	Manual removal of existing HS in RPA. No-dig construction Crown-lift (see rec works) Manual lowering of pavement/ lowering road - pre-emptive root pruning; trial pits
C	12	Plane, London	Lifting of existing HS > soft ground: 3m2	3 m^2 3.42 %	Mature	Normal	Good	Very Low/ positive	N/A	Manual removal of existing HS in RPA.
B	13	Plane, London	New Hard Standing:: 38m2 of which 4m2 is existing Lifting of existing HS > soft ground: 4m2	34 m^2 26.75 %	Mature	Normal	Good	Medium	N/A	Manual removal of existing HS in RPA. No-dig construction
B	15	Plane, London	New Hard Standing: 31m2 Ground clearance 2m	31 m^2 26.34 %	Mature	Normal	Good	Medium	N/A	No-dig construction Remedial tree surgery (see Rec. Works)

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

Ref: LUK/BLH/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	16	Plane, London	New Hard Standing: 4m2	4 m^2 4.78 %	Mature	Normal	Good	Very Low	N/A	No-dig construction
B	17	Plane, London	New Hard Standing:30m2 Lamppost	30 m^2 20.41 %	Mature	Normal	Good	Medium	N/A	No-dig construction Trial pits / pre-emptive root pruning
A	20	Plane, London	New Hard Standing:15m2	15 m^2 7.85 %	Mature	Normal	Good	Low	N/A	No-dig construction
C	21	Cherry, Wild (Gean)	Felled to Facilitate Development	m^2 N/A %	Mature	Normal	N/A	N/A	Low	New planting / landscaping
C	22	Whitebeam	Felled to Facilitate Development	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping
C	23	Maple, Field	Felled to Facilitate Development	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

Ref: LUK/BLH/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
C	24	Birch, Silver	Felled to Facilitate Development	m^2 N/A %	Semi-mature	Normal	N/A	N/A	Low	New planting / landscaping
U	26	Ash, Common	Felled to Facilitate Development Recommended felling under good arboricultural practice	m^2 N/A %	Early Mature	Moderate	N/A	N/A	N/A	New planting / landscaping
U	27	Plum	Felled to Facilitate Development Recommended felling under good arboricultural practice	m^2 N/A %	Mature	Dead	N/A	N/A	N/A	New planting / landscaping
B	28	Birch, Himalayan	Felled to Facilitate Development	m^2 N/A %	Mature	Normal	N/A	N/A	Low/ Medium	New planting / landscaping
C	29	Sycamore	Felled to Facilitate Development	m^2 N/A %	Early Mature	Normal	N/A	N/A	Low	New planting / landscaping
B	32	Lime, Caucasian	New Hard Standing: 9.5m2 Ground clearance 1m	9.5 m^2 11.36 %	Early Mature	Normal	Moderate	Low	N/A	No-dig construction Remedial tree surgery (see Rec. Works)

5.0 Table 1: Arboricultural Impact Assessment for Retained Trees

Hide irrelevant | Show All Trees

(Impacts assessed prior to mitigation and rated with reference to From Matheny & Clark (1998))

Ref: LUK/BLH/AIA

B.S. Cat.	Tree No.	Species	Impact	Tree / RPA Affected	Age	Growth Vitality	Species Tolerance	Impact on Tree Rating	Impact on Site Rating	Mitigation
B	33	Lime, Common	New Hard Standing:5m2 Ground clearance 1.5m	5 m^2 5 %	Early Mature	Normal	Moderate	Very Low	N/A	No-dig construction Remedial tree surgery (see Rec. Works)

6.0 DISCUSSION

6.1 Rating of Primary Impacts

6.1.1 The principal impacts in the current proposals are the removal of 7 trees, comprising 2 category B trees (T10 & T28) and 5 category C trees; 2 further category U trees are also to be felled under the proposals, although are already recommended for felling under good arboricultural practice, therefore the removal of these dead/poor quality trees should not be rated an impact. The overall loss of these trees is rated as a low impact, with no significant effect on the visual character of the local area. Replacement planting will include two off-site trees, the location of which will be agreed with the Local authority.

6.1.2 All remaining primary impacts relate to new hardstanding/removal of old hardstanding and the new access, where mitigation is available to reduce the theoretical potential. The most significant impacts relate to the potentially high impacts to category B trees T9 and T11, resulting mainly from the removal/replacement of hard landscaping, combined with the lowering of the existing pavement to create the proposed access within the theoretical RPAs. With careful supervision and mitigation, these significant theoretical impacts can be mitigated; the lowering of the pavement should be undertaken with arboricultural supervision, allowing any significant roots to be pre-emptively pruned. All new surfaces should be porous to promote healthy soil water relations for future root growth. Other significant impacts relate to the removal/replacement of existing hard surfaces, with potentially high theoretical impacts to category B trees T5 and T7, in addition to medium impacts to T3, T13, T15 & T17 (see Table 1 and summary Table 2 below). These will require the careful removal of existing hard surfaces, with the use of no-dig construction either using the existing sub-base or with a construction technique such as 'Cellweb'. The remaining impacts are either low (T4, T6, T20 & T32) or very low impacts (T8, T12, T14, T16 & T33). These too can be mitigated further as above. Further impacts to retained trees comprise the potential need to crown-lift T11, T15, T32 and T33 to facilitate development. (T32 & T33 subject to third party consent).

6.1.3 BS5837: 2012 now discourages impacts of >20%, even with porous paving/no-dig construction, but does allow for consultant discretion. In my view, the trees in question are healthy specimens of species with a good resistance to development impacts (London plane and sycamore), which are quite capable of tolerating these impacts once mitigated.

6.1.4 Details of the proposed lighting have been provided, with lampposts potentially located within the RPA's of T3, T4, T5, T9, T11 and T17. These will be positioned with trial pits excavated by hand, with pre-emptive root pruning under arboricultural supervision. Where a mass of significant roots are found within a pit, it will be relocated to minimise the potential impact.

Table 2: Potential RPA Impacts from Access/Hardstanding:

Impact	Very Low	Low	Medium	High
Category A		T20		
Category B	T14, T16, T33	T4, T6, T32	T3, T13, T15, T17	T5, T7, T9 & T11
Category C	T8, T12			

6.1.5 The principal of RPA encroachment is established within BS5837:2012 and supported by the source document, National Joint Utilities Guidelines 10 / Vol. 4 1995 / 2010. NJUG introduced the x12 diameter *Precautionary Zone* for supervised working and *Prohibited Zone* at a universal 1m from the base of the tree. RPA's are frequently confused with the NJUG Prohibited Zone, when they clearly correlate with the NJUG Precautionary Zone.

6.1.6 An RPA encroachment of <20% of RPA may be considered as low impact, given the permissive references to 20% RPA relocation and impermeable paving within BS5837:2012 and other published references to healthy trees tolerating up to 30-50% root severance (Coder, Helliwell and Watson in CEH 2006). The trees in question are healthy specimens of species with a good resistance to development impacts, and quite capable of tolerating these low impacts.

6.1.7 "**In practice 50% of roots can sometimes be removed with little problem**, provided there are vigorous roots elsewhere. Inevitably, this degree of root loss will temporarily slow canopy growth and even lead to some dieback" (Thomas 2000). LT do not recommend annexing such high proportions of the root system; rather that within the context of the published science, planning should not be unduly concerned by impacts that are well below the subcritical threshold – *tree health is not at stake.*

6.2 Rating of Secondary impacts

6.2.1 Secondary impacts comprise minor organic deposition (including leaves/honey dew) on to cars and car parking spaces, with some shading. Given that car parking should be short term only, the impact should be minimal; some shading may be beneficial.

6.3 Mitigation of Impacts

6.3.1 All plant and vehicles engaged in demolition works should either operate outside the RPAs, or should run on a temporary surface designed to protect the underlying soil structure. The demolition of the building should proceed inwards in a "pull down" fashion. Hard surfacing within the RPA's can be lifted with caution by a skilled machine operator or manually, again working away from the tree.

6.3.2 The replacement paving/hard landscaping will require a no-dig construction technique, either using a cellular confinement system with no fines aggregate for the sub-base or simply building upon the existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth. A further consideration in the use of a more expensive cellular confinement system or similar, may be the claimed reduction in risk of possible future slab / surface displacement by roots of trees growing in paved areas. NB: no-dig construction and its impacts (c.150mm rise) will need to be factored into the finished site levels.

6.3.3 The immediate canopy encroachment can be avoided with a crown lift of lower limbs, affecting a 3 - 4m ground clearance.

6.3.4 Nuisance deposition can be mitigated with regular crown cleaning.

6.3.5 The shading impacts can be mitigated by routine cleaning. Some minor crown reduction may be necessary, but not such as to impose a burden of frequent, repetitive management.

6.3.6 The landscape impact of tree losses can be offset by the landscape proposals, ideally involving new planting of ornamental varieties of native species, and where appropriate with columnar or compact form. A selection of columnar tree species cultivars for constricted sites is provided in Appendix 4.

7.0 CONCLUSION

7.1 The potential impacts of development are all relatively low in terms of the number and quality of trees removed, and the scale/intensity of the impacts of the hardsurfacing removal/replacement to the retained trees. The cumulative impacts of the proposed access will need further mitigation, although these potentially significant impacts alone affect 3.6 – 11.6% of T9 and T11 which mitigation proposed accordingly.

7.2 The full potential of the impacts can be largely mitigated through design and precautionary measures. These measures can be elaborated in Method Statements in the discharge of planning conditions.

7.3 The species affected are generally tolerant of root disturbance / crown lifting and the retained trees are generally in good health and capable of sustaining these reduced impacts.

7.4 The trees that are recommended for felling are of little individual significance, such that their loss will not affect the visual character of the area.

7.5 Therefore, the proposals will not have any significant impact on either the retained trees or wider landscape. Thus, with suitable mitigation and supervision the scheme is recommended to planning.

8.0 RECOMMENDATIONS

8.1 Specific Recommendations

8.1.1 Current tree works recommendations are found in Appendix 2 to this report, with works to facilitate development in Appendix 3 and a selection of columnar tree species cultivars for constricted sites provided in Appendix 4.

8.1.2 Excavation and construction impacts within the RPA's of trees identified in Table 1 above, will need to be controlled by method statements specifying mitigation methods suggested in para 6.3 above and by consultant supervision as necessary. These method statements can be provided as part of the discharge of conditions.

8.1.3 Replace felled trees with native ornamental nursery stock under current best practice; i.e. conforming to and planted in accordance with the following:

- BS 3936:1980 Nursery Stock;
- BS 4043:1966 Transplanting Semi-Mature Trees; and
- BS 5236:1975 Cultivation and Planting of Trees in the Advanced Nursery Stock Category.
- All replacement stock should be planted and maintained as detailed in BS 4428:1989 (Section 7): Recommendations for General Landscape Operations.

8.2 General Recommendations

8.2.1 Any trees which are in close proximity to buildings proposed for demolition should be protected with a Tree Protection Barrier (TPB). This TPB should comprise steel, mesh panels 2.4m in height ('Heras') and should be mounted on a scaffolding frame (shown in Fig 2 of BS5837:2012). The position of the TPB can be shown on plan as part of the discharge of conditions, once the lay out is agreed with the planning authority. The TPB should be erected prior to commencement of works, remain in its original form on-site for the duration of works and removed only upon full completion of works.

8.2.2 A TPB may no longer be required during soft landscaping work but a full arboricultural assessment must be performed prior to the undertaking of any excavations within the RPA of a tree. This will inform a decision about the requirement of protection measures. It is important that all TPBs have permanent, weatherproof notices denying access to the RPA.

8.2.3 The use of heavy plant machinery for building demolition, removal of imported materials and grading of surfaces should take place in one operation. The necessary machinery should be located above the existing grade level and work away from any retained trees. This will ensure that any spoil is removed from the RPAs. It is vital that the original soil level is not lowered as this is likely to cause damage to the shallow root systems.

8.2.4 Any pruning works must be in accordance with British Standard 3998:2010 Tree work [BS3998].

8.2.5 Where sections of hard surfacing are proposed in close proximity to trees, it is recommended that "No-Dig" surfacing be employed in accordance with BS5837:2012 and 'The Principles of Arboricultural Practice: Note 1, Driveways Close to Trees, AAIS 1996 [APN1]'. The no-dig construction technique should use either a cellular confinement system with no fines aggregate for the sub-base or simply building upon the existing sub-base without disturbing the ground below. Choice of construction method will initially depend upon root penetration within the existing sub-grade. The key principle is not to excavate in the presence of roots and to provide a porous surface to promote healthy soil water relations for future root growth.

8.2.6 If the RPA of a tree is encroached by underground service routes then BS5837:2012 and NJUG VOLUME 4 provisions should be employed. If it is deemed necessary, further arboricultural advice must be sought. Trial pits will be used to determine the location of the foundation pits for the proposed lampposts.

8.2.7 Numerous site activities are potentially damaging to trees e.g. parking, material storage, the use of plant machinery and all other sources of soil compaction. In operating plant, particular care is required to ensure that the operational arcs of excavation and lifting machinery, including their loads, do not physically damage trees when in use.

8.2.8 To enable the successful integration of the proposal with the retained trees, the following points will need to be taken into account:

1) Plan of underground services.
2) Schedule of tree protection measures, including the management of harmful substances.
3) Method statements for constructional variations regarding tree proximity (e.g. foundations, surfacing and scaffolding).
4) Site logistics plan to include storage, plant parking/stationing and materials handling.
5) Tree works: felling, required pruning and new planting. All works must be carried out by a competent arborist in accordance with BS3998.
6) Site supervision: the Site Agent must be nominated to be responsible for all arboricultural matters on site. This person must:
   - be present on site for the majority of the time;
   - be aware of the arboricultural responsibilities;
   - have the authority to stop work that is causing, or may cause harm to any tree;
   - ensure all site operatives are aware of their responsibilities to the trees on site and the consequences of a failure to observe these responsibilities;
   - make immediate contact with the local authority and/or a retained arboriculturalist in the event of any tree related problems occurring.

8.2.9 These points can be resolved and approved through consultation with the planning authority via their Arboricultural Officer.

8.2.10 The sequence of works should be as follows:

i) initial tree works: felling, stump grinding and pruning for working clearances;
ii) installation of TPB for demolition & construction;
iii) installation of underground services;
iv) installation of ground protection;
v) main construction;
vi) removal of TPB;
vii) soft landscaping.

9.0 REFERENCES

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APPENDIX 1

TREE SCHEDULE

Notes for Guidance:

1. Height describes the approximate height of the tree measured in metres from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter (Dm) is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees. BS 5837:2012 formula (Section 4.6) used to calculate diameter of multi-stemmed trees. Stem Diameter may be estimated where access is restricted and denoted by '#'.
5. Protection Multiplier is 12 and is the number used to calculate the tree's protection radius and area
6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present.
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to (British Standard 5837:2012 section 4.5) and refers to tree/group quality and value; 'A' – High, 'B' - Moderate, 'C' - Low, 'U' - Unsuitable for retention. The following colouring has been used on the site plans:
    - High Quality (A) (Green),
    - Moderate Quality (B) (Blue),
    - Low Quality (C) (Grey),
    - Unsuitable for Retention (U) (Red)
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

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BS5837 Tree Constraints Survey Schedule

Site: Proposed Lidl Store, Botwell Lane, Hayes, Middlesex UB3 2BN

Surveyor(s): Adam Hollis

Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
1	Oak, English	15	8966	2	Mature	1040	12	12.5	Normal	Fair	High	A		>40	Small amount of bark loss in crown Major dead wood / stubs Outside development boundary
2	Plane, London	16	6666	6	Mature	600	12	7.2	Normal	Fair		B		>40	Restricted rooting / FP heave T's 1-20 all high CL'd to 6m+ with slight etiolation of limbs Outside development boundary
3	Plane, London	16	8378.	6	Mature	700	12	8.4	Normal	Fair		B	2	>40	Tight in corner of hard surfaces. Cavity visible in pruning wound in crown break to Some damage to path. Slight lean to road. All planes CL'd 6m+
4	Plane, London	15	4374	6	Mature	520	12	6.2	Normal	Fair		B	2	>40	Deadwood (minor) thoughout crown Hung-up (detached) branches In macadam close to road. Heave to fp. Competes with tree behind Outside development boundary
5	Plane, London	16	4447	6	Mature	580	12	7.0	Normal	Fair		B	2	>40	In grass. Slight lean towards path. 50mm x 6m dead branch W 7m abg
6	Plane, London	15	4576	6	Mature	500	12	6.0	Normal	Fair		B	2	>40	Leaf growth a bit thin in places. Heave to path Outside development boundary
7	Plane, London	16	4477	6	Mature	570	12	6.8	Normal	Fair		B	2	>40	A sparser than normal canopy Entry wounds on trunk Cavity visible in pruning wound in crown break to N
8	Plane, London	14	5282	6	Mature	450	12	5.4	Normal	Fair		C	2	>40	A sparser than normal canopy Significant break out wounds in crown with decay inside Outside development boundary
9	Plane, London	16	6566	6	Mature	640	12	7.7	Normal	Fair		B	2	>40	A sparser than normal canopy Entry wounds on trunk
10	Plane, London	16	5556	4	Mature	540	12	6.5	Normal	Fair		B	2	>40	Bit sparse on roadside. Slight lean to road. Entry wounds on trunk Heave to footpath Outside development boundary

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11	Plane, London	16	6	2	Mature	690	12	8.3	Normal	Fair		B	2	>40	
12	Plane, London	16	2424	7	Mature	440	12	5.3	Normal	Fair		C	2	>40	Suppressed by nearby tree Entry wounds on trunk Cavity visible in pruning wound in crown break to E Outside development boundary
13	Plane, London	16	5336		Mature	530	12	6.4	Normal	Fair		B	2	>40	Deadwood throughout crown Entry wounds on trunk
14	Plane, London	12	4444	7	Mature	410	12	4.9	Normal	Fair		B	2	>40	Slight lean to the road. Deadwood throughout crown Suppressed Outside development boundary
15	Plane, London	16	5556	2	Mature	510	12	6.1	Normal	Fair		B	2	>40	
16	Plane, London	12	5353	5	Mature	430	12	5.2	Normal	Fair		B	2	>40	Deadwood through crown long dead branch above fp Outside development boundary
17	Plane, London	15	5555	5	Mature	570	12	6.8	Normal	Fair		B	2	>40	Slight lean Significant break out wound W in crown with decay inside
18	Plane, London	16	3383	5	Mature	480	12	5.8	Normal	Fair		C	2	>40	Bit sparse, slight lean to the road Entry wounds on trunk Outside development boundary
19	Plane, London	16	6565	4	Mature	570	12	6.8	Normal	Fair		B	2	>40	Main growth side towards road Deadwood (minor) Pavement heave Outside development boundary
20	Plane, London	16	5666	3	Mature	650	12	7.8	Normal	Fair		A		>40	Entry wounds on trunk Included bark in branch unions Canker in bases of limbs just above main fork & over FP Outside development boundary

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BS5837 Tree Constraints Survey Schedule

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Surveyor(s): Adam Hollis

Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
21	Cherry, Wild (Gean)	10	4		Mature	290	12	3.5	Normal	Fair		C	2	10-20	Cankered base with resin bleed
22	Whitebeam	11	6555	2	Early Mature	330	12	4.0	Normal	Fair		C		>40	Included bark in branch unions Co-dominant limbs
23	Maple, Field	9	4	1.5	Early Mature	350	12	4.2	Normal	Fair		C	2	>40	Dense growth
24	Birch, Silver	9	4456	1	Semi-mature	260	12	3.1	Normal	Fair		C	2		Thinner on the side of the Maple
26	Ash, Common	9	6	1.5	Early Mature	410	12	4.9	Moderate	Fair		U		10-20	Decay at trunk base Mechanical damage to base Minor dieback in top
27	Plum	6	4242		Mature	550	12	6.6	Dead	Hazardous		U		<10	Decay at trunk base (Phellinus)
28	Birch, Himalayan	10	4444	1.5	Mature	330	12	4.0	Normal	Fair		B		>40	A tree with insignificant defects
29	Sycamore	14	4444	3	Early Mature	490	12	5.9	Normal	Fair		C	2	>40	
30	Chestnut, Horse	10	5555	3	Mature	670	12	8.0	Moderate	Poor		C/u	2	10-20	Decay in trunk Die-back in crown Fork at 3m, next to road Outside development boundary
32	Lime, Caucasian	10	5	1	Early Mature	430	12	5.2	Normal	Good		B		>40	Hung-up (detached) branches Dense habit Included bark in branch unions Outside development boundary

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BS5837 Tree Constraints Survey Schedule

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Surveyor(s): Adam Hollis

Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
33	Lime, Common	12	5	1.5	Early Mature	470	12	5.6	Normal	Good		B	2	>40	Included bark in branch unions Outside development boundary

APPENDIX 2

RECOMMENDED TREE WORKS

Notes for Guidance:

Husbandry 1 - Urgent (ASAP), 2 - Standard (within 6 months), 3 - Non-urgent (2-3 years)

RP - Pre-emptive root pruning of foundation encroachments under arboricultural supervision.
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

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Recommended Tree Works

Hide irrelevant | Show All Trees

Site: Proposed Lidl Store, Botwell Lane, Hayes, Middlesex UB3 2BN

Surveyor(s): Adam Hollis

Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
1	Oak, English	15	1040	8966	DWD FInv Climbing inspection	Small amount of bark loss in crown Major dead wood / stubs
26	Ash, Common	9	410	6	Fell	Decay at trunk base Mechanical damage to base Minor dieback in top Advisable for good arboricultural practice
27	Plum	6	550	4242	Fell Remove	Decay at trunk base (Phellinus) Advisable for good arboricultural practice
30	Chestnut, Horse	10	670	5555	FInv	Decay in trunk Die-back in crown Fork at 3m, next to road Advisable for good arboricultural practice
32	Lime, Caucasian	10	430	5	DWD	Hung-up (detached) branches Dense habit Included bark in branch unions Advisable for good arboricultural practice
3	Plane, London	16	700	8378.	FInv	Tight in corner of hard surfaces. Cavity visible in pruning wound in crown break to N Some damage to path. Slight lean to road. All planes CL'd 6m+ Advisable for good arboricultural practice

Notes:
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
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Pol - Pollard or re-pollard.
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Recommended Tree Works

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Date: 9th October 2013

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Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
4	Plane, London	15	520	4374	DWD	Deadwood (minor) thoughout crown Hung-up (detached) branches In macadam close to road. Heave to fp. Competes with tree behind Advisable for good arboricultural practice
5	Plane, London	16	580	4447	DWD	In grass. Slight lean towards path. 50mm x 6m dead branch W 7m abg Advisable for good arboricultural practice
7	Plane, London	16	570	4477	FInv	A sparser than normal canopy Entry wounds on trunk Cavity visible in pruning wound in crown break to N Advisable for good arboricultural practice
8	Plane, London	14	450	5282	FInv	A sparser than normal canopy Significant break out wounds in crown with decay inside Advisable for good arboricultural practice
10	Plane, London	16	540	5556	Mon	Bit sparse on roadside. Slight lean to road. Entry wounds on trunk Heave to footpath Advisable for good arboricultural practice

Notes:
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

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Recommended Tree Works

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Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
12	Plane, London	16	440	2424	FInv	Suppressed by nearby tree Entry wounds on trunk Cavity visible in pruning wound in crown break to E Advisable for good arboricultural practice
13	Plane, London	16	530	5336	DWD	Deadwood throughout crown Entry wounds on trunk Advisable for good arboricultural practice
14	Plane, London	12	410	4444	DWD	Slight lean to the road. Deadwood throughout crown Suppressed Advisable for good arboricultural practice
16	Plane, London	12	430	5353	DWD	Deadwood through crown long dead branch above fp Advisable for good arboricultural practice
17	Plane, London	15	570	5555	FInv	Slight lean Significant break out wound W in crown with decay inside Advisable for good arboricultural practice
18	Plane, London	16	480	3383	Mon	Bit sparse, slight lean to the road Entry wounds on trunk

Notes:
CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

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Site: Proposed Lidl Store, Botwell Lane, Hayes, Middlesex UB3 2BN

Surveyor(s): Adam Hollis

Date: 9th October 2013

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
20	Plane, London	16	650	5666	FInv	Entry wounds on trunk Included bark in branch unions Canker in bases of limbs just above main fork & over FP Advisable for good arboricultural practice
21	Cherry, Wild (Gean)	10	290	4	Mon	Cankered base with resin bleed

Notes:

CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

APPENDIX 3

RECOMMENDED TREE WORKS TO FACILITATE DEVELOPMENT (See Table 1)

Notes for Guidance:

CB - Cut Back to boundary/clear from structure.
CL# - Crown Lift to given height in meters.
CT#% - Crown Thinning by identified %.
CCL - Crown Clean (remove deadwood/crossing and hazardous branches and stubs).
CR#% - Crown Reduce by given maximum % (of outermost branch & twig length)
DWD - Remove deadwood.
Fell - Fell to ground level.
FInv - Further Investigation (generally with decay detection equipment).
Pol - Pollard or re-pollard.
Mon - Monitor ongoing condition (annually by staff / owners & every 2-3 yrs by consultant).
Svr Ivy / Clr Bs - Sever ivy / clear base and re-inspect base / stem for concealed defects.

Landmark Trees Ltd
Tel: 0207 851 4544

Recommended Tree Works To Facilitate Development

Hide irrelevant | Show All Trees

Site: Proposed Lidl Store, Botwell Lane, Hayes, Middlesex UB3 2BN

Surveyor(s): Adam Hollis

Date: 22 July 2014

Ref: LUK/BLH/AIA

Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
10	Plane, London	16	540	5556	Fell	Bit sparse on roadside. Slight lean to road. Entry wounds on trunk Heave to footpath Outside development boundary Recommended to facilitate development
11	Plane, London	16	690	6	CL4 Crown lift to facilitate development	Recommended to permit development
15	Plane, London	16	510	5556	CL Crown lift to facilitate	Recommended to facilitate development
21	Cherry, Wild (Gean)	10	290	4	Fell	Cankered base with resin bleed Recommended to facilitate development
22	Whitebeam	11	330	6555	Fell	Included bark in branch unions Co-dominant limbs Recommended to facilitate development
23	Maple, Field	9	350	4	Fell	Dense growth Recommended to facilitate development
24	Birch, Silver	9	260	4456	Fell	Thinner on the side of the Maple Recommended to facilitate development
26	Ash, Common	9	410	6	Fell	Decay at trunk base Mechanical damage to base Minor dieback in top Advisable for good arboricultural practice
27	Plum	6	550	4242	Fell Remove ASAP	Decay at trunk base (Phellinus) Advisable for good arboricultural practice
28	Birch, Himalayan	10	330	4444	Fell	A tree with insignificant defects Recommended to facilitate development
29	Sycamore	14	490	4444	Fell	Recommended to facilitate development
32	Lime, Caucasian	10	430	5	DWD CL Crown lift to facilitate development	Hung-up (detached) branches Dense habit Included bark in branch unions Outside development boundary Recommended to facilitate development

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Recommended Tree Works To Facilitate Development

Hide irrelevant | Show All Trees

Site: Proposed Lidl Store, Botwell Lane, Hayes, Middlesex UB3 2BN

Surveyor(s): Adam Hollis

Date: 22 July 2014

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Tree No.	English Name	Height	Stem Diameter	Crown Spread	Recommended Works	Comments/ Reasons
33	Lime, Common	12	470	5	CL Crown lift to facilitate development	Included bark in branch unions Outside development boundary Recommended to facilitate development

APPENDIX 4: TREE SELECTION FOR CONSTRICTED LOCATIONS

Table A4.1: Rosaceous Tree Species for Constricted Planting Locations

Common Name	Species	Selected Form
Hawthorn	Crataegus monogyna	Stricta
Cockspur	Crataegus prunifolia	Splendens
Cherry	Prunus x hillieri	Spire
Bird cherry	Prunus padus	Albertii
Rowan / Mountain ash	Sorbus aucuparia	Cardinal Royal
Rowan / Mountain ash	Sorbus aucuparia	Rossica Major
Rowan / Mountain ash	Sorbus aucuparia	Sheerwater Seedling
Swedish whitebeam	Sorbus intermedia	Brouwers
B. whitebeam	Sorbus x thuringiaca	Fastigiata

Table A4.2: Specimen Tree Species for Constricted Planting Locations

Common Name	Species	Selected Form
Chinese red bark birch	Betula albosinensis	Fascination
Swedish birch	Betula pendula	Dalecarlica
Hornbeam	Carpinus betulus	Fastigiata Frans Fountaine
Turkish Hazel	Corylus colurna	
Maidenhair tree	Gingko biloba	
Pride of India	Koelreuteria paniculata	Fastigiata
European larch	Larix decidua	Sheerwater Seedling
Tulip tree	Liriodendron tulipfera	Fastigiata

APPENDIX 5

TREE CONSTRAINTS PLAN

BOTWELL LANE

GOLDEN CRESCENT

NIELD ROAD

To church

BOTWELL LANE

To church

CENTRAL AVENUE

1 Oak A
2 Plane B
3 Plane B2
4 Plane B2
5 Plane B2
6 Plane B2
7 Plane B2
8 Plane C2
9 Plane B2
10 Plane B2
11 Plane B2
12 Plane C2
13 Plane B2
14 Plane B2
15 Plane B2
16 Plane B2
17 Plane B2
18 Plane C2
19 Plane B2
20 Plane A
21 Cherry C2
22 Whitebeam C
23 Maple C2
24 Birch C2
25 Sycamore C2
26 Ash U
27 Plum U
28 Birch B
29 Sycamore C2
30 Chestnut C/u2
32 Lime B
33 Lime B2

NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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Site: Lidl Hayes	1-200@A0
Drawing Title: Tree Constraints Plan	Rev A, Oct 2013

Key:

- Category A High Quality
- Category B Good Quality
- Category C Moderate Quality
- Category U Trees Unsuitable for Retention

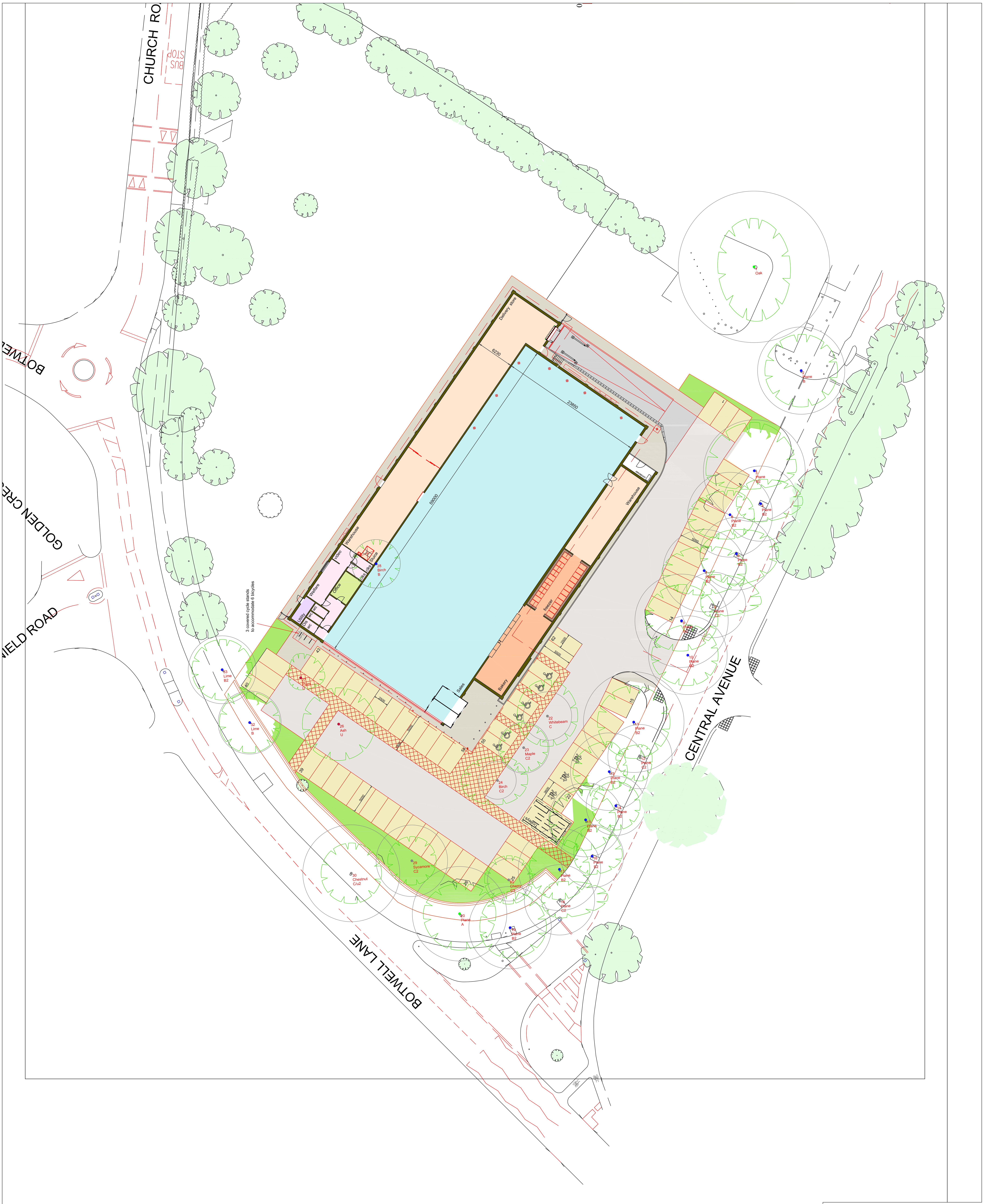
Category — Crown Spread
Root Protection Area — Tree Number, Species, Category

N

5m 10m

APPENDIX 6

ARBORICULTURAL IMPACT ASSESSMENT PLAN



NOTE:

This survey is of a preliminary nature. The trees were inspected from the ground only on the basis of the Visual Tree Assessment method. No samples were taken for analysis. No decay detection equipment was employed. The survey does not cover the arrangements that may be required in connection with the laying or removal of underground services.

Branch spread in metres is taken at the four cardinal points to derive an accurate representation of the crown.

Root Protection Areas (RPA) are derived from stem diameter measured at 1.5 m above adjacent ground level (taken on sloping ground on the upslope side of the tree base).

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Site: Lidl Hayes	1-200@A0
Drawing Title: Arboricultural Impact Assessment	July 2014

Key:

- Category A High Quality
- Category B Good Quality
- Category C Moderate Quality
- Category U Trees Unsuitable for Retention

Category — Crown Spread — Tree Number — Species — Category — Root Protection Area (13 Birch B2)

N W E S