London Borough of Richmond Upon Thames

The Russell Primary School, Petersham Road, Richmond, Surrey, TW10 7AH

Arboricultural Impact Assessment

November 2014

ATKINS

Plan Design Enable

Notice

This document and its contents have been prepared and are intended solely for the London Borough of Richmond Upon Thames's information and use in relation to the proposed developments at The Russell Primary School in Richmond

Atkins assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Job number: 5124790			**Document ref: P:\GBEMB\MandI\Landscape\EP - Arboriculture and Landscape Management\Tree Surveys\TS_296 Russell School Richmond**			
Revision	Purpose Description	Originated	Checked	Reviewed	Authorised	Date
P1	Planning Application	TD	JH	-	TD	24.11.14

Client signoff

Client	London Borough of Richmond Upon Thames
Project	The Russell Primary School Scheme
Document title	Arboricultural Impact Assessment
Job No.	5124790
Copy No.	P1
Document reference	P:\GBEMB\MandI\Landscape\EP - Arboriculture and Landscape Management\Tree Surveys\TS_296 Russell School Richmond

Table of contents

Tables

1. Introduction

1.1. Terms of Reference

Atkins Limited (Atkins) has been commissioned by the London Borough of Richmond Upon Thames Council to undertake a tree survey in accordance with BS5837:2012 Trees in relation to design, demolition and construction – Recommendations in support of a planning application for proposed developments at The Russell Primary School on Petersham Road in Richmond, Surrey.

The survey extents included all trees with the potential to be impacted upon by the proposed developments as deemed appropriate by the Arboriculturist.

1.2. The Application Site

The primary school is located on Petersham Road at Ordnance Survey national grid reference (NGR) TQ 17938 73068. The application site is an existing Primary School facility with supporting infrastructure. The school is bound by the access road to the Ham Polo Club and The German International School to the north. To the east the school adjoins Petersham Road with a combination of commercial and residential properties lining the section of road opposite the school grounds. To the south are residential properties lining Meadlands Drive. The school also directly adjoins Meadlands Drive at its south west corner. To the west the school immediately adjoins Strathmore School with metal fencing separating the two schools.

1.3. Proposed Works

The proposals are covered in detail on the Proposed Site Plan drawing number 5124790-ATK-ZZ-00-PL-AR-0003 Rev P3.0. 5127940_COL_LA001_General Arrangement Plan

1.4. Scope of Works

This report presents Arboricultural information captured on 27th February 2014 by Atkins Senior Arboriculturist Tom Dale BSc(Hons), Cert Arb L6 (ABC), M.Arbor.A.

2. Methodology

2.1. General

This Arboricultural Impact Assessment has been undertaken in accordance with BS5837:2012 Trees in relation to design, demolition and construction – Recommendations. The standard gives recommendations and guidance on the relationship between trees and design, demolition and construction process, setting out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

2.2. Spatial Scope

The survey works spanned one day and concentrated on the trees with the potential to be impacted upon by the proposed works as illustrated on the supplied Topographical Survey Plan.

2.3. Data Gathering

Data was collected in accordance with BS 5837:2012, as outlined in Appendix A of this report. The purpose of the tree categorisation method applied by the Arboriculturist, being to identity the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained if development is to occur.

For a tree to qualify under any given category, it should fall within the scope of that category's definition as defined in figure A2 in Appendix A (category's U, A, B, C) and, for trees in categories A to C, it should qualify under one or more of the three subcategories (1, 2, 3). Subcategories 1, 2 and 3 are intended to reflect arboricultural and landscape qualities, and cultural values, respectively.

Trees were recorded as individual specimens and as groups. Where trees were recorded as groups measurements were taken from the largest tree within the group for the purposes of establishing data for the tree survey drawings. This level of survey meets the requirements of BS 5837:2012, which states that *'trees growing as groups or woodland should be identified and assessed as such'*. The BS defines the term group as *'trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally including for biodiversity (e.g. parkland or wood pasture)'.*

Crown spreads of the surveyed trees were given as an average measurement or to the relevant cardinal points with regards to the proposals. The average measurement was taken from the cardinal point relevant to the direction of the proposed works. This level of survey is deemed sufficient by the Arboriculturist in order to establish the extent of the crown spread in the direction of the proposals. All crown spread measurements should be taken from the tree survey schedules

The trees were assessed in line with the Visual Tree Assessment (VTA) method as developed by Mattheck and Breloer (1994). This method is based on the axiom of uniform stress, whereby a tree will grow in response to environmental stimuli to produce a structure that bears forces evenly across its surface. As such an internal defect, such as decay, would initiate a noticeable change in the stem's shape to accommodate the physical change.

2.4. Survey

The locations of the surveyed trees were primarily taken from the supplied topographical data. Where trees were not illustrated these were plotted by the Arboriculturist using a combination of measuring off from fixed points on site and through aerial imagery. As such the locations of the trees may require checking on site using accurate survey techniques. The recorded trees were sequentially numbered from 001 and G1 for groups.

It is to be noted that only significant trees were recorded in G11, concentrating on trees over 150mm diameter at 1.5m above ground level in line with the recommendations of BS5837:2012 reference paragraph 4.2.4 ('*in the case of woodlands or substantial tree groups, only individual trees with stem diameters greater than 150mm usually need be plotted'*).

2.5. Limitations to Survey

Trees were identified and inspected from ground level only and were not climbed. No invasive examination techniques (such as increment boring, or internal decay detection) were carried out and as such no assessment of the internal condition of the wood of these trees can be given. The tree survey undertaken is not intended to be a tree risk management survey targeting safety related issues. However, where specific hazards have been identified these have been recorded and management recommendations provided.

Where access permitted a Forest Ace Laser Hypsometer was used to measure tree heights and crown spreads of the tree stock.

BS 5837: 2012 does not include arguments for or against development, or for the removal or retention of trees. Where development is to occur the standard provides guidance on how to decide which trees are appropriate for retention.

Validity, accuracy and findings of the tree locations will directly relate to the accuracy of information provided at the time of the survey, i.e. the supplied topographical drawing and the available aerial imagery.

The report does not comment on possible effects of trees on neighbouring properties, including in relation to subsidence or heave, or with regard to possible hazards presented by trees surveyed. Neighbouring owners of trees that are identified as posing a possible risk to the property/site in question should seek their own advice as to possible effects of the recommendations given within this report.

Damage to, or possibility of damage to, any other structure that is not referred to within the report is not considered unless otherwise specified. This includes both neighbouring structures and any other structure on the property.

Trees are living organisms subject to changes outside man's control. Trees and their environment alter with the seasons and it is as well to inspect trees whilst in full leaf and when out of leaf. Following harsh or unexpected weather conditions, or heavy storms it is also prudent to inspect trees. Changes to ground water conditions will affect the root growth of a tree. Such changes are not always the result of man's influence and other factors may be involved.

3. Existing Site Conditions

3.1. Existing Land Use

The school is approximately 1.5km south of the centre of Richmond. Its main vehicular access point is off Petersham Road which enters the site through its eastern boundary. The access road leads to a hard surface car parking facility located centrally to the site. The school buildings are a combination of single and two storey structures that are also located around the centre of the application site and on its south west corner. The site is enclosed by a combination of boundary features including brick built boundary walls and metal fencing. There are pedestrian access points off Petersham Road and Meadlands Drive.

There are sections of grassed lawn located sporadically in between the hard infrastructure. However, the dominant green space encompasses the western aspect of the site with sufficient space for sports pitches and more informal play areas. There is also hard surfaced play ground space close to the centre of the site.

3.2. Existing Tree Stock

There are a range of tree species on site that have been planted and self sown in places. They are predominantly growing as linear groups on the boundaries of the school and within the centre of the site, with a few intermittent standards and groups growing sporadically in green spaces around the site. In each case the trees serve to provide softening qualities to the built infrastructure increasing their landscape amenity value. The boundary tree belts contain sections of continuous trees providing a degree of intermittent screening to views both in and out of the site at these points. However, the screening of views into the site is also provided by the sections of boundary brick walls.

The age of the trees stock varies between newly planted specimens to mature trees, with a number of the more mature trees clearly visible from surrounding views given their size and scale. The central groups of trees reference G3, 008, 009 G4, 012 and G5 form the remnants of an old hedgerow with a dominance of hedgerow tree and shrub species. These groups sustain a number of mature shrubs that are entering over-maturity with old branch tear out wounds and hung-up dead limbs present.

The bases of the trees on site are all readily accessible to pupils, teachers and potentially visitors to the school. As such the target areas surrounding the trees are highly sensitive, meaning any works will have to ensure adequate protection of retained trees.

The presence of more mature trees serves to increase the arboricultural significance of certain specimens, especially tree reference 023, a mature Sycamore tree growing on the eastern boundary of the site.

3.3. Site Topography

The site rises to the south with stepped accesses correcting level changes to the south and east.

3.4. Soil Assessment

No soil assessment was carried out on site by the Arboriculturist although base line data from the British Geological Survey webpage (http://www.bgs.ac.uk) states the site supports an area of sand based bedrock with no superficial deposits.

3.5. Statutory Protection

Atkins contacted The London Borough of Richmond Upon Thames on 17/03/14 by telephone. They confirmed that the site does contain any individual or group Tree Preservation Orders. However, the site is set within the Petersham Conservation Area. Trees within a Conservation Area are afford protection under The Town and Country Planning (Tree Preservation) (England) Regulations 2012. Whilst works necessary to implement a planning permission are exempt from the regulations, the presence of the Conservation Area means that any proposals will have to take into account the amenity value and presence of the tree stock in order to gain approval.

4. Summary of Tree Condition

4.1. Number of Trees Recorded

The survey captured 38no. individual trees, 11no. groups & 1no. hedgerow on site as part of formal and informal groups.

4.2. General Condition Details

The survey sheets in Appendix B provide more detail on all the trees surveyed on site. In general the trees on site were showing signs of fair to good vitality with average bud formation and coverage for the tree species and locality. The trees varied in age structure with the majority being semi-mature to early-mature specimens. The trees are illustrated on drawing:

- 5127940/DG/ARB/001 rev A;

Trees 023 and 041 have been recorded as BS Category A trees. As such these trees are of high quality with a minimum of 40+ year's useful life expectancy. The trees are prominent in the landscape given their size and scale. Their maturity increases their landscape and arboricultural value to high. These trees are highly desirable for retention meaning any proposals should take into account their preservation.

Trees 001, 003, 004, 005, H1, 006, 007, G3, 009, G4 010, G5 011, 014, G6, 016, 017, 018, 020, 021, G9 022, 030, 031, 033, 035, 037, 038, 040 & G11 have been recorded as BS Category B trees. As such the trees are of moderate quality with the majority having a minimum of 20+ year's useful remaining life expectancy. The trees were often downgraded due to impaired structural condition resulting from factors such as competition for light with adjacent trees or minimal past management intervention.

Trees 002, G1, G2, 008, 012, 013, 015, G7, G8 019, 025, 028, 029, 032, 034, G10, 036, 039 & 042 have been recorded as BS Category C trees. As such the trees are of low quality due to their young age or due to poor condition with their estimated useful remaining life expectancy's being reduced to 10+ years for the majority of trees. Whilst by definition these trees are of low quality as defined by their BS Category ratings the majority still offer landscape amenity value as part of larger groups.

Trees 024, 026 & 027 were recorded as BS Category U trees. As such these trees are in poor physiological or structural condition that reduces their useful remaining life expectancy to below 10years. These should be felled on the grounds of safety and sound arboricultural management given the current risk they are posing to surrounding people or property. It is considered that these trees could be failing as a result of the wood decay fungus *Armillaria mellea*, this is because a tree with this pathogen was felled in the close proximity to these trees. Therefore, it is likely that through natural root grafts with the neighbouring trees the pathogen has been passed onto these trees.

Preliminary management recommendations have been recorded for a few of the trees surveyed on site. These works have been identified as part of managing the risk of failure or damage to people or property within proximity of the particular tree. These works should form part of the tree risk management strategy for the site.

5. Arboricultural Impacts

5.1. General

This survey takes into account the tree stock deemed likely to be affected by the proposed scheme and identifies their condition and suitability for retention. The tree protection plan illustrates the extents of the survey area, the root protection area (RPA) for each tree or trees and the proposals.

The British Standard relies heavily on the creation of a protected zone referred to as the RPA around each tree. This is the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. This area should be protected from disturbance "in order to avoid unacceptable damage to the tree as a result of severance or asphyxiation of the root system." The recommended minimum area (m²) for each tree to avoid potentially harmful disturbance has been calculated for all of the trees on site and entered into the tree schedule and is illustrated on the tree survey drawings.

The RPA(s) for each tree or group of trees is illustrated as a circle centred on the base of the stem. This circular area does not take into account pre-existing site conditions or other factors that can influence or modify the shape and disposition of tree roots. Accordingly, the Arboriculturist can make modifications or judgements on the likely extents of RPAs, where through professional judgement it is deemed likely that the root zones have been restricted in a certain direction because of limiting factors such as; topography, drainage or the presence of existing built infrastructure.

5.2. Scheme details

The proposals are covered in detail in further planning submission documentation. They have been overlaid onto the tree survey drawings to produce a preliminary tree protection plan reference 5124790/DG/ARB/001 rev A, this to enable an assessment of the current impacts of the proposals on the recorded tree stock. At present construction methodologies are not readily known and this impact assessment should be used to identify how the proposed layout affects trees and areas of potential mitigation to facilitate the works whilst retaining trees. It is assumed that access will be via existing hard-surfacing and storage of materials or worksites also on hard surfacing or grassed areas outside of the constraints imposed by the tree stock

5.3. Arboricultural Impacts

The table below outlines the impacts of the proposals on the tree stock on site and likely mitigation measures required to facilitate the works.

Table 5.1 – Tree Stock and Works

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
001	Cherry	B1	X	N/A	N/A	N/A	Tree located in the footprint of the new hard surface playground area. Tree will need to be felled.
002	Pear	C3	X	N/A	N/A	N/A	Tree located in the footprint of the new grasscrete surfaced access route. Tree will need to be felled.
003	Common Ash	B1/3	N/A	N/A	X	X	Proposed forest area extends into RPA of the tree. Approximately 5% RPA infringement. Any pathway associated with the forest area is to comprise bark chip placed on a geotextile on top of the existing soil profile. No excavations will be permitted. Any correction of levels can be achieved using sharp sand or topsoil. These measures will be required to prevent any root severance that may be vital to the health or stability of the tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction is to proceed. Details will need to be defined within an Arboricultural Method Statement.
004	Sycamore	B2	N/A	N/A	X	X	Proposed pathway positioned within RPA of the tree. Approximately 10% RPA infringement. Acceptable level of infringement provided the pathway conforms to a no-dig construction or any excavations are carried out by hand under arboricultural supervision within the RPA of the tree. This is to assess any tree roots that may need to be severed to facilitate the works as these may be vital to the health or stability of the tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction is to proceed. Details will need to be defined within an

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							Arboricultural Method Statement.
005	Sycamore	B2	N/A	N/A	X	X	Proposed pathway positioned within RPA of the tree. Approximately 20% RPA infringement. Broadly acceptable level of infringement provided the pathway conforms to a no-dig construction or any excavations are carried out by hand under arboricultural supervision within the RPA of the tree. This is to assess any tree roots that may need to be severed to facilitate the works as these may be vital to the health or stability of the tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction is to proceed. Details will need to be defined within an Arboricultural Method Statement.
G1	Hollyx7, Hawthorn x6	C2	N/A	N/A	N/A	N/A	Tree group outside of the direct works footprint. No impact. The requirements for any tree protective barriers will need to be confirmed once construction methodologies are known for the adjacent works, details will need to be defined within an AMS.
G2	Applex8	C2	X-5	N/A	N/A	N/A	5no. trees will need to be felled to facilitate the new internal access route. Remaining 3no. trees are to be retained. The requirements for any tree protective barriers will need to be confirmed once construction methodologies are known for the adjacent works, details will need to be defined within an AMS.
H1	Beech	B2	N/A	N/A	N/A	N/A	Hedgerow to be retained. The hedgerow may require cutting back to the north to facilitate the adjacent works. Any facilitation pruning will need to be defined within an AMS once construction are

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							known.
006	Silver Birch	B1/2	X	N/A	N/A	N/A	Tree located in the footprint of new parking bays. Tree will need to be felled.
007	Silver Birch	B1	X	N/A	N/A	N/A	Tree located in the footprint of new parking bays. Tree will need to be felled.
G3	Blackthorn	B1/2/3	X	N/A	N/A	N/A	Tree group located in the footprint of the playground area and new pathway. Tree group will need to be felled.
008	Holly	C2	X	N/A	N/A	N/A	Tree located in the footprint of the playground area and new pathway. Tree will need to be felled.
009	Hazel	B2	X	N/A	N/A	N/A	Tree located in the footprint of the playground area and new pathway. Tree will need to be felled.
G4 010	Hollyx3, Blackthornx5, Hazelx3, Elderx2	B2	X	N/A	N/A	N/A	Tree located in the footprint of the playground area, new pathways and the new school building. Tree group will need to be felled.
G5 011	Hawthornx6, Hazelx1, Holly x2	B2	X	N/A	N/A	N/A	Tree group located in the footprint of a new pathway and new early year's playground space. Tree group will need to be felled.
012	Apple	C2	X	N/A	N/A	N/A	Tree located in the footprint of a new pathway and new early year's playground space. Tree will need to be felled.
013	Hawthorn	C1	X	N/A	N/A	N/A	Tree located in the footprint of the new SEN playground space. Tree will need to be felled.
014	Pear	B1	X	N/A	N/A	N/A	Tree located in the footprint of the new SEN playground space. Tree will need to be felled.
015	Whitebeam	C1	X	N/A	N/A	N/A	Tree located in the footprint of the new school building.

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							Tree will need to be felled.
G6	Lawson Cypress x2, Cherryx1	B2	X	N/A	N/A	N/A	Trees located in the footprint of the new school building. Tree group will need to be felled.
016	Silver Birch	B1/2	X	N/A	N/A	N/A	Tree located in the footprint of the new school building. Tree will need to be felled.
G7	Silver Birchx2, Elderx2, Common Beechx2, Blackthorn x2, Buddleighax1	C2	X	N/A	N/A	N/A	2no.Trees located in the footprint of the new school building and playground area. 2no. Trees will need to be felled.
017	Silver Birch	B1/2	X	N/A	N/A	N/A	Tree located in the footprint of the new SEN playground area. Tree currently shown for felling, the potential to retain this tree should be explored by the designers. A retaining structure around the trees or the laying of a semi-permeable surfacing around the bases of the trees could be feasible options. However, it must be noted that the retention of these trees may not be feasible because of the requirements of the SEN pupils.
018	Silver Birch	B1/2	X	N/A	N/A	N/A	Tree located in the footprint of the new SEN playground area. Tree currently shown for felling, the potential to retain this tree should be explored by the designers. A retaining structure around the trees or the laying of a semi-permeable surfacing around the bases of the trees could be feasible options. However, it must be noted that the retention of these trees may not be feasible because of the requirements of the SEN pupils.
G8 019	Laurelx1, Hazelx1, Holm Oak	C2	N/A	N/A	N/A	N/A	Trees located outside of the direct proposals. No impact.
020	Common Ash	B1/	X	N/A	N/A	N/A	Tree located in the footprint of

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
		2					a new parking area. Tree will need to be felled.
021	Blue Atlantic Cedar	B1/2	X	N/A	N/A	N/A	Tree located in the footprint of a new parking area. Tree will need to be felled.
G9 022	Silver Birch	B1/2	N/A	N/A	N/A	N/A	Trees located outside of the direct proposals. No impact.
023	Sycamore	A1/2	N/A	N/A	X	X	Proposed car parking bays located outside of the RPA of tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction is to proceed. Details will need to be defined within an Arboricultural Method Statement.
024	Sycamore	U	X	N/A	N/A	N/A	Tree located in the footprint of a new parking area. Tree will need to be felled. Tree also recommended for removal on the grounds of safety and sound arboricultural management.
025	Shrub	C1	X	N/A	N/A	N/A	Shrub located in the footprint of a new parking area. Shrub will need to be felled.
026	Hawthorn	U	X	N/A	N/A	N/A	Tree located in the footprint of a new parking area. Tree will need to be felled. Tree also recommended for removal on the grounds of safety and sound arboricultural management.
027	Whitebeam	U	X	N/A	N/A	N/A	Tree located in the footprint of a new playground area. Tree will need to be felled. Tree also recommended for removal on the grounds of safety and sound arboricultural management.
028	Holm Oak	C1	N/A	N/A	X	X	Proposed pedestrian access located outside of the RPA of tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							is to proceed. Details will need to be defined within an Arboricultural Method Statement.
029	Flowering Cherry	C1	X	N/A	N/A	N/A	Tree located in the footprint of a new pedestrian and emergency access route. Tree will need to be felled.
030	Hornbeam	B2	N/A	N/A	X	X	Proposed pedestrian access & playground area located outside of the RPA of tree. Tree protective barriers will be required to define the Construction Exclusion Zone around the tree if construction is to proceed. Details will need to be defined within an Arboricultural Method Statement.
031	Hornbeam	B2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
032	Blackthorn	C2	N/A	N/A	X	X	Proposed works limited to a new planting area within the RPA of tree. These operations will benefit this tree through improving the surrounding soil structure relieving any compaction and improving its organic content. Tree protection measures may be required if any existing hard surfacing needs to be removed or a change in levels is required, this is to prevent the damage of any underlying tree roots from this tree. Details will need to be defined within an Arboricultural Method Statement, including the location of any protective barriers.
033	English Oak(TP)	B3	N/A	N/A	X	X	Proposed works limited to a new planting area within the RPA of tree. These operations will benefit this tree through improving the surrounding soil structure relieving any compaction and improving its organic content. Tree protection measures may be required if any existing hard surfacing needs to be removed or a change in levels

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							is required, this is to prevent the damage of any underlying tree roots from this tree. Details will need to be defined within an Arboricultural Method Statement, including the location of any protective barriers.
034	Hawthorn	C2	X	N/A	N/A	N/A	Tree located in the footprint of a new cycle storage facility. Tree will need to be felled.
035	Silver Birch	B1	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
G10	Cherry, London Plane	C2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
036	Hornbeam	C2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
037	Common Ash	B2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
038	Norway Maple	B2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
039	Horse Chestnut	C2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
040	Silver Birch	B2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
041	English Oak	A1/2	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
042	Eucalyptus	C1	N/A	N/A	N/A	N/A	Tree located outside of the direct proposals. No impact.
G11	English Oak, Blackthorn, Hazel, Hawthorn, Lawson Cypress, Sycamore	B2	X	N/A	X	X	Part of G11 will need to be felled to facilitate the introduction of new grasscrete parking bays. Approximately 4no. trees. It must be noted that there are also a number or smaller saplings along this section of G11. These have not been recorded as part of the survey as they are generally below 150mm DBH (as discussed in section 2 of this report). Tree protective barriers will be required to define the Construction Exclusion Zone around the remaining trees if construction is to proceed. Details will need to be defined

Group/Tree No.	Species	Cat	Removal due to		Mitigation required for		Details of how proposed build layout affects trees and mitigation.
			Cons	Cond	Canopy	RPA	
							within an Arboricultural Method Statement.

Key:

Group/ Tree number – Tree referenced in the tree survey.

Species – Common name for species.

Cat – BS5837:2012 Category rating.

Removal due to - Cons – Construction, Cond – Condition. An X or n/a (not applicable) dependant on appropriate action or impact

Mitigation required for - Canopy or for RPA (Root Protection Area). An X or n/a indicates appropriate actions as a result of the impacts on the tree(s).

The impacts of the proposals have been quantified as accurately as possible given the supplied information. The proposed scheme will require the removal of trees through direct impact by being located in the footprint of the proposals and the tree root severance that would likely occur as a result of the works. The trees to be felled are as follows:

- 14 no. individual trees and groups of BS Category B trees (references 001, 007, G3, G4, G5x5, G6x3, G11x4, 009, 014, 016, 017, 018, 020 & 021)
- 10no. individual trees and groups of BS Category C trees (references 002, G2x5, G7x2, 008, 012, 013, 015, 025, 029 & 034); and,
- 3no. BS Category U trees (reference 024, 026 & 027)

The scheme will require the removal of a number of trees located internally and close to the boundaries of the site. When assessing the impact of the proposals BS Category C trees are of low quality as defined by their BS Category rating. This is through either their young age or fair to poor forms limiting their long term potential. Cat C trees should generally not hinder the development as replacement planting will offer greater longevity, where the trees are of fair to poor form, or the young trees could be transplanted or replaced. Similarly, BS Category U trees should not hinder the development given that the trees should be removed on the grounds of safety and sound arboricultural management regardless of the proposed works.

The designs have been modified to preserve trees where feasible. However, the proposals will require the removal of a large number moderate quality trees, the majority of which form part of the central over-grown hedgerow (refs G3, G4 & G5) and the tree group close to the eastern boundary of the site (refs 020 & 021). Mitigation planting is proposed as part of the works with 55no. trees to be planted at locations around the site. These works will partially offset the loss of the trees. It is recommended that management of the existing tree resource also be undertaken to provide continuity of cover and to promote longevity. These works could include under-planting within G1 and G11 to re-enforce the screening potential of these groups.

5.4. Preliminary Management Recommendations

The preliminary management recommendations made within the tree survey schedules are in response to tree risk management of the structural defects recorded on site in certain trees; these works include the removal of deadwood from tree canopies

overhanging sensitive target areas and the removal of ivy to facilitate annual condition assessments.

5.5. Preliminary Mitigation Measures

Reference has been made to protective barriers and these will be required to create construction exclusion zones (CEZ's) in order to protect the remaining RPA's of trees affected by the proposed works. The CEZ's will be defined as all the areas behind the fencing or the existing boundary palisade fencing. Site operations not permitted in the CEZ without consultation with an Arboriculturist include storage of plant, equipment or materials, vehicular or plant access, washing down of vehicles or machinery, handling, discharge or spillage of any substances, including cement washings, actions likely to cause localised water-logging, no mechanical digging, scraping or excavation shall be permitted in the CEZ and no earthworks or changes in the finished ground levels other than those agreed by an Arboriculturist.

The locations of protective barriers will have to be determined once construction methodologies are known and should be detailed within an Arboricultural Method Statement. The protective barriers will need to be installed prior to any works commencing. The barriers are to be erected to exclude construction activity in the RPAs of retained trees and are to conform to figure 3b of BS5837:2012 (page 21), a heras type fencing.

Further mitigation measures have been recommended to facilitate the works whilst ensuring the safe retention of trees on site. These further measures include hand excavations and no-dig construction methods. This is to mitigate for the presence of tree roots as there are works proposed within the RPAs of recorded trees. The main issue is the severance of either structural roots or concentrations of fibrous roots which could adversely affect the vitality or structural stability of the affected trees. The requirements for any facilitation pruning will also have to defined within an AMS once construction operations are confirmed.

6. Arboricultural Method Statement

6.1. General

A site specific Arboricultural Method Statement (AMS) should be produced once planning permission has been obtained, this could be secured by way of a condition attached to the planning permission.

Appendix A. Key & BS5837:2012 Survey Table

Tree No: Sequential reference number given to the tree or group of trees as shown on the tree survey drawings.

Species: This is the common name given to the tree. The botanical name is sometimes given.

Height (Ht): tree height from the base of the tree to its heights stem, measured in metres (m). Measurements are taken to the nearest half metre.

Stem diameter (mm): measured in accordance with figure A1 below. Measurements rounded to the nearest 10mm.

Branch spread (m): measurement of crown spread to the four cardinal points, if the crown is balanced a single measurement is given. Crown spread plotted on the tree survey drawings. Measurements are taken to the nearest half metre.

1st significant branch and direction of growth (m): measurement of the height of the first significant branch above ground level, given in metres and direction of growth e.g. 2.4-N

Canopy height (m): height of the canopy above ground level. Measurements are taken to the nearest half metre.

Life stage: The following abbreviations are used:
Y = Young trees <1/5 life expectancy.
SM = Semi-Mature trees 1/5 – 2/5 life expectancy.
EM = Early Mature trees 2/5 – 3/5 life expectancy.
M = Mature trees 3/5 – 4/5 life expectancy
OM= Over-Mature trees >4/5 life expectancy

General observations, particularly of structural and/or physiological condition: e.g. observations of the any decay and physical defect.

Preliminary management recommendations: any identified preliminary management to rectify defects recorded in general observations. These may include the need for further detailed inspection, or works to address immediate hazard to life or property.

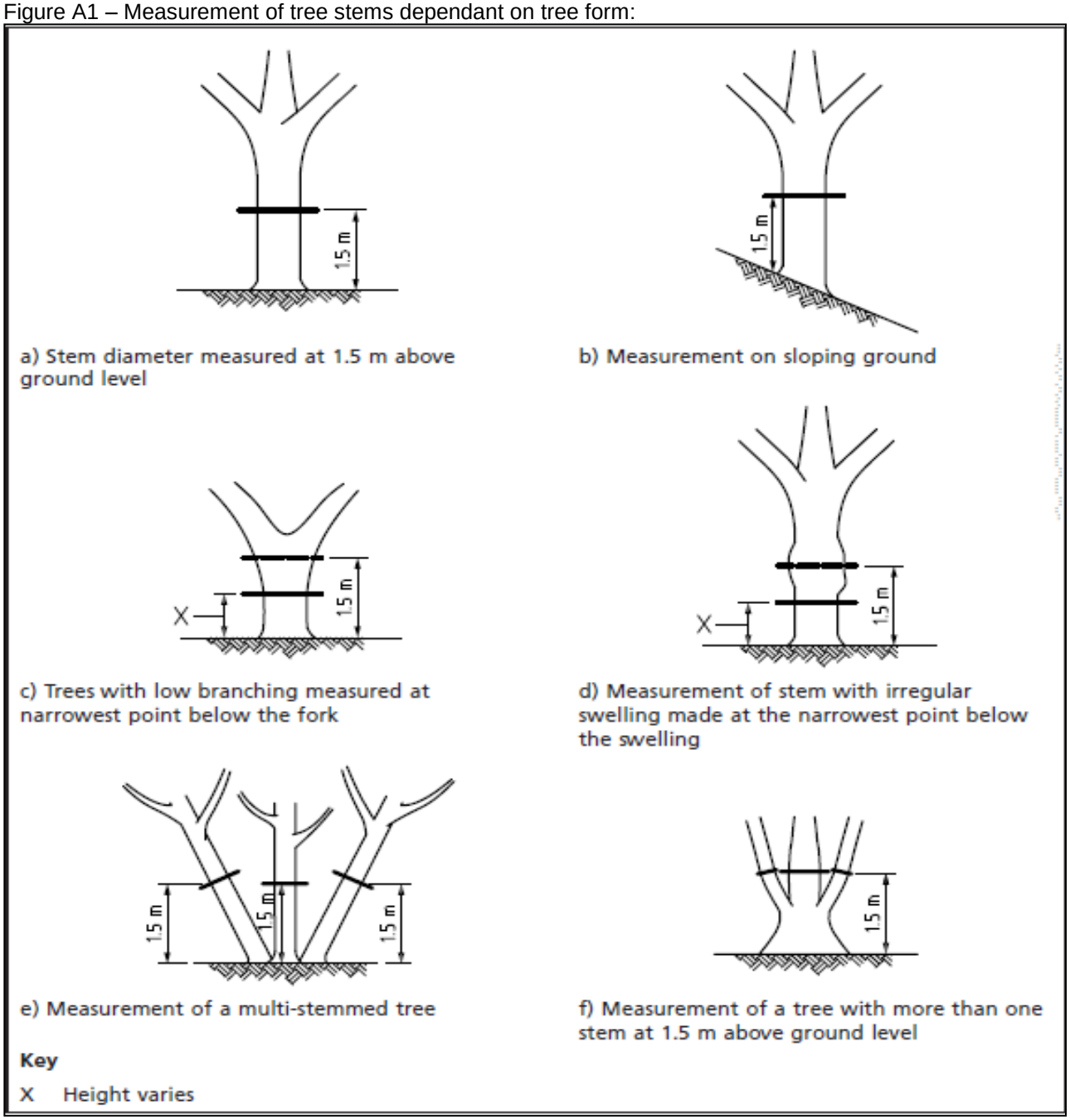
Estimated remaining contribution, in years:
<10
10+
20+
40+

Category grading: As per BS5837:2012 chart in accordance with figure A2 below.
A – Illustrated as light green (RGB code 000-255-000)
B – Illustrated as Mid blue (RGB code 000-000-255)
C – Illustrated as Grey (RGB code 091-091-091)
U – Illustrated as Dark red (RGB code 127-000-000)

Root Protection Area (m^2): plotted around each of the category A, B and C trees on relevant drawings, and illustrates the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability , and where the protection of the roots and soil structure is treated as paramount.

(Note: Red hash tag '#' will denote that a measurement is estimated)

Figure A1 – Measurement of tree stems dependant on tree form:



a) Stem diameter measured at 1.5 m above ground level

b) Measurement on sloping ground

c) Trees with low branching measured at narrowest point below the fork

d) Measurement of stem with irregular swelling made at the narrowest point below the swelling

e) Measurement of a multi-stemmed tree

f) Measurement of a tree with more than one stem at 1.5 m above ground level

Key

X Height varies

Figure A2 – Cascade chart for tree quality assessment from BS5837:2012

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

Appendix B. Tree Survey Schedules

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
001	Cherry	6.5	175	N-5, 4	2-N	1	SM	Good vitality. Crown breaks at 1.8m. Co-dominant stems. Union satisfactory. Pronounced south east buttress root. No apparent significant structural defects recorded.	No works presently required	20+	B1	2.10
002	Pear	6	260	E-1, 4.5	3-W	1.8	EM	Fair vitality. Poor structural condition. Hollow main stem to 2m. Formerly co-dominant from 2m, cavity at old branch wound. West stem principal leader, abrupt angles at unions - crown bias to west.	Reduce western crown by 2m to manage risk of failure	<10	C3	3.12
003	Common Ash	20	700*	9.5	4.5-W	4	M	Good vitality. Crown breaks at 3m into 4xstems. Cavity at old branch wound at 3.2m on west stem, potential woodpecker hole. Open crown. Heavy ivy encroachment on main stem to 3m, hinders full inspection of root collar.	Girdle and remove ivy from main stem to facilitate tree risk management surveys	20+	B1/3	8.40

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
004	Sycamore	18	500x2	N-8	6-N	4	M	Good vitality. Mutual crown suppression. Twin stems from base. Union appears satisfactory. No apparent significant structural defects recorded.	Base not fully inspected given existing vegetation. Recommend clearing vegetation at base to facilitate tree risk management surveys	20+	B2	8.40
005	Sycamore	17	500	N6.5	3-NE	3	EM	Good vitality. Minor small diameter deadwood in crown. Loss of apical dominance at 8m. Unions appear satisfactory. No apparent significant structural defects recorded	No works presently required	40+	B2	6.00
G1	Hollyx7, Hawthorn x6	To 10	To 300	To N-3	n/a	GL	SM-EM	Fair vitality throughout. Mutual crown suppression, spacing indicative of old hedgerow planting. Western holly heavy lean to north west & heavy ivy encroachment on main stem. Moderate landscape value for screening	Coppice western holly leaning towards informal grassed area.	20+	C2	3.60
G2	Applex8	To 3	To 190@200	To 2	n/a	0.5	Y	Good vitality throughout. No apparent significant structural defects recorded	no works presently required	20+	C2	2.28

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
H1	Beech	To 4	To 90	To 2.5	n/a	GL	EM	Good vitality throughout. Maintained hedgerow. Formerly topped at 1.8m. High landscape value as screening	no works presently required	20+	B2	1.08
006	Silver Birch	14	250	3.5	1.6-N	1.8	SM	Good vitality. Co dominant stems at 1.6m. Union satisfactory. No apparent significant structural defects recorded	no works presently required	40+	B1/2	3.00
007	Silver Birch	12	230	3	1.8-S	1.6	SM	Good vitality. Co-dominant stems at 1.8m. Early included bark at junction, not significant at this time. Slight curve on main stem	no works presently required	20+	B1	2.76

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
G3	Blackthorn, Cherry Plum	To 12	850@500	N-5.6	3-W	1	OM	2x Principal trees & self set younger specimens form group. Fair vitality throughout through competition for light. Ivy severed at base on larger specimens, remaining dead ivy stems within crown. *Phellinus tuberculosus* fungal bracket on east failed stem on prominent tree. Hung up limb. Multi stem form, old coppice stool. Failed stems to south. Mutual crown suppression throughout. Moderate landscape value through internal screen function. Abrupt angles on branches, restricted stems.	Remove ivy dead ivy. Prune failed hung up limbs. Undertake aerial inspection of structural condition of remaining stems.	10+	B1/2/3	10.20
008	Holly	14	280, 180	N-3.5	2-N	GL	EM	Fair vitality. Twin stems from base. Union not visible given ivy encroachment. East stem failed at 8m, top tear out. Heavy ivy encroachment on main stems. Moderate landscape value.	Girdle 1m section of ivy at base	10+	C2	3.84

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
009	Hazel	8	80<5	N-5.5	4-N	GL	OM	Fair vitality. Old coppice stool, multi stem form at ground level. Deadwood in crown on old stems-<80mm diameter. Ivy - established. Moderate landscape value.	Cut back south east stem overextending. Girdle and remove ivy	20+	B2	2.40
G4 010	Hollyx3, Blackthornx5, Hazelx3, Elderx2	To 9	270, Av150x5	To 3.5	1.5-S	GL	M	Fair to good vitality. Multi stem forms indicative of past coppice management. Old hedgerow planting. Ivy severed at bases and re-established on 3xtrees. 010-principal tree in group-6xstems from base. No apparent significant structural defects recorded. Moderate landscape value.	Remove hung up failed limbs and deadwood overhanging footway at east extent of group.	20+	B2	5.40
G5 011	Hawthornx6, Hazelx1, Holly x2	To 6	To 170, 160, 200	To 3	2-N	GL	EM	Fair vitality. Multi stem forms and growth habit indicative of past hedge laying with horizontal stems and pruning wounds. Mutual crown suppression. No apparent significant structural defects recorded. Moderate landscape value	No works presently required	20+	B2	4.50

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
012	Apple	6	380@400	3.5	1.5-E	2	EM	Fair vitality. Hollow east stem. Sufficient surrounding sound wood. Planting pit 0.5m square. Limited surrounding soft surface. Crown breaks at 1m, merged stems at 1.5m. Decay entry points at old pruning wounds. Limited landscape value.	No works presently required	10+	C2	4.56
013	Hawthorn	3.5	150x3	2, N-3	2-N	1.5	SM	Good vitality. 3xstems from ground level. No apparent significant structural defects recorded	no works presently required	10+	C1	3.12
014	Pear	16	530	6	3-S	3	M	Good vitality. Crown breaks at 3m. Helical ribs on main stem indicative of reaction wood to torsion stress. Pronounced buttress roots. Old branch wounds in crown - no decay evident at wounds. Geotextile layer at base. Slight lean on stem to west.	no works presently required	20+	B1	6.36

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
015	Whitebeam	6	190	2.5	1.5-W	1.2	SM	Good vitality. Principal branch structure & unions in satisfactory condition. Limited landscape &arboricultural value	no works presently required	20+	C1	2.28
G6	Lawson Cypress x2, Cherryx1	To 11	To 400@100	To 3	n/a	GL	SM	Good vitality. Mutual crown suppression. No apparent significant structural defects recorded	no works presently required	20+	B2	4.80
016	Silver Birch	14	250	3.5	2-W	1.8	SM	Good vitality. Single leader. No apparent significant structural defects recorded	no works presently required	40+	B1/2	3.00
G7	Silver Birchx2, Elderx2, Common Beechx2, Blackthorn x2, Buddleia x1	To 5	To 80x5	To 2.5	n/a	GL	Y	Intermittent young & early mature trees. Fair vitality. Limited landscape & arboricultural value given size. Ivy clad Elder. Leans, crown suppression	no works presently required	10+	C2	2.16

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
017	Silver Birch	12	260	2.5	3-W	1	SM	Good vitality. Single leader. Slight lean to north. No apparent significant structural defects recorded	no works presently required	40+	B1/2	3.12
018	Silver Birch	12	180, 160	3,N-1	2-E	1	SM	Good vitality. Twin stems from 200mm. Union satisfactory. Reaction wood either side of union.	No works presently required	20+	B1/2	2.88
G8 019	Laurelx1, Hazelx1, Holm Oak	To 5.5	To 230	3	n/a	GL	Y-SM	Good vitality. Mutual crown suppression. Principal branch structure & unions appear satisfactory. Moderate landscape value as screening	no works presently required	20+	C2	2.76
020	Common Ash	14	320	5.75	2-S	2	SM	Good vitality. Co-dominant stems at 2m, union appears satisfactory. No apparent significant structural defects recorded	no works presently required	20+	B1/2	3.84

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
021	Blue Atlantic Cedar	15	325	4.5, N-2	E-2	GL	SM	Good vitality. Crown suppression to north from adjacent tree. Moderate landscape & arboricultural value. No apparent significant structural defects recorded	no works presently required	40+	B1/2	3.90
G9 022	Silver Birch	To 10	270	To 3	2-S	0.5	SM	Good vitality. Mutual crown suppression. Slight leans on main stems to east. No apparent significant structural defects recorded.	no works presently required	20+	B1/2	3.24
023	Sycamore	20	1000	W-8	3-SW	3	M	Good vitality. Dominant tree. High landscape & arboricultural value. Part of streetscape. Co dominant stems at 3m, union appears satisfactory. Decay entry point at old branch wound south side of main stem at 2.8m. Flattened main stem indicative of reaction formation to counter wind stress. No apparent significant structural defects recorded	no works presently required	20+	A1/2	12.00

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
024	Sycamore	10	0	0	0	0	SM	Poor vitality, no live bud formation recorded.	Fell tree on grounds of safety and sound arboricultural management. Recommend within 6months	<10	U	0.00
025	Shrub	4	60>10	N-4, 2	n/a	1.5	M	Poor vitality, limited bud formation in crown. Multi stem form. Large diameter basal cavity at old branch wound. Limited landscape value	Fell tree on grounds of safety and sound arboricultural management. Recommend within 6months	<10	C1	2.40
026	Hawthorn	5		2			SM	Poor vitality no live bud formation recorded. Deadwood throughout crown. suspected honey fungus infection as the tree to the west was felled due to honey fungus infection	Fell tree on grounds of safety and sound arboricultural management. Recommend within 6months	<10	U	0.00
027	Whitebeam	6	200	3	1-E	1.8	SM	Poor vitality. Limited bud formation, dieback and deadwood throughout crown.	Fell tree on grounds of safety and sound arboricultural management. Recommend within 6months	<10	U	2.40

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
028	Holm Oak	8	220x2	4.5	1-N	1.5	Y	Good vitality. Growing underneath utility cables. Twin stems from base. No apparent significant structural defects recorded	no works presently required	10+	C1	3.78
029	Flowering Cherry	4	480	3.5, E, S-4.6	2-S	1.8	M	Fair vitality. Graft point 2m, then multi stem form. Crown reduced in past. Wood decay fungal bracket on east stem. Not significant at present. Surrounding soft surfaces compacted.	no works presently required	<10	C1	5.76
030	Hornbeam	18	560	6.8	2-N	2	M	Good vitality. Crown breaks at 2m. Fastigate form. RPA compacted through footfall. Rubber geoweb laid at base. No apparent significant structural defects recorded	no works presently required	20+	B2	6.72

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
031	Hornbeam	18	560	6.8	2-N	2	M	Good vitality. Crown breaks at 2m. Fastigate form. RPA compacted through footfall. Astro-turf laid at base. No apparent significant structural defects recorded	no works presently required	20+	B2	6.72
032	Blackthorn	5	190x2	4	1.5-W	1.8	SM	Good vitality. Co-dominant stems at 200mm. No apparent significant structural defects recorded.	no works presently required	20+	C2	3.24
033	English Oak(TP)	15	1000*	W-6.5	4-W	3	OM	Third party tree. Fair vitality. Deadwood & dieback in crown. Central stems failed. Pruning wounds in crown as part of tree risk management operations.	no works presently required	20+	B3	12.00
034	Hawthorn	3	100	2.5	1.8-N	1.8	SM	Fair vitality. Crown breaks at 1.8m into multi stems. Limited landscape & arboricultural value.	no works presently required	20+	C2	1.20

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
035	Silver Birch	18	500	6.5	2-E	1.8	M	Good vitality. Co-dominant stems at 2m, union tight. Not significant at present. Principal branch structure appears satisfactory. No apparent significant structural defects recorded	no works presently required	20+	B1	6.00
G10	Cherry, London Plane	To 5	To 80	To 2	n/a	1.75	Y	Good vitality throughout. Part of new planting around building. Principal branch structure & unions appear satisfactory. Limited landscape & arboricultural value given size	no works presently required	40+	C2	0.96
036	Hornbeam	6	200	4.5	1.5-S	2	Y	Good vitality. No apparent significant structural defects recorded	no works presently required	40+	C2	2.40

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
037	Common Ash	16	550	8	2-E	2	EM	Fair vitality. Crown reduced in past by approximately 4m. Regenerated stems at pruning wounds. Weaker branch attachments. Overextending scaffold limb to east over car park.	Reduce east scaffold limb back to base-horizontal habit	20+	B2	6.60
038	Norway Maple	14	530	5.5	2-E	2	EM	Good vitality. Crown breaks at 2m. Principal branch structure & unions appear satisfactory. No apparent significant structural defects recorded	no works presently required	40+	B2	6.36
039	Horse Chestnut	10	400	5.5	2-W	1.5	SM	Fair vitality. Rusty residue synonymous with bacterial canker at base and root collar. Not significant at present	no works presently required	10+	C2	4.80
040	Silver Birch	10	200	5-N	2-N	2	SM	Good vitality. Lean to north. No apparent significant structural defects recorded	no works presently required	20+	B2	2.40

Tree No	Species in Group	Ht (m)	Stem diameter (mm)	Branch spread (m) N E S W	1st major branch height (m) & Direction N/E/S/W	Canopy height (m)	Life stage Y SM EM M OM	General observations Structural and/or physiological condition	Preliminary management recommendations	Est'd Remaining contribution (years) <10/10+/20+/40+	Category grading A B C U 1/2/3	Root Protection Area Radius (m)
041	English Oak	20	900*	10*	2-S	5	M	No access to base. Good vitality. Crown breaks 2m. No apparent significant structural defects recorded	no works presently required	40+	A1/2	10.80
042	Eucalyptus	6	250	3	3-E	3	Y	Fair vitality. Topped at 4m. Growing in raised planter. Root plate causing direct damage to adjacent hard surfaces. Limited landscape &arboricultural value	no works presently required	<10	C1	3.00
G11	English Oak, Blackthorn, Hazel, Hawthorn, Lawson Cypress, Sycamore	To 18	To 850	To 8	n/a	GL	Y-M	Informal linear belt of trees on entrance road to school. Mutual crown suppression. Fair to good vitality throughout. No apparent significant structural defects recorded.	No works presently requires	40+	B2	To 10

Appendix C. Glossary of Terms

Term	Description
Access Facilitation Pruning	One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.
Adaptive Growth	The process whereby wood formation is influenced both in quantity and in quality by the action of gravitational force and mechanical stresses on the cambial zone
Amenity Value	The environmental and landscape benefits of trees as opposed to their commercial value for timber
Ancient Woodland	Sites which have been wooded since at least 1600, as defined by English Nature and recognised as being of high nature conservation value, whether managed or not. They may be semi-natural or replanted.
Arboricultural Method Statement	Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.
Arboriculture	The study and care of trees and other woody vegetation
Arboriculturist	A person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.
Cavity	An open wound, characterised by the presence of decay and resulting in a hollow
Co-dominant stems	Where a trees main stem splits into two leaders, can also be called twin-stemmed.
Competent person	A person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.
Construction	Site-based operations with the potential to affect existing trees.
Construction Exclusion Zone	The area based on the root protection area from which access is prohibited for the duration of a project.
Coppice	A traditional method of woodland management in which young tree stems are repeatedly cut down to near ground level. In subsequent growth years, many new shoots will emerge, and, after a number of years the coppiced tree, or *stool*, is ready to be harvested, and the cycle begins again
Crown clearance	This is the removal of all dead, dying and diseased branches; in addition branches that are cleared away from a specific hazard e.g. live railway line.
Crown lifting	The removal of lower branches to provide a desired amount of clearance above ground level. This can be achieved either by the complete removal of a branch or only parts of which extend

Term	Description
	below the desired height
Crown reduction	The overall reduction of both the height and spread of the crown.
Decay	Process of degradation of woody tissues by fungi and bacteria through decomposition of cellulose and lignin.
Deadwood	Deadwood is often present within the crown or on the stems of trees. In some instances is may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).
Epicormic growth	A secondary growth from dormant adventitious buds on the stem or main braches.
Failure	In connection with tree hazards, apartail or total fracture within woody tissue or loss of cohesion between roots and soil.
Hazard beam	An branch that has over extended in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).
Hung-up limb	Dead or fallen branch from within the crown or from another tree's crown that has failed and been caught up by, and resting on, branches of a tree
Included Bark Junction	Pattern of development at branch junctions where bark is turned inward rather than pushed out. Potential weakness due to a lack of a woody union.
Ivy Growth	Ivy growth may ascend into the tree's crown, increasing wind resistance, concealing potential defects and reducing the tree's photosynthetic capacity. Ivy growth is often acceptable in woodland areas as a conservation benefit.
Monolith	A large bulk of standing dead wood. Usually the truck of the tree or the truck with the base of the branch frame work. These should be retained for wildlife habitat when the risk is appropriate for the location.
Pollarding	This involves the removal of whole branches to leave only the main trunk. In species such as willows and poplars such as significant pruning is acceptable with new branches developing from the pollard heads. Secondary pruning of the new wood can help form a new canopy to the tree several years after the initial pollard
Reaction Wood	Specialised secondary xylem, which develops in response to a lean or similar mechanical stress, attempting to restore the stem to the vertical.
Root Protection Area	The layout design tool indicating the minimum area around a

Term	Description
(RPA)	tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.
Service	Any above or below ground structure or apparatus required for utility provision.
Stem	The principal above-ground structural component(s) of a tree that supports its branches.
Structure	A manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork.
Structural Defect	Internal or external points of weakness, which reduce the stability of the tree
Sub-dominant stem	A branch within the crown that is not the dominant leader
Suppressed	Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.
TPO	A Tree Preservation Order is an order made by Local Planning Authority which in general makes it an offence to cut down, lop, top, uproot, wilfully damage or wilfully destroy a tree without first getting permission from us. Tree Preservation Orders are usually made to protect trees that make a significant contribution to the amenity of an area. They may particularly be made when it is felt that a tree may be under threat.
Tree Constraints Plan	Abbreviated to TCP. Plans showing specific tree constraints including Root Protection Areas and Crown spread.
Tree Protection Plan	Abbreviated to TPP. Scaled drawing, informed by descriptive text where necessary, based upon the finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures.
Veteran Tree	A 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. These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem.
Visual Tree Assessment	A non-invasive method of examining the health and structural condition of trees. Developed by Claus Mattheck and David Breloer 1994
Wound	Any injury, which induces a compartmentalisation response
Wound Wood	Wood with atypical anatomical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound as opposed to the ambiguous term "callus."

Appendix D. Drawings

Tom Dale
Wellbrook Court
Girton Road
Cambridge
CB3 0NA

Thomas.dale@atkinsglobal.com
01223814088
01223277529