17 KEMPLAY ROAD, HAMPSTEAD

PRE-DEVELOPMENT ARBORICULTURAL SURVEY

A Report to: Crawford Partnership

Report No: RT-MME-126117 Rev A

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MIDDLEMARCH ENVIRONMENTAL

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REPORT VERIFICATION

This study has been undertaken in accordance with British Standard 5837:2012 “Trees in relation to design, demolition and construction - Recommendations”.

Report Version	Date	Completed by:	Checked by:	Approved by:
Final	11/09/2017	Dean Moore Dip Arb (Arboricultural Consultant) & Charlie Partridge (Arboricultural Support Officer)	Ed Lusk HND, PTI (Principal Arboricultural Consultant)	Dr Philip Fermor CEnv, MCIEEM (Managing Director)
Revision A	12/09/2017	Dean Moore Dip Arb (Arboricultural Consultant)	Ed Lusk HND, PTI (Principal Arboricultural Consultant)	Dr Philip Fermor CEnv, MCIEEM (Managing Director)

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified and experienced arboriculturist to assess any changes to the trees, groups and hedgerows on site and to inform a review of the conclusions and recommendations made.

It should be noted that trees are dynamic living organisms that are subject to natural changes as they age or are influenced by changes in their environment. As such following any significant meteorological event or changes in the growing environment of the trees they should be re-assessed by a suitably qualified and experienced arboriculturist.

NON-TECHNICAL SUMMARY

Middlemarch Environmental Ltd was commissioned to undertake a Pre-development Arboricultural Survey of a site on Kemplay Road in Hampstead, London. To fulfil the project brief, a desk study and a field survey of the trees present on site were undertaken in August 2017.

The desk study exercise identified that the site is situated within a Conservation Area. Additionally, Camden Council have been contacted about Tree Preservation Orders, but at the time of writing, this information has not been received. This report will be revised when the data is received.

Dean Moore (Arboricultural Consultant) undertook the field survey in August 2017. The survey identified that the site contains a number of young and early-mature trees which are predominantly in a fair condition.

The most significant trees recorded within the survey were the Sycamore (*Acer pseudoplatanus*) and Silver birch (*Betula pendula*) trees present at the front of the house.

To ensure the protection of trees selected for retention during the course of the proposed development it is recommended that the guidance set out in Section 5 of this report is considered and that, during development of the site, the retained trees are protected by the erection of tree protection barriers to the specification set out in BS5837:2012.

CONTENTS

1. INTRODUCTION

1.1 PROJECT BRIEF

In August 2017, Crawford Partnership commissioned Middlemarch Environmental Ltd to undertake an Arboricultural Survey of trees growing on land at, and adjacent to, 17 Kempley Road in Hampstead, London.

At the time of writing, it was known that the client was proposing to build an extension to rear of 17 Kempley Road, however full details of the proposed development were not known.

The purpose of this report is to:

- Record the current condition of the trees found on the site and categorise them using criteria outlined in BS5837:2012 “Trees in relation to design, demolition and construction - Recommendations”.
- Provide a Tree Constraints Plan that identifies any constraints to development presented by the trees to include root protection areas for the retained trees as described in BS5837:2012.
- Provide guidance detailing arboricultural constraints to development and factors to be considered during the detailed design of the proposed development.

1.2 SITE DESCRIPTION

The site under consideration, hereinafter referred to as the study area, is the front and rear garden of 17 Kemplay Road, it measures approximately 0.05 ha in size and is located in Hampstead at Ordnance Survey Grid Reference TQ 26752 85675.

The study area is located within a predominantly residential area on the south-western side of Hampstead, in North London. To the north is Hampstead Heath, a large park and recreation ground while to the south, residential development dominates the wider landscape.

The northern boundary of the study area is delineated by Kemplay Road opposite which is another row of terraced housing. To the east the study area runs into adjacent to Rossyln Hill Chapel whilst to the south it borders The Academy School, beyond which is the A502 and an area of residential development. To the west of the study area, more residential development is found beyond which is Willoughby Road.

The study area consists of a mixture of amenity grassland and hardstanding with all notable vegetative features located adjacent to or beyond its boundaries.

The topography of the study area is generally flat with a notable decline along its eastern boundary.

The location of the trees surveyed can be found on Middlemarch Environmental Ltd Drawing Number C126117-01, contained within Section 7 of this report.

2. METHODOLOGY

2.1 DESK STUDY

A desk study was undertaken to identify if any of the trees present within or in close proximity to the site are covered by Tree Preservation Orders (TPOs) or if the site is situated within a Conservation Area. This involved consultation with the Local Planning Authority.

2.2 CONDITION STATUS

To determine the status of the trees within the site a full arboricultural survey has been undertaken, assessing the species and status of all trees present. This survey has been carried out in accordance with British Standard 5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

All trees have been assigned a unique reference number. Individual trees above 75 mm in diameter (at 1.5 m above ground level) have had their position plotted to a survey drawing. The trees were visually assessed and a schedule prepared listing: tree number, species, trunk diameter at 1.5 m above ground level (or in accordance with Annex C of BS5837:2012), tree height, crown spread (cardinal points), crown clearance (cardinal points), height of first branch and growth direction, age class and estimated remaining life expectancy in years. Measurements for tree height, first branch height, crown clearance and crown spread were taken to an accuracy of 0.5 m. Stem diameter measurements were recorded to the nearest 10 mm. Any specific observations or recommendations with regard to management were also noted. All these observations and measurements are summarised in Section 3.3.

Each tree was assessed and assigned to one of the following categories:

- Category A: Those trees of high quality and value with an estimated remaining life expectancy of at least 40 years.
- Category B: Those trees of moderate quality and value with an estimated remaining life expectancy of at least 20 years.
- Category C: Those trees of low quality and value with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150 mm.
- Category U: Trees 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.

Categories A, B and C have further sub-categories with regards to the reasons for tree retention:

1: Mainly arboricultural qualities.
2: Mainly landscape qualities.
3: Mainly cultural values, including conservation.

2.3 ROOT PROTECTION AREA (RPA)

In order to avoid damage to the roots or rooting environment of retained trees, the RPA has been calculated for each of the Category A, B and C trees. This is a minimum area around a tree which is deemed to contain sufficient roots and rooting volume to maintain the tree's viability. Protection of the roots and soil structure in this area should be treated as a priority.

These figures have been calculated utilising the formulas within Section 4.6 and Annex D of British Standard 5837:2012.

3. RESULTS

3.1 DESK STUDY

An internet search using the online mapping tool provided by Camden Council (http://gis.camden.gov.uk/geoserver/ConservationArea.html) confirms that the study area is situated within a Conservation Area (Hampstead Conservation Area 01/02/1968). Information regarding TPOs present on the site has not yet been received.

3.2 WEATHER CONDITIONS AND PERSONNEL

Dean Moore (Arboricultural Consultant) completed the survey on 16th August 2017. The weather conditions at the time of the survey are shown in Table 3.1.

Conditions	Result
Temperature (°C)	13
Cloud Cover (%)	100
Precipitation	Rain
Wind Speed (Beaufort)	F1-2

Table 3.1: Weather Conditions at Time of Survey

3.3 SURVEY RESULTS

Tree species recorded during the survey are listed in Table 3.2.

Common Name	Scientific Name
Bay	*Laurus nobilis*
Cherry	*Prunus* sp.
Common lime	*Tilia x europaea*
Firethorn	*Pyracantha* sp.
Oleaster	*Elaeagnus pungens* 'maculata'
Silver birch	*Betula pendula*
Sycamore	*Acer pseudoplatanus*

Table 3.2: Tree Species Recorded During Survey

The full results of the Arboricultural Assessment are detailed in Table 3.3.

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
1	Cherry	1	180	8.0	2.0 NE	3.5	3.5	3.5	4.0	2.5	3.0	3.0	2.5	Y	F	F	10+	C3	• Dieback present on lateral and apical branches. • Minor deadwood present. • Previous work – crown lift, not occluding due to poor pruning.	-
2	Cherry	1	60	4.5	2.0 S	0.5	2.0	1.5	0.5	2.5	2.5	2.5	2.5	Y	F	F	10+	C3	• Dieback present on lateral and apical branches. • Minor deadwood present. • Suppressed form. • Tree offers the site a limited contribution.	-
3	Bay	1	140	9.5	2.5 W	3.0	3.0	3.0	4.0	2.5	2.5	3.0	2.5	Y	G	G	20+	B1	• Limited inspection due to ivy. • Tree is located off-site but does overhang. • Trifurcate at ground level. • Crossing branches. • Previous work – cutback to boundary.	-
4	Common Lime	1	650	13.5	-	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	EM	G	G	20+	B1	• Limited inspection due to ivy. • Previous work – pollarded. • Tree is located off-site but does overhang.	-
5	Firethorn	1	120	5.0	1.5 W	2.0	1.5	0.5	0.5	2.0	2.0	2.0	2.0	Y	F	F	10+	C3	• Hardstanding within RPA of tree. • Crossing branches. • Previous work – crown lift.	-
6	Oleaster	1	40	4.5	2.0 N	2.0	1.5	0.5	1.5	2.0	2.0	2.0	2.0	Y	F	F	10+	C3	• Hardstanding within RPA of tree. • Crossing branches. • Previous work – crown lift.	-

Table 3.3: Results of Arboricultural Survey (continues)

Tree No.	Species	No. Stems	Diam (mm)	H't (m)	H't 1st Branch (m)	Branch Spread (m)				Crown Clearance (m)				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
						N	E	S	W	N	E	S	W							
7	Sycamore	1	520	18.0	4.5 N	7.5	5.5	7.5	5.5	5.0	6.0	6.0	6.0	Y	G	G	40+	B1	• Ivy present on main stem. • Dieback present on lateral branches. • Hardstanding within RPA of tree. • Bifurcate at 4.0 m above ground level. • Generally a good specimen. • Previous work – crown lift, wounds occluding.	-
8	Silver birch	1	260	17.0	3.0 W	7.5	5.0	6.0	6.5	2.0	4.0	4.0	3.0	EM	F	F	10+	C1	• Hardstanding within RPA of tree. • Sparse crown. • Dieback present on lateral and apical branches. • Bifurcate at 0.5 m above ground level. • Previous work – crown lift and cutback from ivy. • Minor deadwood present. • Small branches hanging in crown. • Tree seems to be in decline.	-

Key

Age Class
Y: Young = tree within first third of average life expectancy
EM: Early mature = tree within second third of average life expectancy
M: Mature = tree within final third of average life expectancy
OM: Over mature = tree beyond average life expectancy

Physiological Condition
G: Good = no health problems
F: Fair = symptoms of ill health that may be remedied
P: Poor = poor health

Structural Condition
G: Good = no structural defects
F: Fair = remedial structural defects
P: Poor = significant structural defects

000: Estimated dimension due to access restrictions
RPA: Root Protection Area

Table 3.3 (cont'd): Results of Arboricultural Survey

3.4 ROOT PROTECTION AREA (RPA)

Table 3.4 provides details of the Root Protection Area (RPA) of all trees surveyed which were classified as Category A, B or C specimens. This table also gives an approximate root protection radius for these trees.

Tree No.	Species	Diameter (mm)	Approximate Root Protection Radius (m)	Root Protection Area (m^2)
1	Cherry	180	2.4	18
2	Cherry	60	0.9	3
3	Bay	140	1.8	10
4	Common lime	650	7.8	191
5	Firethorn	120	1.5	7
6	Oleaster	40	0.9	3
7	Sycamore	520	6.3	124
8	Silver birch	260	3.3	34

Table 3.4: RPA and Approximate Root Protection Radius of Category A, B and C Trees Surveyed

4. DISCUSSION

4.1 DESK STUDY

Camden Council have been contacted about TPOs and this information is currently pending. The site is situated within a Conservation Area (Hampstead Conservation Area 01/02/1968).

The existence of the Conservation Area confers a degree of statutory legal protection upon the trees, with a stem diameter of greater than 75 mm (at 1.5 m above ground level), growing within it. In particular, it should be noted that prior to undertaking any works to trees within the Conservation Area it is necessary to submit a Section 211 notice to the Local Planning Authority giving six weeks' notice of the proposed works. In practice, the submission of a planning application containing fully specified details of proposed tree works will usually meet this requirement.

An authority may treat a planning application for development in a Conservation Area that includes specified tree work as a Section 211 notice if the applicant has clearly stated that it should be considered as such. However, if work is proposed to trees other than those immediately affected by a proposed development then a separate Section 211 notice should be submitted. Where an authority has granted planning permission for development in a Conservation Area, only tree works necessary to implement the development may be carried out. The Authority may use conditions or informatives attached to the permission to clarify this requirement.

4.2 TREE QUALITY

Retention Value

The initial stage of a tree survey in accordance to BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.

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

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

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

Category U trees are those that have been assessed as having no retention value; these trees should not be a material consideration in the planning process. These trees are shown in Red on the Tree Constraints Plan.

Category A, B or C trees are those that should be a material consideration in the planning process whilst Category U trees are those which would be lost in the short term for reasons connected to their physiological or structural condition and hence they should not be a consideration in the planning process.

Overall eight trees have been inspected in accordance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

A summary of the trees in each of the four categories is given in Table 4.1.

BS5837:2012 Category	Tree Number
A	-
B	3, 4, 7.
C	1, 2, 5, 6, 8.
U	-

Table 4.1: Summary of Trees in BS5837:2012 Categories

Physiological Condition

Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally trees within the good condition class are likely to tolerate changes within their growing environment that occur as a result of development; as such their successful retention will be easier to achieve.

Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.

Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.

Chart 4.1 summarises the distribution of tree physiological condition across the study area.

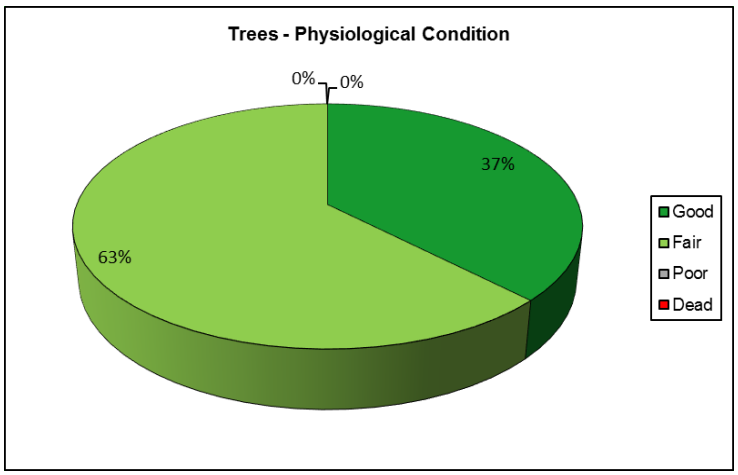


Chart 4.1: Tree Physiological Condition

Age Distribution

Those trees assessed as being young (Y) in age can generally be considered to have significant growth potential. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.

Early mature trees (EM) will generally make a significant contribution to the landscape character and appearance of the site and their retention will provide more immediate succession. These trees will also have significant growth potential.

Mature trees (M) are not considered to have significant future growth potential and have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape contribution of the site however a tree stock over dominated by mature trees will require careful management to ensure that continuation of canopy cover can be achieved.

Over-mature trees (OM) do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

Chart 4.2 shows the distribution of the age class of trees within the study area.

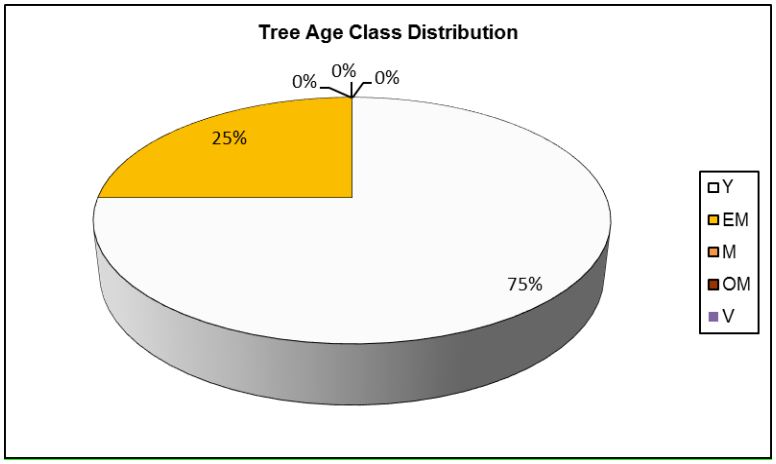


Chart 4.2: Tree Age Class Distribution

Visual Amenity

The Sycamore (tree number 7) and Silver birch (tree number 8) trees located at the front of the house are prominent features of the local landscape and are therefore considered to have visual amenity value.

Ecological Value

Generally speaking it is known that trees are of ecological value and that they fulfil an important role in the urban landscape. In particular it should be noted that trees may provide habitat for protected species, notably for birds and bats.

5. ARBORICULTURAL DESIGN GUIDANCE

5.1 INTRODUCTION

The proposed development is to extend the rear of the current property and the proposed extension is located within the RPA of tree numbers 3 and 4. There are a number of constraints that might impeded tree root development and whether the proposed is achievable without adversely damaging the trees. The constraints comprise of a water pipe and level change.

5.2 THE TREE CONSTRAINTS PLAN

The Tree Constraints Plan (Drawing Number C126117-01), contained within Section 7 of this report) is designed to show the influence that the trees have upon the site by virtue of their size and position. The plan seeks to act as a design tool that shows both the above and below ground constraints presented by the trees.

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

5.2 TREE RETENTION / REMOVAL

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

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

When considering which Category C trees to retain in the new development priority should be given to those trees that have been included within this category solely due to their having stem diameters of less than 150 mm at 1.5 m above ground level. These specimens are normally relatively young trees with future potential.

5.3 BELOW GROUND CONSTRAINTS

5.3.1 Root Protection Areas

Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2012 and a schedule of Root Protection Areas is detailed within this Report as Table 3.4.

Initial Root Protection Areas (RPA's) for the trees have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, required for protection.

It must be noted that there are areas on site where, due to the presence of existing structures, hard surfaces, ground levels and services, tree root development will have been restricted as a result of reduced nutrient or moisture availability and a lack of provision for gaseous exchange. In such areas it may be appropriate to modify the shape of the RPAs, whilst not reducing their area, to take into account the likely root morphology and distribution of the affected trees.

It has been confirmed that a water pipe and significant level change are present on site. Either one will affect root development and potentially impeded root development of tree numbers 3 and4. Further investigation is required to establish to what degree root development has been restricted.

The water pipe that goes through the RPA of tree numbers 3 and 4 (going north to south along the garden), initially this would have meant roots would have been severed to install the pipe. What is unknown is when the pipe was laid and without knowing this it is hard to say whether roots will be present. But on the assumption that it was laid when the house was built, then roots which were severed would have grown back and be present in this area.

However, it is not a simple process to determine exactly where a tree's root system will extend to and whilst roots can generally be considered to be absent beneath substantial buildings, such as houses, they may well

be present, if not abundant, beneath lighter structures and areas of hard surfacing. It is understood that the proposed extension will be located within the RPA of tree number 3 and 4. Depending whether roots are present within the RPA will affect the foundation design, it is recommended that trial pits are excavated within the footprint of the proposed extension to determine the extent of root activity in the construction area. The location and methodology of trial pit excavations should be discussed with the Project Arboriculturist, or in an Arboricultural Impact Assessment report.

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

5.3.2 Removal of Existing Hard Surfaces and Buildings

As noted above there are areas on site where buildings and hard surfaces are present within the initial Root Protection Areas of trees on the site.

In addition to the effects that such construction may have upon the shape and location of the Root Protection Area of the tree the presence of existing construction within the trees initial RPA's is also of note. Removal of such construction, should it be required, has a greater potential to cause harm to the trees due to the need for works in close proximity to them.

Where existing hard surfaces are located within the Root Protection Areas of retained trees care should be taken in their removal and such works should be completed by hand and supervised by an Arboricultural Consultant.

Where existing buildings are located within the Root Protection Areas of retained trees, care shall be taken in their demolition and works should be completed from outside the RPA with buildings being pulled back away from the trees. Again it is recommended that such works are supervised by an Arboricultural Consultant.

5.3.3 New Hard Surfaces and Buildings within Root Protection Areas

The construction of new hard surfaces and buildings around trees has the potential to cause soil compaction, to cause root damage and to reduce nutrient and moisture availability to tree roots to the detriment of tree health and vitality.

To minimise harm occurring as a result of such works, where installation of new hard surfacing is proposed within the Root Protection Areas of retained trees, it must be installed in accordance with no-dig principles.

Should new buildings be proposed within the RPA of an existing tree it will be necessary to take steps to minimise the potential impact to the tree to allow construction. In this respect the guidance contained within BS5837:2012 at clause 7.5 should be considered. This states: "*The use of traditional strip footings can result in extensive root loss and should be avoided. The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually Categories A or B). Designs for foundations that would minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the project arboriculturist and an engineer. In shrinkable soils, the foundation design should take account of the risk of indirect damage.*"

5.3.4 Building Foundations

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

If trees are removed across the site the potential for soil heave should be assessed and foundations designed accordingly (see NHBC Chapter 4.2, 2014).

It is understood that the proposed building extension will be laid on foundations approximately 1000 mm deep. Tree Numbers 3 and 4 are located directly adjacent to this extension in the neighbouring garden of 19 Kemplay Road. During the arboricultural survey it was noted that ground levels are higher within the study area compared to the adjacent property and the retained trees. This difference was later confirmed to be 650 mm.

Despite the difference in ground level between the two properties, it is considered that significant root activity within the study area associated with Tree Numbers 3 and 4 is likely. The proposed extension, which will measure 4.0 m in length, is therefore expected to have significant impacts on the long-term health of the retained trees. In order to mitigate these impacts, it is recommended that foundations either be laid on mini-piles or cantilevered to prevent soil compaction and consequent harm to existing roots.

Further details of mini-piling or cantilevering methods of construction should be provided within an Arboricultural Impact Assessment report for this site.

5.3.5 Service Runs

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

5.4 ABOVE GROUND CONSTRAINTS

Existing Canopy Spreads

The existing canopy spreads of the trees on site are shown on the Tree Constraints Plan (Drawing Number C126117-01, contained within Section 7 of this report).

The current spread of a tree is a constraint due to its dominance, size and movement in strong winds. It will typically be unacceptable to design any built development within the current spread of a tree.

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

Additionally where development is proposed in close proximity to the existing canopy spread of a tree the likelihood of leaf or fruit fall or an accumulation of honeydew causing nuisance must be given.

It should also be noted that where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA may sustain damage during construction.

Where this occurs there are two primary options available to manage and minimise the potential for damage to tree canopies during development and these may be used singularly or in combination.

The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the tree's canopy. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.

Future Tree Growth

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

Within the area of maximum branch spread, construction activities should be restricted for the long-term health and vigour of the trees. It is considered that within the area of maximum branch spread single storey buildings and the installation of hard surfaces would be an appropriate form of construction, however should car parking be proposed beneath the ultimate spread of trees the likelihood of fruit fall, leaf litter or sap exudation causing a nuisance must be considered.

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

6. RECOMMENDATIONS

The following site-specific recommendations are made:

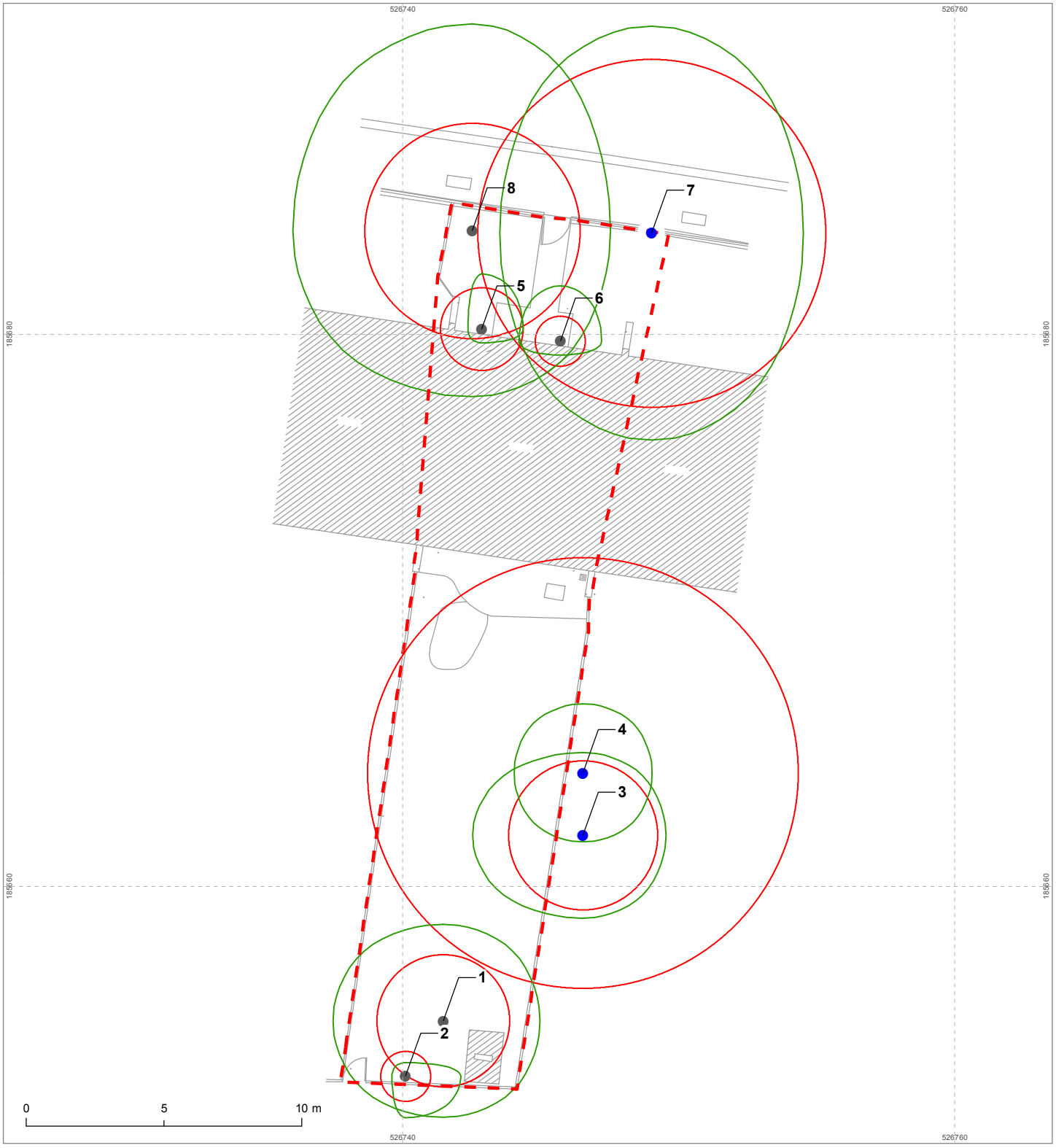
- No works to any trees within the Hampstead Conservation Area (i.e. any trees within the study area) are to be carried out without prior submission of a Section 211 notice to the Local Planning Authority (LPA) giving six weeks' notice of the proposed works.
- In order to determine the extent of root activity associated with Tree Numbers 3 and 4, it is recommended that trial pits are excavated within the footprint of the proposed building extension prior to the commencement of construction works. Trial pits should be dug by hand at numerous locations to be determined by the Project Arboriculturist.
- Upon completion of the trial pits and the report stating what was present, an Arboricultural Impact Assessment should be commissioned. This report is to support the proposed development on this site.
- The retention of the Category B trees across the site should be considered as a priority as these specimens are likely to make a contribution to the continued landscape character of the site.
- The retention of the Category C trees should be considered where possible though it must be noted that these specimens have a low retention value and are likely to only offer a temporary contribution to the landscape character of the site.
- In general all new development shall be located outside of the RPA or canopy spread of any retained tree.
- Where any new development is proposed within the RPA or canopy spread of a retained tree it must be constructed in such a way that damage of the trees root system or crown can be avoided.
- Should new development require works within the RPA of any retained tree an Arboricultural Method Statement should be prepared to set out what steps are to be taken to protect the trees during the course of development.
- Any proposed new planting should consist of native and wildlife attracting species with a robust five year management plan to assist with the development proposal and to offer mitigation for any tree loss.
- This Arboricultural Survey is valid for a period of 12 months. If works are not commenced within this time period then it is advised that the trees are re-inspected to ensure no significant defects have developed since the original survey.

The following generic guidance should also be taken into account during the construction phase of any development, or significant engineering:

- Any trees that are to be retained should be adequately protected by Heras fencing, in line with BS5837:2012, extending at least to the Root Protection Radius, to prevent accidental damage by vehicles or contractors (see Table 3.4, pages 8-9, for RPA data for each tree).
- All tree works are to be carried out by a competent and qualified arborist to BS3998:2010 standards.
- Tree protection should be included in the induction and/or briefing sessions by the contractors to site personnel.
- Soil compaction, from the storage of large quantities of materials and plant tracking, may result in changes to soil permeability and local drainage. This may lead to waterlogging or loss of soil crumb structure. These effects may in turn lead to root asphyxiation and root death, a cause of instability and or mortality in trees. For this reason, heavy machinery and the storage of materials should be excluded from the crown and Root Protection Radius of all trees.
- The recommendations of BS5837:2012 and National Joint Utilities Group Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees) (as appropriate to operations) should be followed when working close to trees.
- If works take place during the bird breeding season, usually from March to September inclusive, trees and hedgerows should be checked for nesting birds. If any trees are to be removed this should be done outside the breeding season or in the presence of a suitably qualified ecologist.
- Mature trees often contain cavities, hollows, peeling bark or woodpecker holes which provide potential roosting locations for bats. Bats and the places they use for shelter or protection (i.e. roosts) receive European protection under The Conservation of Habitats and Species Regulations 2010, as amended (Habitats Regulations 2010, as amended). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. Consequently causing damage to a bat roost constitutes an offence. As such prior to undertaking works to trees a check to see if they are being used for bat roosting should be undertaken by a suitably qualified and experienced ecologist.

7. DRAWINGS

Drawing Number C126117-01– Tree Constraints Plan



Legend

- Category B tree
- Category C tree
- Current canopy extent
- Root Protection Area
- Site boundary

The original of this drawing was produced in colour - a monochrome copy should not be relied upon

Project	17 Kemplay Road, Hampstead
Drawing	Tree Constraints Plan
Client	Crawford Partnership
Drawing Number	C126117-01
Revision	00
Scale @ A4	1:200
Date	August 2017
Approved By	CP
Drawn By	GP

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C126117-01

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