ARBORICULTURAL SURVEY

BOURNE ESTATE
CAMDEN

A Report to CampbellReith Hill LLP

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CAMDEN

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1 OF 2

01 CAMPBELLREITH HILL LLP
02 MIDDLEMARCH ENVIRONMENTAL LTD

This study was compiled by
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This report is 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.

Contract Number C111475

May 2012

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1. INTRODUCTION

1.1 PROJECT BRIEF

CampbellReith Hill LLP (hereafter referred to as CampbellReith) commissioned Middlemarch Environmental Ltd to undertake an Arboricultural Survey on trees at the Bourne Estate in Camden, London.

Middlemarch Environmental Ltd have also completed an Extended Phase 1 Habitat Survey of the site, the results of which can be found in Report Number RT-MME-111475A-01.

It is understood that the proposals for the site include the demolition of the community centre and associated buildings in the centre of the site and Mawson House in the south east of the site, and construction of new residential dwellings.

1.2 SITE DESCRIPTION

The study site is situated in a residential area of Camden, London at central National Grid Reference TQ 311 818. The survey area occupies an area of approximately 0.9 ha and is predominantly flat in topography. At the time of the survey the site was dominated by hardstanding with a number of buildings and areas of amenity grassland, shrub beds and scattered trees. Additional habitats recorded included dense scrub and species-poor defunct hedgerow. St Albans Church of England Primary School bordered the site to the south east. Portpool Lane formed the northern boundary and Baldwin Gardens bordered the site to the south. The eastern and western boundaries were formed by high-rise residential buildings.

The trees present were predominantly London plane *Platanus x hispanica* which generally formed street planting. Scattered tree planting was also present within the amenity spaces on site. Species in these areas included almond *Prunus dulcis*, silver birch *Betula pendula,* cherry *Prunus* spp., honey locust *Gleditsia triacanthos*, Norway maple *Acer platanoides* and silver maple *Acer saccharinium.* Specimens were varied in age with young, early mature and mature trees recorded. The majority of trees were in good condition.

The location of the trees surveyed can be found on Middlemarch Environmental Ltd Drawing Number C111475A-02-01.

2. ARBORICULTURAL SURVEY 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 council.

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 BS 5837 Trees in Relation to Construction (2005).

All trees have been identified with a metal tag at 1.8 m above ground level or given a unique reference number. Individual trees above 75 mm diameter at 1.5 m above ground level have had their position confirmed on the survey drawing. The trees were visually assessed and a schedule prepared listing tree number, species, trunk diameter at 1.5 m above ground level, tree height, crown spread (radius), age class and estimated remaining years. Any specific observations or recommendations with regard to management were also noted. All these observations and measurements are summarised in Section 3.3.

The condition of each tree was assessed according to the following categories:

Category A. Those trees of high quality and value. This category includes:

- Significant trees that are structurally sound and can be retained in the long term (i.e. greater than 40 years) or
- Trees that can be retained in the long term following remedial tree surgery.

Category B Those trees of moderate quality and value. This category includes:

- Trees that may only live 15 to 40 years or
- Trees that may live for more than 40 years but whose removal may be required in that timescale to allow development of retained trees or
- Trees that are defective but could be retained in the medium term by remedial tree surgery.

Category C Those trees of low quality and value. This category includes:

- Trees that can only be retained in the short term (i.e. 5 to 15 years) or
- Trees that have little landscape impact due to poor form or condition or
- Trees having a stem diameter of less than 150 mm at 1.5 m above ground level that could be replaced.

Category R Trees that are dead, dying or diseased that will become dangerous in the near future (within 10 years).

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

1: Mainly arboricultural values

2: Mainly landscape values

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 in m^2, which should be left undisturbed around each retained tree.

These figures are calculated utilising the formula below taken from BS5837 Trees in relation to Construction (2005):

Single Stem Tree

$$\text{RPA } (m^2) = \left(\frac{\text{Stem diameter (mm) @ 1.5m x 12}}{1000} \right)^2 \text{ x } 3.142$$

Tree with more than one stem arising below 1.5m above ground level

$$\text{RPA } (m^2) = \left(\frac{\text{Basal diameter (measured immediately above root flare (mm) x 10}}{1000} \right)^2 \text{ x } 3.142$$

3. RESULTS

3.1 DESK STUDY

Alex Hutson (Trees and Landscapes Officer, Camden Council), confirmed by email on 24th May 2012 that there are no TPOs within or closely surrounding the study area.

Alex confirmed that parts of the eastern half of the study site are located within Hatton Garden Conservation Area. A plan showing Hatton Garden Conservation Area in relation to the study area is provided within Appendix 1. Trees 25-34 and Group 8 are located within this Conservation Area. Trees 17-19 are located on the boundary of the Conservation Area and consequently it is advised that these trees are treated as if they are situated within the area. Details of how this may impact on the proposals is discussed in Section 4.

3.2 WEATHER CONDITIONS

The survey was completed on 29th April 2012 by Marco Bartolini TechCert (Arbor A), FdSc WM, Consultant Arborist. The weather conditions at the time of the survey are shown in Table 3.1.

Conditions	Result
Temperature (°C)	7
Cloud Cover (%)	100%
Precipitation	Rain
Wind Speed (Beaufort)	F 3-4

Table 3.1: Weather Conditions at Time of Survey

3.3 SURVEY RESULTS

Tree, shrub and climber species recorded during the survey are listed in Table 3.2.

Common Name	Scientific Name
Almond	*Prunus dulcis*
Ash	*Fraxinus excelsior*
Barberry	*Berberis sp.*
Beech	*Fagus sylvatica*
Black cherry	*Prunus serotina*
Californian lilac	*Ceanothus* sp.
Cherry	*Prunus* sp.
Firethorn	*Pyracantha* sp.
Flowering cherry	*Prunus* sp.
Hazel	*Corylus avellana*
Holly	*Ilex aquifolium*
Honey locust	*Gleditsia triacanthos*
Ivy	*Hedera helix* subsp. *helix.*
Lawson cypress	*Chamaecyparis lawsoniana*
London plane	*Platanus x hispanica*
Mahonia	*Mahonia aquifolium*
Manna ash	*Fraxinus ornus*
Maple	*Acer* sp.
Norway maple	*Acer platanoides*
Osmenthus	*Osmenthus* sp.
Privet	*Ligustrum lucidum*
Rhododendron tree	*Rhododendron arboreum*
Rowan	*Sorbus aucuparia*
Silver birch	*Betula pendula*
Silver maple	*Acer saccharinium*
Spotted laurel	*Aucuba japonica*
Stranviesa	*Photinia davidiana*
Viburnum	*Viburnum* sp.

Table 3.2: Tree Species Recorded During Survey

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
1	London Plane	S	940	20.0	11.0	13.0	6.0	7.0	3.0	4.0	4.0	6.0	M	G	G	>20	B1,2	• Growing in park next to building and road. • Previously crown reduced off building. • Trunk leans North. • Exposed surface roots with erosion. • Old pruning wounds occluding. • Crown shape distorted due to proximity to building.	• None required at time of survey.
2	Black Cherry	S	260	9.0	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	EM	G	G	>20	B2	• Growing in park next to building. • Caged trunk protection. • Trunk leans North. • Previously crown lifted at 3.0m above ground level. • Old pruning wounds occluding.	• None required at time of survey.
3	London Plane	S	460	20.0	8.0	4.0	8.0	6.0	3.0	5.0	3.0	4.0	EM	G	G	>20	B2	• Growing in park next to building. • Previously crown reduced off building. • Growing on slope. • Previously crown lifted 3.0m above ground level. • Old pruning wounds occluding. • Caged trunk protection occluding at base.	• Remove cage.
4	Black Cherry	S	310	14.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	EM	G	G	>20	B2	• Growing in park. • Previously crown lifted 3.0m above ground level. • Crown shape distorted due to group pressure. • Old pruning wounds occluding. • Caged trunk protection. • Growing on slope.	• None required at time of survey.
5	Black Cherry	S	360	13.0	5.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	EM	G	F	>10	C1,2	• Growing in park on top of slope. • Old pruning wounds occluding. • Bifurcated at 3.0m above ground level. • Co-dominant leaders. • Crown shape distorted due to group pressure. • Exposed surface roots due to erosion. • Caged trunk protection. • Bark wound to North at 0.1m to 1.2m above ground level occluding.	• None required at time of survey.

Table 3.3: Results of Arboricultural Survey (continues)

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
6	Manna Ash	S	420	7.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	EM	G	G	>20	B2	• Growing in park. • Caged protection around trunk - occluding. • Multi-stemmed at 2.4m above ground level. • Old pruning wounds occluding.	• Remove caging.
7	Silver Birch	S	110	10.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	EM	G	G	>20	C1	• Developing tree. • Growing next to existing boundary fence and footpath. • Previously crown lifted over footpath. • Old pruning wounds occluding.	• None required at time of survey.
8	Rowan	S	210	7.0	4.0	4.0	2.0	4.0	3.0	3.0	3.0	3.0	EM	F	F	<10	R	• Caged protection around trunk and occluding at base. • Bark wound at base to 1.3m above ground level occluding. • Previously crown lifted 3.0m above ground level. • Old pruning wounds occluding. • Exposed surface roots with mechanical damage – mower.	• Advise removal within 6 months.
9	London Plane	S	1015	21.0	12.0	10.0	9.0	10.0	3.0	4.0	8.0	6.0	M	G	G	>20	B1,2	• Growing in park. • Girdling roots at base. • Previously crown lifted 3.0m above ground level. • Old pruning wounds occluding. • Exposed surface roots with mechanical damage - mower. • Trunk leans to North.	• None required at time of survey.
10	Norway Maple	S	340	14.0	3.0	4.0	4.0	6.0	6.0	4.0	5.0	4.0	EM	P	P	<10	R	• Exposed surface roots with mechanical damage - mower. • Low crown density. • Poor quality tree of limited value. • Bark wound on trunk at 0.1m to 2.0m above ground level.	• Advise removal within 6 months.
11	Flowering Cherry	S	140	7.0	2.0	4.0	3.0	1.0	3.0	3.0	3.0	3.0	EM	F	F	>10	C1	• Growing in park. • Caged trunk protection. • Crown weighted East. • Previously crown lifted 3.0m above ground level. • Growing under T9.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
12	Rowan	S	200	11.0	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	EM	P	P	<10	R	• Growing in park. • Caged trunk protection and occluding into stem. • Previously crown lifted 3.0m above ground level. • Old pruning wounds occluding. • Poor quality tree of limited value. • Low crown density.	• Advise removal within 6 months.
13	Black Cherry	S	340	16.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	EM	G	F	>10	C1,2	• Exposed surface roots with mechanical damage - mower. • Growing in park. • Epicormics on trunk. • Bark wound on trunk at ground level to 0.4m above ground level occluding. • Bifurcated at 4.0m above ground level. • Co-dominant leaders. • Old pruning wounds occluding. • Minor deadwood in crown.	• None required at time of survey.
14	Rowan	S	180	7.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	EM	G	G	>20	B1,2	• Growing in park next to road and existing boundary fence. • Previously crown lifted 2.0m above ground level. • Old pruning wounds occluding. • Minor deadwood in crown.	• None required at time of survey.
15	Rowan	S	210	8.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	EM	G	G	>20	B2	• Growing in play park next to road and existing boundary fence. • Previously crown lifted 2.0m above ground level. • Old pruning wounds occluding. • Good shape and form.	• None required at time of survey.
16	London Plane	S	550	14.5	7.0	7.0	7.0	7.0	6.0	4.0	7.0	5.0	M	G	G	>20	B1	• Growing on elevated area over school playground. • Previously crown lifted and crown reduced. • Old pruning wounds occluding. • Minor deadwood in crown. • Trunk shape distorted due to previous management.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
17	Ash	S	320	11.0	3.0	5.0	3.0	4.0	6.0	4.0	5.0	6.0	EM	F	F	>10	C2	• Growing next to existing boundary fence, playground and existing retaining wall. • Growing on elevated bank 0.7m above ground level. • Exposed surface roots. • Bark wound to East at 0.2m above ground level occluding. • Previously crown lifted and crown reduced. • Old pruning wounds occluding. • Part of linear group.	• None required at time of survey.
18	Silver Maple	S	340	11.0	3.0	5.0	2.0	5.0	6.0	5.0	8.0	6.0	EM	F	F	>10	C1,2	• Growing in elevated bank 0.7m above ground level. • Crown shape distorted due to group pressure. • Previously crown lifted and crown reduced. • Old pruning wounds occluding with cavities. • Exposed surface roots. • Part of linear group. • Growing next to playground, existing boundary fence and existing retaining wall.	• None required at time of survey.
19	Silver Maple	S	350	11.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	6.0	EM	F	F	>10	C1,2	• Growing in elevated bank 0.7m above ground level. • Crown shape distorted due to group pressure. • Previously crown lifted and crown reduced. • Old pruning wounds occluding. • Old pruning wounds occluding with cavities. • Exposed surface roots. • Part of linear group. • Growing next to playground, existing boundary fence and existing retaining wall.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
20	Almond	S	190	6.5	2.0	4.0	2.0	2.0	3.0	2.0	2.0	5.0	EM	F	F	>10	C1,2	• Growing next to existing boundary fence on slope. • Trunk leans East. • Crown weighted East. • Caged trunk. • Previously crown lifted 2.0m above ground level. • Old pruning wounds occluding. • Crown shape distorted due to group pressure.	• None required at time of survey.
21	Almond	S	110	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Y	F	F	>10	C3	• Growing next to existing boundary fence on slope. • Caged trunk protection. • Growing under T20. • Crown shape distorted due to group pressure. • Trunk shape distorted due to previous management.	• None required at time of survey.
22	Almond	S	190	6.0	2.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	EM	F	F	>10	C2	• Suckers at base. • Caged trunk. • Growing on slope next to existing boundary fence. • Crown shape distorted due to group pressure. • Old pruning wounds occluding.	• None required at time of survey.
23	Almond	S	115	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	EM	G	G	>10	C1,2	• Caged trunk protection. • Growing next to existing boundary fence. • Old pruning wound occluding. • Developing tree.	• None required at time of survey.
24	Silver Birch	S	320	13.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	2.0	EM	G	G	>20	B3	• Growing next to building. • Crown weighted and trunk leans West. • Bifurcated at 2.0m above ground level. • Old pruning wounds occluding.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
25	Honey Locust	S	450	15.0	7.0	2.0	2.0	6.0	4.0	4.0	3.0	5.0	M	F	F	>10	C1,2	• Bifurcated at 2.0m above ground level. • Growing next to road and existing boundary fence. • Previously crown lifted over road. • Old pruning wounds occluding. • Minor deadwood in crown. • Crown shape distorted due to group pressure.	• None required at time of survey.
26	Honey Locust	S	350	14.0	2.0	2.0	5.0	4.0	7.0	9.0	8.0	10.0	M	F	F	>10	C1,2	• Bifurcated at 4.0m above ground level. • Previously crown lifted over road. • Growing next to road, existing boundary fence and T25. • Crown shape distorted due to group pressure. • Hanging deadwood in crown.	• Remove major deadwood in crown.
27	Silver Birch	S	390	13.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	M	G	G	>20	B3	• Growing next to road and existing boundary fence. • Multi-stemmed at 3.0m above ground level. • Faciated limbs to South. • Minor deadwood in crown. • Old pruning wounds occluding.	• None required at time of survey.
28	Silver Birch	S	310	12.0	5.0	4.0	3.0	4.0	4.0	3.0	4.0	8.0	M	F	F	>10	C1,2	• Trunk leans West. • Crown weighted West. • Low crown density. • Poor shape and form. • Trunk and crown shape distorted due to group pressure. • Bark wound at base occluding to South and West.	• None required at time of survey.
29	Honey Locust	S	495	21.0	4.0	4.0	4.0	4.0	8.0	6.0	7.0	8.0	M	F	F	>10	C1	• Low crown density. • Grows in island flowerbed near to buildings. • Cavity in trunk at 0.3-3.0m above ground level and occluding. • Old pruning wounds occluding. • Deadwood stubs.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
30	London Plane	S	615	15.0	3.0	6.0	6.0	4.0	10.0	3.0	6.0	8.0	M	G	G	>20	B1,2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Pollarded away from buildings. • Part of linear group. • Street tree.	• None required at time of survey.
31	London Plane	S	485	16.0	3.0	4.0	5.0	5.0	10.0	8.0	8.0	9.0	M	G	G	>20	B1,2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Pollarded away from buildings. • Part of linear group. • Street tree.	• None required at time of survey.
32	London Plane	S	425	15.0	4.0	7.0	6.0	3.0	5.0	5.0	5.0	5.0	EM	G	G	>20	B1,2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Pollarded away from buildings. • Part of linear group. • Street tree.	• None required at time of survey.
33	London Plane	S	430	15.0	4.0	4.0	6.0	4.0	5.0	5.0	5.0	5.0	EM	G	G	>20	B1,2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Pollarded away from buildings. • Part of linear group. • Street tree.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
34	London Plane	S	450	15.0	4.0	4.0	6.0	4.0	5.0	5.0	5.0	5.0	EM	G	G	>20	B1,2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Pollarded away from buildings. • Part of linear group. • Street tree.	• None required at time of survey.
35	London Plane	S	720	15.0	7.0	9.0	7.0	8.0	5.0	5.0	5.0	5.0	M	G	G	>20	A2	• Growing in tarmac next to road and building. • Roots lift paving. • Previously crown lifted 5.0m above ground level. • Old pruning wounds occluding. • Part of linear group. • Street tree.	• None required at time of survey.
G1	Hazel Holly Barberry Spotted Laurel Osmanthus Common Beech	M S	300	5.0	2.0	2.0	2.0	2.0	0.1	0.1	0.1	0.1	EM	G	G	>20	C1	• Managed bed of shrubs and trees. • Coppiced Hazel stools.	• None required at time of survey.
G2	Pyracantha Hazel Privet	M S	70	2.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1	• Managed border of shrubs.	• None required at time of survey.
G3	Spotted Laurel Cherry Ivy	M S	75	2.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1	• Managed border of shrubs and flowers.	• None required at time of survey.
G4	Hazel Holly Spotted Laurel	M S	60	1.5	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1,2	• Managed bed of developing trees and shrugs.	• None required at time of survey.
G5	Cherry Maple	S	60	4.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	Y	G	G	>10	C2	• Newly staked developing trees with caged trunks.	• None required at time of survey.

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

Tree No.	Species	S or MS	Diam (mm)	H't (m)	Branch Spread (m)				Crown Clearance				Age	Phys Cond	Struc Cond	Est. Remain Contrib (Years)	Cat	Comments	Preliminary Management Recommendations
					N	E	S	W	N	E	S	W							
G6	Californian lilac Cherry Maples Bamboo Almond	S	30	2.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1,2	• Newly staked developing trees with caged trunks. • Managed shrubs in park.	• None required at time of survey.
G7	Stranviesa Rhododen-dron Viburnum Mahonia Firethorn	M S	60	2.0	1.0	1.0	1.0	1.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1,2	• Managed shrubs in border.	• None required at time of survey.
G8	Lawson cypress	M S	110	8.0	2.0	2.0	2.0	2.0	0.1	0.1	0.1	0.1	EM	G	G	>10	C1,2	• Part of linear group. • Provides good visual separation. • Grows next to park area and buildings.	• None required at time of survey.

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

S: Single stemmed.
MS Multi-stemmed.

Major deadwood: branches in excess of 50 mm diameter.
Minor deadwood: branches/twigs less than 50 mm diameter.

Table 3.3 cont'd: Results of Arboricultural Survey

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3.4 ROOT PROTECTION AREA (RPA).

Tables 3.4 and 3.5 provide details of the Root Protection Area (RPA) of all trees and groups 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	Category	Single or Multi-stemmed	Diameter at 1.5 m (mm)	Approximate Root Protection Radius (m)	Root Protection Area (m^2)
1	London Plane	B1,2	S	940	11.28	399.78
2	Black Cherry	B2	S	260	3.12	30.59
3	London Plane	B2	S	460	5.52	95.74
4	Black Cherry	B2	S	310	3.72	43.48
5	Black Cherry	C1,2	S	360	4.32	58.64
6	Manna Ash	B2	S	420	5.04	79.81
7	Silver Birch	C1	S	110	1.32	5.47
9	London Plane	B1, 2	S	1015	12.18	466.12
11	Flowering Cherry	C1	S	140	1.68	8.87
13	Black Cherry	C1,2	S	340	4.08	52.30
14	Rowan	B1,2	S	180	2.16	14.66
15	Rowan	B2	S	210	2.52	19.95
16	London Plane	B1	S	550	6.60	136.87
17	Ash	C2	S	320	3.84	46.33
18	Silver Maple	C1,2	S	340	4.08	52.30
19	Silver Maple	C1,2	S	350	4.20	55.42
20	Almond	C1,2	S	190	2.28	16.33
21	Almond	C3	S	110	1.32	5.47
22	Almond	C2	S	190	2.28	16.33
23	Almond	C1,2	S	115	1.38	5.98
24	Silver Birch	B3	S	320	3.84	46.33
25	Honey Locust	C1,2	S	450	5.40	91.62
26	Honey Locust	C1,2	S	350	4.20	55.42
27	Silver Birch	B3	S	390	4.68	68.82
28	Silver Birch	C1,2	S	310	3.72	43.48
29	Honey Locust	C1	S	495	5.94	110.86
30	London Plane	B1,2	S	615	7.38	171.13
31	London Plane	B1,2	S	485	5.82	106.43
32	London Plane	B1,2	S	425	5.10	81.72
33	London Plane	B1,2	S	430	5.16	83.66
34	London Plane	B1,2	S	450	5.40	91.62
35	London Plane	A2	S	720	8.64	234.55

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

Group No.	Species	Category	Single or Multi-stemmed	Diameter at 1.5 m (mm)	Approximate Root Protection Radius (m)	Root Protection Area (m^2)
G1	Hazel Holly Barberry Spotted Laurel Osmanthus Beech	C1	MS	300	3.00*	28.28*
G2	Pyracantha Hazel Privet	C1	MS	70	0.70*	1.54*
G3	Spotted Laurel Cherry Ivy	C1	MS	75	0.75*	1.77*
G4	Hazel Holly Spotted Laurel	C1,2	MS	60	0.60*	1.13*
G5	Cherry Maple	C2	S	60	0.72*	1.63*
G6	Californian lilac Cherry Maples Bamboo Almond	C1,2	S	30	0.36*	0.41*
G7	Stranviesa Rhododendron Viburnum Mahonia Firethorn	C1,2	MS	60	0.60*	1.13*
G8	Lawson cypress	C1,2	MS	110	1.10*	3.80*

Key:.
*: around each individual within the group/ from centre of hedgerow

Table 3.5: RPA and Approximate Root Protection Radius of Category A, B and C Groups Surveyed

4. DISCUSSION AND CONCLUSIONS

4.1 DESK STUDY

The desk study identified that no trees within the study site are subject to TPOs.

The desk study identified that part of the study area is located within Hatton Garden Conservation Area. Trees 25-34 and Group 8 are located within this Conservation Area. Trees 17-19 are located on the boundary of the Conservation Area and consequently it is advised that these trees are treated as if they are situated within the area. Any works that are to be undertaken to these trees should be fully specified within any planning application or the Local Planning Authority will require a statutory 'six weeks Conservation Area Notification', prior to any tree works being performed.

4.2 TREE QUALITY

Thirty five trees and eight groups have been inspected in accordance with BS 5837:2005 Trees in Relation to Construction:

- One tree is considered to be Category A – Trees of high quality and value.
- Sixteen trees are considered to be Category B – Trees of moderate quality and value.
- Fifteen trees and eight groups are considered to be Category C – Trees of low quality and value.
- Three trees are considered to be Category R – Trees whose immediate removal is advised.

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

BS 5837 (2005). Category	Tree Number
A	35.
B	1, 2, 3, 4, 6, 9, 14, 15, 16, 24, 27, 30, 31, 32, 33, 34.
C	5, 7, 11, 13, 17, 18, 19, 20, 21, 22, 23, 25, 26, 28, 29, G1, G2, G3, G4, G5, G6, G7, G8.
R	8, 10, 12.

Table 4.1: Summary of Trees in BS 5837 (2005) Categories

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4.3 TREES OF CONCERN

Tree 26 (honey locust) has major deadwood present within its crown. This tree is located within an amenity area utilised by the public and consequently the presence of deadwood poses a health and safety risk. The removal of major deadwood from the crown of this specimen is advised. This tree is located within Hatton Garden Conservation Area and as such discussion with the Local Planning Authority is advised prior to completion of these works.

Protective tree cages are present around a number of trees within the study area. The cages are starting to cause potential issues with Tree 3 (London plane) and Tree 6 (manna ash) as bark occlusion around these structures is occurring. It is advised that the cages are removed from around these trees.

5. RECOMMENDATIONS

The following site-specific recommendations are made:

- Trees 25-34 and Group 8 are located within Hatton Garden Conservation Area. Trees 17-19 are located on the boundary of the Conservation Area. Any works required to these trees should be fully specified within any planning application or the Local Planning Authority will require a statutory 'six weeks Conservation Area Notification', prior to any tree works being performed.
- Trees 8, 10 and 12 (Category R) should be removed and replacement planting installed.
- Remove major deadwood from the crown of Tree 26 (honey locust).
- Remove protective cages from around Tree 3 (London plane) and Tree 6 (manna ash).
- Where possible all trees suitable for retention should be retained and protected as part of the 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.

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

- Any trees, hedges or woodland that are to be retained should be adequately protected by Heras fencing (in line with BS5837) extending at least to the Root Protection Radius (RPR), to prevent accidental damage by vehicles or contractors (see Tables 3.4 and 3.5, pages 18 and 19, for RPA and RPR for each tree).
- All pruning works are to be carried out by a competent tree surgeon to BS3998 (2010) standards.
- Tree protection should be included in the induction and/or briefing sessions by the contractors to their workforce.
- 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 radius of all trees.
- The recommendations of BS5837 (2005) and NJUG Volume 4 (as appropriate to operations) should be followed when working close to trees.
- Any damaged tree branches should be treated by a competent tree surgeon.

- 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.

REFERENCES AND BIBLIOGRAPHY

Arboricultural Advisory Information Services. (2007). 'Practice Note 12. Through Trees to Development'.

BS5837. (2005). 'Guide for trees in relation to construction'.

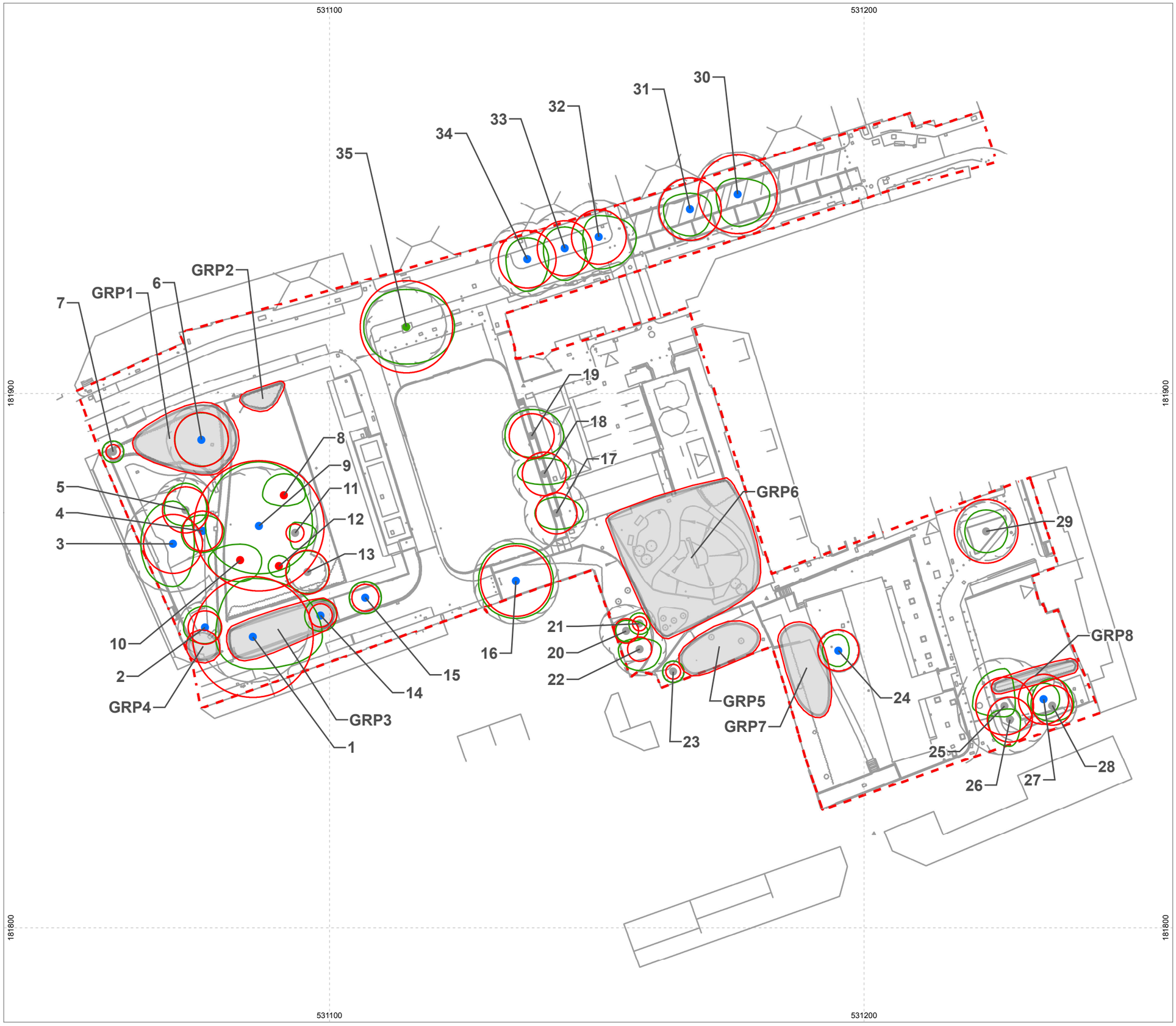
Johnson, O. and More, D. (2004). *Tree Guide*. Collins, London.

Middlemarch Environmental Ltd. (2012). Extended Phase 1 Habitat Survey**:** Bourne Estate, Camden. Report Number RT-MME**-**111475-01.

NJUG Volume 4. (2007). 'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees'.

DRAWINGS

Middlemarch Environmental Ltd Drawing C111475A-02-01 **-** Location of Trees Surveyed.



C111475A-02-01

Legend

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

N

Client: Campbell Reith Hill	Project: Bourne Estate, Camden
Drawing: Arboricultural Survey	Drawing Number: C111475A-02-01
Revision: 00	Date: May 2012
Scale at A3: 1:700	Drawn By: CC
Approved By: LP	Notes: -

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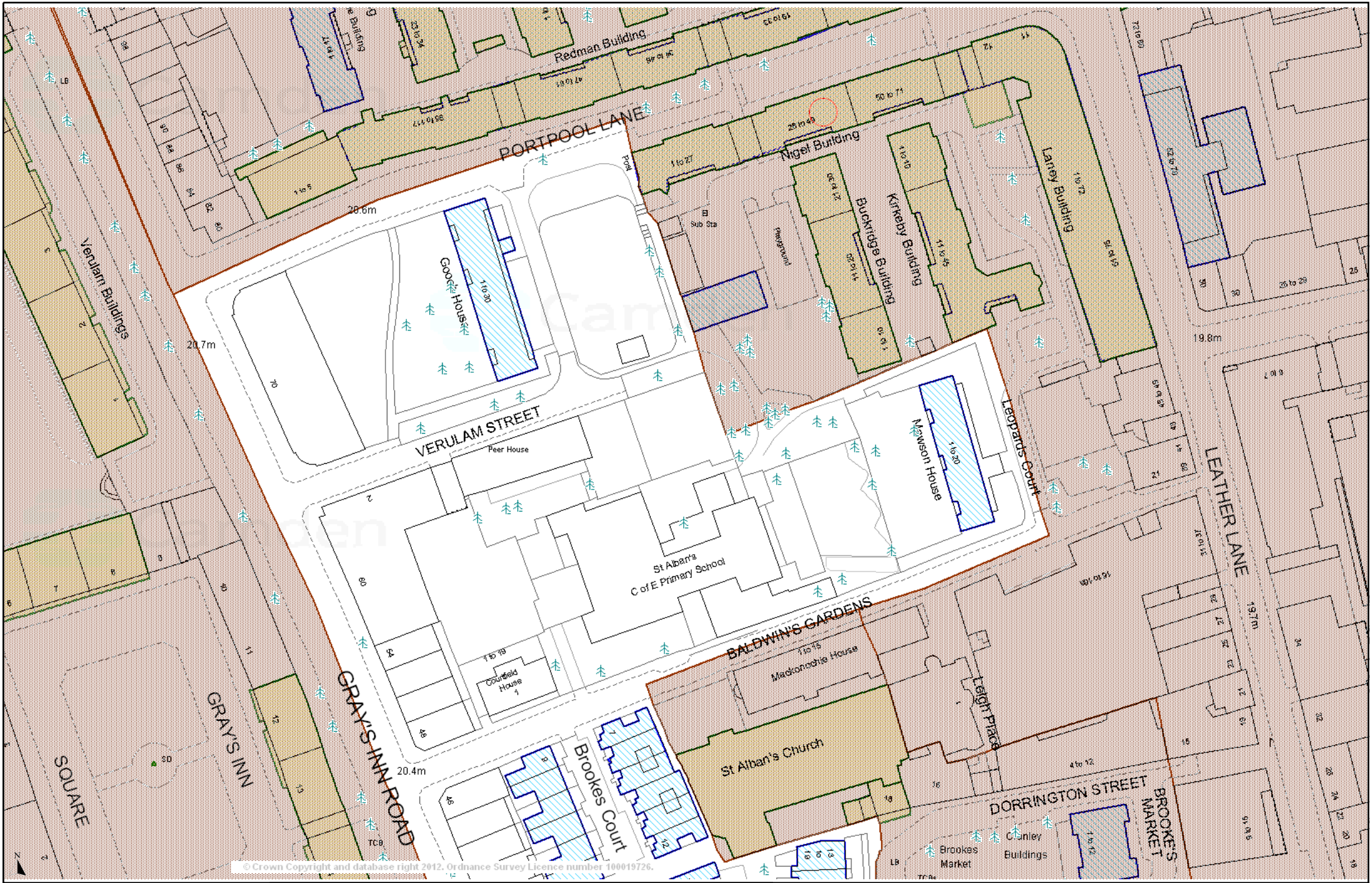
APPENDIX 1

Hatton Garden Conservation Area Map



Camden

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Scale 1/1042

Centre = 531145 E 181851 N

Date 24/5/2012

MIDDLEMARCH ENVIRONMENTAL LTD.

QUALITY ASSURANCE.

TITLE: ARBORICULTURAL SURVEY

BOURNE ESTATE
CAMDEN

A Report to CampbellReith

Contract Number: C111475

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Report Number: RT-MME-111475A-02

Revision Number: 01

Description: Final

Date: May 2012

Checked by:

Anna Dudley
Senior Ecological Consultant

Approved by:

David Smith
Ecology and Landscapes Director

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