Acland Burghley School, Camden

Arboricultural Impact Assessment and Method Statement

March 2021

Client	Plann
Job name	Acland Burghley School, Camden
Report title	Arboricultural Impact Assessment and Method Statement
File reference	21-1191-Report

	Name	**Position**	**Date**
Author	Neil Taylor	Arboricultural Consultant	March 2021

Report Contents

1 Introduction

1.1 Site Description

Achland Burghley School (the ''site'') is situated to the northwest of the centre of Tufnell Park, Camden. The survey area comprises the assembly hall and surrounding environs. The majority of the site is hard standing with a number of areas of soft landscaped, some of which are covered with AstroTurf.

There are no Tree Preservation Orders (TPOs) on the site and the site is not within a conservation area.

1.2 Proposed Works

The installation of an underground duct is proposed. The duct is required to be a specified length to enable sufficient heat transfer. Works that are likely to affect retained trees include excavations and the movement of machinery.

1.3 Aims of Study

To inform a planning application, Canopy Consultancy has been commissioned by Plann to undertake a tree survey of the site, in accordance with British Standard (BS) 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations".

The aim of this report is to present the results of the survey, including a Tree Survey Schedule (TSS), an Arboricultural Implications Assessment (AIA), and an Arboricultural Method Statement (AMS). A Tree Protection Plan (TPP) has also been produced and accompanies this report as a separate drawing.

This report in no way constitutes a health and safety survey report. Where concerns for tree health and safety exist, the necessary and appropriate tree inspections should be carried out.

2 Methodology

The trees were inspected from ground level by consultant arboriculturist Neil Taylor on 22nd February 2021 and measurements taken in accordance with the recommendations set out in the BS 5837:2012. Canopy spreads were measured and plotted to the four compass points. Where direct access was not possible measurements have been estimated. The surveyed trees are colour coded on the accompanying tree survey drawing according to their relevant BS category.

The tree data collected is used to enable the current canopy spread of the surveyed trees and the Root Protection Area (RPA) to be plotted on the accompanying TPP. The RPA is defined by the formula in paragraph 4.6 from the BS 5837:2012 and may be refined by taking into account current on-site constraints to root activity such as buildings, earthworks and hard paving. This forms part of the design process for the proposed development.

3 Assessment

3.1 Tree Character Groups

The detailed results of the tree survey are provided in the TSS, in Appendix 1. In summary, the trees on the site are in a good condition and vary in terms of amenity value provided to the wider landscape. The trees can be divided into two distinct character groups as follows:

1. The first character group includes the medium sized, middle aged trees found growing across the site. The majority of the trees in this character group are in a good condition and provide significant amenity to the local area.

2. The second character group includes the smaller, young trees found growing across the site. The majority of the trees in this character group are in a good condition but due to their size are of limited amenity value to the local area.

4 Arboricultural Impact Assessment (AIA)

4.1 Methodology

The AIA uses the information obtained in the tree survey to identify areas where the proposed construction may be at odds with accepted standards, in terms of a tree's requirements for space in which to maintain existing roots and shoots, and space for future growth.

The quality and relative importance of each tree is illustrated as a coloured polygon. The colour used relates to the BS categories as follows: A - green, B - blue, C - grey and U - red (see accompanying drawing reference 21-1191-TPP). In general the design process will try to retain A and B category trees. Proposed construction will therefore normally be excluded from the RPA of A and B category trees. Red trees are discounted as they are recommended for removal.

Details of the trees surveyed are given in the TSS (Appendix 1). The juxtaposition of the proposed development in relation to existing tree locations are shown on the accompanying TPP drawing, reference 21-1191-TPP.

The AIA considers existing site conditions and the effect that they may have on the development of the surveyed trees root systems. Hard structures such as building and paved roads and paths can influence the root activity of trees by reducing the availability of both moisture and nutrients.

4.2 Assessment

Refer to the accompanying TPP, drawing, reference 21-1191-TPP, for the relationship between the proposed development and the trees on and adjacent to the site.

- The following tree will be removed to enable the proposed development:

  T2 to allow for landscape improvements and the installation of an underground duct

- The tree to be removed is within the 'C' category due to being in a state of decline due to bacterial canker. A replacement tree will be planted within the site following the works.

- There will be no demolition within the RPA of a retained tree.

- The following trees will be affected by the installation of a duct on the edge of the RPA:

  T3 and T4

The percentage incursion into the RPA is less than 5% and is therefore considered acceptable. As a precaution, excavations will be carried out in accordance with the methodology outlined in Section 5.3 below.

5 Arboricultural Method Statement (AMS)

5.1 Methodology

The AMS provides the means by which retained trees and hedges can be protected throughout the development.

The movement of demolition and construction machinery in close proximity to trees may cause compaction of the soil which affects the tree's ability to absorb moisture and nutrients. The RPAs of retained trees and hedges will be protected by a tree protection barrier as described in paragraph 5.5 below and shown on the accompanying TPP, drawing number 21-1191-TPP.

5.2 Demolition within the RPA of Retained Trees

There will be no demolition within the RPA of a retained tree.

5.3 Construction within the RPA of Retained Trees

Prior to the works commencing, the retained trees will be protected in accordance with the accompanying TPP, drawing number 21-1191-TPP.

Excavations within the RPA

Where excavations for the installation of an underground duct are required within the RPA of T3 and T4, they will be carried out by hand under the supervision of a suitably qualified arboriculturist for the top 600mm or until no more roots are found. Any roots encountered will be pruned back to the edge of the trench using sharp secateurs.

No materials or spoil is to be stored within the RPA of a retained tree.

5.4 Services

The installation of the underground duct that is within the RPA of a retained tree will be carried by hand in accordance with 'broken trenches' described in NJUG 4 Section 4, an extract of which can be found in Appendix 2. This will ensure that root damage will be minimised during the installation of the service. All root pruning will be agreed beforehand with the named arboriculturist in consultation with the local authority arboricultural officer. All root pruning will be in accordance with current best working practice.

5.5 Tree Protection

All trees that are to be retained on the site will be protected by the use of a tree protection barrier erected in the location shown on the accompanying TPP, drawing number 21-1191-TPP.

The fence will consist of "Heras" type panels or similar braced at appropriate intervals and secured to keep in place. The tree protection barrier will be erected prior to the occupation of the site by the building contractor and will only be removed once the construction phase is complete.

5.6 Site Monitoring and Supervision

The process of reporting to the client and LPA/Tree Officer will be by emailing the checklist form at Appendix 3. Site monitoring is to be at a frequency agreed and approved by the LPA. It will involve a site visit by the arboriculturist at selected intervals to ensure that the appropriate tree protection measures, as detailed in the approved drawings and method statements, are continually adhered to

6 Conclusion

Canopy Consultancy was commissioned by Plann to carry out a tree survey at the site. The results of the survey indicate that the trees within the survey area vary considerably in terms of condition and contribution to the amenity of the wider landscape.

A total of one tree will be removed to enable the proposed development. The tree to be removed is within the 'C' category and will have little impact on the amenity of the local area.

The proposed works provides an opportunity to plant a replacement tree as part of a landscape scheme for the site. This will improve the age range and species diversity of the trees in the local area, as well as enhancing the tree cover on the site.

Through the specified tree protection measures and construction methodology, it will be possible to minimise the impact of the proposed development on the retained trees.

Overall, there are no known overriding arboricultural constraints which would prevent the proposed development from going ahead, subject to the protection measures and construction methodologies specified within this report being correctly implemented.

7 Appendices

Appendix 1: Tree Survey Schedule

Project:	Acland Burghley School, Camden	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT	CANOPYCONSULTANCY
Ref:	21-1191-TSS		Weather	Overcast	
Date:	22.02.21		Tagged	No	
Client:	Plann				

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T1	Salix X chrysocoma (Weeping Willow)	11	570	3	5	5	5	1	2	MA	Good	Good	None	20-40	B2
T2	Aesculus hippocastanum (Horse Chestnut)	9	470	4	4	4	4	1	2	MA	Fair - bacterial canker	Good	None	20-40	C1
T3	Acer pseudoplatanus (Sycamore)	8	430	4	5	4	6	1	2	MA	Good	Good	None	40+	B2
T4	Acer pseudoplatanus (Sycamore)	7	350	3	4	4	4	1	3	MA	Good	Good	None	40+	B2
T5	Fagus sylvatica (Beech)	18	650	7	6	7	6	1	3	MA	Good	Good	None	40+	A2
T6	Betula pendula (Silver Birch)	9	288	3	2	4	3	4	2	Y	Good	Fair	None	20-40	C1
T7	Fagus sylvatica (Beech)	18	720	8	8	7	7	1	3	MA	Good	Good	None	40+	A2
T8	Fagus sylvatica (Beech)	12	490	6	8	5	7	1	3	MA	Good	Good	None	40+	B2
T9	Betula pendula (Silver Birch)	11	230	4	3	3	2	1	2	MA	Good	Good	None	20-40	C1
T10	Betula pendula (Silver Birch)	11	200	3	3	3	3	1	2	MA	Good	Good	None	20-40	C1
T11	Betula pendula (Silver Birch)	12	480	5	5	5	6	1	3	M	Good	Good	None	20-40	B2

Project:	Acland Burghley School, Camden	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT
Ref:	21-1191-TSS		Weather	Overcast
Date:	22.02.21		Tagged	No
Client:	Plann			

CANOPYCONSULTANCY

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T12	Aesculus hippocastanum (Horse Chestnut)	9	360	3	4	4	5	1	3	MA	Fair - bacterial canker	Good	None	10-20	C1
T13	Fagus sylvatica (Beech)	18	730	8	8	8	7	1	4	MA	Good	Good	None	40+	A2
T14	Betula pendula (Silver Birch)	11	370	5	5	5	5	1	2	MA	Good	Good	None	20-40	B2
T15	Betula utilis 'Jacquemontii (Himalayan Birch)	7	340	7	5	4	6	1	2	MA	Good	Good	None	20-40	B2
T16	Betula utilis 'Jacquemontii (Himalayan Birch)	7	210	4	5	4	1	1	2	MA	Fair - suppressed.	Fair - poor form	None	10-20	C1
T17	Fagus sylvatica (Beech)	17	670	6	6	6	6	1	4	MA	Good	Good	None	40+	A2
T18	Prunus sp. (Cherry species)	5	300	4	4	4	3	1	2	MA	Good	Good	None	10-20	C1
T19	Alnus glutinosa (Common Alder)	8	210	3	2	3	3	1	3	MA	Good	Good	None	40+	C1
T20	Robinia pseudoacacia (Locust Tree)	9	420	4	7	5	4	1	3	MA	Good	Good	None	20-40	B2
T21	Prunus sp. (Cherry species)	3	50	1	1	1	1	1	2	Y	Good	Good	None	40+	C1

Appendix 2: Section 4, extracted from NJUG 4

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 **Fine Roots**
Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 **Precautions**
The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

4.1.3 **Realignment**
Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless
Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug
The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.

- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 **Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

4.2 Above Ground

4.2.1 Damage by Pruning

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 2 - Prevention of Damage to Trees Above Ground

Causes of Damage	Type of Damage	Implications for the Tree	Precautions
Impact by vehicle or plant Physical attachment of signs or hoardings to the trunk Storage of materials at base of tree Rubbing by winch or pulling cables	Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk	Wounding with the potential for infection ultimately resulting in death of all or part of the tree. Structural failure of the tree	Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.
Impact by vehicle or plant Rubbing by overhead cables	Bark damage to branches, breakage and splitting of branches, abrasion to branches	Structural failure of the branch. Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.	Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes. All pruning should be carried out in accordance with BS3998 *(prune affected branches to give appropriate clearance from cables)*
Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.	Inappropriate pruning, unnecessary tree removal	Severely pruning tree to acquire line of sight signal for communications dish etc.	Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.
Lack of forethought in design and location of apparatus and services entries on new developments	Complete tree removal	The tree is removed unnecessarily	Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.
Use of herbicides	Poisoning of the tree via absorption through bark, leaves and shoots	Death of the whole tree, death of individual branches, damage to leaves and shoots	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.

Appendix 3: Programme of Site Monitoring

Acland Burghley School
Site Monitoring Form

To be completed by the named arboriculturist and emailed to the client and tree officer at the completion of each operation.

Arboriculturist……

Client……

Project Manager……

Tree Officer……

(The above to be filled in with names and contact numbers)

OPERATION	TIMING	DATE	COMMENTS
Pre-commencement meeting or contact with project/site manager.	Before any works or pre-works on site, including storage of materials		
Spot check of protective fencing	Before works begin		
Supervision of excavation within RPA of T3 and T4	During duct installation		
Completion of development	Once all construction activity has been completed		