



Arboricultural Consultancy
Holmwood Farm Grange Horsham Road North Holmwood Dorking Surrey RH5 4JR
Tel: 01306 743374 Email: info@chaliceconsulting.co.uk Web: www.chaliceconsulting.co.uk

Our Ref: CC/1601 AR3546

Ms. Rosemary Colver
Brodie Plant Goddard
Studios 1 & 2
Old Kings Head Court
11 High Street
Dorking
Surrey
RH4 1AR

27th November 2017

Dear Ms. Colver,

Re: Tree Protection Relating to Sidney Estate, Werrington Street, Kings Cross, London

Please find enclosed an arboricultural report relating to the proposed development at the above site. I would be grateful if you could review the contents of this report to ensure it meets your requirements before it is sent to the Local Planning Authority. A copy of this report should be maintained on site at all times and be available to all site personnel.

Attendance at the pre-commencement meeting and for inspections/supervision (sections 16.0 and 27.0 of report) is chargeable at the standard hourly rate, details of which are available upon request.

I hope that this information is clear and helpful and if I can be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

Mr. David Chalice
Chartered Arboriculturist

Enc.

Chalice Consulting Ltd.
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Registered in England and Wales No. 6080792

**Tree Survey
Arboricultural Impact Assessment
Arboricultural Method Statement**

Relating to:

**Sidney Estate, Werrington Street,
Kings Cross, London**

Produced for:

Brodie Plant Goddard

Prepared by:

Chalice Consulting Ltd.

Mr. David Chalice

Dip. Arb. (RFS), F.Arbor.A, MICFor

Chartered Arboriculturist

Date:

27th November 2017

Our Ref:

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APPENDICES

Appendix 1	Tree Survey Schedule with Recommended Tree Works
Appendix 2	Tree Protection Plan in Colour at A1 and Scale 1:200 with Tree Protective Fencing Specification
Appendix 3	Example of Site Inspection Record
Appendix 4	Hand Digging Methodology and Installation of Services within Root Protection Areas
Appendix 5	Induction Form for Personnel

INTRODUCTION

1.0 Frequently Used Key Terms and Abbreviations

Tree Preservation Order	TPO
Arboricultural Method Statement	AMS
British Standard 5837:2012 – Recommendations for Trees in Relation to Design, Demolition and Construction	BS 5837
British Standard 3998:2010 - Recommendations for Tree Work	BS 3998
Root Protection Area/Root Protection Areas	RPA/RPAs
Local Planning Authority	LPA

2.0 The Proposal

2.1 It is proposed to re-landscape the existing central courtyard to include the planting of new trees, installation of hard surfacing, lighting and gates.

3.0 Instructions and Purpose

- 3.1 This report has been commissioned by Brodie Plant Goddard to;
- Survey the trees in accordance with British Standard (BS 5837) 5837:2012 - Trees in Relation to Design, Demolition and Construction- Recommendations.
 - Make suggestions to decrease the arboricultural impact of the proposed scheme on the retained trees during the design process.
 - Detail the arboricultural impact of the proposed project.
 - Prepare a tree work schedule to British Standard (BS 3998) 3998:2010 - Recommendations for Tree Work.
 - Develop a tree protection strategy for the duration of the development including any demolition works.
- 3.2 Provision of the above information is designed to address the requirements of the LPA in terms of the arboricultural information necessary to register and determine the planning application.

4.0 Scope

4.1 In surveying the trees to the requirements of BS 5837, trees on and immediately adjacent to the site with a stem diameter over 75mm have been included. Large shrubs and hedges have been included where these are considered to be of significant amenity value. These are particularly important where they provide boundary screening. For clarity and ease of data interpretation, large shrubs have been classified as trees.

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- 4.2 A full hazard assessment of the trees (including the assessment of decay or defects and their impact), has not been undertaken as this is considered beyond the scope of this report. Any obvious hazards and defects have been identified in the Tree Survey Schedule and appropriate works recommended for immediate action.

5.0 Documents Supplied/Used

Document	Obtained From	Format/Ref.
Existing and proposed layout plans	Brodie Plant Goddard	Dwg.
Topographical Survey	Brodie Plant Goddard	Dwg.

6.0 Site Details

- 6.1 The site is comprised of the existing landscaped area located within the Sidney Estate.
- 6.2 The site is largely flat with no significant inclines in any direction that would affect the recommendations in this report.
- 6.3 I have not been instructed to ascertain the protection status of any of the trees on or near the site.

TREE SURVEY

7.0 Survey Method

- 7.1 The site and trees were inspected on 15th November 2017.
- 7.2 The trees were inspected from ground level and no climbing inspections were undertaken.
- 7.3 Stem diameters were measured using a diameter tape at 1.5m from ground level unless stated in the Tree Survey Schedule at **Appendix 1**. The locations of the surveyed trees has originated from the drawings

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supplied by the client unless otherwise stated in the Tree Survey Schedule.

8.0 Tree Details

8.1 The total number of records is as follows:

Individual Trees (T): 14

Tree Groups (G): 0

8.2 The tree details and proposed works are presented in the Tree Survey Schedule with Recommended Tree Works at **Appendix 1** and tree positions are shown on the Tree Protection Plan at **Appendix 2**.

8.3 The quality and value of the tree stock has been broken down by BS 5837 quality grade. The grading system can be summarised as follows:

A Grade – trees of high quality and value with a life expectancy of more than 40 years

B Grade – trees of moderate quality and value, with a life expectancy of more than 20 years

C Grade – trees of low quality and value, with a life expectancy of more than 10 years

U Grade – trees for removal, with a life expectancy of less than 10 years

Quality and Value of Existing Tree Stock

Total No. Trees (14)	A Grade	B Grade	C Grade	U Grade
No. of Trees	0	5	7	2

8.4 The RPAs of the trees are included in the Tree Survey Schedule with reference to Table 1 of BS 5837. The RPA is the area, measured in m², which is calculated in accordance with the BS 5837 using the stem diameter of the trees. This should provide retained trees with sufficient rooting environment to survive the proposed development.

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ARBORICULTURAL IMPACT ASSESSMENT

9.0 Introduction to Arboricultural Impact Assessment

9.1 This section comprises an assessment of the impact the proposed works detailed in Section 2 above have on trees. It considers the arboricultural impact and how this may be mitigated.

10.0 Tree Removal and Retention

10.1 The proposed scheme provides for the retention and protection of all the trees surveyed with the exception of T4 and T5 both of which should be removed and replaced irrespective of the proposed development.

11.0 Tree Pruning Works

11.1 Minor tree pruning is recommended for good arboricultural practice and to ensure reasonable clearance from the proposed construction. The pruning described in the Tree Survey Schedule with Recommended Tree Works at **Appendix 1** will not adversely affect the trees or their contribution to local amenity.

12.0 Incursions into Root Protection Areas

12.1 Low level incursions are required to install hard surfacing, gates and lighting. To ensure the protection of the retained trees, all excavations within the RPAs of these trees will be carried out by hand under direct arboricultural supervision to limit root disturbance to an acceptable level (see **Appendix 4 Method 2**).

12.2 Existing buildings are also to be demolished adjacent to the RPAs of the retained trees. These works will be undertaken in an arboriculturally sensitive manner as detailed in the AMS.

12.3 No new underground services are to be installed within the RPAs of retained trees.

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13.0 Proximity Issues and Shading

13.1 The shade patterns for the surveyed trees has not been plotted as this is not a constraint to this type of development.

14.0 Summary of Arboricultural Impact

14.1 In summary, the arboricultural impact of the proposed scheme is relatively minor as the majority of the trees to be removed are of low quality.

14.2 During the landscaping phase of the development there is an opportunity to plant trees in the space outside the development footprint to mitigate for those recommended for removal. These areas have been safeguarded with tree protective fencing where possible to shelter the soil in these areas.

14.3 The retained trees can be afforded an appropriate degree of protection in accordance with the BS 5837 as detailed in the AMS.

ARBORICULTURAL METHOD STATEMENT

15.0 Introduction to Arboricultural Method Statement

15.1 To safeguard the retained trees (both above and below ground parts) during the development works and preserve the soil structure of areas which could be allocated for new planting, it will be necessary to implement tree protection measures as outlined below.

15.2 The basic principle is that the area inside the tree protective fencing and where ground protection has been used is to be protected for the duration of the works.

15.3 A copy of this AMS shall be maintained on site at all times and made available to all site personnel.

15.4 All site personnel shall be made aware of the key impact of this AMS and be given an arboricultural induction by the Site Manager. An Induction

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Form is attached at **Appendix 5**. A copy of the Induction Form will be signed by all site personnel to confirm that they have understood the issues involved.

- 15.5 As of 2005, Local Planning Authorities have powers to serve **Temporary Stop Notices** if agreed tree protection measures are not carried out. Adhering to this AMS will ensure that such costly and time consuming action is avoided.

16.0 Pre-Commencement Meeting

- 16.1 A pre-commencement site meeting, involving representatives from the Development Company, the Arboricultural Consultant and the LPA Tree Officer will be held to ensure that all aspects of the tree protection process are understood and agreed. A record of the meeting will be communicated to all parties by the Arboricultural Consultant.

17.0 General Site Precautions

- 17.1 The following points will be observed at all times:
- No fires will be lit on site during the construction or demolition phases.
 - No access will be permitted inside the tree protective fencing.
 - No materials, equipment or debris will be stored within the tree protective fencing.
 - Notice boards, telephone cables or other services will not be attached to any parts of retained trees.
 - Materials which will contaminate the soil (e.g. diesel oil and vehicle washings) will not be permitted to migrate into the RPAs of retained trees.
 - A dedicated mixing and cleaning area will be set up to prevent concrete, cement and cleaning residue leaching into the RPAs of the retained trees (see Tree Protection Plan for specification).
 - Site cranes are to be automatically programmed to avoid loads striking the crowns, stems and branches of the retained trees.

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18.0 Tree Works

- 18.1 All works will be carried out in accordance with BS 3998:2010 'Recommendations for Tree Work' (as amended) and to current arboricultural best practice. Tree works will be carried out by a suitably qualified and experienced Arboricultural Contractor holding the necessary insurance cover. This contractor should carry out the relevant site specific risk assessments and record such information prior to commencement of tasks and work in accordance with current health and safety standards, practices and legislation. A list of such contractors is available from the Arboricultural Association at www.trees.org.uk.
- 18.2 The subject trees may be protected by virtue of being within a Conservation Area or covered by a TPO. Submission of this AMS in connection with a planning application should be construed as a formal application to carry out those works specified in the Tree Survey Schedule with Recommended Tree Works at **Appendix 1**. It is recommended that this matter be clarified by the Client in writing with the LPA prior to any works commencing.
- 18.3 Tree ownership should be clarified in writing by the Client before any trees are removed or pruned.
- 18.4 If additional pruning of trees is required to facilitate the proposed works or access for machinery/plant, the Arboricultural Consultant will be contacted to advise on appropriate works and liaise with the LPA as necessary.

19.0 Tree Protective Fencing

- 19.1 Tree protective fencing is used to ensure that the RPAs of retained trees are safeguarded. These measures may also be employed to protect areas of ground for new landscaping.
- 19.2 The positioning and specification of the fencing is shown in **Appendix 2**. In this case, the default specification of BS 5837 consisting of **fixed Heras** fencing would be effective.

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- 19.3 The protective fencing will remain in position for the duration of the development, including the removal of any existing structures. Clear signs will be attached to the fencing once erected – suggested wording will be **‘Construction Exclusion Zone No Access’**.

20.0 Ground Protection

- 20.1 In this instance, there is no requirement for ground protection as the RPAs of the retained trees can be afforded an adequate degree of protection using tree protective fencing and the existing hard surfacing.

21.0 Site Access/Hard Surfaces

- 21.1 The existing access into the site is suitable for ingress during demolition and construction and little or no damage is anticipated to the root systems of the retained trees.
- 21.2 Where possible, the sub-base for the existing hard surfacing within the RPAs of the retained trees will be utilised for the proposed new hard surfacing. This will reduce the requirement for excavations where roots may be present. Any excavations within the RPAs of the retained trees will be carried out by hand under direct arboricultural supervision as detailed in **Appendix 4**).

22.0 Demolition

- 22.1 The existing buildings will be demolished using the ‘top down, pull back’ method as recommended in BS 5837. This is achieved by demolishing the structure into its own space with the placement of heavy machinery (if required) onto the existing foundation or ground protection.

Example of demolition within the RPAs of retained trees (note that the machinery is located within the building footprint and the debris is contained by the tree protective fencing and the ground protection)



23.0 Underground Services

23.1 The locations, specifications and installation methods of all new services will be available for review at the pre-commencement site meeting before any works start on site.

24.0 Foundations

24.1 There is no requirement for any foundations within the RPAs of the surveyed trees.

25.0 Construction/Hard Landscaping

25.1 There is no requirement for additional construction or hard landscaping that will affect the retained trees.

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- 25.2 Construction is taken to include erection of scaffolding and the installation of associated hard landscaping features such as retaining walls, patios, and cycle stores.
- 25.3 In this instance, retained trees will not impede the erection of scaffolding and no ancillary structures are proposed within the RPAs of the retained trees.
- 25.4 Subject to all of the above tree protection measures being implemented, construction works may proceed without risk of damage to retained trees.

26.0 Soft Landscaping/Boundary Fencing

- 26.1 Soft landscaping will be undertaken when heavy machinery has been removed from site and tree protective fencing taken down. The following points will be observed:
- Care will be taken not to compact the soil within the RPAs of retained trees or where new tree planting is to be carried out.
 - No changes in ground levels will occur within the RPAs of the retained trees.
 - Unwanted vegetation will be removed manually or using contact herbicides that will not damage existing tree roots.
 - No irrigation or drainage pipes will be installed within the RPAs of retained trees.
 - If soil has been compacted in areas where planting is proposed, measures to improve soil structure (e.g. decompaction) may be necessary to facilitate successful plant establishment.
 - Where fence and gate post holes are to be installed within the RPAs of the retained trees, they shall be lined with heavy duty polythene to prevent the harmful cement leaching into the soil and damaging the roots of the retained trees.

27.0 Sequencing/Supervision, Responsibility and Incident Reporting

- 27.1 Effective tree protection relies on following a logical sequence of events and arboricultural inspection/supervision.

- 27.2 Works which have the potential to affect trees will be supervised by a suitably qualified and experienced Arboricultural Consultant. Regular inspection visits will also be undertaken to ensure that tree protection measures are being adhered to. The final details of supervision and the frequency of inspection visits will be agreed with the Tree Officer at the pre-commencement meeting. The Arboricultural Consultant will make a record of visits, which will be attached to the site copy of the AMS for inspection and communicated in writing to the LPA. An example of the Site Inspection Record is found in **Appendix 3**.
- 27.3 Daily inspection of the physical tree protection measures will be carried out by the on-site Arboricultural Liaison who will be responsible for the implementation of the approved tree protection. Any deviation from the approved methodologies will need to be agreed by the Arboricultural Consultant who may need to visit site to authorise the revised tree protection measures.
- 27.4 Any damage to stems, branches or any size roots of the retained trees will be reported immediately by email and telephone by the Arboricultural Liaison to the Arboricultural Consultant. The Arboricultural Liaison will take photographs of the damage and send these to the Arboricultural Consultant who will visit site to assess the scale of the damage and report to the LPA Tree Officer. Mitigation for the damage will be agreed with the LPA Tree Officer.

Sequencing and Supervision

Stage	Action/Task	Personnel Responsible
1.	Issue arboricultural report to site manager	Client/Developer
2.	Give Arboricultural Consultant (AC) at least a week's notice of pre-commencement meeting	Client/Developer
3.	Pre-commencement meeting	Site Manager, Tree Officer and AC
4.	Arboricultural induction	Site Manager
5.	Client to establish tree ownership and protection status in writing before tree works are carried out	Client
6.	Erect tree protective fencing	AC to inspect
7.	Carry out demolition within the RPAs of the retained trees	AC to supervise
8.	Install underground services	AC to supervise
9.	Construct hard surfacing	AC to supervise
10.	Remove machinery/plant	Site Manager
11.	Remove tree protective fencing	Site Manager
12.	Carry out soft landscaping and erect boundary fencing	Site Manager to brief landscaping company on site and supervise

28.0 Amendments

28.1 Issues sometimes arise on development sites which require amendments to the previously agreed tree protection details. Any amendments to this AMS will be discussed with the Arboricultural Consultant and approved in writing by the LPA prior to being implemented. Copies of paperwork relating to any amendments shall be attached to the site copy of the AMS to provide a definitive record of what has been agreed.

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29.0 List of Contacts

Contact	Name	Company/LPA	Contact Number(s)	Report Issued to?
Client	Ms. Rosemary Colver	Brodie Plant Goddard	01306 887070	Yes
Arboricultural Supervisor	Mr. David Challice	Challice Consulting Ltd.	01306 743374 07831 855764	N/a
On Site Arboricultural Liaison	TBC	TBC	TBC	No

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Appendix 1

Site: Sidney Estate, Werrington Street, Kings Cross, London

Surveyor: Mr. James Burton

Date Surveyed: 15/11/2017

Our Ref: CC/1601 AR3546

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
T1	Tree of Heaven 1 Number	16	6 6 5 7	GC 4 FB 5 S	Mature	710 1	12	8.5	Normal	Fair	Medium	B	2,3	20+	History of crown reduction 4m of re-growth

Recommended Works/Reason for Works: Crown reduce to previous reduction points
Advisable for good arboricultural practice

T2	Tree of Heaven 1 Number	16	8 5 4 7	GC2.5 FB 2.5 W	Mature	690 1	12	8.3	Normal	Fair	Medium	B	2,3	20+	Crown reduction at approximately 10m 6m of re-growth
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Recommended Works/Reason for Works: Crown reduce to previous reduction points
Advisable for good arboricultural practice

T3	Box Elder 1 Number	8	2 2 3 2	GC 2 FB 2.5 S	Mature	290 1	12	3.5	Poor	Fair	Low	C	2,3	<10	A tree with insignificant defects Heavily reduced in past
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Recommended Works/Reason for Works: No work proposed

T4	Flowering Cherry 1 Number	8	2 2 3 2	GC2.5 FB 2.5 W	Mature	370 1	12	4.4	Poor	Poor	Low	U		<10	Western side of tree is dead
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Recommended Works/Reason for Works: Remove and replace
To reduce risk of injury or damage

Notes:

- Height describes the approximate height of the tree measured in meters from ground level.
- The Crown Spread refers to the crown radius in meters from the stem centre and is shown above on each of the four compass points (i.e. N, S, E, W).
- Ground Clearance (GC) is the height in meters of crown clearance above adjacent ground level, the height of the first significant branch (FB) and the direction in which it is growing.
- Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level. The stem diameter may be estimated (est) where access is restricted or an average (ave) taken for groups or multi-stemmed trees with more than five stems. The number of stems is also indicated.
- Protection Multiplier is the number used to calculate the tree's protection radius and area and is shown as 12.

- Protection Radius is a radial distance measured from the trunk centre.
- Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak) or Dead (dead or dying tree).
- Structural Condition - Good (no or only minor defects), Fair (remedial defects), Poor (major defects present).
- Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
- B.S. Cat refers to British Standard 5837:2012 Table 1 and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'U' - Remove.
- Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
- Useful Life is the tree's estimated remaining contribution in years.

Site: Sidney Estate, Werrington Street, Kings Cross, London

Surveyor: Mr. James Burton

Date Surveyed: 15/11/2017

Our Ref: CC/1601 AR3546

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
T5	Box Elder 1 Number	8	5 2 2 2	GC2.5 FB 2.5 N	Mature	340 1	12	4.1	Poor	Poor	Low	U		<10	Southern part of canopy and much of stem is dead

Recommended Works/ Remove and replace

Reason for Works: Advisable for good arboricultural practice

T6	Silver Maple 1 Number	10	4 4 6 6	GC 1 FB 6 S	Mature	440 1	12	5.3	Normal	Fair	Medium	C	1,2	20+	Areas of bark missing around root collar on western side Heavily reduced in the past
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Recommended Works/ Crown reduce to previous reduction points

Reason for Works: Advisable for good arboricultural practice

T7	Cockspur Thorn 1 Number	4	2 2 2 2	GC 2 FB 2.5 N	Mature	160 1	12	1.9	Moderate	Fair	Low	C	1,2	20+	A tree with insignificant defects
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Recommended Works/ No work proposed

Reason for Works:

T8	Norway Maple 1 Number	10	2 4 3 4	GC 3 FB 2.5 S	Mature	460 1	12	5.5	Normal	Good	Medium	B	2,3	20+	A tree with insignificant defects Historically crown reduced
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Recommended Works/ No work proposed

Reason for Works:

Notes:

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is shown above on each of the four compass points (i.e. N, S, E, W).
3. Ground Clearance (GC) is the height in meters of crown clearance above adjacent ground level, the height of the first significant branch (FB) and the direction in which it is growing.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level. The stem diameter may be estimated (est) where access is restricted or an average (ave) taken for groups or multi-stemmed trees with more than five stems. The number of stems is also indicated.
5. Protection Multiplier is the number used to calculate the tree's protection radius and area and is shown as 12.

6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak) or Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remedial defects), Poor (major defects present).
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to British Standard 5837:2012 Table 1 and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'U' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

Site: Sidney Estate, Werrington Street, Kings Cross, London

Surveyor: Mr. James Burton

Date Surveyed: 15/11/2017

Our Ref: CC/1601 AR3546

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
T9	Variegated Sycamore 1 Number	8	2 2 1	GC2.5 FB 2.5 N	Early Mature	260 1	12	3.1	Moderate	Fair	Medium	C	1,2	20+	A tree with insignificant defects

Recommended Works/ No work proposed

Reason for Works:

T10	Swedish Whitebeam 1 Number	10	3 3 3	GC 4 FB 5 N	Mature	370 1	12	4.4	Normal	Fair	Medium	B	2,3	20+	A tree with insignificant defects Lower stem flare growing over concrete tree grills around base
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Recommended Works/ No work proposed

Reason for Works:

T11	Variegated Sycamore 1 Number	8	4 3 4	GC 2 FB 2 W	Early Mature	320 1	12	3.8	Normal	Fair	Medium	C	1,2	20+	A tree with insignificant defects Some branches recently removed by Contractors
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Recommended Works/ No work proposed

Reason for Works:

T12	Flowering Cherry 1 Number	7	4 4 3	GC 3 FB 2.5 S	Mature	400 1	12	4.8	Moderate	Poor	Medium	C	2,3	<10	Significant deadwood throughout crown
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Recommended Works/ Remove all deadwood over 25mm in diameter

Reason for Works:

To reduce risk of injury or damage

Notes:

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is shown above on each of the four compass points (i.e. N, S, E, W).
3. Ground Clearance (GC) is the height in meters of crown clearance above adjacent ground level, the height of the first significant branch (FB) and the direction in which it is growing.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level. The stem diameter may be estimated (est) where access is restricted or an average (ave) taken for groups or multi-stemmed trees with more than five stems. The number of stems is also indicated.
5. Protection Multiplier is the number used to calculate the tree's protection radius and area and is shown as 12.

6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak) or Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remedial defects), Poor (major defects present).
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to British Standard 5837:2012 Table 1 and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'U' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

Site: Sidney Estate, Werrington Street, Kings Cross, London

Surveyor: Mr. James Burton

Date Surveyed: 15/11/2017

Our Ref: CC/1601 AR3546

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
T13	Flowering Cherry 1 Number	5	2 2 3	GC2.5 FB 2.5 N	Mature	260 1	12	3.1	Moderate	Fair	Low	C	2,3	<10	A tree with insignificant defects Remains of unidentifiable fungus on surface root

Recommended Works/ No work proposed

Reason for Works:

T14	Flowering Cherry 1 Number	6	5 5 5	GC1.5 FB 1.5 W	Mature	440 1	12	5.3	Normal	Fair	Medium	B	2,3	20+	A tree with insignificant defects
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Recommended Works/ No work proposed

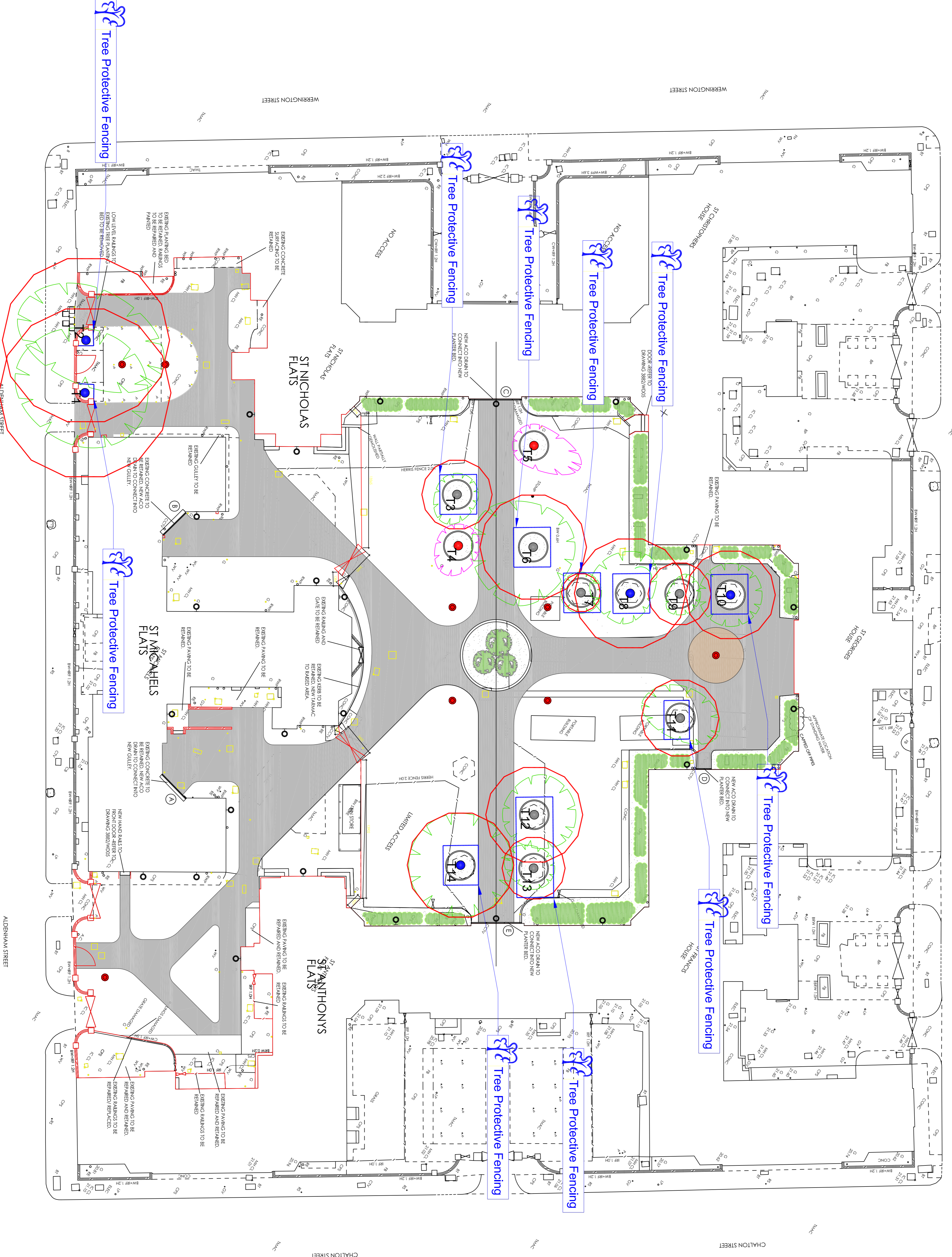
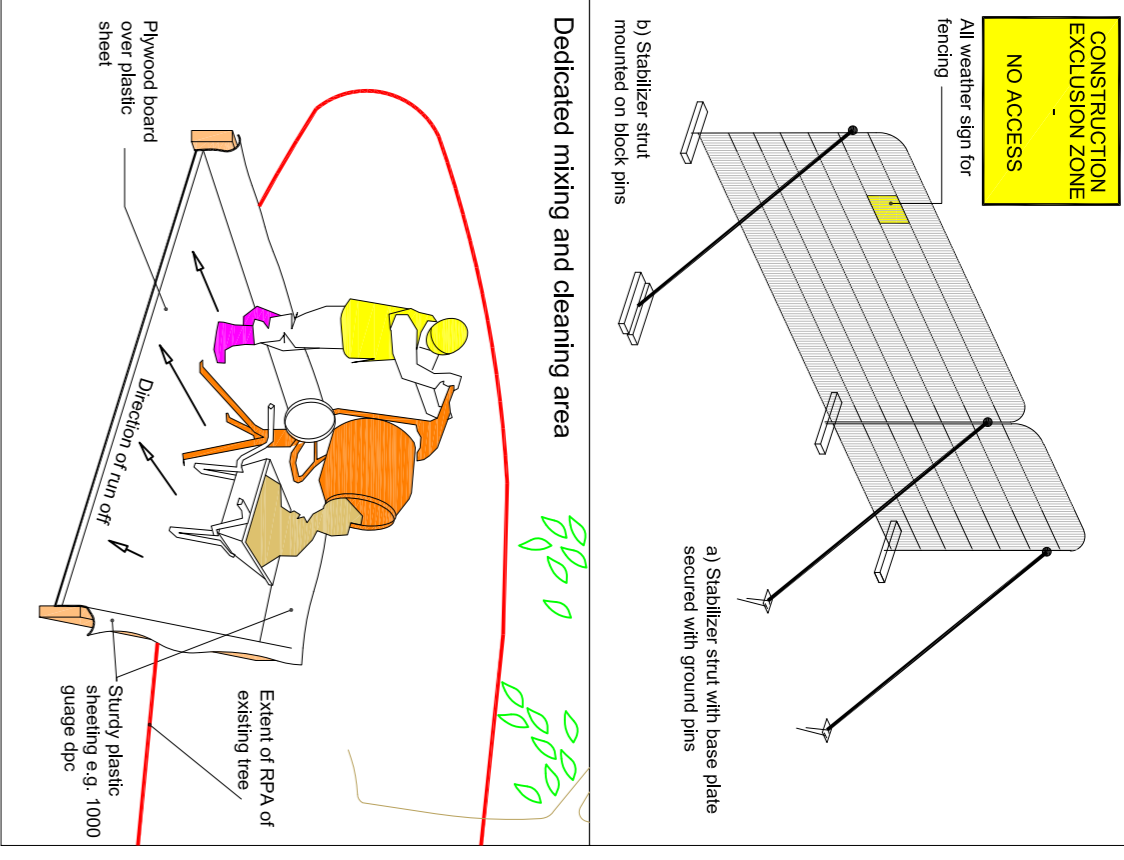
Reason for Works:

Notes:

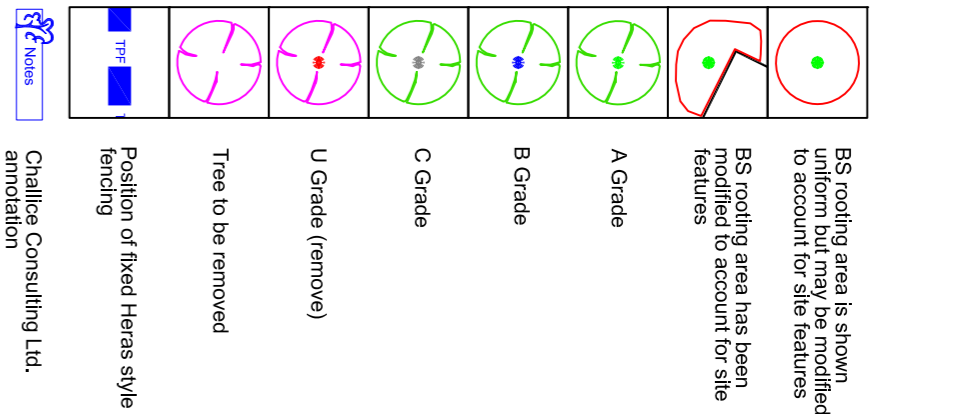
1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is shown above on each of the four compass points (i.e. N, S, E, W).
3. Ground Clearance (**GC**) is the height in meters of crown clearance above adjacent ground level, the height of the first significant branch (**FB**) and the direction in which it is growing.
4. Stem Diameter is the diameter of the stem measured in millimeters at 1.5m from ground level. The stem diameter may be estimated (**est**) where access is restricted or an average (**ave**) taken for groups or multi-stemmed trees with more than five stems. The number of stems is also indicated.
5. Protection Multiplier is the number used to calculate the tree's protection radius and area and is shown as 12.

6. Protection Radius is a radial distance measured from the trunk centre.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak) or Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remedial defects), Poor (major defects present).
9. Landscape Contribution - High (prominent landscape feature), Medium (visible in landscape), Low (secluded/among other trees).
10. B.S. Cat refers to British Standard 5837:2012 Table 1 and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'U' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservational, Historic and Commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

Appendix 2



KEY:



Challenge Consulting Ltd. annotation

Notes:

Tree protection barrier to be erected and installed before machinery or materials are brought onto site before any demolition or development of land and before soil stripping. Tree protection measures should be implemented following any necessary pre-development tree work. Barriers must not be removed or altered except with prior recommendation by project arboriculturist and where necessary, approval from the Local Planning Authority. Setting out to be confirmed by project arboriculturist prior to commencement of other operations.

Tree Protection Plan

Plan to be printed in colour and to scale
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: 28.11.2017
 SCALE: 1:200 @ A1
 PROJECT: St Nicholas Flats, Werrington Street, Kings Cross, London
 CLIENT: Challice Consulting Ltd.
 ADDRESS: Holmwood Farm Garage, North Holmwood, Dorking, Surrey, RH6 4JR
 TEL: 01306 743374
 EMAIL: info@challiceconsulting.co.uk
 WEB: www.challiceconsulting.co.uk

THIS PLAN TO BE USED FOR SETTING OUT OF TREE PROTECTION MEASURES ONLY; DO NOT SCALE FROM THIS PLAN UNLESS IT IS PRINTED AT A1. DO NOT USE UNLESS PRINTED IN COLOUR

Appendix 3

Site: Sample
Inspected By: D. Challice
Client: The Builder
Site Agent: No staff present

Date of Inspection:
Time of Inspection:

Tree Protective Fencing

Tree protection in correct location

Comments/Action

No action at this time



Tree protection T23

Agreed Construction Exclusion Zone

No debris within construction exclusion zone

Comments/Action

No action at this time



Tree protection T14

Amendments to Documentation Required

No amendments required

Comments/Action

Remedial Works

Install protection as per Arboricultural Method Statement

General Comments

No ground protection in place for T11,12,14,17 & 22
Sweet Gum T1 not removed

Appendix 4

Hand Digging Methodology and Installation of Services within Root Protection Areas

Introduction

- Trees need roots to stay upright and to obtain water and nutrients from the soil
- Any excavation within the Root Protection Area of a tree may affect its stability and health
- Roots over 25mm in diameter are likely to be of particular structural significance
- Roots less than 25mm in diameter are likely to be important to the tree for survival and structural significance. Cutting many small roots may have an impact on tree health and stability
- Most tree roots are within 0.6 -1m from the soil surface
- Desiccation and exposure to rapid temperature change is likely to cause root death
- Hand digging carried out correctly is less likely to damage tree roots than digging with machinery
- All digging within the Root Protection Areas of trees should be supervised by an Arboriculturalist
- Whether digging is acceptable and how it should be carried out depends on tree species and characteristics (age, vigour, past management etc.)
- Site conditions are also important when deciding whether digging is acceptable (soil type, ground levels, existing structures etc.)
- Carry out a suitable risk assessment prior to starting work. In particular, take care when working in the vicinity of underground services

Why/What For?

- Service installation/maintenance
- Demolition
- Foundations
- Hard surface installations
- Decay detection

Relevant Documents

- British Standard 5837:2012 - Section 7.2 - Trees in Relation to Design, Demolition and Construction – Recommendations
- National Joint Utilities Group Volume 4 2007: Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook

Principles

The key principles are as follows:

- Avoid compaction of the soil when carrying out the works
- Sever as few roots as possible
- Do not leave damaged or poorly cut roots as these are likely to lead to decay in the future
- Do not let exposed roots dry out
- Do not use materials containing harmful chemicals or salt as these will harm the trees (including builders' sand)

How/What to Use?

Method 1 - Hand Digging Retaining all Roots Above 25mm in Diameter to British Standard 5837:2012 Section 7.2:

- Hand tools –pick, fork, spade, wheel barrow and trowel
- Brush - it is useful to brush away loose soil from exposed roots prior to cutting them
- Secateurs/sharp pull-saw - roots that need to be cut must be cut cleanly using suitable hand tools
- Damp Hessian sacking – this should immediately cover the sides of the trench down to a depth of 1m below ground level and is effective in preventing roots drying out following excavation
- Suitable back-fill - covering the exposed or cut roots with a 100mm layer of topsoil or a mixture of 50% composted organic matter and 50% un-compacted sharp sand is suitable
- Supervision - ***a suitably qualified and experienced Arboriculturalist should be present when the works are carried out***

Method 2 - Hand Digging Removing all Roots to a Depth of 1m Below Ground Level to British Standard 5837:2012 Section 7.2:

- Hand tools –pick, fork, spade, wheel barrow and trowel
- Brush - it is useful to brush away loose soil from exposed roots prior to cutting them
- Secateurs/sharp pull-saw - roots that need to be cut must be cut cleanly using suitable hand tools
- Damp Hessian sacking – this should immediately cover the sides of the trench down to a depth of 1m below ground level and is effective in preventing roots drying out following excavation
- Suitable back-fill - covering the exposed or cut roots with a 100mm layer of topsoil or a mixture of 50% composted organic matter and 50% un-compacted sharp sand is suitable
- Excavations below 1m from ground level can be carried out using an excavator or similar due to health and safety requirements
- Supervision - ***a suitably qualified and experienced Arboriculturalist should be present when the works are carried out***

Method 3 - Compressed Air Soil Displacement Combined with Hand Digging Retaining all Roots Above 5mm in Diameter to British Standard 5837:2012 Section 7.2:

- Air spade - this uses a high pressure jet of air, delivered from a compressor to a hand held lance
- Hand tools – pick, fork, wheel barrow and trowel
- Brush - it is useful to brush away loose soil from exposed roots prior to cutting them
- Secateurs/sharp pull-saw - roots that need to be cut must be cut cleanly using suitable hand tools
- Damp Hessian sacking – this should immediately cover the sides of the trench down to a depth of 1m below ground level and is effective in preventing roots drying out following excavation
- Suitable back-fill - covering the exposed or cut roots with a 100mm layer of topsoil or a mixture of 50% composted organic matter and 50% un-compacted sharp sand is suitable
- Supervision - ***a suitably qualified and experienced Arboriculturalist should be present when the works are carried out***

Method 4 - Trenchless Technique Retaining all Roots to British Standard 5837:2012 Section 7.7:

- Micro-tunnelling, thrust boring or surfaced launched directional drilling is designed to avoid open trenches and can provide single service runs for up to 150m between starting pits
- Starting pits should be located outside the Root Protection Areas of the retained trees or can be hand dug using **Method 1**
- Bore holes should be a minimum of 500mm below ground level
- Only water should be used to lubricate the mole or drill to prevent root death due to soil contamination
- Supervision of hand digging using **Method 1 - a suitably qualified and experienced Arboriculturalist should be present when the works are carried out**

Appendix 5

Induction Form for all Site Personnel:

Site Name:

- I have had explained to me by the Site Manager the key implications of the Arboricultural Method Statement relating to the development at the above site.

- I am aware that the tree protective fencing must remain in its original position and must not be moved without the approval of the appointed Arboricultural Consultant.

- I understand that certain operations must be supervised by the appointed Arboricultural Consultant and that these operations must not start until the consultant is present and has given approval.

- I confirm that I will bring any concerns about potential damage to trees to the attention of the Site Manager.

- I am aware that I must not cause damage to any of the retained trees on or adjacent to the site. Damage may be caused by direct means (i.e. physical damage caused to roots or the trunk/branches of the tree) or by indirect means (e.g. by fire or toxic materials entering the rooting environment of the tree).

Print Name:

Sign Name:

Date: