Arboricultural Report

Planning and Development

Arboricultural Appraisal, Implications Assessment and Preliminary Method Statement

Project Name and Address	**28 Canfield Gardens, London, NW6 3LA.**		
Prepared for	Michael Doyle- Doyle Design	**Project Ref**	-
ACS Ref	jc/aiams1/28cg	**Client**	Mr Hagai Nivron
Prepared by	James Cox BSc. (Hons), Tech. Cert (ArborA)		
Report Date	14th November 2019		

Tree Tops | 2 Redwood Mount | Reigate | Surrey | RH2 9NB

T: 01737 244819

London – Office Eighty-Five | 272 Kensington High Street | London | W8 6ND

ACS (TREES) Consulting

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Executive Summary

A proposal for a basement development scheme with additional light wells to the front and rear is to be carried out in the vicinity of trees at 28 Canfield Gardens.

A semi-mature Silver Birch (T1) is located within the front garden of the property and is the most relevant tree in relation to the proposed scheme, with consideration also given to protection of other nearby trees. The site is located within the South Hampstead Conservation Area (CA), and it is not known whether any of the relevant trees are subject to Tree Preservation Orders (TPO's)

This report assesses the impact of the proposed construction upon the trees and sets out tree protection measures that are to be adopted in order to successfully integrate the development project into the visual landscape.

Subject to the implementation of the proposed scheme in accordance with the recommendations set out in this report, the character and appearance of the area will not be adversely affected either directly by or resulting from the construction of the proposed scheme.

1.0 Introduction and Scope

1.1 A proposal for a basement development scheme with additional light wells to the front and rear is to be submitted for consideration by the Local Planning Authority.

1.2 The proposed construction is to be undertaken in the vicinity of trees within the South Hampstead Conservation Area (CA). The implications upon the trees and the methods for tree protection and preservation during ground works and construction are set out in this report and which includes a requisite a tree protection plan.

1.3 I have been appointed on behalf of the site owners as a competent and qualified arboricultural consultant to provide this report and to supervise any works that may have the potential to affect the protected and retained trees.

1.4 The trees have been inspected on February 15th 2019 and a total of 5 tree records are provided within **Appendix 1** below. The tree details are provided in accordance with the guidance set out in BS 5837:2012 'Trees in relation to design, demolition and construction- Recommendations' (the BS) and an extract from that guidance is appended herewith. The root protection areas (RPAs) of the relevant trees are indicated upon the plans. Some RPAs may be modified from the standard circle by the presence of structures in the ground e.g. foundations, roads or kerbs.

2.0 The Site and Trees

2.1 The site comprises a ground floor apartment located within a residential area of South Hampstead, London. The plot is bordered to the east and west by similar residential properties with open communal grounds to the north and access from Canfield Gardens to the south. The relevant trees are located within the front garden of No.28 itself and within neighbouring land to the east and north.

2.2 The Royal Borough of Camden Councils online records indicate that the site is within the South Hampstead CA, but I have not been able to ascertain whether any of the trees are subject to TPO's at this stage. Verification of these details should be sought from the council prior to commencing any tree works. Online geological records show that the site sits upon London Clay bedrock suggesting the soil is poorly drained in nature. The site is approximately level across the four cardinal points.

2.3 The BS details of the trees are provided within the tree survey schedule at **Appendix 1** and their corresponding positions are shown on the tree protection plan (TPP1_28CG) included at **Appendix 2**.

Fig 1: View of 28 Canfield Gardens with T1 in the foreground

2.4 The most relevant tree in relation to the proposed scheme is a young to middle aged Silver Birch (T1) within the front garden of the site. Despite having a relatively drawn habit and low landscape contribution, it does not exhibit any significant structural or physiological defects at present. It is growing within an area surrounded by hard surfacing, that is likely to influence the development and pattern of its root system. I have assigned this tree a 'C' grade according to the BS.

2.4.1 Tree No.3 is a higher quality ('B' grade) Common Lime located within neighbouring land to the east. It is a significant feature within the local visual landscape with no obvious visible defects. It is located at a greater distance from the proposed scheme, therefore any impacts related to construction work/ landscaping are only likely to affect the outer portion of its RPA.

Fig. 2: View of T1 with T3 in the background.

2.4.2 The remaining tree no's 2, 4 and 5 smaller trees, more remote from the proposal, and therefore, are unlikely to be affected by construction activities.

Proposed Construction and associated works

2.5 The proposal involves a basement development scheme with additional light wells to the front and rear.

2.5.1 It will not be necessary to remove or prune any of the relevant trees in order to facilitate this scheme, resulting in no visual impact upon the landscape in terms of trees.

2.5.2 The proposed construction of the light wells does not require excavation within the RPA of retained trees as shown upon the TPP at **Appendix 2**. However, suitable ground protection should be installed at the locations shown upon the TPP to prevent damage to any exposed tree roots and compaction of the soil horizon during construction. This can then be removed to allow installation of the new low invasive surfacing in this area. Further information on ground protection can be found at **Appendix 3** below.

2.5.3 Construction of the cycle and bin store areas will require work to be carried out within the RPA of tree no's 1 and 3. This involves the installation of rubber grass mats, grass areas and planting of shrubs/ hedging as illustrated upon the TPP. This should be carried out using low invasive materials and methodology to prevent undue excavation into the RPA's of retained trees. Examples of these methods are included within **Appendix 5** below.

2.6 The implications of the proposed scheme are detailed in tables 1 and 2 below. An assessment of the visual impact of the works resulting from the scheme is also provided.

2.7 The BS at para. 5.3 recommends that applicants should provide justification for conducting construction works within the BS root protection area (RPA) of trees to be retained. The extent of proposed works within the BS root protection areas and the justification for same, is set out in Table 1 below:

Table 1. Construction Activities within RPAs of retained trees

Tree Ident.*	Maturity	Vitality	% of RPA*	Tolerance**	Reasons
T1-Silver Birch	Middle Aged	Normal	95%	High	No dig installation of rubber grass matting to avoid root damage
T3-Common Lime	Mature	Normal	10%	High	No dig installation of rubber grass matting at periphery of RPA only

* % of BS RPA used for construction
** Tolerance to construction activities is described as High (no adverse effects); Medium (potential for temporary stress, mitigation recommended) and Low (Potentially unsustainable adverse impacts, tree replacement to be considered)

2.8 Subject to the implementation of the tree protection measures from the outset of construction, the trees of importance to the landscape, will not be adversely affected by the proposals.

Table 2. Summary of Implications of Construction on Trees*

Tree Ident.*	Landscape Contribution	Implications /Impact	Mitigation measures	***Tolerance[1,2]	Impact Assessment**
1	Low	Damage to low canopy/ trunk during construction	1. Erect tree protection fencing (hoarding type)	N/A	Neutral
1, 3	Low-High	Loss of rooting area, root damage/ severance, soil compaction.	1. Installation of suitable ground protection within RPA's. 2. Low invasive/ permeable surfacing installed around trees.	High	Neutral

* Main trees selected for comment included above. Refer to previous notes on other trees.
** Negative – adverse impact upon trees and landscape; Neutral – no material impact (negative or positive); Positive – improvement (potential) to tree quality and landscape
*** Tolerance to proposed work within extent of RPA, in association with proposed tree protection – High - No adverse impacts; Medium - Temporary reduction in vitality only; Low - Susceptible to longer-term reduction in vitality and likely to require follow-up management.

3.0 Recommended Tree Protection Methods

3.1 In order to afford protection from general construction processes associated with the basement development, it will be necessary to erect robust tree protection barrier around T1, in the position indicated on the Tree Protection Plan at **Appendix 2** (TPP1_28CG). A recommended example of the type BS grade tree protection is included at **Appendix 3**.

3.2 Following erection of the tree protection fencing I recommend installing ground protection (refer to the TPP) to ensure that roots under the surface are not damaged by compaction during regular passing by operatives and light machinery. I have included recommended examples of ground protection at **Appendix 3** also.

NOTE: THE APPOINTED ARBORICULTURAL SUPERVISOR IS TO BE CONSULTED BEFORE ANY WORK, EITHER SCHEDULED OR UNSCHEDULED, IS CONSIDERED WITHIN THE EXCLUSION ZONE OR ROOT PROTECTION AREAS OF ANY RETAINED TREE. FAILURE TO DO SO MAY LEAD TO ENFORCEMENT ACTION BY THE LPA.

3.3 In order to ensure that the tree protection measures are implemented effectively, a site monitoring exercise will be undertaken to confirm:

i) The efficacy and accuracy of the fencing and ground protection
ii) Maintenance of tree and ground protection

An example of a site record (tree protection) is provided at **Appendix 4**. In this case, the form will be used as confirmation that all practical precautions have been undertaken in accordance with this method statement.

3.4 The details pertaining to tree protection will be explained to the Site Agent at the pre-commencement site meeting. It will be the responsibility of the Site Agent to ensure that all personnel working on site are aware to the tree protection measures processes and a copy of this method statement is to be retained on site for the duration of the build process together with a scaled, colour copy of the Tree Protection Plan.

3.5 Key times for site supervision include:

1. Erection of tree protection barriers
2. Installation of ground protection (if required)
3. Works within RPAs of retained trees

3.6 Effective site monitoring will be undertaken from the outset of the project and at agreed intervals thereafter. The frequency of monitoring may well decrease following the proper installation of all tree protection measures. A preliminary

programme of arboricultural supervision is outlined in Table 3 below. (This programme may alter dependent upon site circumstances or by agreement.)

3.7 The ideal process for recording the tree protection measures will involve:

i) Site Agent to contact Arboricultural Supervisor with a minimum of 5 days' notice of any site work commencement.

ii) Arboricultural Supervisor to monitor site to agree tree protection fencing

iii) When all tree protection is installed in accordance with the tree protection plan, the Arboricultural Supervisor is to arrange with LPA tree officer and relevant contractors **the pre-commencement site meeting** in order to agree the tree protection and subsequent works within RPAs of retained trees and importantly the lines of communication between the on-site contractors, the Arboricultural Supervisor and the LPA tree officer and incident reporting,

iv)Arboricultural Supervisor to record all site visits and distribute reports to LPA tree officer and contractors for their records

v)Subsequent to completion, Arboricultural Supervisor to sign-off and complete.

vi) Any incidents resulting in potential tree damage are to be reported in line with the 'Incident Reporting Flow Chart in **Appendix 4**.

Table 4 Preliminary site supervision schedule

Stage	Action	Arboricultural Supervisor (AS) (Required – Y/N)	Notes
1	Pre-commencement meeting*	Y	Site Agent(SA) and LPA tree officer, contractor to attend
2	Installation of tree protection and ground protection	Y	PRIOR to ground/demolition works
3	Ground works and Construction phase	Y	AS to monitor tree protection at agreed and suitable intervals
4	Remove tree/ground protection	N	No tree protection to be removed without prior agreement with the AS
5	Tree planting/landscaping	Y	Brief landscape company & sign off

3.8 The frequency of tree protection monitoring depends upon the nature of the project. In this case, it will be appropriate for the SA to organise with the AS monitoring visits to be twice in the initial 28 days from commencement and thereafter once every 28 days for two months.

Table 5 Contact List (to be completed **PRIOR** to commencement)

Interested Party	Name	Company/LPA	Contact Number(s)	Comment/ Responsibilities
Planning Consultant(s)	TBA			Planning submissions & Conditions
Site Agent	TBA			Day to day site management; co-ordination of timings; **contact with project Arboriculturist**
Main Contractor	TBA			Legal and administrative running of the project; finance; appointment of and liaison with all project consultants
Arb. Supervisor	TBA			Tree protection and management; dissemination of tree-related information
LPA Tree Officer	Gerry Oxford	Royal Borough of Camden	020 7974 4444	Tree protection and enforcement
Site Engineers	TBA			Technical advice and design
Architects	Michael Doyle	Doyle Design	020 3305 7476	Design

TBA – to be advised

***Pre-commencement means i) before any works including tree felling or pruning and ii) before any ground works or demolition commences and upon completion of the initial installation of the tree protection, including ground protection.**

4.0 Underground Services & Foundations

4.1 The proposed scheme can make use of existing services but if this is to change, installation of services must adhere to the NJUG4 methodology set out in **Appendix 6**. The location of new services will also be subject to engineers' advice.

4.2 Foundations of the existing building are not being altered and in this case, construction of the proposed light wells will be outside the RPA's of retained trees.

5.0 Precautions during Landscape Work

5.1 The following steps (both general and site specific), are advisable in relation to implementing any landscape works, which may have the potential to affect retained and or protected trees:

1. Advise arboricultural supervisor of intended time frame of landscape work in advance of commencement.
2. Re-locate existing tree protection fencing/ground protection to enable landscape work to proceed.
3. With bio-degradable spray paint or site pins with plastic tape, mark out the position of the relevant tree root protection areas (RPA) as per the tree protection plan.
4. Within the RPAs, avoid using any mechanical tools or vehicles (e.g. tracked or wheeled machinery).
5. Spread any mulch or top soil manually, with the use of wheel barrows and hand tools. It will be acceptable to use of the back actor of a tracked excavator to spread piled top soil or mulch into the RPAs of protected trees provided the bucket does not come in contact with the ground and that the power unit is positioned outside of the RPAs at all times.
6. Any planting pits are to be excavated manually within the RPAs of any retained trees.
7. Multiple passes within the RPAs along one route, pedestrian and with wheel barrows will require some ground protection to be installed prior to working. Ground protection can be scaffold boards over wood chip for example.
8. A record of the landscape working method is to be made and provided to the Council for their file.
9. Hard landscaping features will be constructed under supervision within the RPA of retained trees and will avoid, where possible, the re-grading of soil.

6.0 General site care (trees)

6.1 No fires will be lit on site.

6.2 No access will be permitted to within the fenced or otherwise protected areas (unless for site accommodation or Authorised agreement) at any stage during construction.

6.3 No materials, equipment or debris will be stored within the RPA of retained trees unless agreed with the arboricultural supervisor.

6.4 Areas for mixing are to be located beyond RPAs of trees and contained to prevent leaching into the soil.

6.5 A copy of this report and the Tree Protection Plan is to remain on site at all times.

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James Cox
Date: 14th November 2019

References:

1. Matheny. N, Clark. J. R, 1998. '*Trees and development; A technical guide to the preservation of trees during land development*'. ISA
2. Costello, L.R, Jones. K. S, 2003. '*Reducing infrastructure damage by roots: A compendium of strategies.*' ISA Western Chapter.
3. Roberts. J, Jackson. N, Smith. M, 2006. '*Tree roots in the built environment*.' TSO DCLG
4. Lindsey, P. Bassuk, N. 1991 *'Specifying soil volumes to meet the water needs of mature urban street trees and trees in containers'.* Journal of Arboriculture vol. 17 No 6.
5. Harris et al, 1999 *'Arboriculture, Integrated Management of Trees, Shrubs and Vines'* Third Edition Prentice Hall
6. Watson, G.W., Costello, L., Scharenbroch, B. & Gilman, E. 2008 *The landscape below ground III* The international society of arboriculture

APPENDIX 1

ACS (Trees) Consulting
Tree Management Consultants
T: 020 8687 1214

ACS Consulting (London)
Tel: 020 8687 1214

Tree Survey Schedule

Site: 28 Canfield Gardens, London, NW6 3LA

Surveyor: J. Cox

Date: 15th February 2019

Ref:ts1/28cg

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	Birch, Silver	10	3 3 3 3	2/S3	Middle Aged	150	12	1.8	Normal	Good	Low	C	1,2	10-20	Drawn habit Root pattern affected by structures
T2	Hawthorn	6	2 2 2 2	1/S1	Young	100	12	1.2	Normal	Good	Low	C	1,2	10-20	Off-site tree A tree with insignificant defects
T3	Lime, Common	13	5 5 5 5	4/E4	Mature	600	12	7.2	Normal	Good	High	B	1,2	20-40	Off-site tree Reduced in past No significant defects
T4	Lime, Common	5	1 1 1 1	4/N4	Mature	300	12	3.6	Moderate	Good	Medium	C	1,2	10-20	Off-site tree Pollard One of a group
T5	Lime, Common	5	1 1 1 1	4/N4	Mature	270	12	3.2	Moderate	Good	Medium	C	1,2	10-20	Off-site tree Pollard One of a group

Notes:

1. Height describes the approximate height of the tree 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, E, S, W) clockwise.
3. Ground Clearance is the height in meters of crown clearance above adjacent ground level together with the height and direction of the lowest branch
4. Stem Diameter is the diameter of the stem measured in millimetres at 1.5m from ground level. The diameter may be estimated (e), where access is restricted. An average (a) may be taken for tree groups. A full inspection is always recommended.
5. Protection Multiplier is 12 for single-stemmed trees; for multi-stemmed a cross-sectional area is calculated to derive the DBH, which in turn is multiplied by 12.
6. Protection Radius is a radial distance measured from the trunk centre and is used to calculate the BS RPA.
7. Growth Vitality - Normal growth, Moderate (below normal), Poor (sparse/weak), Dead (dead or dying tree).
8. Structural Condition - Good (no or only minor defects), Fair (remediable defects), Poor - Major defects present or suspected.
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 category and refers to tree/group quality and value; 'A' - High, 'B' - Moderate, 'C' - Low, 'U' - Remove or very poor quality.
11. Sub Cat refers to the retention criteria values where 1 is Arboricultural, 2 is Landscape and 3 is Cultural including Conservation/ecological, historic and commemorative.
12. Useful Life is the tree's estimated remaining effective contribution in years.

Table 1 **Cascade chart for tree quality assessment**

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

APPENDIX 2

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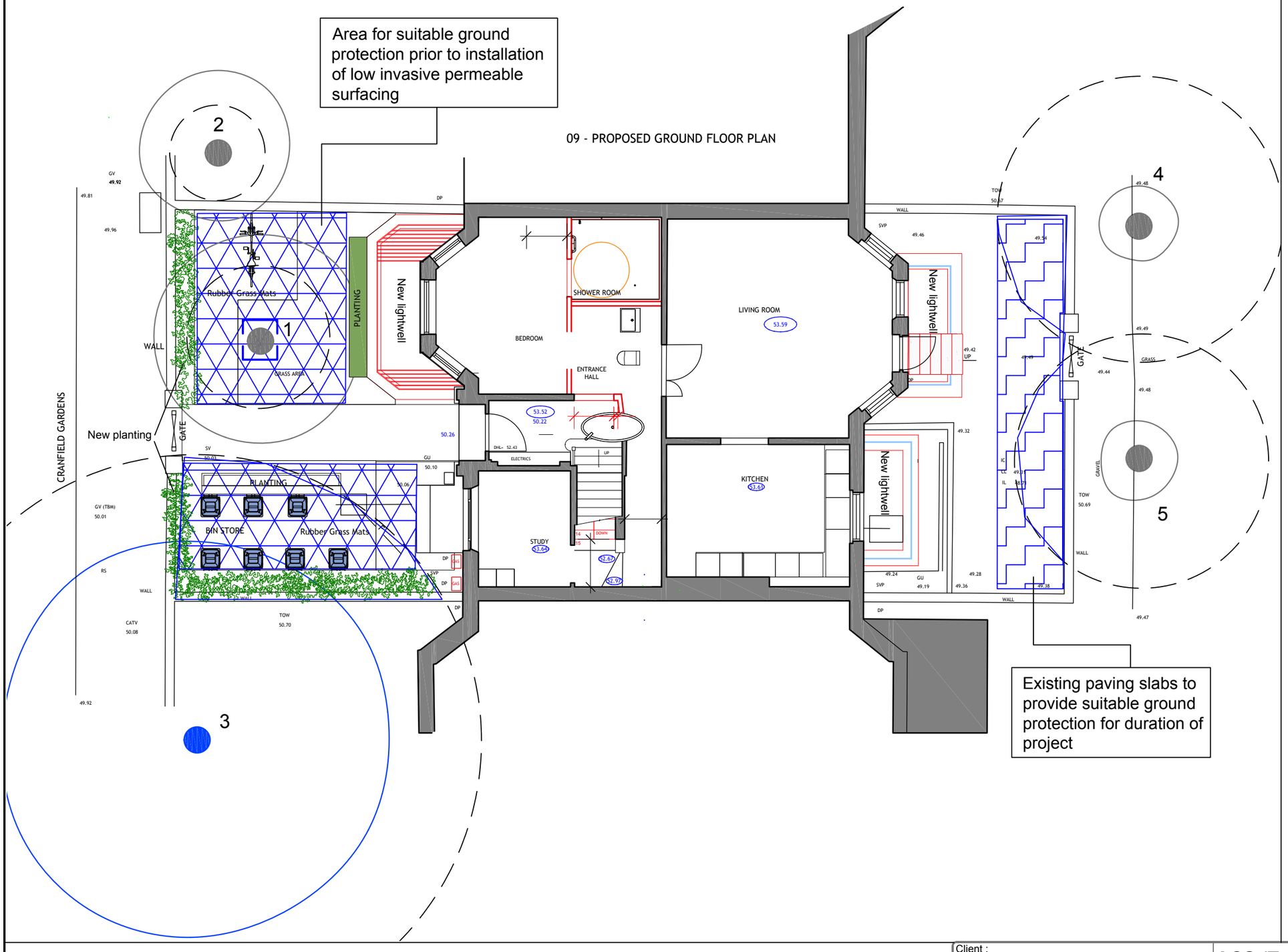
Tree Management Consultants
T: 020 8687 1214



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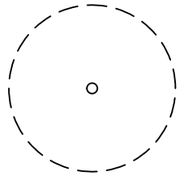

Indicative

BS Root Protection Area, (RPA) shown uniform (above left) but site features such as roadways, retaining walls and foundations, may modify root patterns and therefore the RPA shape.

A grade trees

B grade trees

C grade trees

U grade trees

Recommended position for fixed tree protection hoarding

Area for suitable ground protection for duration of project

Recommended area for suitable ground protection prior to installation of low invasive permeable surfacing

Tree Management Methods to be adopted on site.

1. Undertake pre-commencement site meeting to agree tree protection methods and timings.
2. Carry out any permitted tree works if required - ask before beginning.
3. Install all tree and ground protection (see Appendix 3).
4. Carry out groundworks.
5. Construction phase.
6. Remove tree protection and carry out landscaping incuding installation of low invasive surfacing.

Client : Hagai Nivron	**ACS (Trees) Consulting**
Project : 28 Canfield Gardens, London, NW6 3LA.	**Consultants in the Management of Trees and Woodlands**
Title : Tree Protection Plan	Treetops | 2 Redwood Mount | Reigate | Surrey | RH2 9NB
Scale : 1: 100@ A3	TEL: 01737 244819 | Mobile: 07770 820 105
Date : Nov. 2019	London: Office Eighty Five | 272 Kensington High Street | London | W8 6ND
Dwg No : TPP1_28CG	www.acstrees.co.uk
Rev : -	ACS (TREES) Consulting Urban & rural tree management

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Example of Tree Protection Box Frame

Designed to provide immediate protection from impacts and damage to the trunk and root crown.

Specification:

Uprights x 4, min. 100 X 100 treated wood

Batons top, middle and base min. 25mm x 75mm

45^{o} angled batons to and base for rigidity 25mm x 75mm

Fix 12mm OSB sheeting to framework

Affix ‘Tree Protection’ signage.

Fig. 1 Ground protection – hoarding over sharp sand and wood chip

Installing heavy-duty OSB boarding over a depth (min. 50mm) of sharp sand and/or wood chip between the tree protection fencing and the foundation line of new development is effective in protecting roots, which grow in the soil beyond the position of the fencing.

APPENDIX 4

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T: 020 8687 1214

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T: 020 8687 1214

Arboricultural Site Supervision

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Site: 1 Hyde Park, London
Inspected By: H .Appleyard
Client: RPC
Site Agent: Shaun Clark

Date of Inspection: 15/02/2007
Time of Inspection: 3:30pm

Tree Protective Fencing

Tree protection in correct location

Comments/Action
No action at this time

Effective fencing in position

Agreed Construction Exclusion Zone

No debris within construction exclusion zone

Comments/Action
No action at this time

Amendments to Documentation Required

No amendments required

Comments/Action
Building works outside scope of Method Statement

Fencing with signs

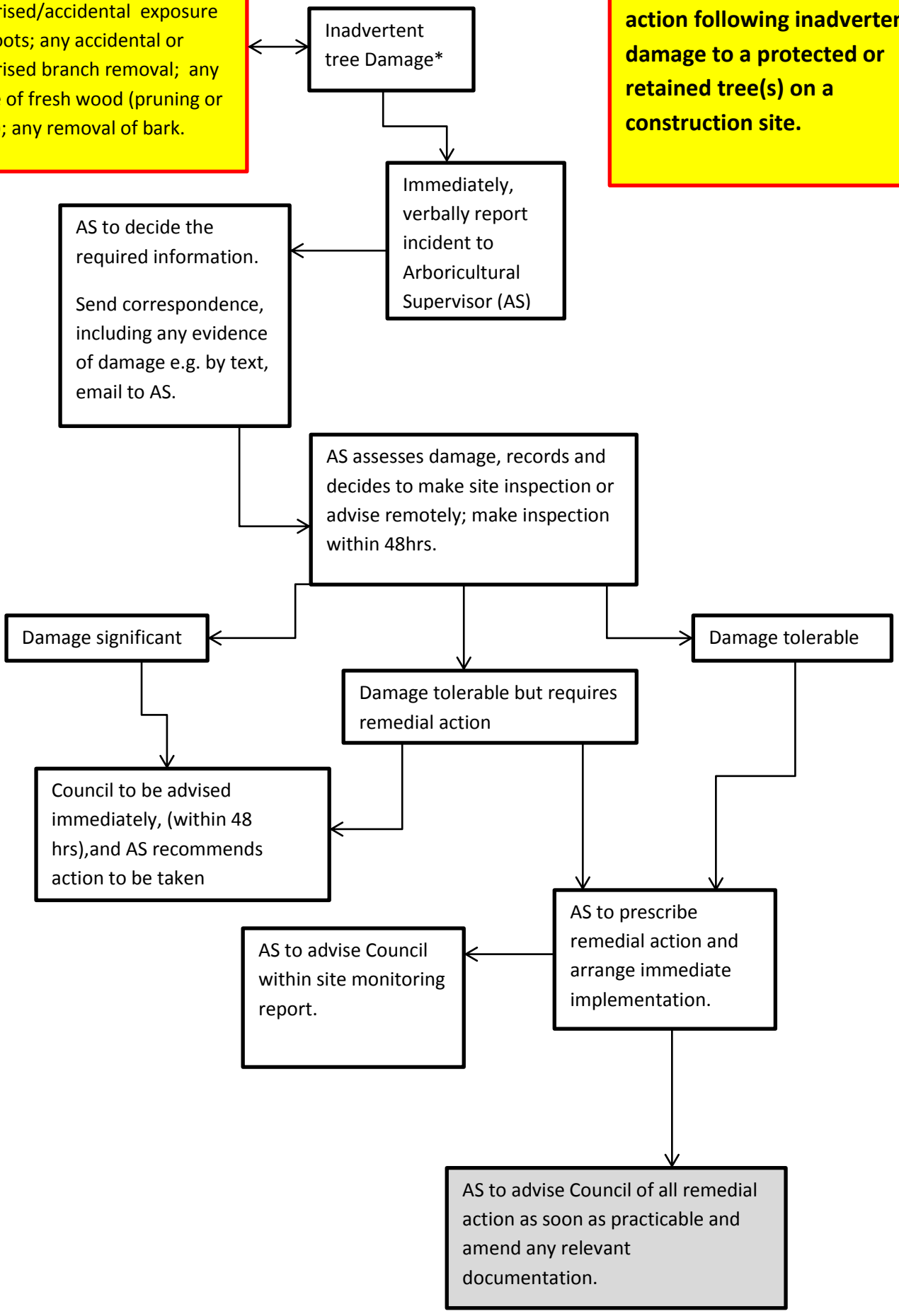
Remedial Works

General Comments

Tree protection and on-site supervsion effective and understood.

Procedure for reporting and action following inadvertent damage to a protected or retained tree(s) on a construction site.

*Tree Damage is defined as: any unauthorised/accidental exposure of tree roots; any accidental or unauthorised branch removal; any exposure of fresh wood (pruning or accident); any removal of bark.



APPENDIX 5

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T: 020 8687 1214

Bin/Cycle store Base & Footpath Construction (guidance)

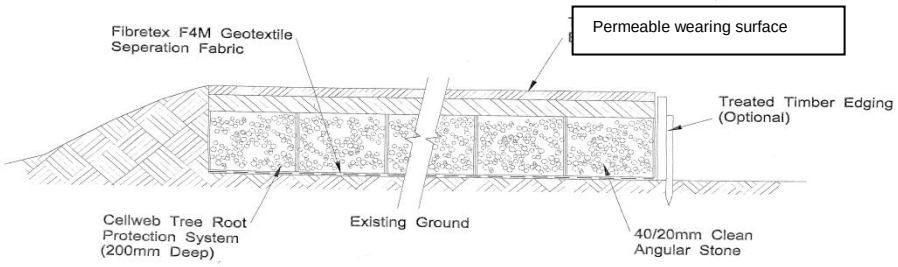
In order to construct a hard surface footpath or bin store base within a rooting area of a valued tree, the suggested following precautions and construction process are to be adopted:

NB. The primary principle is to avoid excavations into the soil to a depth which may encounter roots. As such this method seeks to construct a permeable base, (which permits access of moisture and air to the root zone), at or slightly above ground level.

1. All work involving even light excavations within the RPA of a retained tree should be undertaken using hand tools and ensuring that no roots in excess of 25mm Ø are removed or damaged. Roots in excess of 50mm Ø are to be protected by void formers or surrounded by compressible materials such as sharp sand.
2. Only the area identified as the footprint of the Store/footpath is to be prepared for construction.
3. Lay ground protection around the identified foot print to offer protection to roots from inadvertent compaction from light machinery and pedestrian traffic (see examples below).
4. Remove grass or loose surface litter, gravel or hard surface with hand tools. In the case of removing hard surfacing, remove only the wearing course and retain the sub base material.
5. Cover the footprint area of the exposed soil with a non-woven geotextile membrane and lay a suitable sub-base material as appropriate.
6. Install load-dissipating, cellular confinement grid (e.g. Cell Web 100 or Duobloc) and back fill with a no-fines 40-20mm washed stone aggregate. Edges are to be retained with treated wooden boards and pegs (see example below).

Shallow Duobloc can be used to ‘sit’ over existing surfaces and remain pervious. Useful for paths or hard-wearing bases for stores.

ACS Consulting (London), Pilgrims Court, 15-17 West Street, Reigate, Surrey RH2 9BL
T:020 8687 1214 ● T: 01737 249351 ● E: hal@acstrees.co.uk



Images courtesy of Geosynthetics Ltd – 0870 850 1018

Example of cycle store with pervious base e.g. Duobloc

Bin store with low-invasive base

Example of ground protection cover –

Image courtesy of Greentech – 0113 267 6000

NOTE:

It is assumed that methods of construction as set out in this guide will be undertaken in accordance with all relevant Health and Safety legislation and Regulations and that all risk assessments have been undertaken PRIOR to construction.