

# Arboricultural Report

## Planning and Development

### Arboricultural Impact Assessment and Tree Protection Methods

<b>Project Name and Address</b>	18 Anerley Park, London SE20 8NL		
<b>Prepared for</b>	Typology Architects	<b>Project Ref</b>	-
<b>ACS Ref</b>	ha/aiams2/20/18anerleyprk	<b>Client</b>	FS Design and Build Purley Limited
<b>Prepared by</b>	Hal Appleyard Dip. Arb (RFS), F.Arbor. A. MICFor RCarborA		
<b>Report Date</b>	22 <sup>nd</sup> July 2020		

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## Executive Summary

Construction of a new, low level detached dwelling house is proposed for construction. A mature Sycamore tree grows to the front (west) of the building, which is protected by a tree preservation order.

This report provides an assessment of the impacts upon the tree from construction and the measures for effective tree protection during construction. Subject to the implementation of standard tree protection methods and processes, there will be a neutral impact upon the tree, which can be successfully protected and preserved for the future.

## PART ONE

### 1.0 Introduction and Scope

- 1.1 A planning application for the construction of a new, low-level detached dwelling, is to be submitted for consideration by the Local Planning Authority.
- 1.2 The proposed construction is to be undertaken in the vicinity of a Sycamore tree subject of a tree preservation order (TPO). The implications upon the tree 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 6<sup>th</sup> December 2019. The 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, Trees and Implications of Proposals**

- 2.1 The site comprises an open garden area which dips downward from west to east. A tree grows within soft landscaped border adjacent to the southern site border. A concrete pedestrian access path leads in off the road Anerley Park. Residential houses adjoin the southern, eastern and northern site boundaries. The pavement of Anerley Park runs along the western site boundary A recently-constructed low-level house exists to the south the of the site.

Fig. 1 Sycamore at the front of the proposed construction site



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- 2.2 The BS details of the tree is provided within the tree survey schedule at **Appendix 1** and its corresponding positions are shown on the tree protection plan included at **Appendix 2**.
- 2.3 There is only one tree of significance to the project, which is the Sycamore as detailed within the tree survey. The tree is a typical self-seeded tree growing close to the boundary, having developed from a neglected seedling. The tree's canopy over-hangs the boundary to No 16 and the spreading branches reach the roof line of the building to its north. Some canopy pruning will not be unreasonable irrespective of development. The base is rooted within a soft area of landscaping. Ivy grows upon the trunk to around 8m from ground level. There is no evidence of significant pruning other than to remove some lower branches in the past.
- 2.4 The root spread of the tree is unlikely to be prohibited from growing laterally by the foundations of significant structures for example and I expect some roots to have grown beyond the boundary and under the pavement surfacing to the tree's west.
- 2.5 A recently constructed residential dwelling has been constructed at approximately 5m separation from the base of the tree, but within neighbouring land to the south (No 16). This is a similar separation to that which is proposed.



Fig. 2  
Sycamore  
with a new  
house  
constructed  
to its south-  
east.

- 2.6 The distance between the tree, coupled with normal tree management, will serve to ensure a comfortable relationship between the new building and the tree. No shade is cast by the tree over rear garden space. Any calls for the tree’s removal will be outweighed by the amenity the tree provides to the wider public.
- 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 trees

Tree Ident.*	Maturity	Vitality	% of RPA*	Tolerance** Acceptability	Justification/Recommendation
T1	Mature	Normal	3%	High	1. The Sycamore tree is vigorous and the species is known for its tolerance to root disturbance 2. The extent of RPA used for construction is minimal leaving 97% unaffected 3. Hard landscaping can retain all roots which are over 25mm diameter 4. Compensatory rooting space is available to the tree 5. Soil improvement measures such as applications of mulch can be carried out

\* % 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)

- 2.7 Subject to the implementation of the tree management protection measures from the outset of construction, the Sycamore will not be adversely affected by the proposals.

Table 2 Proposed/Recommended Tree Works

Tree Works (Spec.)	Tree Nos	Visual Landscape Impact of Works*	Space Available for Replacement Planting(Y/N)	Comments
Crown reduce by 2-3m (Sp1)	T1	Low	-	Spreading branches touching building Significant neighbour overhang
Crown clean (Sp3)	T1	None	-	Remove ivy growth
Remove lowest 1 x N-E growing limb (100mm diam.) Sp4	T1	None	-	Remove future potential to impact upon buildings
<b>Total</b>		None		

\*This is a preliminary visual appraisal based upon the opinion of the author having inspected the trees in the context of their current surroundings. – None (no change or beneficial impact) Negligible or indiscernible difference to treed landscape; Low – Noticeable but mitigated by retention of other landscape trees and features; Medium – Obvious but temporary alteration to the treed landscape; High – Obvious and permanent alteration to the landscape.

Visual receptors include the public or community at large, residents, visitors or other groups of viewers together with the visual amenity of potentially affected people.

## **Specifications for recommended tree works:**

### General

All work is to conform to BS 3998:2010 'Tree work – Recommendations' and with current arboricultural best practice. Tree works are to be undertaken by a professional and specialist arboricultural contractor, who carries the appropriate experience and insurance cover, equipment and PPE. All works and processes are to comply with all relevant Planning, Wildlife, Environmental, Conservation and Health and Safety legislation.

Sp1. Crown reduction will include reducing the height and spread of a tree's canopy (branching structure) whilst retaining the tree's natural tree form (species determined). The amount of reduction is described in linear metres e.g. 2m (from 6m to 4m radial spread) or 3m (from 15m to 12m tree height). Crown reduction work will be undertaken for a specific purpose, which may include containing tree growth in a given location or reducing wind purchase and stress.

Sp2. Part reduction (selective pruning) includes pruning back from structures or boundaries and which is normally applied to no more than two sides of a tree's canopy. The amount of pruning is specified in metres. The result form will be even and provide a framework for re-growth in an even form. The extent of pruning will not impinge upon tree condition and seek to preserve so far as possible, the natural outline of the tree, which is species determined. All pruning cuts are to be made to a suitable growing point (secondary shoot) or removed from the parent branch or stem and no inter-nodal cuts are to occur.

Sp2.1 Any branch shortening work, (including as part of crown reduction work) will be conducted by pruning back to a suitable growing point, e.g. a shoot or smaller branch, which can continue to support branch growth.

Sp3. Crown Cleaning involves the removal of all dead wood small and large diameter, stubs and broken branches. Some small, densely arranged shoots (including epicormic shoots) will be thinned out or removed as recommended.

Sp4. Crown lifting includes the removal of the lowest lateral branches and shoots, (which would not result in irrevocable tree injury), to a specific height above ground level measured in metres.

Table 3 Summary of Implications of Construction on Trees\*

Tree Ident.*	Landscape Contribution	Implications /Impact	Mitigation measures	***Tolerance <sup>1,2</sup>	Impact Assessment**
T1	High	Construction of light structures and building within RPA (3%)	1. Erect tree protection and install ground protection 2. Carry out professional pruning 3. Undertake supervised manual dig for new path and bin store landscaping 4. Monitor tree protection	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 Summary and Conclusions

- 3.1 The protected Sycamore tree possesses a spreading canopy form, one which should be reduced to contain it and preserve the tree in this location in harmony with its surroundings. Such tree pruning should be carried out irrespective of development.
- 3.2 The Sycamore tree is in normal growing condition. The extent of rot protection area loss is 3% for the proposed building and the new light structures including bin stores and footpaths can be constructed manually without impacting upon the root system of the tree. The tree's natural tolerance to root disturbance and its current vigorous condition suggest that the tree will, subject to standard tree protection measures, be unaffected by the development.
- 3.3 I have had consideration also to the proximity of the tree to the new building and whether this would be uncomfortable for new residents. The proximity is no different to the separation between the tree and the new house to the tree's south-east within neighbouring land, which has just been constructed and in the same way I consider the tree to be growing at a suitable separation so as not to cause

unreasonable discomfort to the residents. The proposed tree management will serve to reduce the impact of the tree. It is to be noted that the tree is located to the west of the building and to the front and no significant shade will be cast by the tree over the rear garden amenity space, which might otherwise be a source of inconvenience. Indeed, the quality of the tree and its contribution to amenity, will doubtless outweigh any calls for the tree's removal.

## **PART TWO – Trees and their Protection**

### **4.0 Recommended Tree Protection Methods**

- 4.1 In order to afford protection from general construction processes associated with the building of the new dwelling house, it will be necessary to erect robust tree protection fences/barriers (normally wire mesh panels) in the position indicated on the Tree Protection Plan at **Appendix 2** (TPP1\_AP\_18 Rev A). A recommended example of the type BS grade tree protection is included at **Appendix 3**. It will be prudent to ensure that all materials and equipment are transported to and from the site via the dedicated 'construction route' as indicated upon the tree protection plan.
- 4.2 Following erection of the tree protection fencing/barriers and following the completion of the tree works, I recommend installing the 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.
- 4.3 Where it is proposed to construct new, lightweight structures such as footpaths and bin stores, it will be necessary to first remove the tree protection and to undertake construction using manual means only. The methods of manual digging near trees is described with **Appendix 5** but for clarity I have set out the procedure below, which is to be overseen by the appointed arboricultural consultant:
- i) Clearly mark out the area for hand dig (using biodegradable marker paint) (see TPP)
  - ii) Use hand tools (forks and spades) to remove the spoil and deposit beyond RPA.

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- iii) Identify roots to be retained by brushing or the use of compressed air
- iv) Unless after professional assessment permits pruning, roots in excess of 25mm Ø are to be retained in-situ by manually clearing around (with compressed air for example), wrapping with non-woven geotextile (e.g. Terram), covering with a void former e.g. split, rigid polythene piping.
- v) Unless after professional assessment permits pruning, retention of roots 50mm Ø or more will be by the use of void-formers (see **Appendix 5**).
- vi) Roots <25mm Ø will be pruned using sharp pruning tools ensuring that no splits or tears occur and that the pruning wound is made as small as possible. Roots will be pruned back to a side shoot where possible or to a suitable position.

**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.**

4.4 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) The root inspection and treatment exercise
- iii) Effective 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.

4.5 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.

4.6 The details pertaining to tree protection as set out in this method statement, specifically include:

- i) erection of tree protection barriers;
- ii) the installation of ground protection;
- iii) lines of communication and incident reporting,

are to 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. A copy of this method

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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.

4.7 Key times for site supervision include:

1. Completion of agreed/necessary tree works
2. Erection of tree protection barriers
3. Installation of ground protection
4. Works within RPAs of retained trees
5. Landscaping

4.8 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. Below is a recommended programme of arboricultural supervision. (This programme may alter dependent upon site circumstances or by agreement.)

4.9 The 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	Tree works	Y	Following completion of tree works
3	Installation of tree protection and ground protection	Y	PRIOR to ground/demolition works
4	Manual dig exercise and any root treatment	Y	SA to advise AS prior to commencement
5	Ground works and Construction phase	Y	AS to monitor tree protection at agreed and suitable intervals
6	Remove tree/ground protection	N	No tree protection to be removed without prior agreement with the AS
7	Hard and Soft landscaping	Y	Brief landscape company & sign off

4.10 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; <b>contact with project Arboriculturist</b>
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	Mr M Cannon	L B Bromley	020 313 4516	Tree protection and enforcement
Site Engineers	TBA			Technical advice and design
Architects	Mr G Osbourne	Typology Architects	020 8658 3025	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.**

## 5.0 Precautions during Landscape Work

- 4.1 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)

- 5.1 No fires will be lit on site.
- 5.2 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.
- 5.3 No materials, equipment or debris will be stored within the fenced areas unless agreed with the arboricultural supervisor.

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

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

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Hal Appleyard

Date: 22<sup>nd</sup> July 2020

#### 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

No.	Species	Height	Trunk Dia.	Radial Crown Spread	Crown Clearance	Height to 1st Branch	Life Stage	Physiology	Struct. Condition	Landscape Value	Est. Years	Category	Comments	RPA Radius	RPA m2
T1	Sycamore ( <i>Acer pseudoplatanus</i> )	13m	520mm	6m	5m	3m E	M	Good	Good	High	40+	B (12)	Self-seeded tree near site boundary; ivy covering 8m; TPO (advised).	6.2m	122.3m <sup>2</sup>

## Notes to the tree survey schedule

### Notes:

1. No refers to the tree identification number e.g. T1, T2 etc. numbers preceded by 'G' refer to Groups and 'H' refer to Hedges
2. Species refers to the tree name as an English and botanical. (Sometimes the botanical name will not be included)
3. Height describes the approximate height of the tree in meters from ground level.
4. Trunk Diameter is the diameter of the stem/trunk 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. Radial Crown Spread refers to the crown's radius in meters from the stem centre. This dimension is estimated.
6. Crown Clearance is the height in meters of crown clearance above ground level together with the height and direction of the lowest branch
7. Height to first branch is the height in metres from ground level to the first main branch
8. Life stage is the tree's maturity **Young**; **Semi Mature**, **Early Mature**, **Mature**, **Over Mature**, **Veteran**
6. Physiology describes the tree's general vitality as **Good** (normal), **Fair** (sub normal), **Poor** (weak), **Dead**.
8. Structural Condition - **Good** (no or only minor defects), **Fair** (remediable defects), **Poor** - Major defects present or suspected.
9. Landscape Value (Contribution) - **High** (prominent landscape feature), **Medium** (visible in landscape), **Low** (secluded/among other trees).
10. Estimated Years – Estimated remaining useful years: **10yrs+**, **20yrs+**, **40yrs+**
11. Category - refers to the British Standard 5837:2012 Table 1 Category and refers to the tree/group quality and value; **'A' - High**, **'B' - Moderate**, **'C' - Low**, **'U' - Remove or very poor quality**. The sub-category in brackets refers to the retention criteria values where **1** is **Arboricultural**, **2** is **Landscape** and **3** is **Cultural** including **Conservation/ecological, historic and commemorative**.
12. Comments include observations regarding tree condition, setting and function/properties and characteristics
13. RPA radius refers to the radial distance measured in metres from the trunk centre. It is a function of the tree's diameter (s). RPA means root protection area
14. RPA m<sup>2</sup> means the area of the BS standard root protection area derived from the RPA radius.

**NB: Column headings may alter and some of the above notes are not applicable to the schedule in question.**




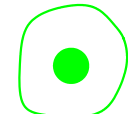

Table 1 Cascade chart for tree quality assessment

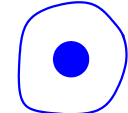

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
<b>Trees unsuitable for retention (see Note)</b>		
<b>Category U</b> Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> <li>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)</li> <li>Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</li> <li>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</li> </ul> <p><i>NOTE</i> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</p>	See Table 2
	<b>1 Mainly arboricultural qualities</b>	<b>2 Mainly landscape qualities</b>
		<b>3 Mainly cultural values, including conservation</b>
<b>Trees to be considered for retention</b>		
<b>Category A</b> <b>Trees of high quality</b> 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
<b>Category B</b> <b>Trees of moderate quality</b> 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, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
<b>Category C</b> <b>Trees of low quality</b> 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 with material conservation or other cultural value
		Trees with no material conservation or other cultural value


## APPENDIX 2

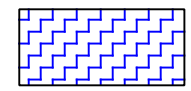
**ACS (Trees) Consulting LEGEND**

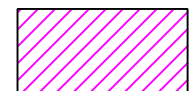
BS Root Protection Area, (RPA) shown uniform (above left) but site features such as roadways, retaining walls and foundations, may modify root patterns and therefore the RPA shape. 

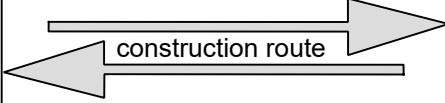
A grade trees  C grade trees 

B grade trees  U grade trees 

**CEZ** Position of tree protection barriers; denotes Construction Exclusion Zone for the duration of the project. 

 Area for effective ground protection suitable for the project

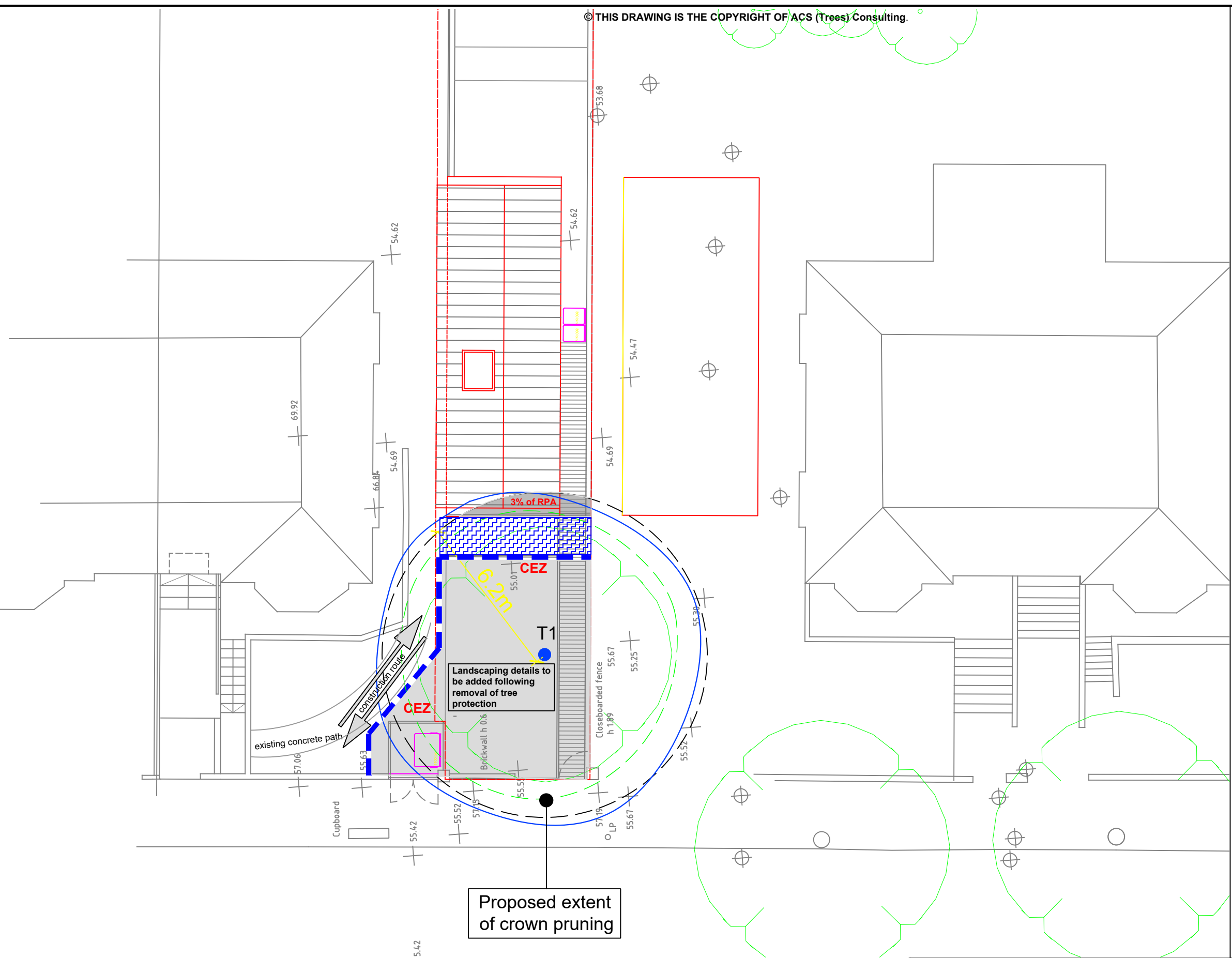
 Area identified for hand excavations prior to construction of foundations. All work to be supervised by an arborist to advise upon root treatment where necessary.

 construction route

Construction route - all materials and equipment to pass by existing access.

**Tree Management Methods to be adopted on site.**

1. Undertake pre-commencement site meetings to agree tree protection methods and timings.
2. Carry out any permitted tree works - ask before beginning.
3. Install all tree and ground protection (see Appendix 3).
4. Undertake demolition and ground works.
5. Construction phase.
6. Remove tree protection and carry out hard and soft landscaping.



Proposed extent of crown pruning

0 5 m 10 m 15 m



Scale: 1:150

Client : FS Design and Build Purley Limited		
Project : 18 Anerley Park London SE26		
Title : Tree Protection Plan		
Scale : 1:150 A3	Dwg No : TPP1_AP_18	Rev : A
Date : June 2020		

**ACS (Trees) Consulting**  
Consultants in the Management of Trees and Woodlands

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**ACS (TREES)**  
Consulting  
Urban & rural tree management

Do not scale from this drawing. Any discrepancies are to be reported to ACS (Trees) Consulting. This drawing is to be used when printed to scale & in colour.

## APPENDIX 3

## Tree Protection Barriers

**Specifications** (specifically identified by outline box and shading)

### 2.4m Hoarding

3.0m 100 X 100mm square wooden posts

3 X 38 X 87mm wooden rails affixed to posts

2.4m X 1200 outside grade ply panels (12mm) affixed to rails.

50 X 100mm angled supporting struts affixed internally (quantity as required).

(Supporting posts fixed into position using concrete. All post holes to be hand excavated. Post holes to be no larger than 300 X 300mm.)

### 'Heras' (Style) Fencing

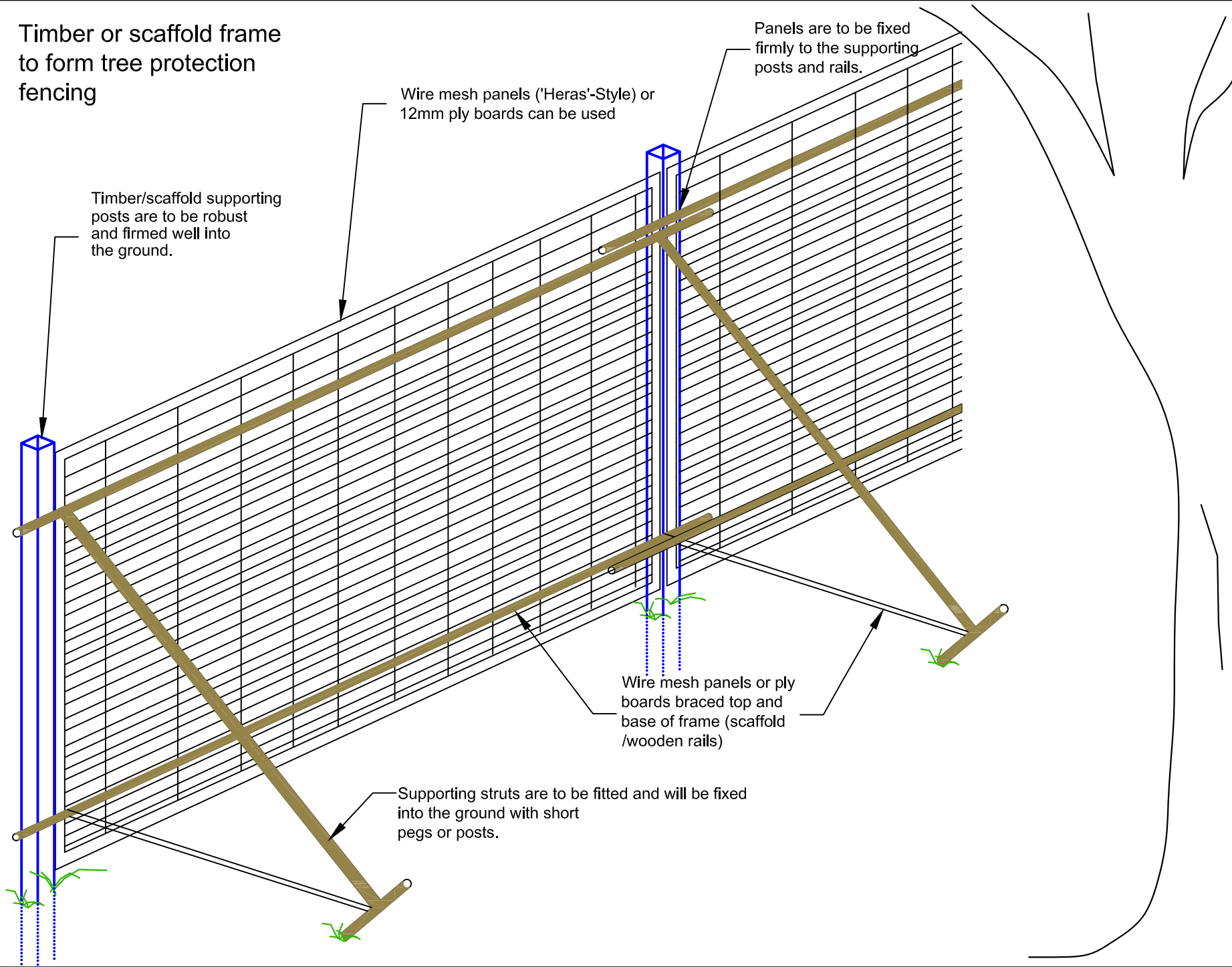
'Heras' fencing describes the 2.4m galvanised steel mesh panelled fencing normally supplied with block bases and block trays. **Block bases are to be used in conjunction with angled scaffold struts only. The use of blocks only is not effective.** For extra barrier vertical stability, scaffold poles set at a 45° angle upon the 'tree-side' of the barrier and fixed to the ground at the end of each panel. Up-right supporting posts will be braced at the top and the base for added support.

Timber or scaffold frame to form tree protection fencing

Wire mesh panels ('Heras'-Style) or 12mm ply boards can be used

Panels are to be fixed firmly to the supporting posts and rails.

Timber/scaffold supporting posts are to be robust and firmed well into the ground.



Wire mesh panels or ply boards braced top and base of frame (scaffold /wooden rails)

Supporting struts are to be fitted and will be fixed into the ground with short pegs or posts.

# ACS Consulting (London)

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## Title:

Example of Tree Protection Fencing

## Note:

Steel scaffold or timber can be used to support boards or wire mesh panels

Date: Jan. 07

Ref:

Note: Sketch Plan Only - Not to Scale

## Tree Protection Fencing

Scaffold Framework supporting 'Heras' type panels with signs attached.



Wooden Framework with 'Heras' type panels attached.



**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.

**Fig.2 Side-butting scaffold boards and covered and fixed with 20mm OSB boarding**





## APPENDIX 4

# Arboricultural Site Supervision

**Site:** Project Site Address/Name  
**Inspected By:** Arboricultural Supervisor (AS)  
**Client:** Client  
**Site Agent:** Site Agent's Name (SA)

**Date of Inspection:** 24/02/2017  
**Time of Inspection:** 8:15:00

## Tree Protective Fencing

Tree protection in correct location

### Comments/Action

Ground protection - temporary concrete and existing paving

## Agreed Construction Exclusion Zone

No debris within construction exclusion zone

### Comments/Action



Robust hoarding and temporary concrete ground protection

## Amendments to Documentation Required

No amendments required

### Comments/Action



Tree protection Hoarding and ground protection over sharp sand.

## Remedial Works

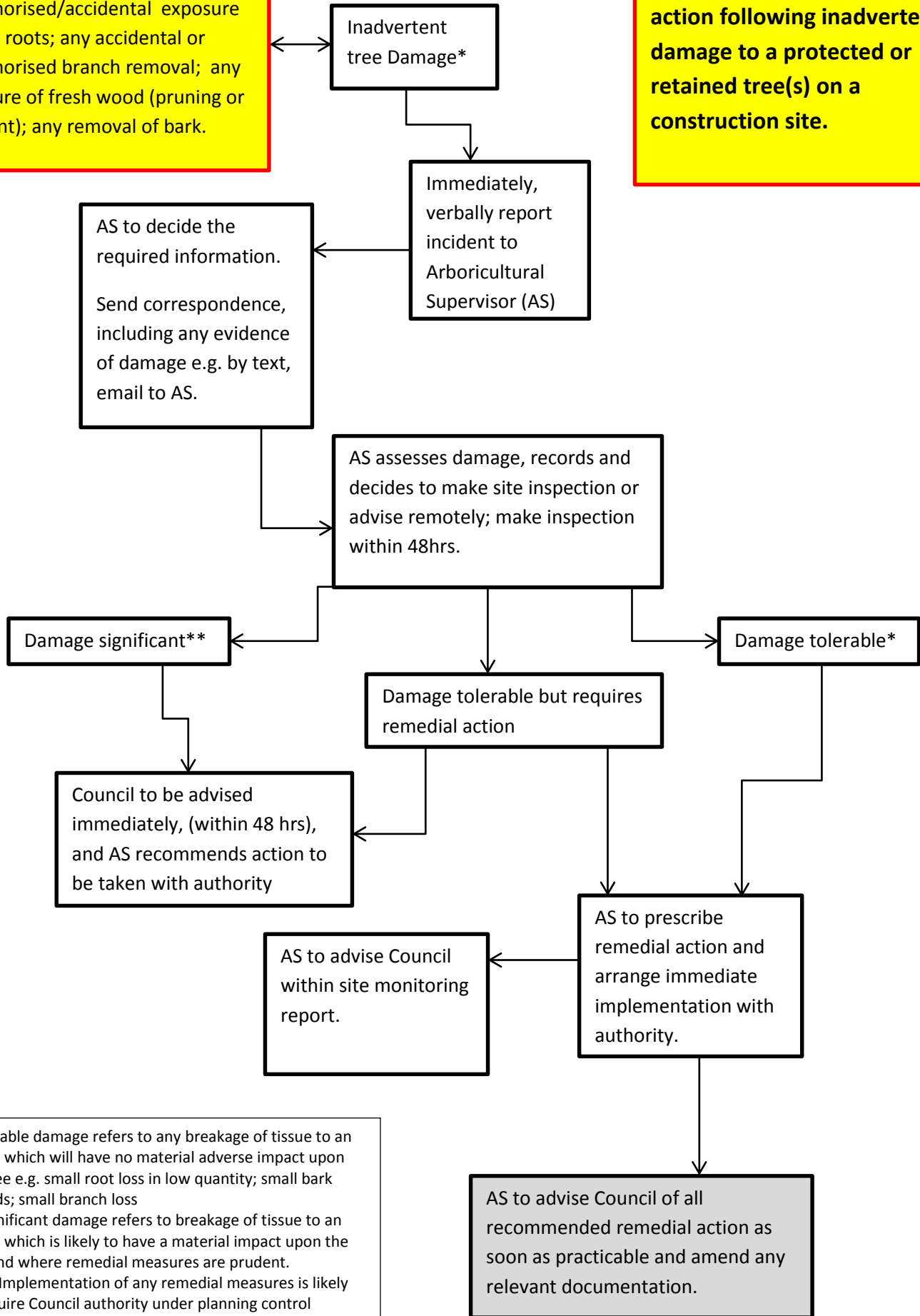
## General Comments

1. Tree protection in position and effective
2. Position of site huts used as tree protection for T7 and T10
3. Temporary concrete used for ground protection for T10
4. Hoarding style tree and ground protection effective and in position

Next Inspection April 2017

**\*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.

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



\*Tolerable damage refers to any breakage of tissue to an extent which will have no material adverse impact upon the tree e.g. small root loss in low quantity; small bark wounds; small branch loss  
 \*\* Significant damage refers to breakage of tissue to an extent which is likely to have a material impact upon the tree and where remedial measures are prudent.  
 Note: Implementation of any remedial measures is likely to require Council authority under planning control legislation, in advance.

## APPENDIX 5

# Manual Digging in the Vicinity of Trees - Method Statement

## 1.0 Introduction

- 1.1 Within and adjacent to areas of construction, trees valued as important landscape assets may exist. It is possible such trees are protected by legislation in the form of a Tree Preservation Order, conservation area or by planning conditions. In either case, disregard of the tree's well being by causing damage to the roots, trunk or branches may be an offence. Consent from the Local Planning Authority may be required to undertake works that may have an impact on the tree prior to commencement.
- 1.2 Whilst the trunk and branches of a tree can be seen and therefore more easily avoided, tree roots are concealed beneath the ground. Their hidden nature can lead to inadvertent damage from construction processes. Dependant upon the extent of any root damage, the whole tree can be adversely affected. It is for this reason that it is necessary to ensure adequate precautions are adopted when considering construction in the vicinity of trees.
- 1.3 Hand digging rather than excavation by mechanical means has proved to be an effective way of limiting the effects of construction on nearby trees. It is often considered impractical, time consuming and costly to excavate by hand when machinery exists specifically for the purpose of digging. However, avoidance of unsustainable damage being caused to important trees through hand digging may far out weigh subsequent costs associated with legal penalties and loss of amenity.
- 1.4 Below are detailed the basic principles to acknowledge in respect of tree roots and the practical steps that can be taken to effectively avoid causing unsustainable damage to trees.
- 1.5 It is assumed that all operations are commenced only **AFTER** having undertaken and recorded appropriate risk assessments in line with current and relevant Health & Safety legislation, common industry practice and guidance.

## 2.0 Tree/Root Damage – How it can occur

- 2.1 The majority of tree roots exist in the upper **600mm to 1000mm** of soil. Excavations of the soil in the vicinity of trees, to this depth, can be harmful to tree roots and consequently the tree.
- 2.2.1 Tree root systems comprise two main root types, those that **anchor** the tree in the ground and those that **supply** the tree with water and elements. Roots that support the tree are woody and those that are involved with the **conduction** of water and nutrients are non-woody or fibrous. Both types of roots can be damaged directly by severing or crushing.

Fibrous roots can die from asphyxiation by **soil compaction** and/or soil contamination. Trees differ in their tolerance of root loss or disturbance, according to their species and condition or both.

- 2.2.2 Normally, the greater the diameter of the damaged root, the greater the adverse impact upon the tree.

Fig. 1 Damage to roots can both kill and destabilise a tree. Planning work and care can avoid root damage



### 3.0 Hand Digging in the Vicinity of Trees – The Process

- 3.1 First it is necessary to consider all available options to construct beyond the likely range of influence on the tree's condition – always beyond 1m from the tree's trunk and by referring to an area (distance) calculated using the formulae at para 4.6.1 of BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'. The simple calculation is 12 x the trunk diameter at 1.5m above ground level. The NJUG Volume 4 Issue 2 method is 4 x the trunk circumference/girth. The resulting area is called the Root Protection Area or Precautionary Zone. **When it is established that no options are available other than to construct within this zone, hand digging will be needed.** When considering hand digging, an appointed specialist supervisor/consultant will be able to advise during construction and must be on site at the commencement of works.
- 3.2 Before beginning to dig, mark out the tree's precautionary area with ground marker paint, clearly on the ground. This will identify the area within which hand digging must take

place. **For safety and before beginning to dig, ensure there are no underground services or objects that may cause injury if damaged.** Any existing protection fencing is to be located to the nearest position of construction and fixed in place, between the tree and area of construction. It will be clearly visible to operators thereafter where hand digging will need to be undertaken. The use of mechanical digging equipment to remove the top surface layer (50-100mm) is to be avoided and hand tools are required for this exercise too.

- 3.3 When hand digging, using typical hand tools, carefully work around roots, retaining as many as possible. Using a brush or compressed air will expose roots cleanly before deciding whether it will be necessary to prune. Care must be taken not to damage roots including the roots' bark.

Fig. 2 Roots exposed, retained and protected during manual digging exercise



- 3.4 Retain all roots with a diameter greater than 25mm. Where such roots must be removed, after consulting a trained arboriculturalist (e.g. Local Authority Tree Officer or the appointed Arboricultural Consultant), these roots must be pruned with sharp cutting tools such as a handsaw, secateurs or pruners. The cut must leave the smallest wound possible and the root must be left as long as practicably possible. Roots in excess of 50mm diameter are to be retained and protected by surrounding the root with uncompacted sharp sand, void-formers or other compressible materials.
- 3.5 Where roots do not exist, e.g. beyond the depth of the rooting area, mechanical excavation should not be considered without specialist supervision.

- 3.6 All spoil is to be deposited beyond the precautionary zone. Soil build-up can cause roots to die.
- 3.7 As soon as practicable, exposed roots are to be covered with loose backfill material such as soil/sand mix or a hessian-type material to offer immediate protection from drying winds and desiccation. When excavating for the introduction of posts, pads or piles, the sides of the pits should be lined with a geotextile material to prevent the potential for lime scorching of small diameter roots.
- 3.8 Where it is impossible to avoid completing the construction in one day for example, any exposed roots or their cut ends are to be covered with sacking material over night to prevent drying out and to add protection. This is particularly important in winter months, where frost can cause further damage to roots.
- 3.9 Upon completion of the hand digging, where appropriate protection fences are to be re-located and fixed in their original position.

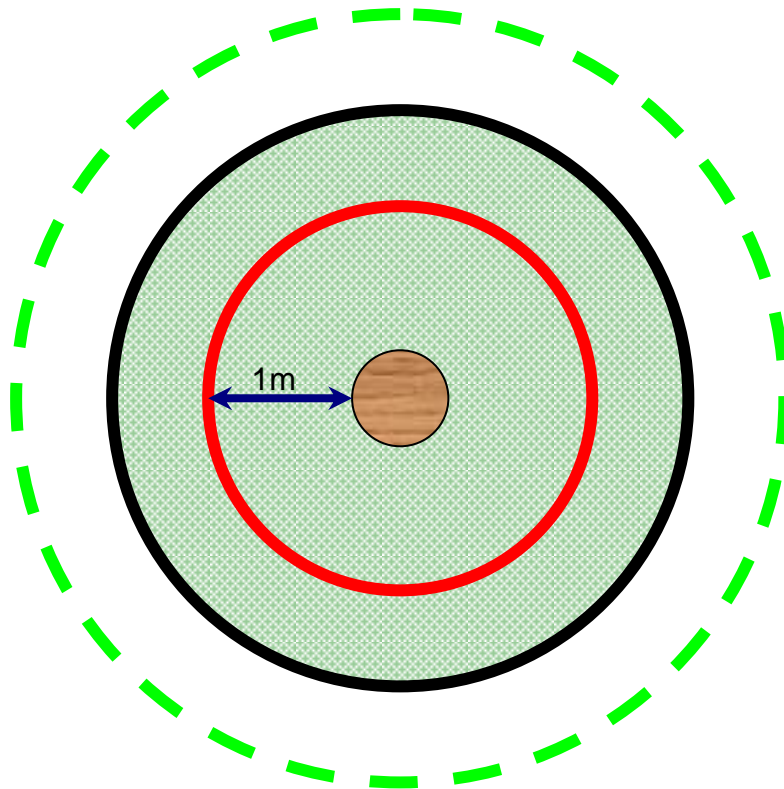
Attached is an extract from the National Joint Utilities Group publication V4 2007, 'Guidelines for the planning installation and maintenance of utility services in proximity to trees'.

**Before considering hand digging and determining precautionary zones or root protection areas, specialist arboricultural advice should be sought.**

Fig. 3 Trees can be destabilised by poor planning and root damage





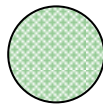


### TREE PROTECTION ZONE

#### Key to Diagram



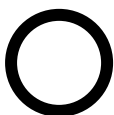
Trunk of Tree



Spread of canopy or branches



**PROHIBITED ZONE – 1m from trunk.** Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



**PRECAUTIONARY ZONE – 4 x trunk circumference.** Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



**PERMITTED ZONE – outside of precautionary zone.** Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2

### **DAMAGE TO TREES**

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

### **PROTECTING ROOTS - DO'S and DON'TS**

There are three designated zones around a tree each of which has its own criteria for working practices.

#### **THE PROHIBITED ZONE**

**Don't** excavate within this zone.

**Don't** use any form of mechanical plant within this zone

**Don't** store materials, plant or equipment within this zone.

**Don't** move plant or vehicles within this zone.

**Don't** lean materials against, or chain plant to, the trunk.

**Do** contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

**Do** protect any exposed roots uncovered within this zone with dry sacking.

**Do** backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

**Do** notify the local authority tree officer or the tree's owner of any damage.

#### **THE PRECAUTIONARY ZONE**

**Don't** excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

**Don't** cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

**Don't** repeatedly move / use heavy mechanical plant except on hard standing.

**Don't** store spoil or building material, including chemicals and fuels, within this zone.

**Do** prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

**Do** backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

**Do** protect any exposed roots with dry sacking ensuring this is removed before backfilling.

**Do** notify the local authority tree officer or the tree's owner of any damage.

#### **THE PERMITTED ZONE**

**Don't** cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

**Do** use caution if it is absolutely necessary to operate mechanical plant within this zone.

**Do** prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

**Do** protect any exposed roots with dry sacking ensuring this is removed before backfilling.

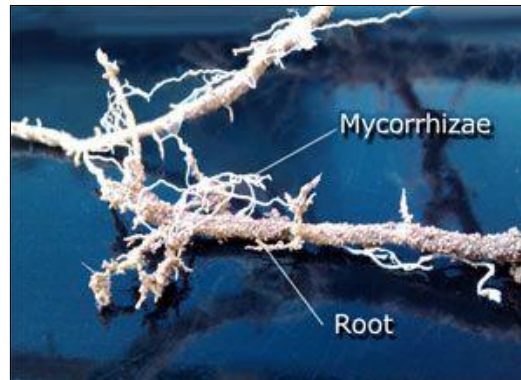
**Do** notify the local authority tree officer or the tree's owner of any damage.

## Tree rooting zone improvement

- Aeration
- Improve soil biosphere (microbial/mycorrhizal content and function)
- Improve soil structure, moisture content and fertility



Aeration of the soil improves soil structure and irrigation



Soil ameliorates can be added such as Organic Matter and Mycorrhizae (specialised fungi)



Simple applications of decomposed woodchip mulch over the bare earth under the canopy spread helps to retain moisture, suppress weed and grass competition and improve soil flora and fauna.