

# Arboricultural Report:

## Implications Assessment and Preliminary Method Statement.

Client: Kitewood Estates Ltd

Site Address: 21-57 Willow Way (Site A), Sydenham, London, SE26 4QP

Prepared by: James Cox (BSc. Hons, AA Tech Cert Arb, M.Arbor.A)

Site Visit: 2<sup>nd</sup> December 2022

Ref: aiams1/willowway

### Executive Summary

A planning application to demolish existing buildings and redevelop the site to provide employment floor space (Use classes E(g)(i)(ii)(iii)) and residential dwellings including affordable housing and amenity space is to be submitted to the Local Planning Authority for consideration.

Southern Beeches Ltd has been commissioned to undertake a tree survey and provide an Arboricultural Impact Assessment and preliminary Method Statement for submission with the planning application. Following the guidelines set out in BS5837: 2012 'Trees in relation to design, demolition and construction Recommendations'.

Some small, low quality trees within the site are to be removed to facilitate the scheme, whilst all other relevant trees are located beyond the site boundary.

This report assesses the impact of the proposed construction upon the tree(s) and their locality, setting out protection measures that are to be adopted in order to successfully integrate the development project into its surroundings.

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

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## **1.0 Introduction and Scope**

- 1.1 A planning application to demolish existing buildings and redevelop the site to provide employment floor space (Use classes E(g)(i)(ii)(iii)) and residential dwellings including affordable housing and amenity space is to be submitted to the Local Planning Authority for consideration. Reference to 'the proposed scheme' below will mean the scheme under consideration by the Local Planning Authority (LPA).
- 1.2 This report has been commissioned by the client- Kitewood Estates Ltd to; i) assess the trees in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction- Recommendations' (The BS); ii) detail the arboricultural consequences of the proposed project and assess its visual impact upon trees and amenity; iii) provide recommendations for effective tree protection, which are commensurate and appropriate for the scale and type of development; iv) develop a tree protection strategy for the duration of the construction including any land preparation.
- 1.3 This report sets out the protection measures that will be adopted to ensure effective tree preservation. The basic principles are that; the established fenced and ground protected areas are exclusion zones for the duration of the construction (or as duly agreed) and; excavations within the BS root protection areas (RPA) will be subject to professional assessment.
- 1.4 Any operational practices recommended in this report are to be undertaken by the appropriate specialist company. Operatives are to carry out the relevant risk assessment and record such information, prior to commencement of tasks and work in accordance with current Health and Safety standards, practices and legislation. Unless formally agreed, no contractors are assessed, appointed or monitored by Southern Beeches Ltd. Responsibility and liability of all actions, non-actions, products and services associated directly with this report will be limited to the relevant client and contractor.

## **2.0 Site Visit and Tree Survey Methodology**

- 2.1 The trees were inspected in accordance with the BS5837: 2012 Trees in relation to design, demolition and construction – Recommendations on 2<sup>nd</sup> December 2022 and

a total of 18 tree records are provided within the Tree Survey Schedule (TSS) at **Appendix 1**.

- 2.2 **Tree Survey and Report Limitations:** The trees were visually inspected from ground level from within the site boundary using non-invasive methods only. The height, crown spread and crown clearance for each tree was estimated to the nearest metre. The DBH (stem diameter at breast height) was measured to the nearest millimetre where access permitted.
- 2.3 A full hazard assessment of the trees (including for example the assessment of decay or defects and its implications) has not been undertaken as this information is considered beyond the scope of this report. Naturally, any obvious hazards have been identified in the schedule and, I recommend that these are acted upon as soon as practicable.



Fig.1: View of site showing small ornamental trees (T1-T5) to be removed.

### 3.0 Site and Tree Appraisal

- 3.1 The existing site at 21-57 Willow Way (Site A) comprises three businesses currently operating, including a vehicle repair / garage, storage/ warehouse catering business and a drinks machine repair/ servicing business. The site contains a mix of single storey and double storey buildings with areas of hardstanding, parking, yard areas and shipping containers interspersed between the buildings. Access to the site is via

Willow Way that runs the length of the western site boundary. Other similar commercial properties border the site to the north and west, whilst a large care home and residential dwellings are located to the east and south of the site.

- 3.2 The tree details are presented at **Appendix 1** in conjunction with the BS cascade chart outlining the tree categorisation methodology. The position of the trees is shown on the Tree Protection Plan (TPP1\_WW) at **Appendix 2**.
- 3.3 The trees identified as being most relevant to this proposal are No's 1, 2, 3, 4 and 5 in terms of removal to facilitate the scheme and No's 8 and 11 in relation to retention and protection measures that are to be adopted during the various stages of demolition and construction.



Figs. 2 & 3: Trees most relevant to proposal, T8 viewed from within the site and T11 taken from within the neighbouring property.

- 3.4 **Statutory Tree Protection:** The Town & Country Planning Act (Tree Preservation) (England) Regulations 2012 and the Town & Country Planning Act 1990 (as amended) provides legislative protection for trees within England. A desk top study of the relevant planning authority's online services has provided the following information:

- **Tree Preservation Orders:** I have not been able to ascertain whether any of the trees surveyed are subject to Tree Preservation Orders (TPOs).



- **Conservation Area:** Whilst the site itself is **not** included within a Conservation Area, those trees located off-site (tree numbers 6-18 inclusive) are located within the Sydenham Park Conservation Area and are thus afforded protection according to section 211 of the Town and Country Planning Act 1990.

3.5 **Underlying Soil Type:** According to the British Geological Survey (BGS) website 'Geology of Britain Viewer' geological records suggest that the local bedrock is London Clay indicating that the soil is likely to be poorly drained in nature.

#### **4.0 Proposed Development and Arboricultural Impact Assessment**

4.1 The proposed scheme involves demolition of existing buildings and redevelopment to provide employment floor space (Use classes E(g)(i)(ii)(iii)) and residential dwellings including affordable housing and amenity space.

4.2 **Tree Removal and Visual Impacts:** Tree numbers 1, 2, 3, 4 and 5 (refer to TPP) are earmarked for removal in order to accommodate the proposed scheme. The trees in question are small and/ or low quality trees, the loss of which will have a negligible impact upon the visual character of the local landscape. The loss of these trees will be mitigated by re-planting with several specimen trees during the landscaping phase.

##### **Retained Trees- Impact Assessment**

4.3 Tree numbers 6-18 inclusive are located off-site and are generally small to medium ornamental trees. In general terms, their canopies do not significantly overhang the site and the robust boundary wall is likely to have prevented significant root growth into the site. Therefore, in my opinion, these trees are not relevant to the proposed scheme.

4.4 The Ash (T8) is mature tree located off-site to the north with a large canopy that significantly overhangs into the site itself. Within the proposed scheme, this area is to be used for bike storage, car parking and amenity space, therefore impacts upon this tree will be minimal, provided that standard protection measures, including sympathetic pruning prior to commencement, care during demolition of existing

buildings/ hard surfaces and hand dig excavations/suitable root treatment are adhered to. These aspects are discussed in more detail within section 5 below.

- 4.5 Tree no. 11 is a mature Horse Chestnut located off-site to the south east within the car park of William Wood House. The tree is growing within a raised bed constrained by a brick retaining wall on the car park side and concrete/ brick boundary wall to the west. Therefore, I would expect its pattern of root growth to be somewhat restricted by these structures and largely confined to the relatively small volume of soil present within the neighbouring property. Furthermore, the rooting environment within the site itself- concrete surfacing covered with shipping containers is also unlikely to support substantial root growth. Despite this, it is possible that some roots have grown under the boundary wall and into the site. Therefore, as a precaution, initial excavations within this area (marked upon the TPP) should be carried out by hand, under supervision, to assess for roots; particularly where treatment of significant roots is necessary.
- 4.5.1 The canopy of T11 considerably overhangs the site and would require pruning back to approximately boundary level to accommodate the proposed scheme. The tree is likely to tolerate this level of pruning and indeed, is an old 'pollard' that was once maintained in this way.
- 4.6 Care must be taken during demolition of the existing structures not to damage the root systems of trees located off-site, particularly those of T8 and T11. Existing foundations and concrete slabs within the RPA of these trees should be picked out by hand to avoid root damage and where possible, existing hard surfaces within these areas should be left in situ for as long as practicable to afford protection to any tree roots below prior to being replaced.
- 4.7 Commencement of all or some of the proposed works may be subject to written authorisation from the Local Planning Authority (LPA) should planning consent be obtained. We strongly advise that authorisation for any tree works is obtained from the LPA prior to commencement.
- 4.8 The implications of the proposed scheme, in terms of tree pruning and other works are summarised in the tables 1 and 2 below.

**Table 1- Proposed/ Recommended Tree Works**

Tree Works (Spec.)	Tree No's	Visual Landscape Impact of Works*	Available Replacement Planting (Y/N)	Comments
Fell to ground level (SP6)	1, 2, 3, 4, 5	Low	Y	Removed to facilitate scheme and improve tree stock through re-planting.
Prune back overhanging canopy to approximately boundary level (SP2.1)	11	Medium	N/A	To facilitate construction and provide a comfortable separation.
Prune back overhanging canopy by approximately 2m (SP2.1)	8	Low	N/A	To facilitate construction and provide a comfortable separation.
Raise canopy to provide 5m ground clearance (SP4)	8	Low	N/A	To facilitate construction and provide a comfortable separation.
Hand dig root investigations and suitable treatment. (SP8)	8, 11	None	N/A	Supervised manual excavations prior to construction of bike stores/ foundations

\*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.

Sp2.1- Part reduction 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) and no inter-nodal cuts are to occur.

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.



Sp6- Felling involves the careful removal of a tree to ground level (or other specified height), either in sections or in one unit (straight felling). The method of felling will be suited to the constraints of the site and judged by the competent operator undertaking the task. Removing the stump may be part of the requirements and this will be carried out using a mechanical stump grinder where accessible.

Sp8- Root pruning is to be carried out or supervised by a competent person (arboricultural contractor). Only sharp and specific pruning tools will be used for the root pruning exercise. No roots are to be pruned if it is considered that their loss (or shortening) will adversely impact upon tree condition or anchorage, immediately or in the future. Any exposed roots will be covered with a material to prevent desiccation. All exposed cut root surfaces will be made as small as possible. If possible roots will be pruned back to side shoot.

**Table 2- Summary of Implications of Construction upon Trees\***

Tree Ident.*	Landscape Contribution	Impact/Potential impact	Tolerance **	Mitigation measures	Impact Assessment* **
1, 2, 3, 4, 5	Low	Removed to facilitate scheme/ improve tree stock	N/A	1. Carry out all permitted tree works prior to commencement. 2. Re-plant with higher quality trees post construction.	Neutral
8, 11	Medium	Damage to canopy during demolition/ construction	Medium-High	1. Undertake supervised pruning of canopy prior to commencement.	Neutral
8, 11	Low	Soil compaction; root damage; root severance; loss of rooting area	Medium-High	1. Retain existing hard surfacing in situ for as long as possible. 2. Hand dig root investigations and suitable treatment prior to installation of bike stores/ foundations. 3. Installation of new services away from tree bases and major roots, in compliance with industry guidelines (NJUG 4)	Neutral

\* Main trees selected for comment included above. Refer to previous notes on other trees.

\*\* Tolerance of species to proposed work within extent of RPA, in association with proposed tree protection

\*\*\* Negative – adverse impact upon tree(s) and landscape; Neutral – no material impact (negative or positive);

Positive – improvement (potential) to tree quality and landscape

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.

## 5.0 Preliminary Arboricultural Method Statement

- 5.1 Effective tree protection will be afforded subject to following a logical sequence of events, which will follow a pre-commencement site meeting of relevant parties. A suggested program of works is outlined in Table 3 below together with the recommended involvement of an Arboricultural Supervisor.

**Table 3. Proposed Sequence of operations for effective tree protection**

Stage	Action	Arboricultural Supervisor (AS) (Required – Y/N)	Notes
1	Pre-commencement meeting	Y	Site Agent(SA) and LPA and contractor to attend
2	Tree works	Y	Following completion of tree works
3	Demolition of existing buildings	Y	SA to advise AS prior to commencement
4	Ground works, root investigations and treatment where necessary	Y	SA to advise AS prior to commencement
5	Construction phases	Y	SA to advise AS prior to commencement

- 5.2 A tree's BS root protection area (RPA) is based upon a radius measurement taken from the trunk centre and is included with reference to para. 4.6 of the BS (See **Appendix 1**). Professional arboricultural judgement may identify modifications to the morphology of an RPA. Any work within a tree's RPA will be subject to professional advice and the guidance set out in this report, particularly where construction is required within this area but beyond the position of fixed tree protection fencing.
- 5.3 **Tree Protection Fencing:** Due to the nature of the site and location of relevant trees, no additional tree protective fencing will be required during this project. The robust brick/ concrete boundary wall will afford adequate protection. However, should extra protective fencing be required, the appropriate options can be found at **Appendix 3** below. Any protective fencing installed may only be removed following completion of all construction works or with the formal agreement of the LPA. Any alterations to its position or construction during development must also be approved by the Arboriculturist and subsequently agreed by the LPA.
- 5.4 **Ground Protection:** Existing hard surfacing at this site will provide adequate ground protection where necessary. In the event that it has to be removed early in the

construction process, recommended examples of other materials suitable for ground protection are included at **Appendix 3**.

## **5.5 Root Zone Mitigation:**

- 5.5.1 Care should be taken during the demolition process to carefully pick out existing hard surfacing/ foundations located in the vicinity of nearby trees, thus preventing damage to any roots that may have exploited these areas.
- 5.5.2 The footprint of the proposed development is likely to encroach within RPA's of tree no's 8 and 11. Hand dig excavations and suitable root treatment should be carried out within the areas highlighted upon the TPP to assess for the presence and treatment of significant roots prior to construction works. Full details of this methodology can be found within **Appendix 5** below.

## **6.0 Foundations and Services**

- 6.1 The proposed scheme can make use of existing services (e.g. main drainage and electricity) and there is no requirement for new excavations in the vicinity of retained trees at this stage.
- 6.2 Piled raft foundations are to be used within the proposed scheme. Engineers will advise on foundation design.

## **7.0 Soil Grade Level Changes**

- 7.1 There are no significant changes proposed to soil levels (existing grade level), within the RPA of any retained tree. As such, no specific instructions are required to address grade changes and tree preservation.

## **8.0 Site Supervision - Arboricultural Specialist**

- 8.1 In order to ensure that the tree protection measures are implemented effectively, a **Pre-Commencement Site Meeting**, involving invited representatives from the local planning authority, the developer, contractors and engineers (as appropriate) will be undertaken to establish the principal timings and actions.

**\*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.**

8.2 So as to ensure that the tree protection measures are implemented, an arboricultural specialist will be appointed to record the condition of the trees to be retained and the position and type of tree protection erected and or installed. The specialist will make a record of visits and which will be retained by the contractor/developer and or left on site for inspection (see **Appendix 4**). Key times for supervision include:

- Completion of agreed tree works
- Erection of tree protection fencing
- Hand digging and construction works within RPAs of retained trees

8.3 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.

8.4 An example of a site monitoring record 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.

8.5 The details pertaining to tree protection as set out in this method statement 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 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.

8.6 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 by agreement following the pre-commencement meeting.

## **9.0 General Site Care**

- No fires will be lit on site.

- 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.
- No materials, equipment or debris will be stored within the fenced areas unless agreed with the arboricultural supervisor.
- Areas for mixing are to be located beyond RPAs of trees and contained to prevent leaching into the soil.
- A copy of this report and the Tree Protection Plan is to remain on site at all times



James Cox

15<sup>th</sup> December 2022

**Liability Limitation**

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Please note that all relevant planning approvals and approval to planning conditions must first have been issued by the relevant planning authority in order for this report to become effective. We strongly advise that you consult your planning advisors before implementing any recommendations set out in this report.



## **Appendix 1**

## Tree Survey Schedule

Site: Willow Way  
Date: 2nd December 2022

Surveyor: James Cox  
Ref: willowway-tss1

Tree No.	English Name	Height	Crown Spread N	Crown Spread E	Crown Spread S	Crown Spread W	Ground Clearance	Age	Stem Diameter	Protection Multiplier	R.P.R	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	General Observations
1	Palm	4	1	1	1	1	2/N2	MA	200	12	2.4	N	F	L	C	1,2	10-20	A tree with insignificant defects Garden ornamental
2	Palm	4	1	1	1	1	2/N2	MA	200	12	2.4	N	F	L	C	1,2	10-20	A tree with insignificant defects Garden ornamental
3	Apple , Crab	5	2	2	2	2	0	M	200	12	2.4	N	F	L	C	1,2	10-20	Reduced in past One of a group
4	Apple , Crab	5	2	2	2	2	0	M	150	12	1.8	N	F	L	C	1,2	10-20	Reduced in past One of a group
5	Apple , Crab	5	2	2	2	2	0	M	180	12	2.2	N	F	L	C	1,2	10-20	Reduced in past One of a group
6	Mimosa	8	3	3	3	3	2/N2	MA	200e	12	2.4	N	G	L	C	1,2	10-20	Off-site tree Inspection limited by access
G7	Elder, Sycamore	6	1	1	1	1	2/N2	Y	100	12	1.2	N	F	L	C	1,2	10-20	Off-site tree group Self set group Inspection limited by access
8	Ash	14	6	6	6	6	2/N2	M	600e	12	7.2	N	G	M	B	1,2	20-40	Off-site tree Multistem form Inspection limited by access
9	Lime, Common	15	3	3	4	3	2/S2	M	600e	12	7.2	N	F	M	C	1,2	10-20	Off-site tree Inspection limited by access Minor die-back and deadwood
G10	Hawthorn	6	2	3	2	2	2/N2	MA	150a	12	1.8	N	F	L	C	2	10-20	Off-site tree gorup Trees with insignificant defects Boundary screen group
11	Chestnut, Horse	15	5	5	5	5	1/N2	M	750	12	9.0	N	F	M	B	1,2	20-40	Off-site tree Pollard (old) Root pattern affected by structures
12	Birch, Weeping	3	2	2	2	2	0	MA	100	12	1.2	N	F	L	C	1,2	10-20	Off-site tree One sided form/ suppressed A tree with insignificant defects
13	Whitebeam	7	2	2	2	2	1/N1	MA	180a	12	2.2	N	G	L	C	1,2	10-20	Off-site tree Tree group One sided form/ suppressed

# Tree Survey Schedule

Site: Willow Way  
Date: 2nd December 2022

Surveyor: James Cox  
Ref: willowway-tss1

Tree No.	English Name	Height	Crown Spread N	Crown Spread E	Crown Spread S	Crown Spread W	Ground Clearance	Age	Stem Diameter	Protection Multiplier	R.P.R	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	General Observations
14	Whitebeam	7	2	2	2	2	1/N1	MA	180a	12	2.2	N	G	L	C	1,2	10-20	Off-site tree Tree group One sided form/ suppressed
15	Whitebeam	7	2	2	2	2	1/N1	MA	180a	12	2.2	N	G	L	C	1,2	10-20	Off-site tree Tree group One sided form/ suppressed
16	Cherry flowering	7	3	2	2	2	2/N2	M	250a	12	3.0	N	F	L	C	1,2	10-20	Off-site tree Ivy covered trunk and branches One of a group
17	Cherry flowering	7	3	2	2	2	2/N2	M	250a	12	3.0	N	F	L	C	1,2	10-20	Off-site tree Ivy covered trunk and branches One of a group
18	Cherry flowering	7	3	2	2	2	2/N2	M	250a	12	3.0	N	F	L	C	1,2	10-20	Off-site tree Extensive resin exudates One of a group

# Tree Survey Schedule

Site: Willow Way  
Date: 2nd December 2022

Surveyor: James Cox  
Ref: willowway-tss1

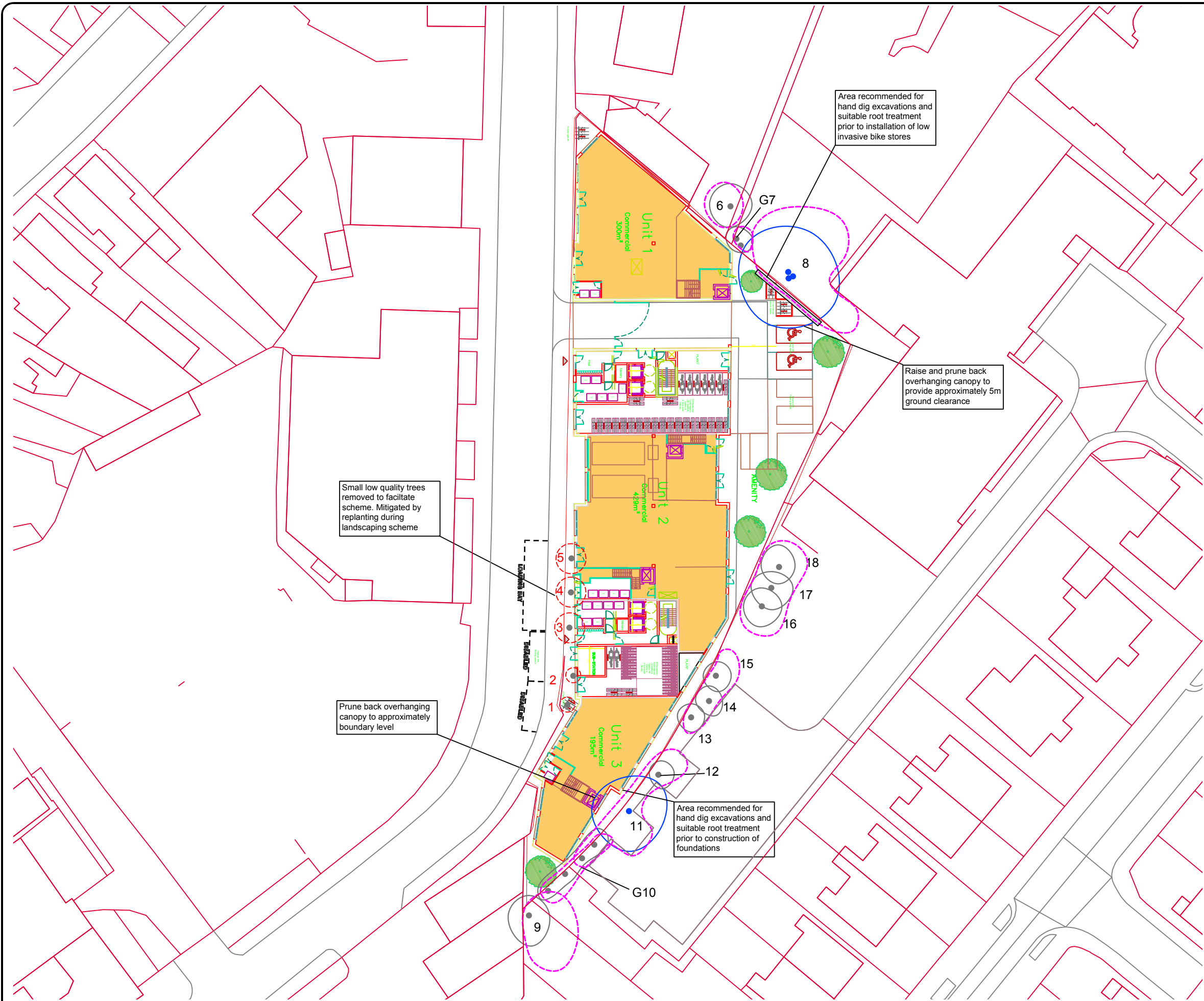
Tree No.	English Name	Height	Crown Spread N	Crown Spread E	Crown Spread S	Crown Spread W	Ground Clearance	Age	Stem Diameter	Protection Multiplier	R.P.R	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	General Observations
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## 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.









## **Appendix 2**





## LEGEND



-  A grade trees
-  B grade trees
-  C grade trees
-  U grade trees
-  BS Root Protection Area, (RPA) shown uniform and where site features such as roadways, retaining walls and foundations, may modify root patterns and therefore the RPA shape.
-  Trees to be removed
-  Proposed new trees
-  Area identified for hand excavations and suitable root treatment prior to construction of foundations. All work to be supervised by a qualified arborist.

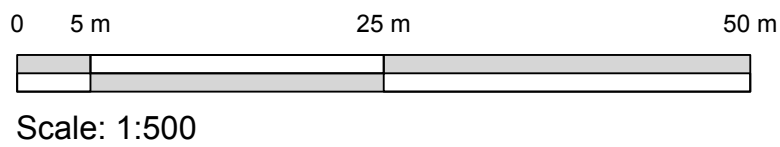
### Tree Protection Methods to be adopted on site.

1. Undertake pre-commencement site meeting to agree tree protection methods and timings.
2. Carry out any permitted tree works.
3. Erect and fix in place all tree protection where necessary (see Appendix 3).
4. Undertake demolition and ground works
5. Construction phase.
6. Remove tree protection.

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Project :	21-57 Willow Way (Site A), Sydenham, London.
Title :	Tree Protection Plan
Scale :	1: 500 @A3
Date :	Dec. 2022
Dwg No :	TPP1_WW



## Appendix 3

## Ground Protection



Fig.1 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. An effective way to protect roots, which grow in the soil beyond the position of the fencing.



Fig.2 Heavy-duty metal ground plates laid on minimum 75mm depth sharp sand/ woodchip, fixed in position with road pins.

## **Appendix 4**

## Site Monitoring Record

Site Address:		Client:		Inspector:		Site Agent:	
Date	Activity	Comments	Actions	By whom	Signed (on behalf of Southern Beeches)	Signed (on behalf of client)	
	Protective Fencing						
	Construction Exclusion Zone						
	Ground Protection						
	Remedial Works						

Notes:



## **Appendix 5**

## **Manual Excavation In the Vicinity of Trees**

### 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. Dependent 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 outweigh 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.

2.3 The larger the root damaged, the greater the impact on the tree.

### 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 – normally beyond 1m from the tree's trunk and within an area below the tree's canopy or by referring to an area calculated using the formulae at para 4.6.1 of BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'. This area is called the Precautionary Zone or Root Protection Area. 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.

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 un-compacted 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.

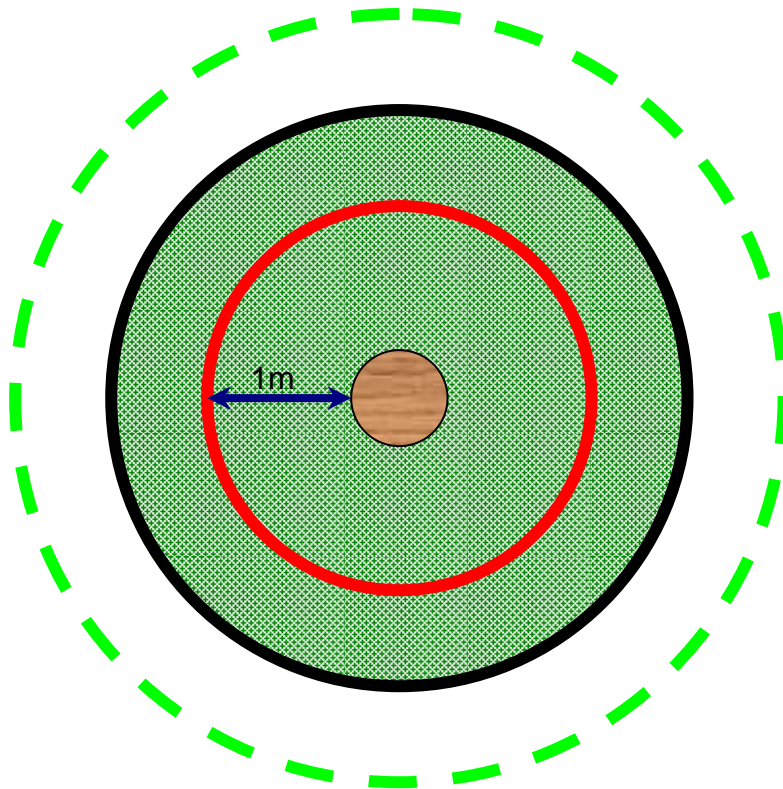
3.8 Where it is impossible to avoid completing the construction in one day for example, any exposed roots or their cut ends are to be covered with sacking material over night to prevent

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.**

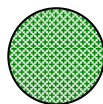


### TREE PROTECTION ZONE

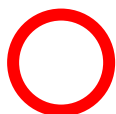
#### Key to Diagram



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 – beneath canopy or branch spread.** 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 1**

### **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.

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

**TABLE 1 - Prevention of Damage to Trees Below Ground**

<b>Causes of Damage</b>	<b>Type of Damage</b>	<b>Implications to Tree</b>	<b>Precautions</b>
Trenching, mechanical digging etc.	Root severance	<ul style="list-style-type: none"> <li>The tree may fall over</li> <li>Death of the root beyond the point of damage</li> <li>Potential risk of infection of the tree</li> </ul> <p>The larger the root the greater the impact on the tree.</p>	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	<ul style="list-style-type: none"> <li>The tree may fall over</li> <li>If the damage circles the root it will cause the death of the root beyond that point</li> <li>Potential risk of infection of the tree</li> </ul> <p>The larger the root the greater the impact on the tree.</p>	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	<ul style="list-style-type: none"> <li>Death of the whole tree</li> <li>Death of individual branches</li> </ul> <p>Damage to leaves and shoots.</p>	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management