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ARBORICULTURAL REPORT

for :

148 Fellows Road
London
NW3

Produced for:
ASTS Ltd

Prepared by:
Hal Appleyard
Dip. Arb. (RFS)., F.Arbor.A.MICFor

Date: 23rd March 2007

Reference: ha/ms2/148fellowsrd

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Tree Appraisal & Protection Method Statement

Trees at 148 Fellows Road, Swiss Cottage, London, NW3

Introduction and Scope

This report has been commissioned by ASTS Ltd to; i) assess the trees in accordance with BS 5837:2005 'Trees in relation to construction- Recommendations' (The BS); ii) detail the arboricultural consequences of the proposed project; iii)set out the tree protection measures considered appropriate for the scale and type of construction; iv) develop a tree protection strategy for the duration of the construction including any demolition works.

Reference to 'the proposed scheme' below will mean either the approved scheme for which planning consent has been granted or the scheme under consideration by the Local Planning Authority (LPA).

The trees were inspected on 13th October 2006 and a total of 12 tree records are provided.

This Method Statement 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 and; excavations within the RPA will be subject to professional assessment (see Note 1).

1.0 Tree Appraisal

1.1 The tree details are presented at **Appendix 1**. The implications of the proposed scheme are detailed in the table below:

Tree Works	Tree No	Visual Landscape Impact of Works	Replacement Planting (Y/N)	Comments
Crown lift over site to 4m clearance	10,11,12	Low	-	Trees branches over- hang and some are broken.
Fell	1	Medium	N	Dying tree over road and pavement
Crown reduce	12	Medium	-	Safety pruning; create effective new canopy; owner's discretion
Total		Medium	-	New plantings to set in light wells

*This is a preliminary visual appraisal based upon the opinion of the author having inspected the trees in the context of their current surroundings. – Negligible (None.) Indiscernible difference to landscape; Low – Noticeable but mitigated by other landscape features; Medium – Obvious but temporary alteration to the landscape; High – Obvious and permanent alteration to the landscape

1.2 All work is to conform to BS 3998:1989 'Tree Work' (with amendments) and to current arboricultural best practice. Tree works are to be undertaken by a professional and specialist arboricultural contractor, who has the appropriate experience and insurance cover. 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.

1.3 In addition, prior to the commencement of any tree works, an ecological assessment of specific trees may be required to ascertain whether protected species (e.g. bats, badgers and invertebrates etc) may be affected.

2.0 Tree Protection

2.1 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 Table 2 of the BS (See **Appendix 2**). Works within a tree's assessed RPA will be subject to guidance set out here, particularly where construction is required within this area but beyond the position of tree protection fencing.

2.2 Effective tree protection will be afforded subject to following a logical sequence of events, which **will follow a pre-commencement site meeting** (see 4.0) **with the LPA representatives and the site agents and any specialist supervisors**:

('S' refers to the stage in order)

S1 Undertake any agreed and or necessary tree works.

S2 Erect protective fencing and install ground protection

S3 Carry out demolition works

S4 Carry out ground works including hand excavations for root pruning exercise (see below)

S5 Install piles/scaffolding and complete construction works

S6 Remove protective fencing and ground protection complete and landscaping works.

2.3 The protection fencing will be erected in the position indicated on the Tree Protection Plan (TPP) at **Appendix 2**.

2.4 The type of fencing and its recommended specification is attached at **Appendix 3**. In this case both, hoarding or fixed Heras fencing will be effective.

2.5 The protection fencing will remain in position for the duration of the construction phases for the development, including the removal of any existing structures. Clear signs will be attached to the fencing once erected – suggested wording will be **'Protected Trees – No Access'**. It is possible to increase tree protection during construction by positioning tree protection in stages and agreeing that particular construction processes can be brought forward or delayed in the development period. Where appropriate the TPP will indicate, by colour coding, the position of the fencing at most effective times. Any alteration to the position of fencing will be agreed with the LPA.

2.6 Where, for construction purposes, it is necessary to position tree protection fencing within the assessed RPA of a tree (s), ground protection will be installed to prevent undue soil compaction from pedestrian and vehicular traffic. At **Appendix 4** are examples of effective ground protection. The type of ground protection will be suitable for the type of proposed traffic e.g. scaffold boards over compressible material will be suitable for pedestrian and light machinery such as wheel barrows but polyethylene or steel ground plates will be used for heavier machinery and temporary re-enforced concrete may be suitable by agreement. In this case, fixed boards or ground guards will be suitable.

2.7 Hand excavations, which are required and agreed to occur within the RPA's of retained trees may encounter roots. Root pruning will be undertaken as described below and is outlined in **Appendix 6**.This methodology will be adopted when undertaking the initial excavations in this case. Following excavation to a depth clearly beyond the rooting zone of trees (to be assessed by a specialist), mechanical excavation can commence. Specifically in this case however the treatment of roots will be undertaken in the following ways:

i) A hand dug trench will be excavated along the line of the proposed excavations in the proximity of trees (following previous excavations, it has been found that some roots extend into the site).

ii) Roots <25mm Ø will be pruned back to the soil edge, using sharp pruning tools. Roots, where possible, will be pruned back to a side shoot or suitable position, ensuring the exposed face is kept to a minimum.

iii) Exposed ends of roots will be covered with sacking or geotextile material to prevent full exposure to the air and prevent desiccation.

iv) This exercise will be supervised by a competent person.

3.0 Underground Services & Foundations

3.1 The proposed scheme can make use of existing services and there is no requirement for new excavations in the vicinity of retained trees.

3.2 Owing to the predominantly subterranean nature of the proposal there are no special precautions, other than those set out above, for the construction of foundations.

4.0 Site Supervision - Arboricultural Specialist

4.1 It is important to recognize that the Local Planning Authority Officers (Enforcement Sections) have stringent powers to serve a **Temporary Stop Notice** through recent changes in the legislation governing planning and development. Circular 02/2005 (see Note 2). It is therefore important that works, which may impact upon trees and amenity, are suitably controlled by competent personnel. Identified below are details of a site monitoring process designed to minimize potential risks to retained trees on or off site.

4.2 A **pre-commencement** site meeting, involving representatives from the development, contractors and engineers (as appropriate), site agent and relevant LPA officers, will be undertaken to establish the principal timings and actions.

4.3 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 5**).

4.4 Key times for site supervision include:

1. Completion of agreed/necessary tree works
2. Erection of tree protection fencing
3. Installation of ground protection
4. Hand Excavation Works and root treatment
5. Landscaping

4.5 Site monitoring will be at regular intervals, (beyond that stated above) and at minimum three-week intervals (subject to development scale).

Contact List

Interested Party	Name	Company/LPA	Contact Number(s)	Comment
Site Agent	TBA			
Arb. Supervisor	Hal Appleyard	ACS Consulting	020 8687 1214	
LPA Tree Officer	K Fisher	L B Camden	0207 7974 1544	
Other	TBA			

TBA - to be advised

5.0 General Site Care

5.1 No fires will be lit on site

5.2 No access will be permitted to within the fenced areas (unless it is used for site accommodation) 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.

5.4 A copy of this Method Statement and Tree Protection Plan is to remain on site at all times.

Note 1. RPA to be assessed by an arboriculturalist. BS 5837:2005 'Trees in Relation to Construction - Recommendations' paras. 5.2.4 and 11.1.1.

Re-building of existing structures located within the protection distances, such as retaining walls, may require soil excavation and root treatment.

Note 2. The Circular 02/2005 gives guidance on the temporary stop notice provisions in Part 4 of the Planning and Compulsory Purchase Act 2004 which inserted sections 171E to 171H to the Town and Country Planning Act 1990.

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APPENDIX 1

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TREE SURVEY SCHEDULE

Site: 148 Fellows Road, NW3
Date:13th October 2006

Surveyor: H. Appleyard
Ref: ts2/148fellowsrd

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
1	Ash, Common	21	N5S10 E4W9	2.5	Over-Mature	740		0.0	Poor	Poor	Medium	R	1	<10	A sparser than normal canopy Dying back (extensive) Large limbs over road almost dead.
2	Plane, London	17	5	2.5	Mature	670	12	8.0	Normal	Good	High	B	1,2	>40	A tree with insignificant defects Street tree, reduced regularly
3	Plane, London	17	5	2.5	Mature	800	12	9.6	Normal	Good	High	B	1,2	>40	A tree with insignificant defects Street tree, reduced regularly
4	Ash, Common	15	5	3	Mature	410e		0.0	Moderate	Poor	Low	R	1	<10	Cavities with decay(significant) Multiple pests and diseases
5	Chestnut, Red	15	5	3	Mature	410	12	4.9	Moderate	Fair	Low	C	1	10-20	Leaning (slightly) Off-site tree Early decay behind cankers
6	Lime, Small-leaved	20	N4S3E 3W3	5	Mature	490e	12	5.9	Normal	Fair	Medium	B	1,2	20-40	Suppressing better/other trees Off-site tree
7	Chestnut, Red	15	6	3.5	Mature	430	12	5.2	Normal	Fair	Medium	C	1	20-40	Off-site tree

Notes:

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees and is the number used to calculate the trees' protection radius and area.
6. Protection Radius is a radial distance from the trunk centre and used to calculate the 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.
9. Landscape Contribution High(Prominent landscape feature); Medium(visible in landscape); Low(secluded/among other trees)
10. B.S. Cat refers to (BS 5837 :2005 Table 1) and refers to tree/group quality and value; 'A' - High; 'B' - Moderate; 'C' - Low; 'R' - Remove.
11. Sub Cat refers to the retention criteria values where 1 is arboricultural, 2 is landscape and 3 is cultural including conservational, historic and commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

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TREE SURVEY SCHEDULE

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Site: 148 Fellows Road, NW3
Date:13th October 2006

Surveyor: H. Appleyard
Ref: ts2/148fellowsrd

Tree No.	English Name	Height	Crown Spread	Ground Clearance	Age Class	Stem Diameter	Protection Multiplier	Protection Radius	Growth Vitality	Structural Condition	Landscape Contribution	B.S. Cat	Sub Cat	Useful Life	Observations
8	Sycamore	20	6	7	Mature	550e	12	6.6	Normal	Good	Medium	B	1,2	20-40	Off-site tree Pollard (Old) Roots contained to the north by boundary wall
9	Sycamore	20	6	7	Mature	600e	12	7.2	Normal	Good	Medium	B	1,2	20-40	Off-site tree Boundary screen tree Roots contained to the north by boundary wall
10	Lime, Common	22	5	2.5	Mature	400e	12	4.8	Normal	Good	Medium	B	1,2	20-40	Boundary screen tree Low branches over site Epicormic shoots; near boundary
11	Lime, Common	24	5	2.5	Mature	600e	12	7.2	Normal	Good	Medium	B	1,2	20-40	Boundary screen tree Low branches over site Epicormic shoots; near boundary
12	Ash, Common	22	N4S7E 7W8	3	Mature	520	12	6.2	Normal	Fair	High	B	1,2	20-40	Broken brancehs over site Unkempt appearance, off site

Notes:

1. Height describes the approximate height of the tree measured in meters from ground level.
2. The Crown Spread refers to the crown radius in meters from the stem centre and is expressed as an average of NSEW aspect if symmetrical.
3. Ground Clearance is the height in metres of crown clearance above adjacent ground level.
4. Stem Diameter is the diameter of the stem measured in millimetres at 1.5m from ground level for single stemmed trees or at ground level for multi-stemmed trees. Stem Diameter may be estimated where access is restricted.
5. Protection Multiplier is 12 for single stemmed and 10 for multi-stemmed trees and is the number used to calculate the trees' protection radius and area.
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11. Sub Cat refers to the retention criteria values where 1 is arboricultural, 2 is landscape and 3 is cultural including conservational, historic and commemorative.
12. Useful Life is the tree's estimated remaining contribution in years.

Table 1 — Cascade chart for tree quality assessment

TREES FOR REMOVAL		
Category and definition	**Criteria**	**Identification on plan**
<u>Category R</u> Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management	• 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 R category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality NOTE Habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost: installation of bat box in nearby tree).	DARK RED

TREES TO BE CONSIDERED FOR RETENTION				
Category and definition	**Criteria — Subcategories**			**Identification on plan**
	1 Mainly arboricultural values	**2 Mainly landscape values**	**3 Mainly cultural values, including conservation**	
<u>Category A</u> **Those of high quality and value:** in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups)	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
<u>Category B</u> **Those of moderate quality and value:** those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)	Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage)	Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	MID BLUE
<u>Category C</u> **Those of low quality and value:** currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	GREY
	NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation.			

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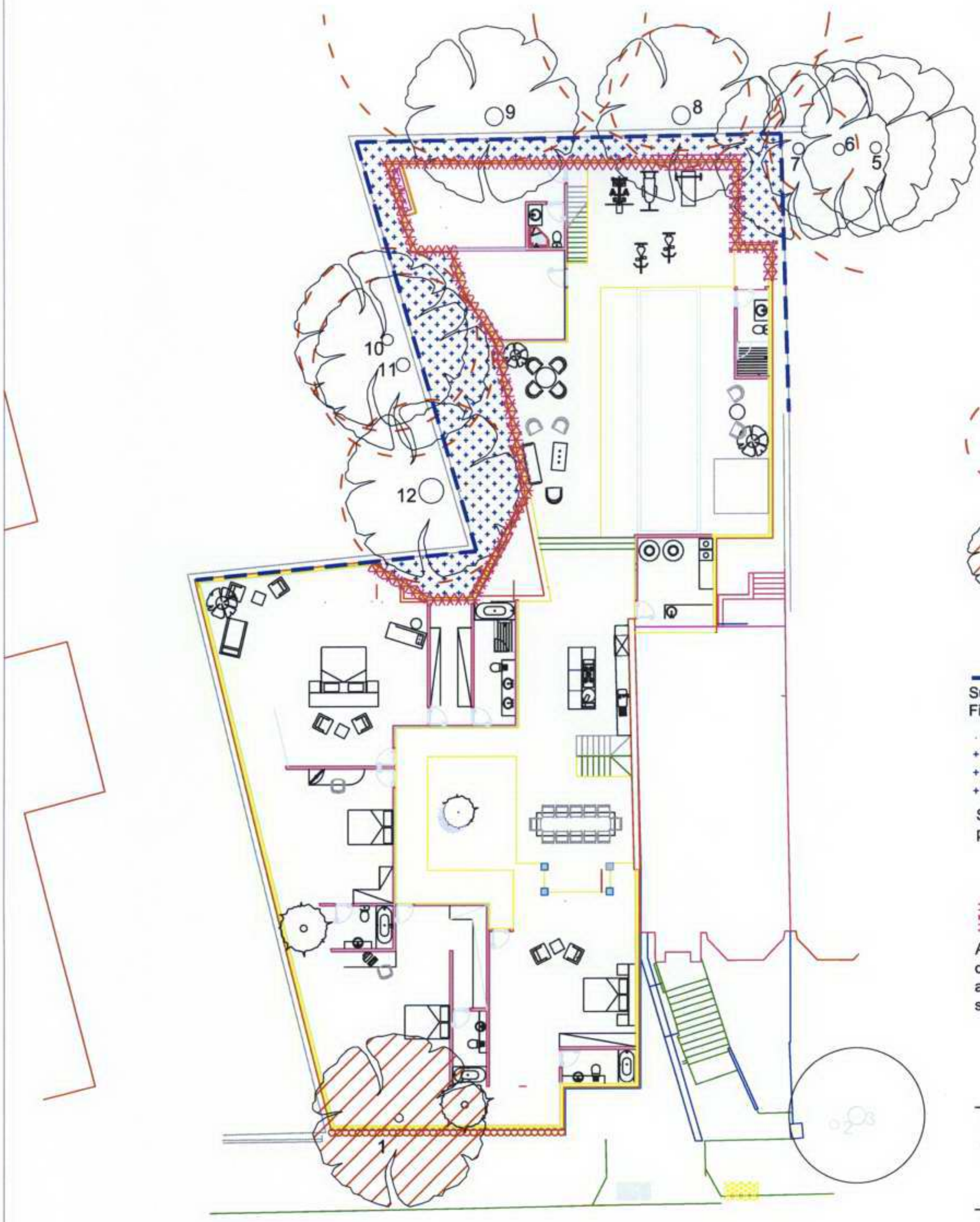

Root protection area as assessed and agreed with LPA 13.10.06.

Tree to be removed - No 1

Suggested position of Fixed Heras-style fencing

Suggested position of ground protection

Area of hand dig to beyond rooting depth. All roots pruned in accordance with BS 3998 and supervised by a competent person.

PROJECT:
148 Fellows Road

DRWG. TITLE:
Tree Survey/Protection Plan

SCALE: 1:200@A.3

DATE: 23.03.07

DRAWN BY: HA

DRAWING NO: TPP1

REV:

Indicative

APPENDIX 3

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Tree Protection Fencing

Specifications (specifically identified by outline box)

1.5m (min) Chestnut Paling Fence on Scaffold

Chestnut Paling to be affixed to a scaffold framework comprising two horizontal braces (top and bottom) supported by vertical scaffold posts driven firmly into the ground at 4.0m centres or less. Angled supporting struts are to be affixed 'tree-side' as appropriate.

1.5m (min) Chestnut Paling on Wooden supporting frame

Stakes – 1.8m half round 100mm Ø untreated timber posts @ 1.8m centres (or as directed).

- 2 X 38 X 87mm rails (motorway)
- 1.2m Chestnut Paling will be industrially stapled to the rails

Extra wooden support struts to be affixed at an angle on the innermost side of the fence.

2.4m Hoarding

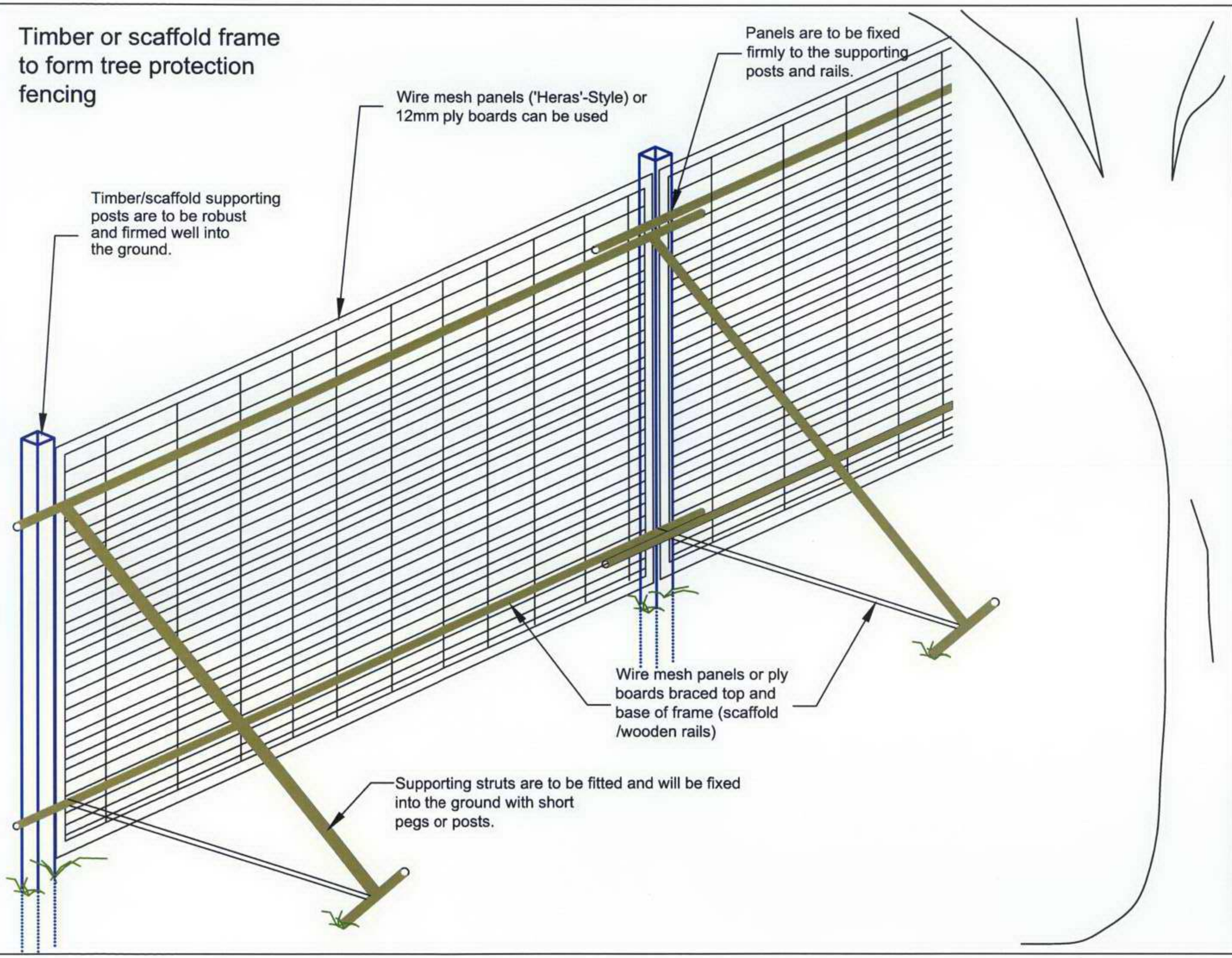
3.0m 100 X 100mm square wooden posts
3 X 38 X 87mm wooden rails affixed to posts
2.4m X 1200 outside grade ply panels (12mm) affixed to rails.
50 X 100mm angled supporting struts affixed internally (quantity as required).

(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 Fencing

Heras fencing describes the 2.4m galvanised steel mesh panelled fencing normally supplied with pre-cast concrete bases. **Bases are to be replaced with a fixed frame to which panels are clamped/ firmly fixed.** For extra stability, scaffold poles/4x4 wooden posts are to be firmed into the ground as supporting posts and supporting struts are to be attached at a 45 degree angle on the 'tree-side' of the fencing and fixed into the ground. Supporting posts will be braced at the top and base for added support.

Timber or scaffold frame to form tree protection fencing



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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

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Example 1.
Heras Fencing with supporting struts fixed at 45 degrees (tree side) for extra support.

Example 2.
Hoardingstyle fencing with robust w ooden posts with supports to ensure minimal movement.

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Fax: 0113 267 2222

Ground plates can be useful for dissipating loads, at sensitive construction locations.

Example of ground protection, this is laid over 50mm of a compressible material such as woodchip or sharp sand for optimum tree root protection.

WALK TOP - Ideal for car parks and walk ways.

DOUBLE LINK JOINERS - lock Ground-Guards into one large working platform.

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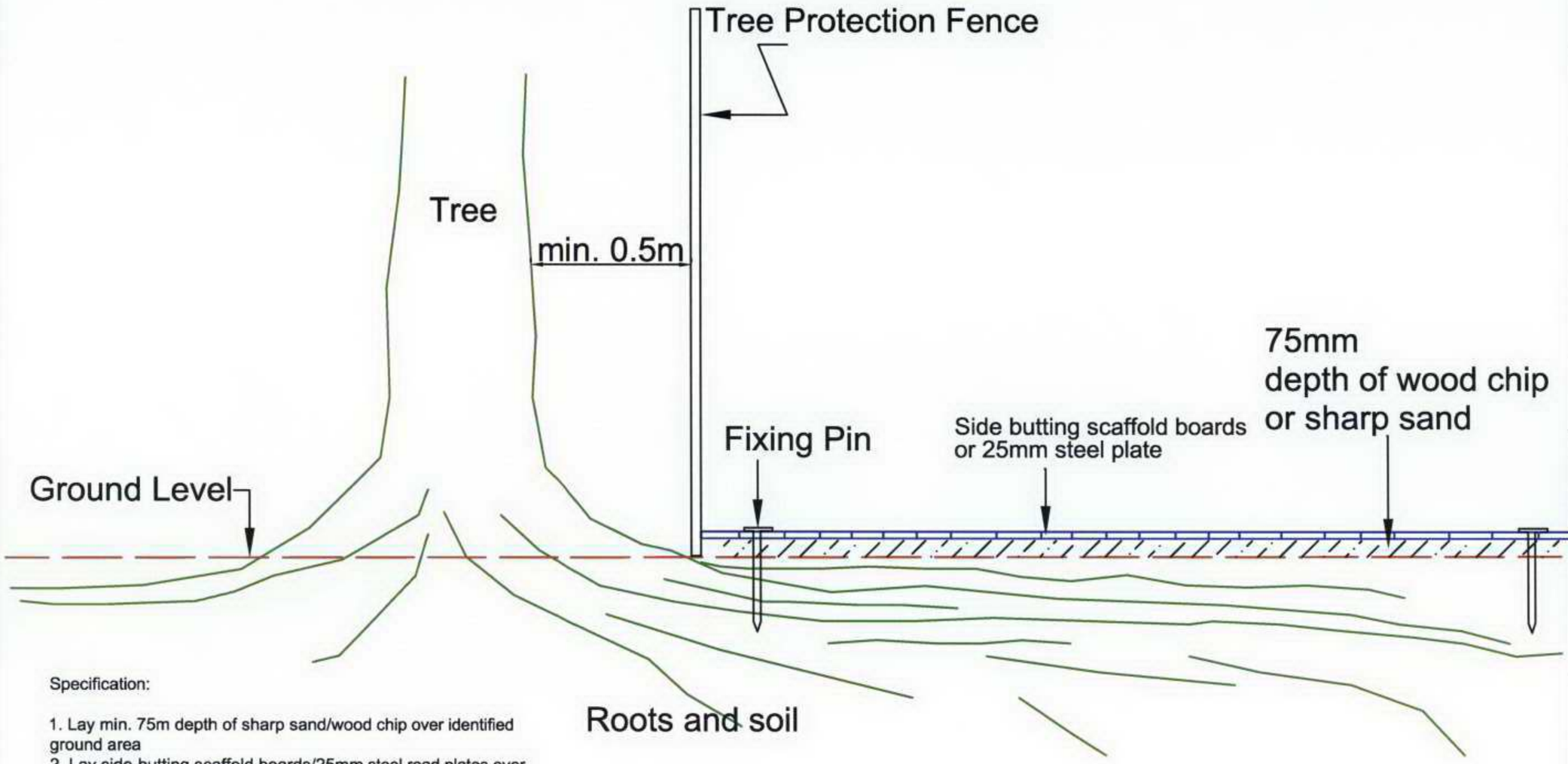

Specification:

1. Lay min. 75m depth of sharp sand/wood chip over identified ground area
2. Lay side-butting scaffold boards/25mm steel road plates over sand/wood chip
3. Fix ground protection cover into place with pins/pegs
4. Erect protection fence (where feasible).
5. Erected scaffolding can act as protection fencing.
6. Remove ground protection upon completion/landscaping only.

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Ground Protection Example

Date:

Ref:

Note: Sketch Plan Only - Not to Scale
Not all site features shown

APPENDIX 5

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ARBORICULTURAL SITE SUPERVISION

SITE:		PERSONNEL INFORMED ON SITE:
CLIENT:		
SITE AGENT:		
DATE:		
INSPECTED BY:		

TREE PROTECTIVE FENCING IS DESCRIBED AS:

- in place ☐
- in wrong location ☐
- partially in wrong location ☐
- not in place ☐
- in need of re-erection ☐

COMMENTS/ACTIONS:

WITHIN THE AGREED EXCLUSION AREA:

- all is clear ☐
- minor debris exists ☐
- excessive debris exists ☐
- materials/equipment are stored ☐
- works are being undertaken ☐
- works/excavation have been undertaken ☐

COMMENTS/ACTIONS:

DETAILS OF PROPOSED WORKS:

AMENDMENTS TO:

- Development Proposal ☐
- Logistical Implementation ☐
- Method Statement ☐
- Fencing Layout ☐

DETAILS/ACTIONS:

GENERAL COMMENTS:

SIGNED:

_____

(For and on behalf of ACS Consulting)

SIGNED:

_____

(For and on behalf of developer or main contractor)

APPENDIX 6

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Hand 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.

2.0 Tree/Root Damage – How it can occur

2.1 The majority of tree roots exist in the upper **0mm to 100mm** 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 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 – this can be calculated by multiplying the distance of the tree trunk's circumference (at 1.5m above ground level) by 4 (NJUG 10) or by referring to Table 1 of BS 5837:2005 'Trees in Relation to 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 precautionary area with ground marker paint, clearly on the ground. This will identify the area within which hand digging must take place. **For safety, ensure there are no underground services 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 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 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 to offer immediate protection. 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 No 10 1995, 'Guidelines for the planning installation and maintenance of utility services in proximity to trees'. In addition Table 2 from BS 5837:2005 'Trees in Relation to Construction. Recommendations' is provided.

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

In the Precautionary Area:

(2) ■ **Don't** excavate with machinery. Use trenchless techniques where possible. Otherwise dig only by hand.

■ When hand digging, carefully work around roots, retaining as many as possible.

■ **Don't** cut roots over 25mm in diameter, unless the council's Tree Officer agrees beforehand.

■ Prune roots which have to be removed using a sharp tool (eg. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

■ 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.

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

■ **Don't** store spoil or building material, including chemicals and fuels.

(3) Frost can damage exposed roots. If trenches are to be left open overnight, cover the roots with dry sacking. Remember to remove the sacking before backfilling.

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NJUG GUIDELINES FOR INSTALLING AND MAINTAINING UTILITY SERVICES CLOSE TO TREES

DAMAGE TO TREES

(1) Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil. They 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 pavement and into front gardens, but they can also grow under the carriageway.

If roots are damaged, for example by trenching, the tree may fall or lose its vigour and decline.

(2) Tree trunks can be easily damaged, so be careful when working near them. For example, **don't** lean paving slabs against trees, **don't** chain machinery to them or nail site notices to their trunks.

PROTECTING ROOTS

(1) Establish a protection zone around each tree: the Precautionary Area. See Fig. 1.

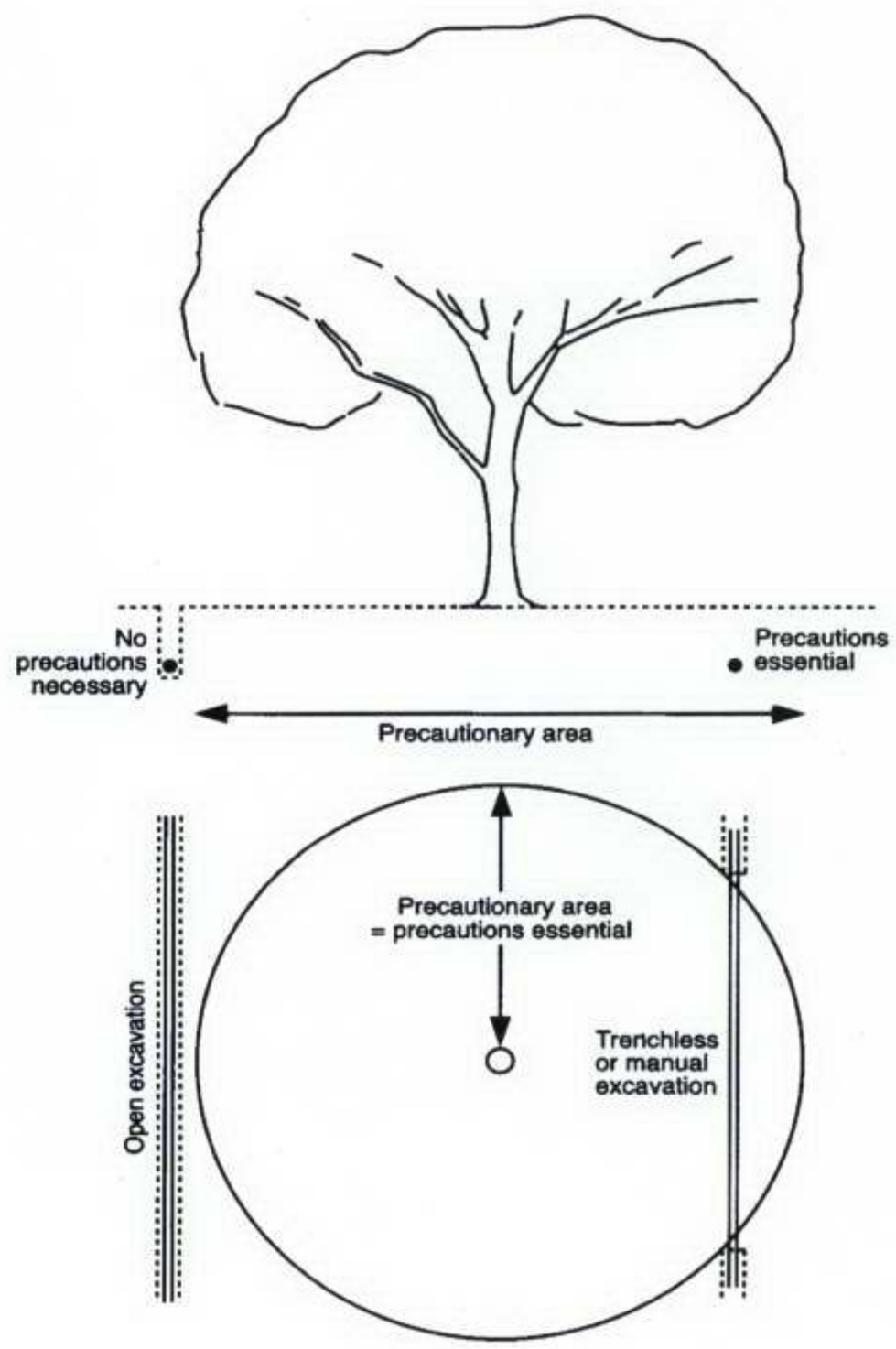

Fig. 1 To determine the Precautionary Area measure the girth of the tree at chest height. Multiply this by 4 and draw a circle of this radius from the centre of the tree.