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Arboricultural Impact Assessment

& Method Statement (to BS:5837 2012)

For

Land Adjacent to Whiteheath Junior School, Whiteheath Avenue

Ruislip, HA4 7PR

Prepared for Stewart M & PS

Prepared by Trevor Heaps BSc, MICFor, M. Arbor.A.

Date: 17th February 2023

Ref: TH 1981/C

Arboricultural ASSOCIATION Professional Member

Institute of Chartered Foresters Registered Consultant

Summary

It is proposed to construct a new residential building, separated into four dwellings on land adjacent to Whiteheath Junior School.

A group of four low value, self-seeded trees will need to be removed to facilitate construction.

To mitigate, several new trees will be planted within the site post-construction.

Some basic tree protection measures and working methodology (in accordance with BS 5837:2012) will ensure the third-party trees are not detrimentally affected during construction.

The relationship between the proposal and third-party trees is sustainable and will not result in any unreasonable pressure to carry out inappropriate tree works.

If the proposal is implemented in accordance with the recommendations laid out in this report, neither the trees nor wider landscape will be adversely affected.

This is an arboriculturally defensible scheme and there are no (arboricultural) reasons why planning consent should not be granted.

Contents

1.0 Introduction

1.1 I am Trevor Heaps, Director of Trevor Heaps Arboricultural Consultancy Ltd. I have experience and qualifications in the field of Arboriculture. Further information is provided in Appendix 1.

1.2 Contact details:

Who	Name	Organisation	Details
Arboricultural consultant	Trevor Heaps	THAC Ltd. 6 Molefields, Milford-on-Sea, Hampshire, SO41 0UB	Tel: **07957 763 533** E-mail: trevor@trevorheaps.co.uk
London Borough of Hillingdon - LPA	Tree Officer	The London Borough of Hillingdon, Civic Centre, High Street, Uxbridge, UB8 1UW	E-mail: trees@hillingdon.gov.uk Tel: 01895 556000

2.0 Instruction

2.1 We are to survey all significant trees that could be affected by the proposals.

2.2 We are then to prepare a report to appraise the impact of the proposals on the trees and surrounding landscape.

2.3 We are then to set out recommendations for the protection of the trees during development - in accordance with British Standard 5837:2012 '*Trees in relation to design, demolition and construction – Recommendations*' (BS5837).

3.0 Drawings provided

3.1 Proposed Site Plan – Ref. 2018/D271/P/03 Rev I – Dated Dec 2019

4.0 Report context

4.1 The site was surveyed by Trevor Heaps on the 15th May 2019.

4.2 The trees were surveyed from within the site at ground level. No climbed inspections were carried out and no root/soil samples were taken for analysis.

4.3 The trees were inspected based on the Visual Tree Assessment (VTA) developed by Mattheck & Breloer (The Body Language of Trees, 1994).

4.4 Tree heights, crown spreads and stem diameters were measured with a clinometer, a Disto laser measure and a diameter measuring tape respectively.

4.5 Small trees and shrubs (with stem diameters less than 75mm) were not surveyed.

4.6 This report is based on the information provided (i.e. site plans, proposed drawings, scales, measurements etc.) and observations during the site visit.

4.7 This report will support a planning application or an application to discharge a tree-related condition and its purpose is to assist and inform the planning process.

4.8 This report does not set out the detailed, working specifications of tree protection measures and engineering / design features, but provides enough detail to demonstrate the feasibility of the scheme in principle.

4.9 We were not instructed to investigate the statutory protection status of trees on or adjacent to the site (but have checked the LPAs website for any relevant information).

4.10 The report does not assess the potential influence of trees upon load-bearing soils beneath existing and proposed structures (resulting from water abstraction by trees on shrinkable soils).

5.0 Statutory tree protection

5.1 According to the LPAs website, none of the trees within or adjacent to this site are covered by a Tree Preservation Order (TPO) or within a Conservation Area.

6.0 Ecological constraints

6.1 The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) provides statutory protection to birds, bats and other species that inhabit trees.

6.2 In addition to any tree matters considered in this report, these protected animals could impose significant constraints on the use and timing of access to the site.

6.3 You are therefore advised to seek advice from a suitably qualified ecologist prior to any works being started.

7.0 The site

7.1 This vacant site is situated within a leafy, residential part of West Ruislip.

8.0 The soil and topography

8.1 The soils at this site were determined using information provided by the British Geological Survey and observations during the site visit.

8.2 The site is level with no adverse features, and the soil texture is clayey loam-to-silty loam. The soil parent material is Prequaternary Marine / Estuarine sand and Silt.

8.3 The soil is deep, and so a thick soil profile is likely. Soil (and any underlying parent Material) should be easily dug to a depth of more than one metre.

8.4 Given the information above, the soil has the potential of becoming compacted (which is harmful to tree roots).

9.0 Arboricultural Impact Assessment (AIA) and Tree Protection Methods

9.1 The following section describes the potential effects the construction works will have on the subject trees. Mitigation measures are recommended, and this information should be read in conjunction with the supporting Tree Protection Plan (TPP).

9.2 Further information on the subject trees is provided in Appendices 2 & 3.

9.3 RPA Amendments

9.3.1 The Lime (T1) has recently been heavily pruned / pollarded and this will inadvertently affect the size of its RPA (see referenced text below).

"The overall size of the root system depends on the shoots, and vice versa (the root: shoot ratio). Although the ratio varies through the life of a tree, and can be influenced by a change in conditions, for any individual it is a very fundamental value which is under tight control in the allocation of carbon resources. If the ratio is upset for any reason, for instance being damaged by pruning either the roots or the shoots, the tree will seek to readjust back to the original relationship either by enhanced growth, if this can be achieved, or the die back of tissues which are in surplus."

P.G. Biddle (1998) *Tree Root Damage to Buildings: Vol. 1 causes, diagnoses and remedy.*

9.3.2 Subsequently, the RPA of Lime T1 has been reduced by 25%. The amended RPA is shown as solid magenta circles. The original RPA is shown on the TPP as a dotted blue circle.

9.4 Trees to be removed to facilitate development

9.4.1 Four small trees will need to be removed to facilitate development (see 9.2) and to provide future occupiers with usable garden spaces. They are not particularly valuable or visible from outside the site.

9.4.2 To mitigate, several new trees will be planted post-construction.

9.4.3 It is normally appropriate to deal with re-planting matters by condition or by way of a landscape plan; however, several potential re-planting locations have been shown on the Tree Protection Plan (TPP); and the following details can be confirmed at this stage:

- The new trees will be of heavy standard size (about 3-4m high);
- The new tree species will be carefully chosen to suit the site conditions and reflect the existing arboreal character of the local area (see Table 1).
- The new trees will be planted in full accordance with current British Standards (BS 8545: From Nursery to Independence in the Landscape);
- Once planted, the trees will be regularly maintained (watered and weeded during the spring and summer months) for at least 5 years or until established.

Table 1

Code	Species	Girth	Container	Spacing	Quantity
BET	Betula pendula (Silver Birch)	14-16cm	C65L	As shown on plan	2
PYR	Pyrus communis (Common Pear)	14-16cm	C65L	As shown on plan	1
AME	Amelanchier lamarckii (Snowy Mespil)	14-16cm	C65L	As shown on plan	1
PRU	Prunus Amanogowa (upright Cherry)	14-16cm	C65L	As shown on plan	2

9.5 Soil compaction around retained trees

9.5.1 Soil compaction can be caused by various construction-related activities such as storage or materials and the use of heavy machinery (or even heavier than normal footfall during works). It is harmful to tree roots because it reduces gaseous exchange and the availability of water and nutrients.

9.5.2 To avoid soil compaction affecting the roots of the third-party trees adjacent to this site, all vulnerable areas will be separated from the working area by protective fencing.

9.5.3 Where possible, all existing hard surfaces (within the RPAs of retained trees) will also be left in situ during construction and only be removed (by hand / small machinery) at the landscaping stage.

9.6 New surfaces to be laid within RPA of retained trees

9.6.1 Part of the proposed parking area will be constructed within the RPA of Lime T1.

9.6.2 The area affected is well within the 20% limit set by current British Standards (see paragraph below from BS 5837/2012 page 25, section 7.4.2.3); however, to minimise root disruption, a load-spreading system with a permeable surface will be used.

"New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA."

9.6.3 During the construction phase of development, this area will be separated from the working area by protective fencing.

9.6.4 It should be noted that an RPA is depicted on a plan as a two-dimensional circle; however, they are in fact three-dimensional, because the roots of most trees extend down into the soil by about 600mm (some roots can extend 2-3m down into the soil). Therefore, even if the roots in the upper soil horizons are slightly disturbed during construction works, only be a very small portion of the actual rooting area will be affected.

9.6.5 With the above in mind, the Lime will tolerate these works, and there will be no detrimental effect on the health or appearance of the tree, nor the visual amenity or arboreal character of the area.

10.0 Conclusions

10.1 Four trees (of poor quality) will need to be removed to facilitate construction.

10.2 To mitigate, several new replacement trees will be planted within the site (post-construction). The replacement planting will help enhance and complement the amenity and arboreal character of the local area.

10.3 The retained and third-party trees will be protected using up-to-date methodology and guidance provided by the current British Standards (BS 58378:2012). To this end, a site-specific AMS and TPP have been provided. These are found in Section 12 and Appendix 9 respectively.

10.4 Provided the recommendations laid out in this report are followed, the proposals will not detrimentally affect the trees or the character / appearance of the local area.

10.5 The trees do not cause any significant conflicts in terms of construction activities, nor will any significant issues of post-development pressure be likely to emerge that could not be managed with routine, minor tree maintenance.

11.0 The Arboricultural Method Statement (AMS)

11.1 Effective tree protection relies on following a logical sequence of events and arboricultural supervision. This AMS lays down the methodology for all construction works that may influence significant trees and recommendations for arboricultural supervision are provided in Section 12.

11.2 It is essential that this AMS is observed and adhered to. Therefore, a copy of this AMS must be issued to the building contractor to be integrated into their work schedule and must also be permanently made available on-site for the duration of development.

11.3 This AMS should be read in conjunction with the supporting Tree Protection Plan (TPP), which is found in Appendix 9.

11.4 At this site, operations are to occur in the following sequence (refer to Appendix 4 for further details on underlined methodology; which are listed in alphabetical order):

1. Carry out tree work operations highlighted yellow in the tree data schedule (Appendix 2). All works to be carried out by a competent and experienced arborist (see Appendix 5.9).

2. Hold pre-commencement site meeting with project arboriculturist, building contractor and arboricultural officer**.** The contractor will be required to read and sign the induction form (see Appendix 7).

3. Erect protective fencing along the position(s) shown by the dashed red line/s on the TPP.

4. Arboricultural Consultant to check Tree Protection at this stage.

5. Commence construction of main building.

6. After all heavy construction works are completed, install 'no-dig' driveway and parking area.

7. Remove tree protection when all construction activity has ended.

8. Carry out tree planting and any other landscaping works.

12.0 Arboricultural supervision

12.1 A suitably qualified arboriculturalist will provide on-going supervision during construction. The occasions when supervision is required are outlined in Table 2. If the LPA wish to see further supervision, this matter can be dealt with by amending the report and/or by condition.

Table 2: Indicative arboricultural supervision requirements

Supervision details	Required (Y / N)	When	Details	Nature	Sign off
Pre-commencement site meeting	Y	Prior to any site activity	To ensure contractors are briefed & understand the AMS & TPP. A site supervisor will be appointed to oversee tree protection & the reporting of any damage to trees or deviation from the AMS - to the project arboriculturist / LPA	Informal and open discussions. Induction form signed by attendees	Details of meeting to be sent to LPA within 5 days
~~Meeting with tree contractors~~		~~Prior to protective measures being installed~~	~~To ensure tree work instructions are clear and understood.~~	~~Informal meeting~~	~~No follow up required~~
Protective measure(s) check	Y	Prior to any site activity	To ensure that protective measures are fit-for-purposed and correctly positioned.	Site meeting with a site monitoring report to be prepared	Details of to be sent to LPA within 5 days
~~On-going supervision~~		~~Every 2 weeks during construction~~	~~To ensure that the protective measures have not been moved and continue to be fit-for-purpose.~~	~~Site meeting with a site monitoring report to be prepared~~	~~Details of to be sent to LPA within 5 days~~
~~Supervision of excavation works near trees~~		~~During construction~~	~~To supervise key stages of works near trees (insert which / when)~~	~~Site meeting with a site monitoring report to be prepared~~	~~Details of to be sent to LPA within 5 days~~
~~Meeting with landscape contractors~~		~~After construction~~	~~To provide advice on tree / shrub selection (if not conditioned)~~	~~Informal meeting~~	~~No follow up required~~

12.2 A site inspection record (see Appendix 8) will be prepared after each visit and will state the condition of tree protection measures and outline any required remedial action (and timescales).

12.3 To demonstrate compliance, and to help the LPA discharge relevant planning conditions, all site monitoring reports will be forwarded to the LPAs arboricultural officer within 5 working days of the visit.

12.3 NOTE: It is the applicant's responsibility to arrange meeting dates with the arboriculturist.

13.0 Signature

This report represents a true and factual account of the potential arboricultural impacts, and makes recommendations for appropriate protective measures, at the subject property.

Signed

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Trevor Heaps
Chartered Arboriculturist
BSc (Hons), MArborA, MICFor.

Dated

17th February 2023

Appendix 1 - Professional résumé

I am Trevor Heaps, director of Trevor Heaps Arboricultural Consultancy Ltd. I am a Chartered Arboriculturist, a Professional Member of the Arboricultural Association (AA) and hold a First-Class Honours Degree in Arboriculture.

Professional training

- Arboriculture and Bats: Scoping Surveys for Arborists (BCT & AA) – October 2017
- Tree Science (AA) – June 2016
- OPM (Oak Processionary Moth) Training (FC) – May 2016
- Visual Tree Assessment (Arboricultural Association) - October 2015
- Trees and the Law (Dr Charles Mynors) - June 2015
- Mortgage (Home Buyers) Report Writing (LANTRA / CAS) - February 2015
- Tree Preservation Orders - effective application (LANTRA / CAS) - November 2014
- Professional Tree Inspection 3-day course (LANTRA / AA) - July 2014
- Arboricultural Consultancy Course (AA) - May 2014
- Further down the subsidence trail 1-day course (AA) - April 2013
- Getting to grips with subsidence 1-day course (AA) - November 2012

AA – Arboricultural Asscociation

BCT – Bat Conservation Trust

CAS – Consulting Arborist Society

FC – Forestry Commission

Appendix 2 - Tree data schedule

Ref	Name	Age	DBH (mm)	Hgt. (m)	Can. hgt. (m)	Can N (m)	Can E (m)	Can S (m)	Can W (m)	Physio cond.	Struct cond.	Life Exp.	Ret. Cat.	Comments	Rec's (proposed works are highlighted)
T1	Tilia X europaea (Common Lime)	M	705	16	6	3	3	3	3	Normal	Normal	40+	B2	Street tree growing in grass verge. Recently heavily reduced / pollarded	No works required at present.
T2	Prunus sps. (Flowering Cherry)	OM	250	4	2	2	2	2	2	Fair	Fair	20+	C2	Street tree growing in grass verge. Asymmetrical crown. Die-back in crown. Low bud/leaf density.	No works required at present.
T3	Salix caprea (Goat Willow)	SM	80	5	1.5	2	2	2	2	Normal	Normal	40+	C2	Multi-stemmed at base. Suppressed. Asymmetrical crown.	No works required at present.
T4	Quercus robur (Common Oak)	SM	80	5	1.5	2	2	2	2	Normal	Normal	40+	C2	Suppressed.	No works required at present.
T5	Fraxinus excelsior (Ash)	M	425	16	4	4	4	4	4	Fair	Fair	40+	C2	One of three close-growing trees of different species	Remove (to facilitate development).
T6	Quercus robur (Common Oak)	M	400	16	4	1.5	4	1.5	4	Normal	Fair	40+	C2	Suppressed. Asymmetrical crown. One of three close-growing trees of different species.	Remove (to facilitate development).
T7	Fraxinus excelsior (Ash)	M	250	16	4	4	4	4	4	Fair	Fair	40+	C2	Triple-stemmed at base. Tight forks noted. One of three close-growing trees of different species. Central stem dead	Remove (to facilitate development).
T8	Fraxinus excelsior (Ash)	SM	100	7	1.5	2.5	2.5	2.5	2.5	Normal	Normal	40+	C1	Twin-stemmed at base.	Remove (to facilitate development).
T9	Quercus robur (Common Oak)	SM	125	7	1.5	2.5	2.5	2.5	2.5	Fair	Fair	40+	C1	Suppressed. Asymmetrical crown. Die-back in crown.	No works required at present.
T10	Fraxinus excelsior (Ash)	SM	150	7	1.5	2.5	2.5	2.5	2.5	Normal	Normal	40+	C1		No works required at present.
T11	Picea abies (Norway Spruce)	EM	350	12	2.5	2.5	2.5	2.5	2.5	Fair	Fair	40+	B2	Growing on third-party land (dbh estimated). Ivy (light covering). Suppressed.	N/A - Third party tree.
T12	Fraxinus excelsior (Ash)	EM	440	15	2.5	4.7	4.7	4.7	4.7	Normal	Normal	40+	B2		No works required at present.
T13	Fraxinus excelsior (Ash)	SM	150	7	1.5	2.5	2.5	2.5	2.5	Normal	Normal	40+	C1	Multi-stemmed at base.	No works required at present.
T14	Salix caprea (Goat Willow)	M	150	16	2.5	4.5	4.5	4.5	4.5	Normal	Fair	40+	C2	Multi-stemmed at base.	No works required at present.

Ref	Name	Age	DBH (mm)	Hgt. (m)	Can. hgt. (m)	Can N (m)	Can E (m)	Can S (m)	Can W (m)	Physio cond.	Struct cond.	Life Exp.	Ret. Cat.	Comments	Rec's (proposed works are highlighted)
T15	Salix caprea (Goat Willow)	M	200	16	2.5	4.5	4.5	4.5	4.5	Normal	Fair	40+	C2	Suppressed. Asymmetrical crown.	No works required at present.
T16	Salix caprea (Goat Willow)	M	200	16	2.5	4.5	4.5	4.5	4.5	Normal	Fair	40+	C2	Multi-stemmed at base.	No works required at present.
T17	Salix caprea (Goat Willow)	M	200	16	2.5	4.5	4.5	4.5	4.5	Normal	Fair	40+	C2	Multi-stemmed at base.	No works required at present.
T18	Fraxinus excelsior (Ash)	SM	150	8.5	1.5	2.5	2.5	2.5	2.5	Normal	Normal	40+	C1		No works required at present.
T19	Fraxinus excelsior (Ash)	SM	150	8.5	1.5	2.5	2.5	2.5	2.5	Normal	Normal	40+	C1	Twin-stemmed at base.	No works required at present.
T20	Sambucus nigra (Elder)	SM	100	5	1.5	2	2	2	2	Normal	Normal	20+	C1	Sparse. Die-back in crown.	No works required at present.

Appendix 3 - Tree data schedule explanatory notes

This section explains the terms used in the **Tree data schedule** (Appendix 2).

Ref: Each item of vegetation has its own unique number, prefixed by a letter such that:

T1=Tree **S2**=Shrub or stump **G3**=Group **H4**=Hedge **W5**=Woodland

Species: Latin (and common names in brackets) are given.

Age:

- **Y - Young** - Usually less than 10 years' old
- **SM - Semi-mature** - Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy)
- **EM - Early-mature** - Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy)
- **M - Mature** - Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy)
- **V - Veteran** - A level of maturity whereby significant management may be required to keep the tree in a safe condition
- **OM – Over-mature** - As for veteran except management is not considered worthwhile

DBH (mm): Stem diameter, measured in mm, taken at 1.5m above ground level where possible.

Hgt. (m): Height: Measured from ground level to the top of the crown in metres.

Can Hgt. (m): Crown height: Measured from ground level to the lowest tips of the main crown begins in metres. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.

Can N, S, E, W: - Canopy extents
Approximate radial crown spread measured to the four cardinal points (for individual trees only)

Physio cond.: Indicates the physiological condition of the tree as one of the following categories:

- **Normal** - Healthy tree with no symptoms of significant disease
- **Fair** - Tree with early signs of disease, small defects, decreased life expectancy, or evidence of less-than-average vigour for the species
- **Poor** - Significant disease present, limited life expectancy, or with very low vigour for the species and evidence of physiological stress
- **Very poor** - Tree is in advanced stages of physiological failure and is dying
- **Dead** - No leaves or signs of life

Struct cond.: Indicates the structural condition of the tree as one of the following categories:

- **Normal** - No significant structural defects noted
- **Fair** - Some structural defects noted but remedial action not required at present
- **Poor** - Significant defects noted resulting in a tree that requires regular monitoring or remedial action
- **Very poor** - Major defects noted that compromise the safety of the tree. Remedial works or tree removal is likely to be required.
- **Dead** - No leaves or signs of life

Life Exp.: The estimated number of years before the tree may require removal (<10), (10 – 20), (20 – 40), or (40+).

Ret. Cat.: - Retention category: BS5837:2012 Category where:

- **U = Trees unsuitable for retention**. Trees in such a condition that cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. These trees are shown on the tree plans with red centres.

- **A = Trees of high quality**. Trees of high quality with an estimated remaining life expectancy of at least 40 years. These trees are shown on the tree plans with green centres.

- **B = Trees of moderate quality**. Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. These trees are shown on the tree plans with blue centres.

- **C = Trees of low quality.** Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. These trees are shown on the tree plans with grey centres.

Trees of notable quality are graded as Category A or Category B. These trees are sometimes divided further into sub-categories:

- Sub-category 1 is allocated where it has been assessed that the tree has mainly arboricultural qualities.
- Sub-category 2 is allocated where it is assessed that the tree has mainly landscape qualities.
- Subcategory 3 is allocated where it is assessed that the tree has mainly cultural qualities, including conservation.

Trees may be allocated more than one sub-category. All sub-categories carry equal weight, with for example an A3 tree being of the same importance and priority as an A1 tree.

Comments: Tree form and pruning history are also recorded along with an account of any significant defects.

Rec's - Recommendations: Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.

Appendix 4 – Specifications for tree protective measures

Excavations within or close to the Root Protection Areas (RPAs) of retained trees

To minimise root disruption during excavation works, the following guidance shall be followed:

The RPA of the subject tree shall be clearly marked on the ground with fluorescent marker paint - by tying the spray can to a tree's stem using a pre-determined length of string to represent the tree's root protection radius (RPR) and keeping the string taught when spraying the ground. Cross reference the fourth column of the table in Appendix 2 (DBH mm) with the 2nd column in table 1 below to determine the length of string required.

Table 1. The RPRs given below are for single-stemmed trees.
Please contact the project arboriculturist if the subject tree is multi-stemmed.

Single stem diameter (mm)	Radius of nominal circle (m) / RPR	RPA (m^2)	Single stem diameter (mm)	Radius of nominal circle (m) / RPR	RPA (m^2)	Single stem diameter (mm)	Radius of nominal circle (m) / RPR	RPA (m^2)
75	0.9	3	475	5.7	102	875	10.5	346
100	1.2	5	500	6	113	900	10.8	366
125	1.5	7	525	6.3	125	925	11.1	387
150	1.8	10	550	6.6	137	950	11.4	408
175	2.1	14	575	6.9	149	975	11.7	430
200	2.4	18	600	7.2	163	1000	12	452
225	2.7	23	625	7.5	177	1025	12.3	475
250	3	28	650	7.8	191	1050	12.6	499
275	3.3	34	675	8.1	206	1075	12.9	523
300	3.6	41	700	8.4	222	1100	13.2	547
325	3.9	48	725	8.7	238	1125	13.5	572
350	4.2	55	750	9	254	1150	13.8	598
375	4.5	64	775	9.3	272	1175	14.1	624
400	4.8	72	800	9.6	289	1200	14.4	651
425	5.1	82	825	9.9	308	1225	14.7	679
450	5.4	92	850	10.2	327	1250	15	707

To ensure the roots are cut as cleanly as possible, a hand-spade will first be used to cut along the edge of the excavation - to a depth of at least 300mm (spade depth).

Having cleanly severed any roots growing within the upper soil horizons, a mini-digger can then be used to complete the excavation.

Once complete, all severed roots shall be cut cleanly back to a suitable growth point using sharp secateurs or a sharp pull saw.

The exposed soil will be covered with damp hessian (to maintain soil moisture and protect any retained roots from desiccation).

All spoil from the above process shall be removed from site using a wheelbarrow.

Ground Protection

The following is based on an extract from British Standard 5837:2012 - Trees in relation to design, demolition and construction– Recommendations.

Temporary ground protection should be able to support any traffic entering or using the site without being distorted or causing compaction of underlying soil and might comprise one of the following:

a) for pedestrian-movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

The location of the temporary ground protection is shown on the tree protection plan and detailed within the arboricultural method statement.

In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

All ground protection is to be maintained in good order, so it is fit for purpose throughout development. The ground protection will not be altered in any way, or prematurely removed without prior consent of the project arboriculturist or the LPA arboricultural officer.

Figure 1: An example of ground protection on work areas within a RPA (BS 5837:2005).

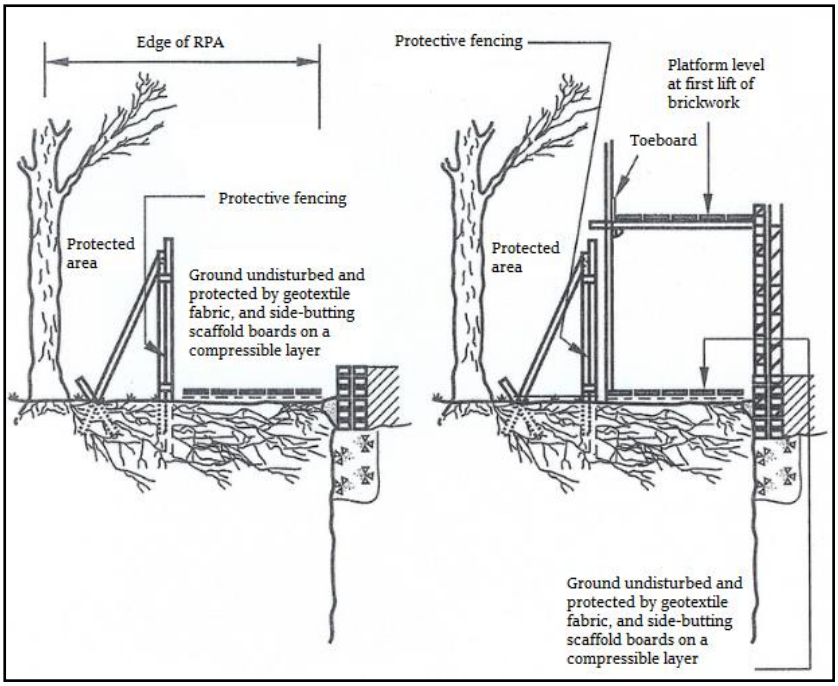
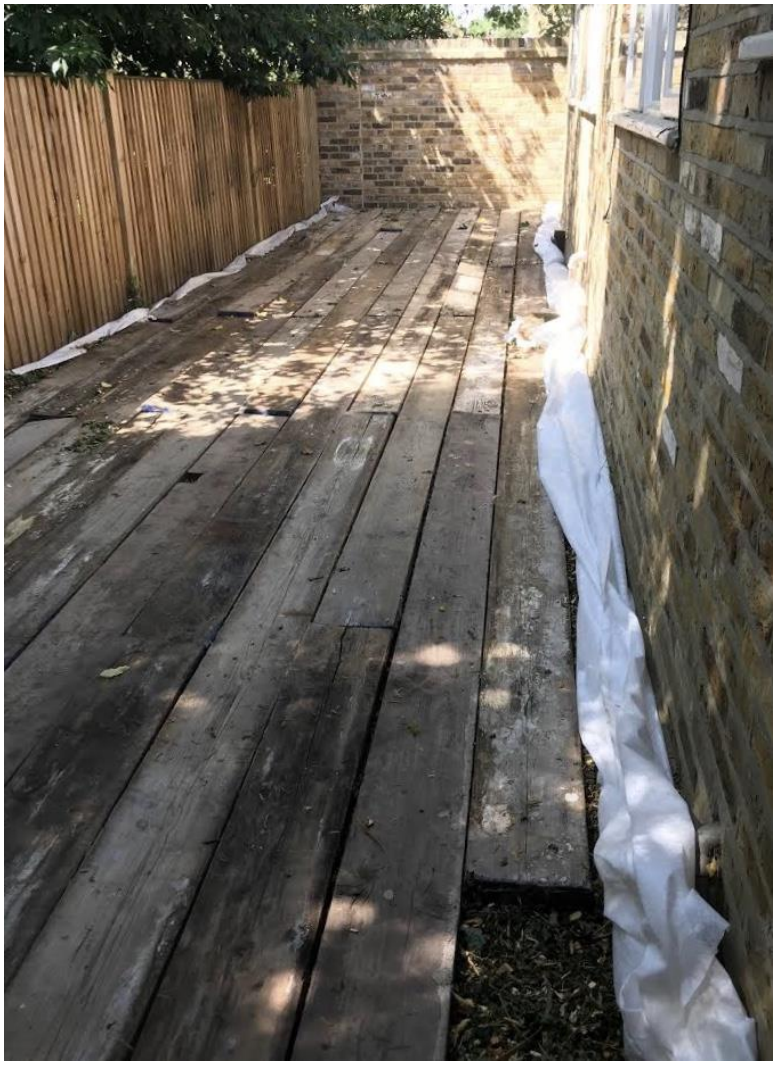


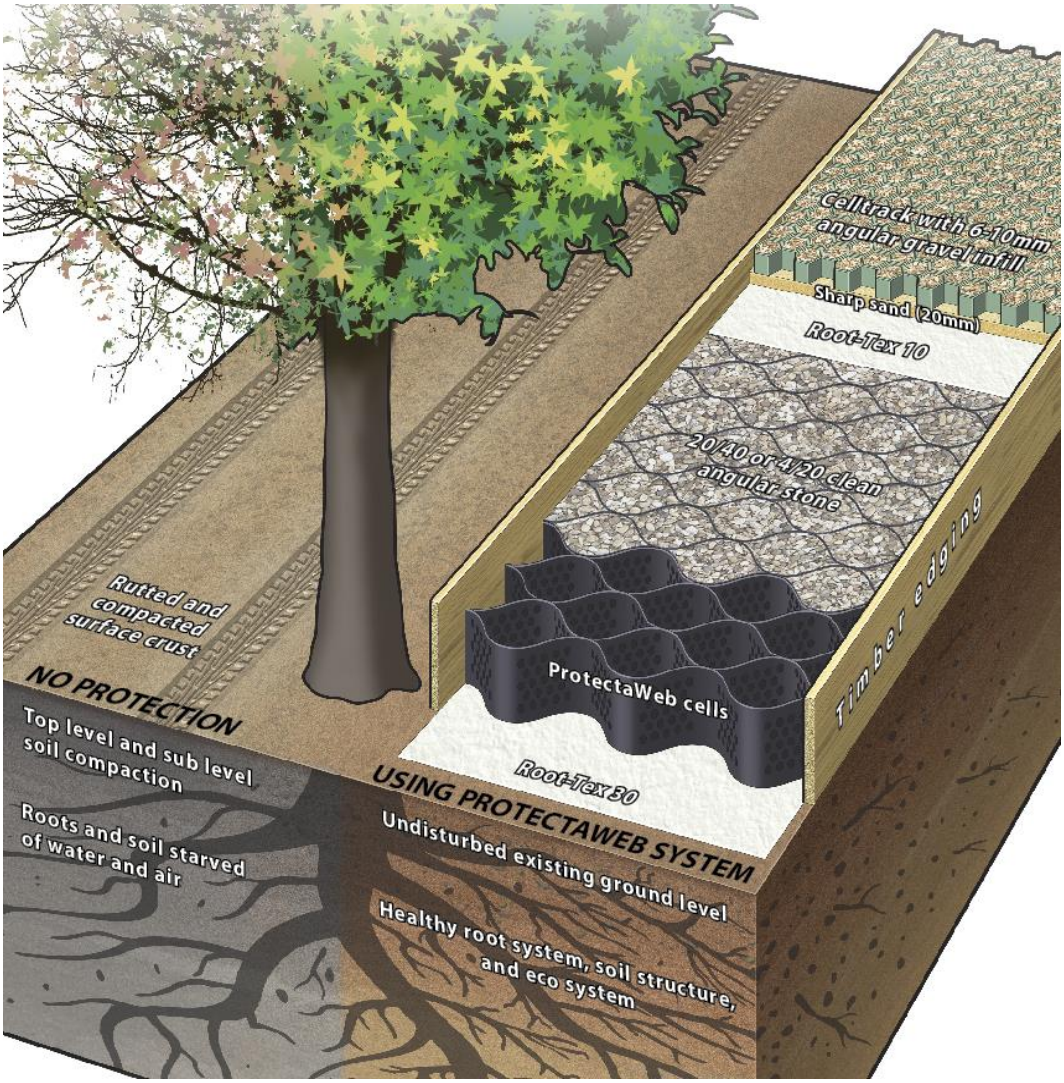
Figure 2: A worked example of the ground protection described at (a) on the previous page



No-dig surface installations

The no-dig construction principles are outlined below and the areas to which they apply are shown on the TPP (shaded with orange honeycomb). A useful example diagram (by Protectoweb) is shown below (Figure 4).

Figure 4: A good example of the principles of a no-dig surface.



The surface vegetation will be treated with a suitable systemic herbicide and then removed by hand.

Any localised depressions will be filled in with sharp sand (not builders' sand, which has a high salt content) to create an even surface profile. The area will not be 'rolled' or consolidated in any way.

Timber edging boards (or similar) will be installed along the perimeter of the no-dig area. The fixing posts and pegs for the edging boards will be located carefully to avoid damaging to tree roots.

A layer of geotextile fabric will be laid across the 'no-dig' area, overlapping adjacent rolls by a minimum of 150mm (it may be necessary to lightly pin the geotextile in place until the overlying layers are installed).

The 3D Cellular Confinement System (3DCCS) will be opened, laid and pinned in place between the edging boards (it may be necessary to cut it to size using a sharp knife, or it can be left uncut and folded up against the edgings if preferred).

The system is available in various depths for varying loadings, but each site should have a specific design detailed to ensure the correct depth of product is used. Unless the existing ground conditions are very soft then the following can apply:

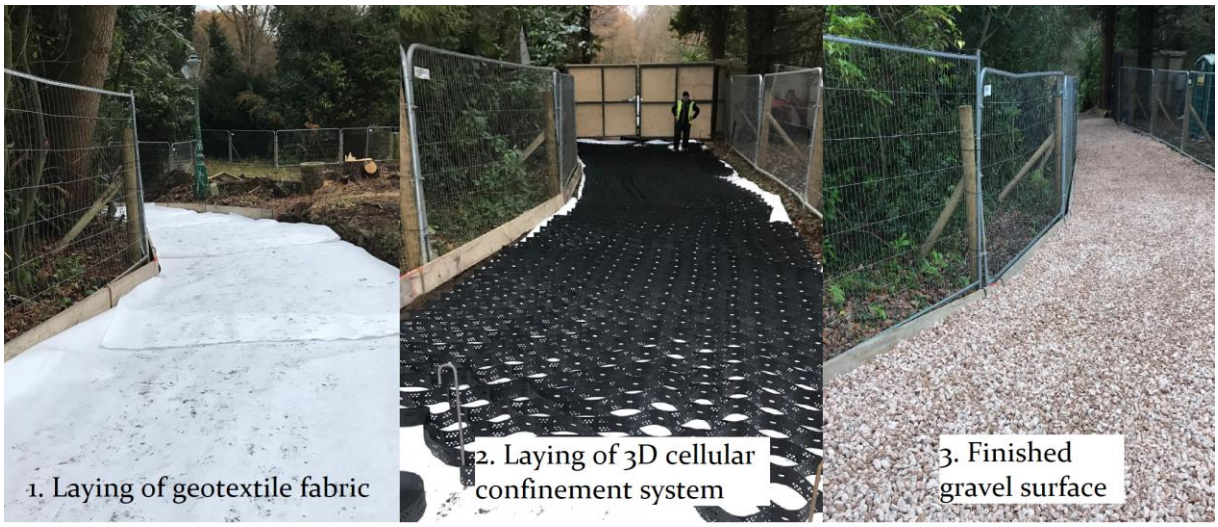
- **50mm deep for Pedestrians and Cycleways, non-vehicular traffic**
- **75mm deep for Pedestrians, Cycleways and vehicles (up to 1.5 tons)**
- **100mm deep for Cars, 4 x Wheel Drives, Vans etc. (up to 6 tons)**
- **150mm deep for Fire Trucks, Removal Vehicles and Dust Carts (up to 20 tons)**
- **200mm deep for construction vehicles, cranes etc. (40 tons and above)**

The 3DCCS will be pinned in place using steel fixing pins to keep it open and fully expanded position whilst the cells are being filled and to stop the structure from being pushed up by migrating aggregate during the filling process. The fixing pins will be driven in so that they are just touching the top of the cells but do not compress the fabric.

The 3DCCS will be filled with clean, open-graded angular aggregate, normally in the particle size range of 5mm - 45mm, working toward the tree(s) from the furthest point away and using the filled sections as a platform.

A light vibratory compaction plate (whacker) will be used to settle the stone into the cells and the permeable surface will then be installed on top of the filled, cellular confinement system.
If the proportion of RPA covered by a no-dig surface is greater than 20%, the wearing surface must be permeable.

Photo 3: Three stages of a 'no-dig' driveway under construction.

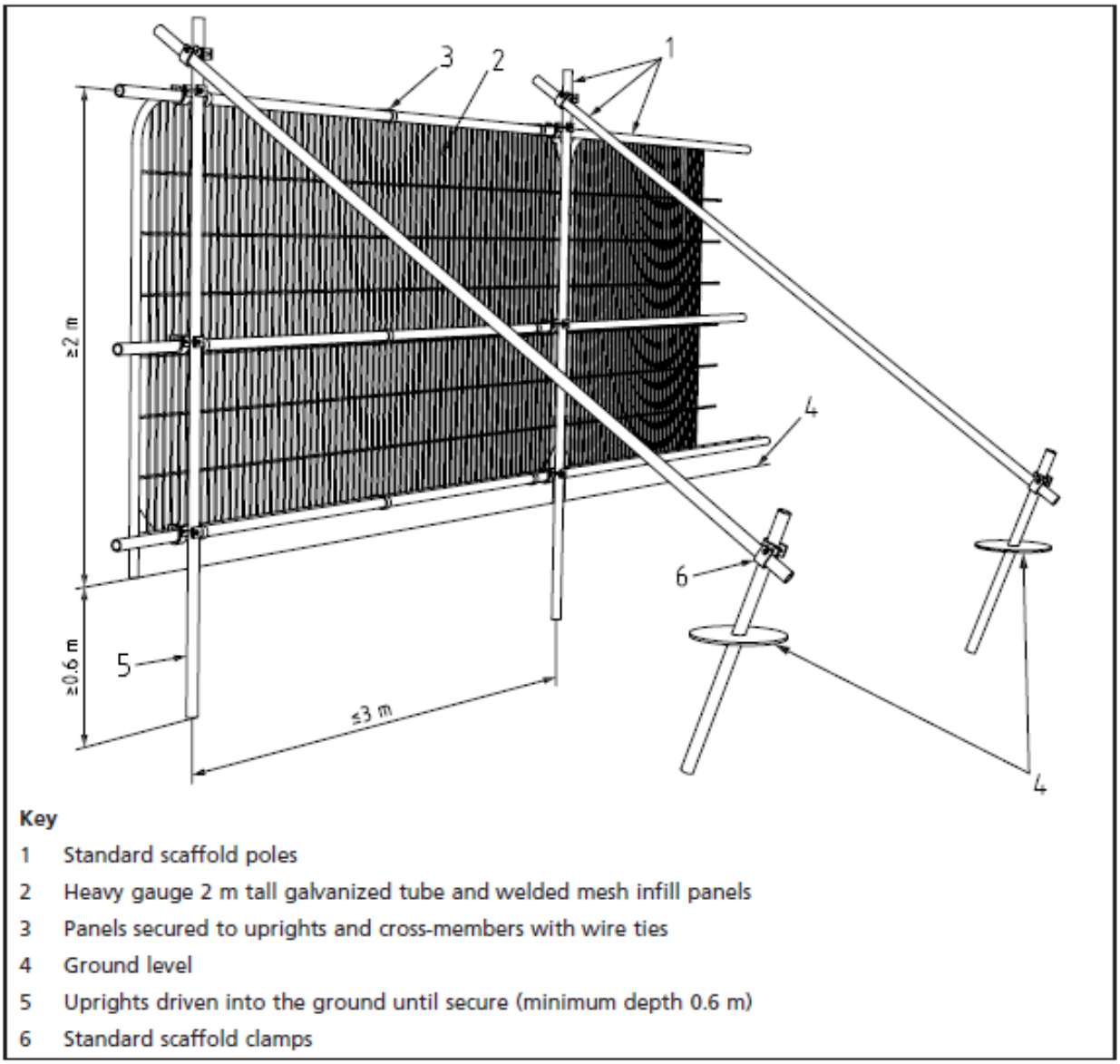


Protective fencing

The following is based on an extract from British Standard 5837:2012 - Trees in relation to design, demolition and construction– Recommendations.

The framework support (shown in Figure 2 and photo 1) is the usual method of support for 'Heras' fencing. Some variations are possible if site conditions are appropriate; i.e. support by wooden posts (75mm x 75mm x 2.75m) dug or concreted into the ground (dry mix concrete contained within a plastic bag), or if there is no pressure for access, a lighter form of netting on stakes.

Figure 2: Default specification for protective barrier (BS 5837:2012)



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Photo 1: A worked example of the default specification for protective barrier (BS 837:2012)

Durable, all-weather signs are to be attached to the fencing (an example sign is provided below). These shall be printed, laminated and attached at regular intervals along the fencing.

Once erected, the protective fencing is to be regarded as sacrosanct and there is to be no access into the area protected by it - the construction exclusion zone (CEZ).

The protective fencing is to be maintained in good order, so it is fit for purpose throughout the construction process. The fencing will not be altered in any way, or prematurely removed without prior consent of the project arboriculturist and/or (if necessary) the LPA arboricultural officer.

Where specified in the AMS, the tree(s) stem/s shall be boxed off with wooden ply boards or wrapped in hessian and chestnut pale fencing. This will help avoid any direct damage to tree stems from passing machinery (see photo 2).

Photo 2: Trees protected by hessian & chestnut pale fencing / limbs protected by wooden boxing

TREE PROTECTION FENCING

KEEP OUT

This fencing must not be removed or altered in any way without prior consultation with the project arboriculturist!

Please report any damage to trees and/or fencing to the site manager or the project arboriculturist

Trevor Heaps

07957 763 53

Light structures (sheds, car ports, cycle / bin stores)

Light structures do not normally require substantial foundations and, where required, can be designed to have permeable bases; which should be of a no-dig, load-spreading construction set directly on to the existing soil surface (or fixed directly onto an existing hard surface).

A flat base will be required and so if the existing soil surface is uneven or sloping, it shall be levelled by removing no more than 50mm height of soil from the elevated areas or raising sunken areas with no more than 50mm of soil.

When levelling raised areas, it will normally be acceptable to sever roots less than 25 mm in diameter. If larger roots are found, the preferred course of action would be to raise the base level of the structure by filling rather than by cutting roots. However, if this is not practical and large roots have to be cut, the situation shall be discussed with a suitably qualified arboriculturist before a final decision is made.

Light covering structures can also be fixed onto a frame that can rise directly from the base or be fixed to supports either banged into the ground or set in carefully in hand-dug holes. Provided the supports are well spaced, i.e. greater than 1.5m apart, and of a relatively narrow diameter, i.e. not more than 15cm, it is unlikely they will cause any significant disturbance to RPAs.

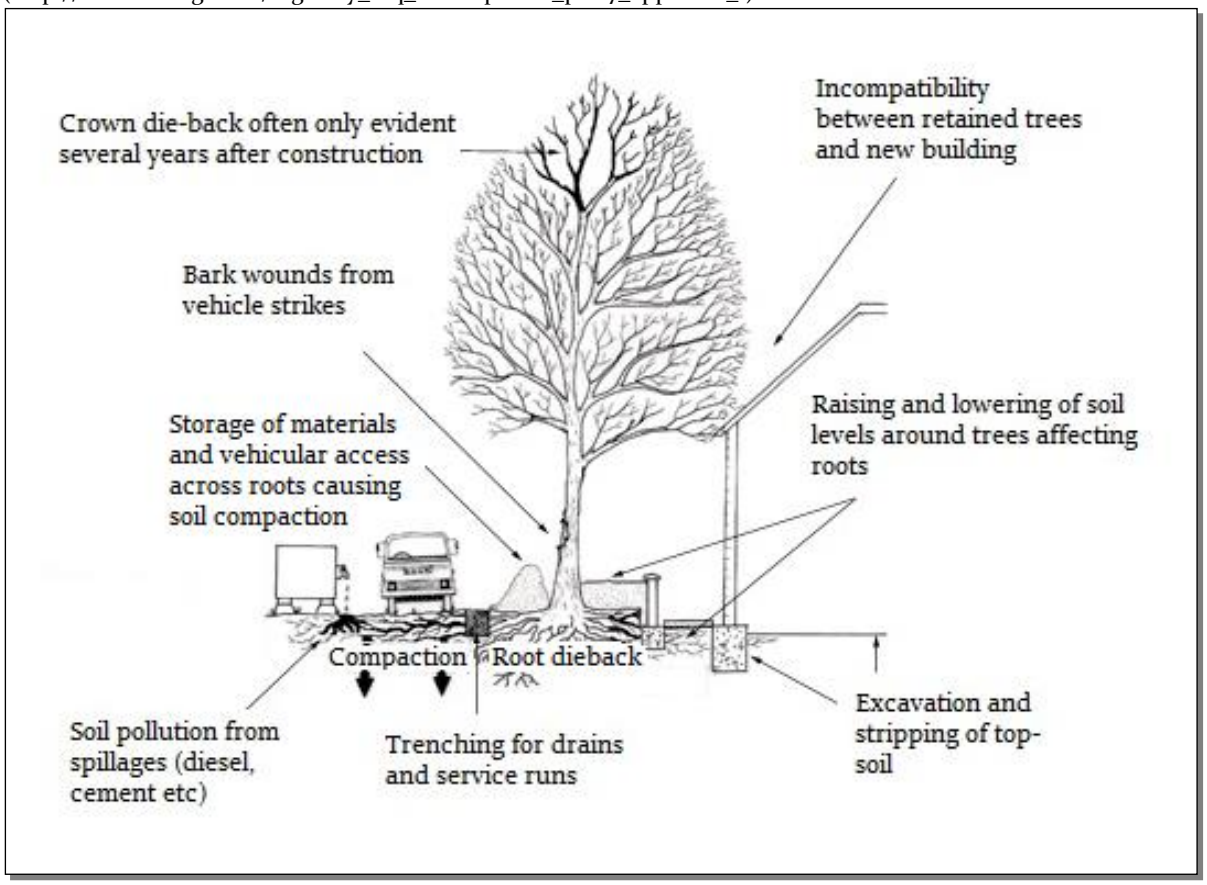
Soft landscaping within or close to the Root Protection Areas (RPAs) of retained trees

The following precautions are necessary to avoid damage to trees (where activities are to take place within their RPAs):

- Ground levels will not be changed;
- Soil must be of good quality and free of contaminants and other foreign objects potentially injurious to tree roots. The topsoil must satisfy the requirements of BS3882:200;
- No heavy machinery will be operated within the RPAs of retained trees during the installation of soft landscaping;
- Unwanted vegetation shall be removed manually or by using systemic herbicide that will not damage tree roots;
- No fuels or chemicals shall be used or stored within these areas; and
- No irrigation or drainage pipes shall be installed within the RPAs

Appendix 5 – General precautions and further information

Figure 4: Common problems for trees on development sites
(http://www.leics.gov.uk/highway_req_development_part7_appendix_f)



5.1 Services and drainage: Surface run-off water shall be sent to soakaways located outside the RPAs of retained tree(s). If trenching is required within the RPA of retained trees to provide routes for services, this work shall be undertaken using mole boring and / or hand digging (under arboricultural supervision).

5.2 Storage of materials: No materials or spoil are to be stored within areas protected by protective fencing and/or ground protection. The same applies for existing hard surfaces that are being used as ground protection.

5.3 Spillages: If any cement residues fall within root protection areas, it shall be swept up, bagged and removed from site – it shall not be washed away with water.

5.4 Demolition: Where any existing structures are to be demolished, they will be done so inwardly (away from root protection areas / retained soil).

5.5 Levels: There is to be no alteration of ground levels within the area protected by protective fencing and/or ground protection, unless previously specified and agreed upon. The same applies for existing hard surfaces that are being used as ground protection.

5.6 Fires: No fires are to be lit within 20 metres of the stems of retained trees.

5.7 Above ground damage to trees: Care must be taken in planning the location and operation of machinery to avoid above ground damage to trees. BS5837 (2012) Section 6.2.4.1 states '*Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs) in order that they can operate without contacting retained trees. Such contact can result in serious damage to trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance of trees is always maintained. Access facilitation pruning should be undertaken where necessary to maintain this clearance.*

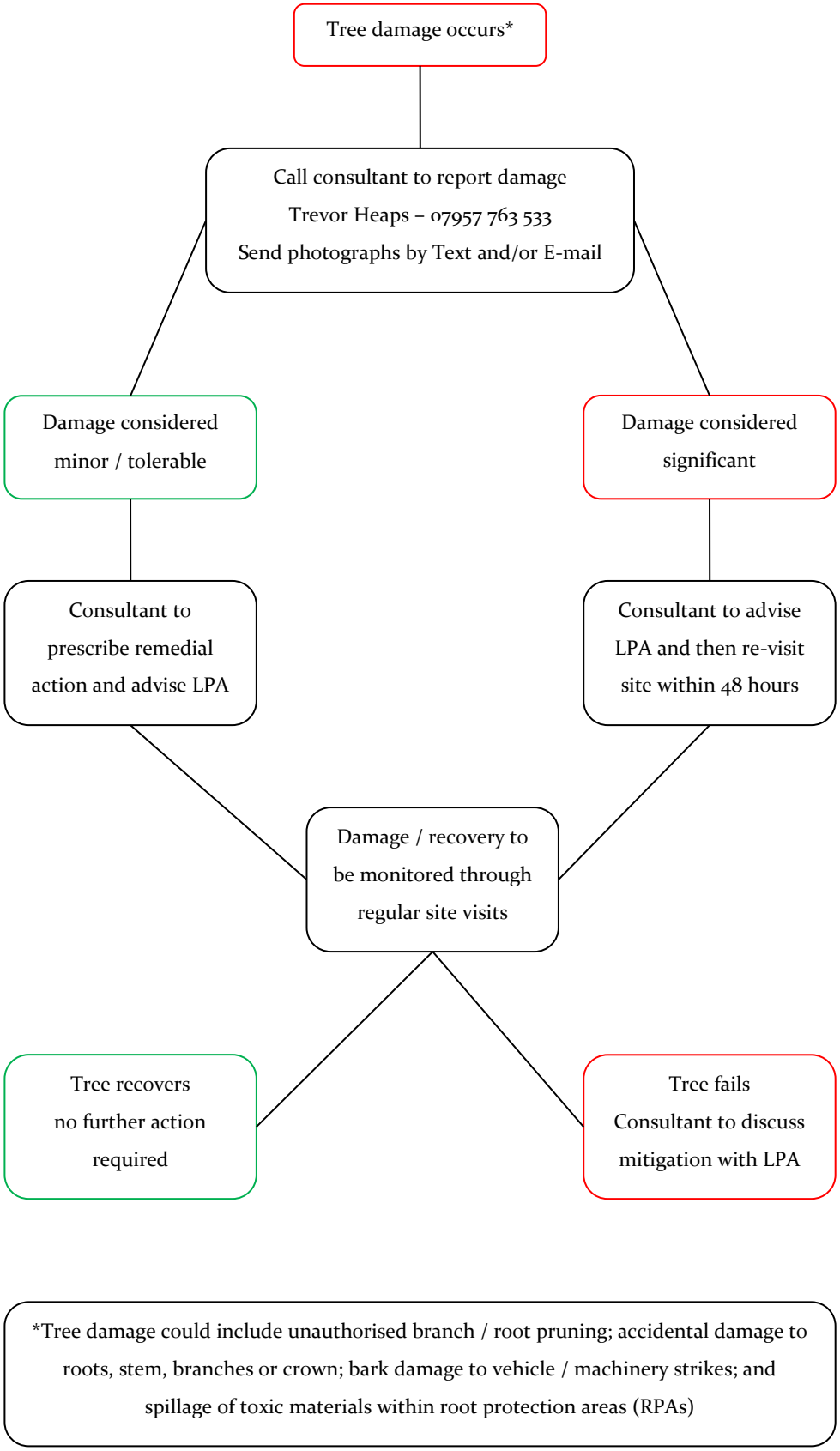
5.8 Remedial works and soil improvement: Exposed soils are easily compacted resulting in loss of water and gaseous exchange; this can lead to root death (and subsequently tree death).

5.8.1 To relieve ground compaction, which may have resulted from the use of vehicles or by the storage of materials, the soils should be broken up to allow air to penetrate and for the soil structure to be restored. There are various methods to achieve this, such as: auguring the soil by hand / fork or pneumatic excavation (e.g. with an air spade); both should be combined with soil structure improvements (see 5.8.2).

5.8.2 The soil structure can be improved by incorporating a compost or mulch within the topsoil, of 75-100mm in depth. This can be spread over the surface and gently forked into the soil. If bark chip is used as mulch, NPK fertilizer should be added to counteract the nitrogen depletion of the soil. There is also the option of adding mycorrhizal fungal which may also improve root function.

5.9 Choosing an arborist: When appointing a tree works contractor, please only use properly qualified and experienced companies who comply with current British Standards (3998) and always check that they carry Public Liability Insurance within a minimum of £2,000,000 cover, and the relevant Employers Liability Insurance. A list of contractors approved by the Arboricultural Association can be found at www.trees.org.uk or by calling 01242 522 152.

Appendix 6 - Procedure to follow in case of damage to retained trees



Appendix 7 - Induction form for all site personnel

Site name: .....

App. No.: .....

Appointed Site Supervisor: .....

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

- I am aware that trees have shallow roots and any excavation works beneath the canopy could cause irreparable damage.

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

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

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

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

Print Name: .....

Sign Name: .....

Date: .....

Appendix 8 - Site inspection record

Date: Time:	Planning reference:
.....	.....
Site:	
.....	

Those present in addition to project arboriculturist:

Client / Agent: .....

Project / Site manager: .....

LPA arboricultural officer: .....

Other (specify): .....

	Yes	No	Notes
Tree protection measures located in accordance with TPP?			
Any disturbance within construction exclusion zone?			
Any materials stored within construction exclusion zone?			
Any evidence of damage to tree roots, stems or canopies?			
Any works programmed before next planned site visit that may affect retained trees? (if yes, provide details below)			

Additional site visit required to ensure compliance with required action? (Y / N)

Proposed visit date:

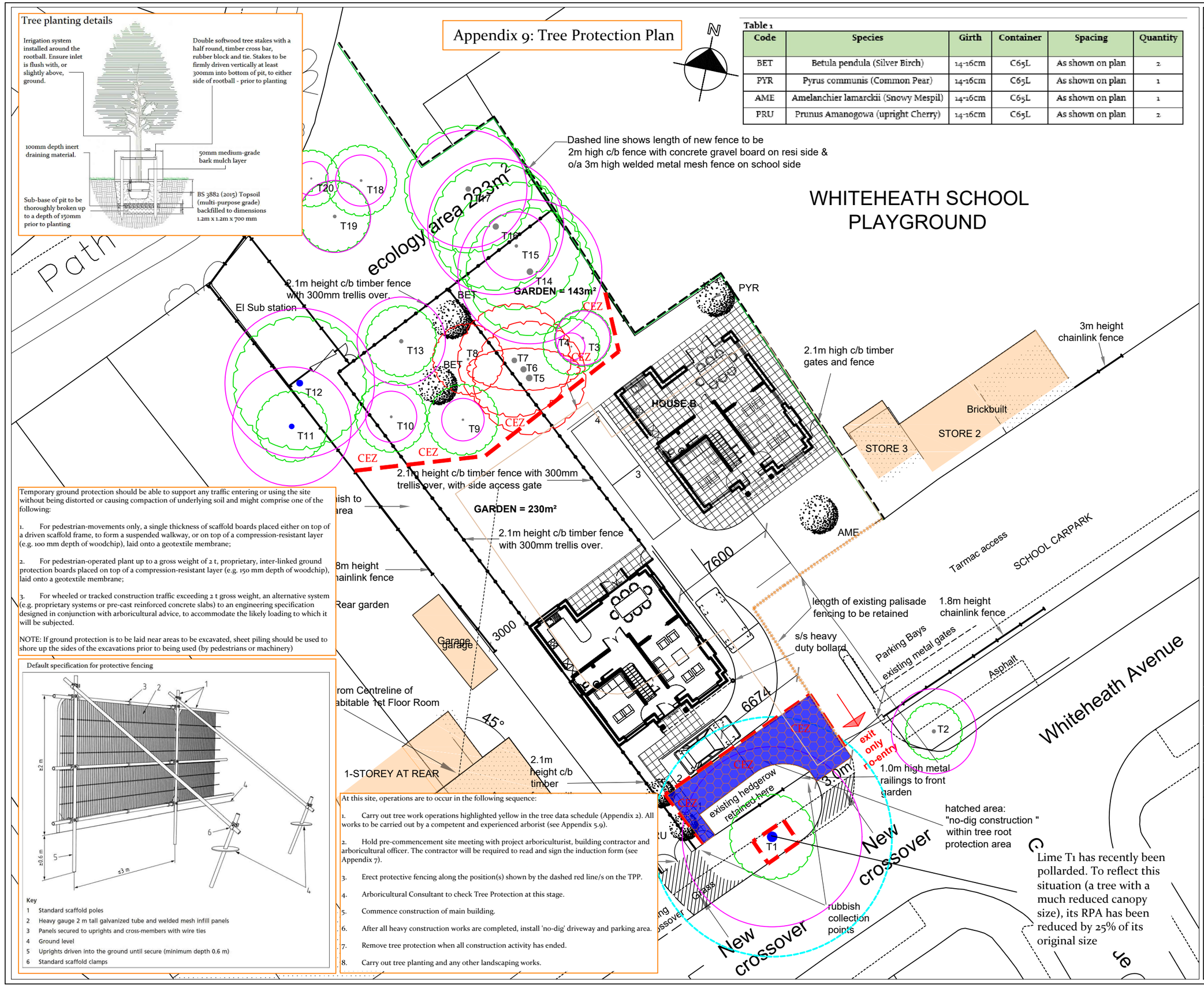
Signed: Date:

Appendix 9: Tree Protection Plan

Tree planting details

Table 1

Code	Species	Girth	Container	Spacing	Quantity
BET	Betula pendula (Silver Birch)	14-16cm	C65L	As shown on plan	2
PYR	Pyrus communis (Common Pear)	14-16cm	C65L	As shown on plan	1
AME	Amelanchier lamarckii (Snowy Mespil)	14-16cm	C65L	As shown on plan	1
PRU	Prunus Amanogowa (upright Cherry)	14-16cm	C65L	As shown on plan	2



Temporary ground protection should be able to support any traffic entering or using the site without being distorted or causing compaction of underlying soil and might comprise one of the following:

1. For pedestrian-movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

2. For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

3. For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

NOTE: If ground protection is to be laid near areas to be excavated, sheet piling should be used to shore up the sides of the excavations prior to being used (by pedestrians or machinery)

Default specification for protective fencing

Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

At this site, operations are to occur in the following sequence:

1. Carry out tree work operations highlighted yellow in the tree data schedule (Appendix 2). All works to be carried out by a competent and experienced arborist (see Appendix 5.9).

2. Hold pre-commencement site meeting with project arboriculturist, building contractor and arboricultural officer. The contractor will be required to read and sign the induction form (see Appendix 7).

3. Erect protective fencing along the position(s) shown by the dashed red line/s on the TPP.

4. Arboricultural Consultant to check Tree Protection at this stage.

5. Commence construction of main building.

6. After all heavy construction works are completed, install 'no-dig' driveway and parking area.

7. Remove tree protection when all construction activity has ended.

8. Carry out tree planting and any other landscaping works.

Plan Legend

- Tree to be retained
- Tree to be removed
- Category A Tree
- Category B Tree
- Category C Tree
- Category U Tree

Areas, groups or woodlands are shown as polygons using the same colours as above. Dashed lines show removals

- Root Protection Area (RPA) Original in dotted light blue if amended.
- Protective fencing
- CEZ — Construction & storage exclusion zone
- Fenced off during construction - 'No-dig, permeable, load-spreading surface afterwards
- Suggested tree planting locations (see Table 1)

Scale: 1:250 @ A3 (0 5m 10m)

Site Address: Land Adjacent to Whiteheath Junior School, HA4 7PR

Client: Stewart M&PS

Drawing No: TH/A3/1981C/TPP

Job Ref: TH1981C

Date: 17/02/2023

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End of Report