KEY

TREE PROTECTION ZONE

SITE MANAGER WELFARE FACILITIES

MATERIAL STORAGE

SITE BOUNDARY WITH SECURE HERAS OR HOARDING ACCESS GATES TO BE LOCKED WHEN SITE CLOSED

SITE ENTRANCE

Cycles Bins

BCP

7-8 EW

CAR PARKING *

EW

CAR PARKING *

GATE AND WALL REMOVED TO IMRROVE ENTRANCE

EXISTING BOLLARDS TO BE RETAINED

NEW BOLLARDS TO BE MATCH EXISTING

EXISTING BOLLARDS TO BE RETAINED

CONNAUGHT CLOSE

NEW ROAD

* CAR PARKING WITHIN VERGE BEING AGREED WITH HIGHWAYS - SUBJECT TO A TEMP TRO

5 OCT 2017

CONNAUGHT CLOSE/NEW ROAD
HILLINGDON
SITE SET UP PLAN
DRG No. 7062-SITESETUP-01

WHY TREE PROTECTION IS NEEDED

1) **Soil compaction kills roots-** caused by plant movement and storage of materials within protected areas.
2) **Trenching severs roots-** many small roots grow within the top 600mm of soil. Even the removal of the top 200mm can cause damage.
3) **Soil pollution kills roots-** Dripping fuel storage or cement washings can contaminate the soil resulting in root death.
4) **Raising & lowering levels kills roots-** the soil used to increase levels can compact the underlying soil (see point 1). Lowering levels will remove roots causing damage to the tree.
5) **Bark and branch damage-** bark removal and branch damage can allow disease and fungi into the tree.

The impact of any of the above can take years to show- trees can have huge reserves of food and water.

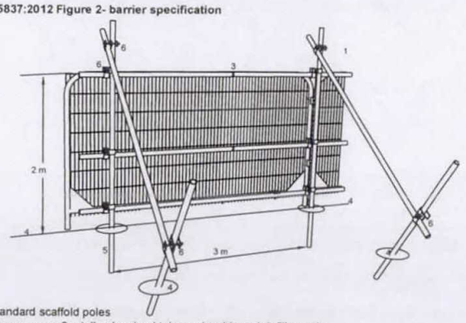
CONSTRUCTION EXCLUSION ZONE

Root protection areas (RPA) of retained trees within which all construction activity is restricted.

All trees that are being retained on site must be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers must be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection can be installed.

DEFAULT POSITION FOR THE TREE PROTECTION BARRIERS.

BS5837:2012 Figure 2- barrier specification



1 Standard scaffold poles
2 Heavy gauge 2m tall galvanized tube and weld 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 0.6m)
6 Standard scaffold clamps

Examples of alternative barrier designs can be found in the method statement. Should an alternative design be more viable and appropriate, it must be agreed with the project arboriculturist before its implementation.

SENSITIVE DEMOLITION
The existing feature(s) is within the RPAs of retained trees and therefore, to minimise impact on underlying roots is to be demolished as per the method statement & under the supervision of the project arboriculturist.

RESTRICTIONS WITHIN TREE PROTECTION AREAS

Inside the exclusion area of the fencing, the following shall apply:

- No mechanical excavation whatsoever
- No excavation by any other means without arboricultural site supervision
- No hand digging without a written method statement having first been approved by the project arboriculturist.
- No lowering of levels for any purpose (except removal of grass sward using hand tools)
- No storage of plant or materials
- No storage or handling of any chemical including cement washings
- No vehicular access
- No fire lighting

In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builders sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection areas of retained trees
- No fire shall be lit such that flames come within 5m of tree foliage.

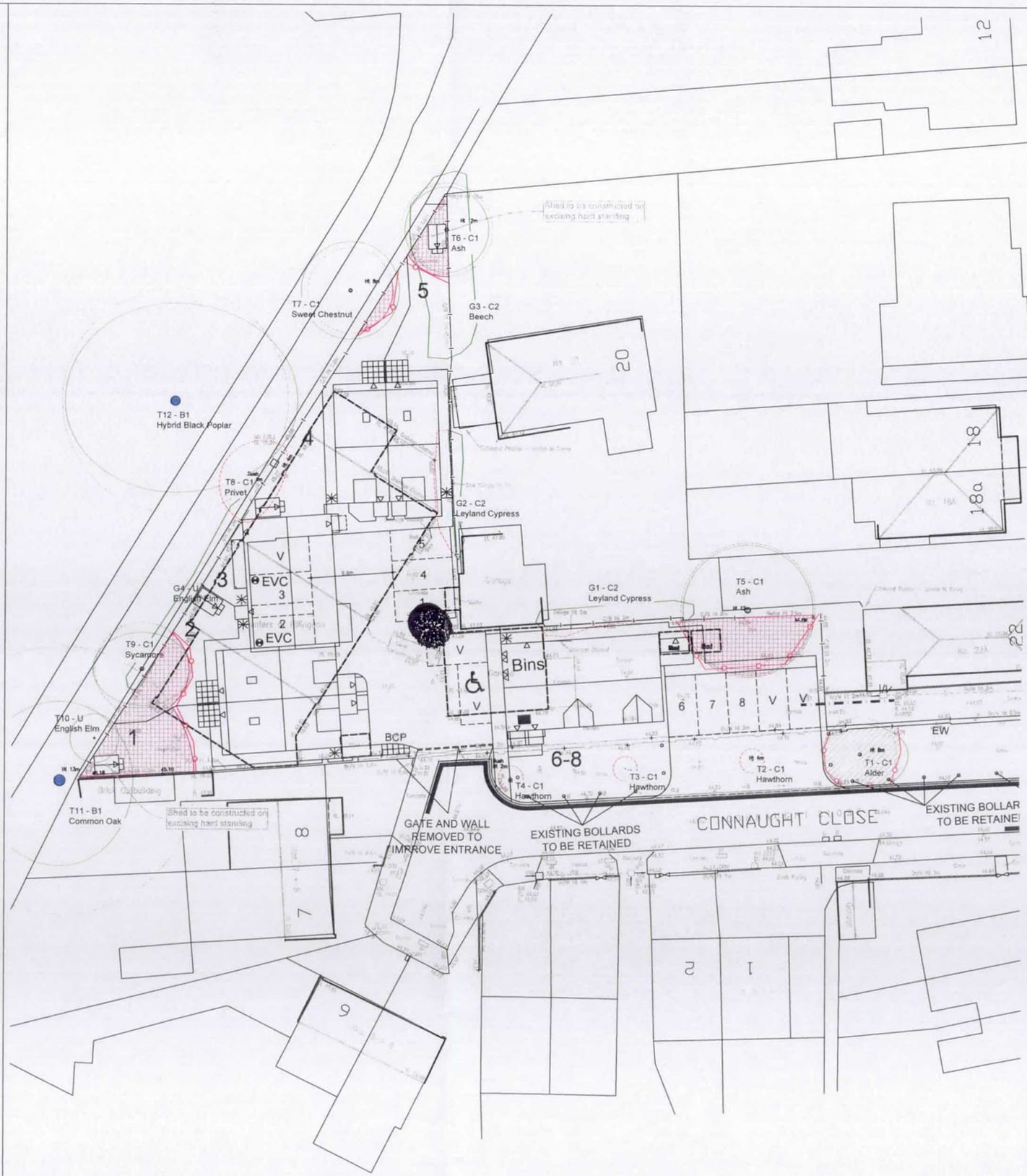
TREE TO BE REMOVED

A CATEGORY TREE
B CATEGORY TREE
C CATEGORY TREE
U CATEGORY TREE

ROOT PROTECTION AREA (RPA) FOR RETAINED TREES

Proposed layout

Existing Layout



The original of this drawing was produced in colour- a monochrome copy should not be relied upon.

Rev	Date	Details	Drawn

ACD ENVIRONMENTAL

Ecology
Archaeology
Arboriculture
Landscape Architecture

ACD at these offices
Rodbourne Rail Business Centre, Grange Lane, Malmesbury, SN16 0ES
Tel: 01666 825646

Courtyard House, Mill Lane, Godalming, GU7 1EY
Tel: 01483 425714

Suite 6, Crescent House, Yonge Close, Eastleigh, SO50 9SX
Tel: 02382 026 300

email: mail@acdenv.co.uk
www.acdenvironmental.co.uk

Copyright of ACD. All rights described in Chapter IV of the Copyright, Designs and Patents Act 1988 have been generally asserted: 2015. Copyright of this plan remains with ACD until all fees have been paid in full.

AQUINNA HOMES
Incorporating Aequi Developments Ltd

scheme: Punters Garage, Hillingdon
client: Aquinna Homes
drawing: Tree Protection Plan
date: January 2017
scale: 1:250@A2
dwg no: PRI20814-03A
drawn: RA checked: MW

PUNTERS GARAGE HILLINGDON

ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT

AQUINNA HOMES

Incorporating Argyll Developments Ltd

ACD ENVIRONMENTAL

Ecology
Archaeology
Arboriculture
Landscape Architecture

Written by:	R. Anderson
Checked by:	M. Welby
Date:	01/12/2016
Ref:	PRI20814aia-ams
Revision:	

Table of Contents

1.0 Executive Summary 3

2.0 Introduction 4

3.0 Arboricultural Impact Assessment 6

3.1. Overview of proposed development 6
3.2. Tree Preservation Orders 6
3.3. Previous planning applications and consents 6
3.4. Trees proposed for removal & surgery 6
3.5. Demolition and construction within RPA's 7
3.6. Protection fencing 8
3.7. Shade and future pressure to prune 8
3.8. Services 8

4.0 Arboricultural Method Statement 9

4.1. Phasing of operations & site supervision 9
4.2. Construction exclusions zone 9
4.3. Tree protection barriers 11
4.4. Ground protection 15
4.5. Site storage, parking, welfare facilities, etc 17
4.6. Tree surgery and removal 17
4.7. Soft landscaping 19
4.8. Installation of underground services 19
4.9. Demolition close to trees 21
4.10. Hard surface removal 22
4.11. No-dig bin/cycle store construction 23
4.12. Resurfacing/repair of existing roads 24
4.13. Tree translocation 25
4.14. Excavation within RPAs 27
4.15. Installation of boundary fencing within protected areas 28

Appendix 1: Tree Work Schedule 30

Appendix 2: Tree Protection Plan 31

1.0 Executive Summary

1.1. ACD was initially instructed, to carry out a tree survey, and present constraints details in accordance with BS5837:2012 *Trees in relation to design, demolition and construction.* This was to identify the quality and value of existing trees on the site, allowing decisions to be made as to the retention or removal of trees during development. Subsequently, the subject layout has been produced and is in line with recommendations of the British Standard. Adequate protection can be provided to ensure all retained trees are protected throughout development.

1.2. The garage buildings are to be removed and replaced with nine residential units across four, two and three storey buildings. For access, there are to be two new access points off Connaught Road.

1.3. Trees to be removed are limited to low-quality trees, which have a limited life or current landscape value, or are new amenity planting that could be transplanted.

1.4. The relationship between the building and retained trees is sustainable and is not likely to result in any pressure to prune requests from future occupants.

1.5. The arboricultural method statement and tree protection plan include details of all tree protection measures required.

1.6. The tree protection must be erected after tree removals and surgery but before any demolition or construction contractor enter the site, and before any soil stripping takes place.

1.7. Areas of hard surfacing within RPA's are to be removed sensitively and returned to soft landscaping.

1.8. There will be no changes in levels, service routeing, machine activity, storage of materials or site hut positioning within areas to be protected, and the protective fencing shall remain in position for the duration of the construction process.

2.0 Introduction

2.1. Aquinna Homes, instructed ACD Environmental in November 2016 to prepare the following impact assessment.

2.2. Following the recommendations of the British Standard[1], this report includes the necessary information to support a planning application. It demonstrates that the impact, both direct and indirect, of the proposed development within the site, has been assessed and where appropriate, mitigation and tree protection proposed.

2.3. The implementation of the protection methods recommended within this report is critical for ensuring the retained trees are successfully protected through the construction process and must be implemented prior to any work on the site.

2.4. This assessment is based on the supplied layout drawing, ref: P1327/01-L and site survey, ref: 16106-TOPO

2.5. The controlling authority is London Borough of Hillingdon Council, who can be contacted at: Civic Centre High Street Uxbridge Middlesex UB8 1UW

2.6. This assessment considers the impact of the development on the constraints posed by the retained trees (both beneath ground: the root protection area (RPA), and above ground: the canopy).

2.7. Direct impact from development comes in six main forms: 1) Surface installation within RPAs, 2) Root loss from excavation for foundations, drainage and other utilities within RPAs, 3) Soil stripping, removal and level changes within RPAs, 4) Excessive access facilitation pruning to retained trees, 5) Soil compaction from storage and vehicle movements within RPAs, 6) Soil contamination.

2.8. The indirect impact can come from changes to the site hydrology, future pressure to prune or fell, failure of trees exposed by removal of neighbouring trees, and other environmental changes which can take several years to manifest.

[1] *BS5837:2012 Trees in relation to design, demolition and construction- Recommendations,* London: British Standards Institute

2.9. The RPA for each tree represents a minimum area in m^2 that should be left undisturbed around each retained tree. This is initially represented by a circle but is often adjusted to account for constraints to root growth within the site (primarily highways and buildings). It is, therefore, important to ensure the protection of trees both above and below ground. Recommendations are provided in the British Standard as to the protection of existing trees before, during and after development. This is achieved by ensuring the tree protection plan and arboricultural method statement are implemented before any commencement on site.

3.0 Arboricultural Impact Assessment

3.1. Overview of proposed development

3.1.1. The garage buildings are to be removed and replaced with eight residential units across four, two to three story buildings. There are to be two new access points off Connaught Road leading to residential parking.

3.2. Tree Preservation Orders

3.2.1. An on-line search was conducted with the local planning authority for any legal tree protection within, or neighbouring the site. No tree preservation orders or conservation areas were found within, or neighbouring the site.

3.3. Previous planning applications and consents

3.3.1. There are no relevant past applications or extant planning consents for this site.

3.4. Trees proposed for removal & surgery

3.4.1. The following trees are proposed for removal:

- Category C (Sub 150mm DBH): T2, T3 & T4(all hawthorn)
- Category T8 (Low quality): T8 (privet)

3.4.2. In relation to the conception and design of development proposals, BS5837:2012 section 5.1.1 states: The constraints imposed by trees, both above and below ground should inform the site layout design, although it is recognised that the competing needs of development mean that trees are only one-factor requiring consideration. Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal.

3.4.3. It is therefore deemed acceptable to remove the trees listed and, as part of the detailed landscape design for the scheme, include suitable and sustainable replacements as and where appropriate. This will more than mitigate any loss that may be felt from tree removals, by providing robust long-term tree cover in keeping with the proposal and surrounding properties.

3.4.4. With particular regard to trees T2-T4, these are highway saplings planted in last few years within the grass verge of Connaught Close. These young trees are proposed for removal, however, could be transplanted to locations within the site or as a group cluster near the entrance of Connaught Close.

3.4.5. Following the preliminary recommendations made at the time of the survey and works necessary to facilitate construction of the proposed development, tree works are recommended and listed in the method statement. This work includes crown lifting and pruning back to facilitate access. See Appendix 1, for a full list of works required.

3.5. Demolition and construction within RPA's

3.5.1. To ensure damage does not occur to trees highlighted for retention, tree protection fencing must be erected before ANY plant/vehicles entering site whatsoever. This should be subject to a pre-commencement site meeting between the developer and the project arboriculturist.

3.5.2. The construction of all buildings is proposed outside the RPAs of retained trees.

3.5.3. The existing hard surfacing within the RPA's of T5, T6, T7, G3, T9 and T11 is to be removed and returned to returned to soft landscape. The removal work must be carried out sensitively under supervision, as per the appropriate section of the method statement to ensure no underlying roots are damaged. Fencing must then be replaced (as shown on the TPP) to protect the newly exposed ground immediately after removal works are completed.

3.5.4. The construction of the parking spaces for plots 7 and 8 encroaches slightly into the RPAs of adjacent ash tree T5. This encroachment is considered marginal

(<2% of the advised sq/m) and will not be to the detriment of the trees. Therefore, special construction measures or adjustment of the plans are NOT required.

3.5.5. The construction of shed within plot 1 and 5 are within close proximity to offsite trees, T6 and T11. The sheds are therefore to be constructed on top of the existing hard surfacing. The excess surfacing around sheds is to be removed sensitively as per the appropriate section of the method statement. It is recommended the soil within these areas is to be de-compacted by the use of Teraventing. This would aid the trees vitality post development, helping increase their contribution to the local area.

3.6. Protection fencing

3.6.1. Figure 2 of the British Standard recommends a standard fencing design for tree protection. This is a weld mesh panel design, mounted upon a well-braced scaffold framework. This is perfectly adequate for this site and all the retained trees can be suitably protected by its erection before any works start on site whatsoever.

3.7. Shade and future pressure to prune

3.7.1. ACD have worked with the design team on this project and we feel that the resulting proposed layout is both sustainable and results in juxtapositions between trees and buildings which will not bring future requests for excessive pruning and/or tree removal.

3.8. Services

3.8.1. Full details of the service and utility provisions for the site remain to be finalised. However, there is adequate space for utility trenches to access the site whilst avoiding RPAs and exclusion zones.

4.0 Arboricultural Method Statement

TO BE READ IN CONJUNCTION WITH THE APPENDED TREE PROTECTION PLAN REF: PRI20814-03

4.1. Phasing of operations & site supervision

4.1.1. The tree protection and other arboricultural works must be carried out in the following order:

	Operation	Present	Notes
1	Tree removals & surgery	Tree contractor	See Tree Protection Plan for trees to be removed
2	Protection barriers erected	Fencing contractor	See Tree Protection Plan for position and type of barriers
3	Removal of hard surfaces near trees	Demolition staff, site manager	Supervised by project arboriculturist. See method statement
4		Demolition and construction	
5	Removal of protection barriers and landscape work	ACD, landscape contractor, site manager	See method statement

4.1.2. Supervision is required should any unplanned access and/or work be required in the construction exclusion zone.

4.2. Construction exclusions zone

4.2.1. Barriers and/or ground protection must be used to protect all retained trees before any machinery or materials are brought onto the site, and before any demolition, development or stripping of soil commences.

4.2.2. Where all activity can be excluded from the RPA, vertical barriers must be erected to create the construction exclusion zone (CEZ). The default position of which is shown on the appended Tree Protection Plan.

4.2.3. Where, due to site constraints, construction activity cannot be fully or permanently excluded from all, or part of a tree's RPA, appropriate ground protection can be installed.

4.2.4. It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

4.2.5. Inside the exclusion zone, the following shall apply:

- No mechanical excavation whatsoever.
- No excavation by any other means without arboricultural site supervision.
- No hand digging without a written method statement having first been approved by the project arboriculturist.
- No lowering of levels for any purpose (except removal of grass sward using hand tools).
- No storage of plant or materials.
- No storage or handling of any chemical including cement washings.
- No vehicular access.
- No fire lighting.

4.2.6. In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builders sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection area of retained trees.
- No fire shall be lit such that flames come within 5m of tree foliage.

4.3. Tree protection barriers

4.3.1. The construction exclusion zone will be protected as per the appended tree protection plan that shows the default alignment of the tree protection barriers, to be installed prior to any of the following taking place:

- Archaeology
- Demolition
- Plant and material delivery
- Soil stripping
- Utility installation
- Construction works
- Landscaping

4.3.2. Stages of installation of barriers:

1) Hand clearance of any vegetation to allow clear working access.
2) Setting out of node points
3) Barriers erected
4) Site meeting with project arboriculturist to 'sign-off' tree protection fencing.
5) Site accessible to demolition/construction traffic

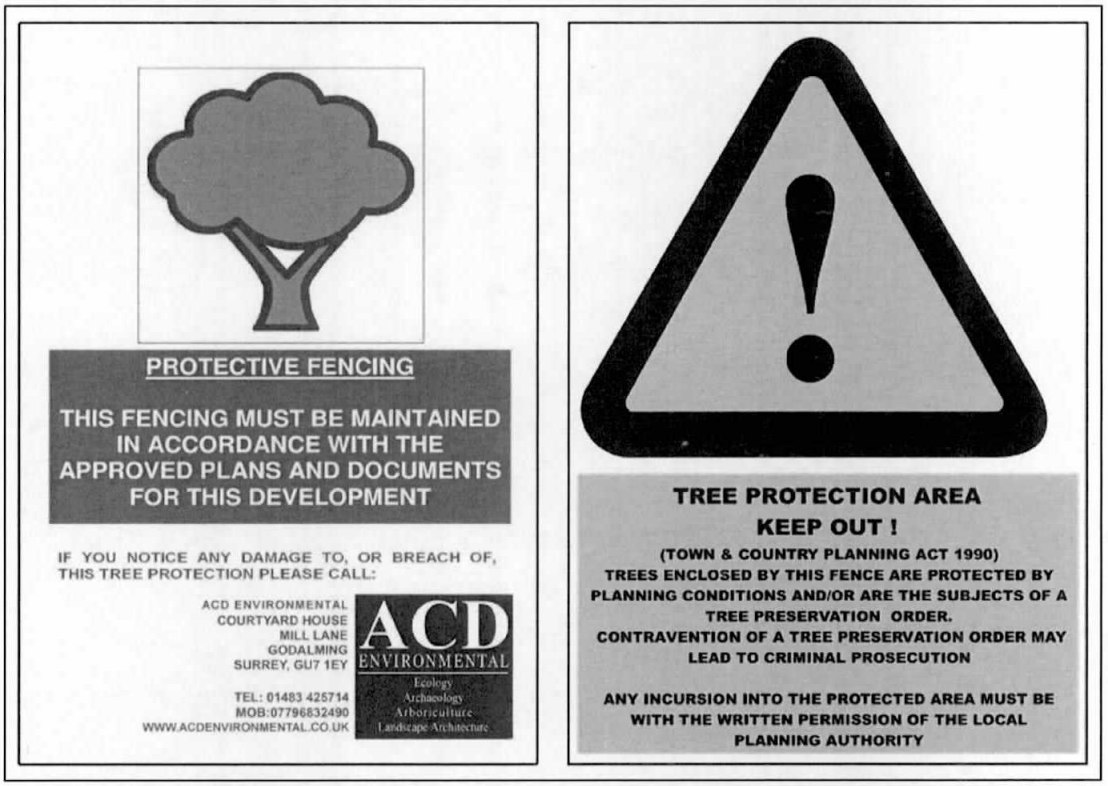
4.3.3. Once erected, all barriers will be regarded as sacrosanct, and will not be removed or altered without prior recommendation by the project arboriculturist and approval of the local planning authority.

4.3.4. The default barrier construction is suitable for areas of high-intensity development and shall comprise of interlocking weld-mesh panels, well braced to resist impacts by attachment to a scaffold framework that is set firmly into the ground. A detailed specification can be found on the TPP.

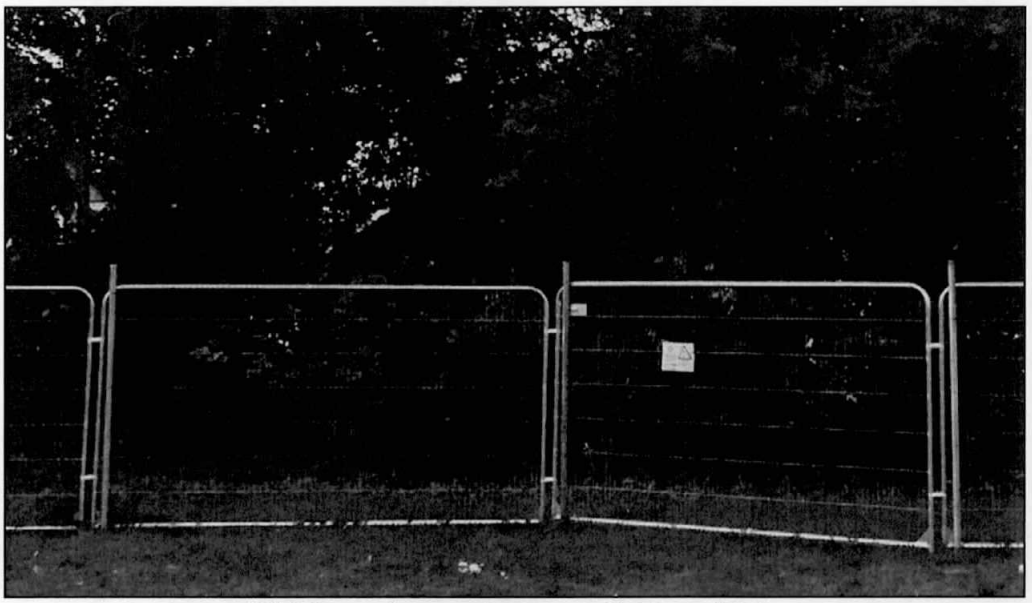
4.3.5. The images below are alternative barrier designs that have been successfully used on site and that ACD are happy to support if a variation from the default style is required. If such a variation is necessary, the approval of the project arboriculturist will be obtained prior to any implementation on site.

4.3.6. Once barriers and/or ground protection have protected the exclusion zone, construction work can commence.

4.3.7. All weather notices should be erected on the barriers (for example see figure below).



Tree protection sign (download from http://www.acdenvironmental.co.uk)



Weld-mesh panels on scaffold uprights



Weld-mesh panels on wooden posts



Chain-link on angle-iron uprights

4.4. Ground protection

4.4.1. If required (or as shown on the appended tree protection plan), ground protection is to be installed as follows. It must be capable of supporting the expected loads and avoiding rutting, compaction and damage to the soil: as advised in section 6.2.3 of the British Standard.

4.4.2. Stages of ground protection installation:

1) No plant machinery to be used in the area of ground protection for whatever reason
2) Dismantle primary TPF and re-erect in secondary location as shown on TPP (if required) OR erect fencing to protect any newly exposed CEZ not to be covered by ground protection.
3) Any shrubs, saplings or trees to be removed, are to be cut or ground out to just below ground level rather than grubbed or winched out, which can damage roots of retained trees.
4) Lay woven geotextile over existing ground surface by hand
5) Cover the area with compressible layer, woodchip, for example, using hand tools only
6) Cover compressible layer with side butting scaffold boards or plywood boards
7) Confirm surface is acceptable for use with project arboriculturist
8) Area ready for construction access

4.4.3. Any scaffolding required within the area will be erected with the uprights placed on spreader boards.

4.4.4. The boarding will be left in place until the construction works are finished.

4.4.5. A single thickness of boarding laid on the soil surface will provide sufficient protection for pedestrian loads. However, for wheeled or tracked construction traffic movements within the RPA, ground protection will involve the use of temporary cellular confinement systems, reinforced concrete slabs or track-board systems

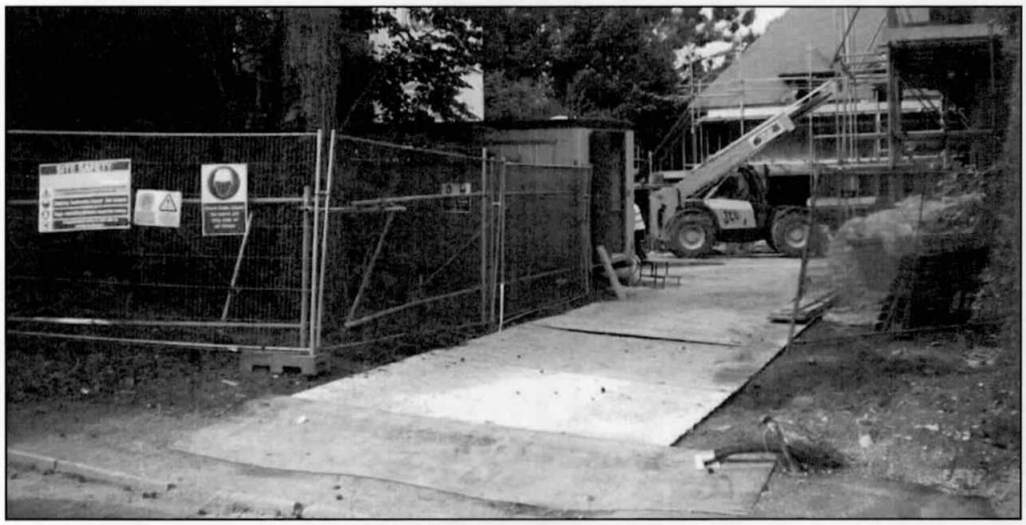
details of which are to be specified by the project engineer and approved for use by the project arboriculturist and local authority before construction commences.

4.4.6. Track-boards can be sourced from Trakmats Europe Ltd, 0845 6435388, www. trakmatseurope.com, or groundguards.com

4.4.7. There is to be no excavation within ground protection area whatsoever. This includes installation of services and associated utilities.



Scaffold board pedestrian ground protection



Vehicular ground protection trackway

4.5. Site storage, parking, welfare facilities, etc.

4.5.1. The site will require provision for; site storage, contractor parking, welfare facilities, temporary services/drainage, material drop off points, etc.

4.5.2. It is acceptable to place site cabins and walkways within the CEZ provided they are installed sensitively:

- Cabins must be placed on sleepers (or similar) to spread the load, avoiding point loading and associated soil compaction.
- The delivery of cabins should ensure that any unloading via 'hi-ab' crane can be carried out without impact on the crowns of retained trees.
- Walkways, if required, should be installed as per the ground protection specification.
- Any utilities for site compounds must be run above ground. For example, WC foul pipes/drainage and temporary electrical connections.

4.5.3. It is imperative that if cabins and walkways are installed, that fencing is erected to limit access to the protected areas. If amendments are made, the project arboriculturist should sign off the proposals prior to their implementation.

4.5.4. Contractor parking and storage areas should be sited outside the CEZ.

4.6. Tree surgery and removal

4.6.1. For full list of trees surgery operations please see Appendix 1.

4.6.2. All trees to be removed are indicated on the TPP.

4.6.3. If any further surgery work is proposed, details will be submitted to, and approved by, the council, before being carried out.

4.6.4. All work will be carried out in accordance with BS3998[2] industry best practice and in line with any works already agreed with the council.

4.6.5. The tree surgeon shall ideally be chosen from The Arboricultural Association's Approved Contractor list. All work shall be undertaken at the appropriate time and with the consent and approval of the site agent.

4.6.6. The statutory protection[3] [4] will be adhered to. If further advice is required, particularly if bats are discovered during tree work, it will be obtained from Natural England or other competent persons and recommendations adhered to.

4.6.7. The stumps of any trees removed from within the Construction Exclusion Zone or the RPAs of retained trees will be either cut flush to ground level and left in situ or ground out using a stump grinder. They will not be winched out.

4.6.8. All operations shall be carefully carried out to avoid damage to the trees being treated or neighbouring trees. No trees to be retained shall be used for anchorage or winching purposes.

[2] *BS3998:2010- Recommendations for Tree Work.* London: British Standards Institute
[3] *Wildlife and Countryside Act.* (1981) London: HMSO.
[4] *Countryside and Rights of Way Act.* (2000) London: HMSO.

4.7. Soft landscaping

4.7.1. All landscaping and associated ground preparation within exclusion zones will be carried out sensitively to ensure root damage is minimised as much as is practicable.

4.7.2. At no time is any heavy plant to be used within any protected area.

4.7.3. Removal of existing vegetation (including turf) will be carried out with hand tools only.

4.7.4. Should the soil be compacted or have a poor structure that may hinder the development of any new planting, soil decompaction techniques may be used upon consultation with the project arboriculturist.

4.7.5. Tree protection barriers may be removed to allow access and then replaced as required/per approved documents (in liaison with the arboricultural clerk of works)

4.7.6. Levels (high spots) will not be reduced or excavated in any way. Use good quality topsoil to level any low-lying areas and hollows, and provide a fine tilth to lay turf on. This imported soil must not result in a level increase of more than 100mm in any area.

4.7.7. Import materials by hand in wheelbarrow or using a digger sited outside the sensitive area.

4.7.8. Any excavation for planting pits must be dug using hand tools only.

4.7.9. No works will be carried out within any protected areas if the soil moisture is at a level likely to allow compaction to occur.

4.8. Installation of underground services

4.8.1. Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care should be taken in the routeing and methods of installation of all underground apparatus.

Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

4.8.2. Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with the project arboriculturist. In such cases, trenchless insertion methods should be used: Microtunnelling, Surface-launched directional drilling, Pipe ramming or Impact moling (see BS5837:2012 Table 3), with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected, excavation using hand-held tools might be acceptable for shallow service runs. If this is case, the following methodology must be followed:

4.8.3. Stages for installing services by hand within tree protection areas:

No plant machinery to be used in the area for whatever reason

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Remove just enough tree protection fencing to allow access to area and facilitate trenching.
3) Remove any surface vegetation or existing hard surfaces using hand tools.
4) Using and air-pick excavate the trench, keeping to minimum dimensions required.
5) Roots occurring in clumps of 25 mm diameter and over are encountered they will be retained and kept damp by covering with hessian (re-wetted as required). If required, these should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.
6) Feed in services.
7) Backfill trench with 200-300mm depth of excavated soil, or a mixture of excavated and imported topsoil to BS3882 (BSI, 2007), firming down with heels.
8) Repeat step 7 until trench is filled.

9) Re-erect tree protection fencing as per approved plan.

4.8.4. The method of excavation above, for trenching within RPAs, is using air excavation. This tool utilises compressed air to remove soil from around tree roots causing minimal damage and can be run off a typical site compressor. ACD can provide details of contractors supplying air excavation services if required.

4.8.5. Alternatively, trenchless technology, such as thrust boring can be used in some instances and is particularly effective as it can pass directly under the tree, at a depth which is likely to avoid almost all impact on roots of the subject tree. As no access/thrust pits will be located within the RPAs of the subject trees, the need for arboricultural supervision is limited.

4.8.6. Reference can be made to NJUG Vol 4[5] for guidance, but any approach must be approved by the project arboriculturist and brought to the attention of the local authority tree officer.

4.9. Demolition close to trees

4.9.1. All TPF to be installed as per approved Tree Protection Plan prior to any plant arriving on site.

4.9.2. Sensitive demolition will occur under supervision from the project arboriculturist

4.9.3. Stages of demolition within tree protection areas:

1) No plant machinery to be sited on any exposed rooting area
2) Dismantle any fencing to allow work to proceed
3) Buildings to be folded in on themselves
4) Removal debris by hand or with plant machinery not located on any exposed rooting area.
5) Floor to be broken up with had held breaker and pieces removed by hand. Slab floor can be lifted carefully by machinery if appropriate

[5] National Joint Utilities Group. (2010). *Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook.* NJUG.

6) Underlying ground levels to be retained. No excavation to occur
7) Any exposed roots and surrounding newly exposed areas to be covered with up to 100mm of topsoil, from elsewhere on site, or imported topsoil to BS3882[6]. Soil may be placed in area by plant but must be spread by hand.
8) Tree protection fencing to be erected in final position as shown on plan

4.9.4. No reduction in levels of the underlying soil surface will occur.

4.9.5. At no point are any heavy machinery permitted within the RPA.

4.9.6. Contamination of the soil by fuel and lubricant leaks must be avoided at all cost. If such a situation arises the project arboriculturist must be notified to assess the situation and prescribe remedial measures.

4.10. Hard surface removal

4.10.1. No hard surface removal within RPAs will occur without arboricultural supervision.

4.10.2. Stages for hard surface removal within tree protection areas:

1) No plant machinery to be sited on any exposed rooting area
2) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
3) Dismantle fencing as required to access area
4) Plant machinery to run only on existing hard surfaces with consent from arboriculturist
5) Plant may be used to carefully peel up existing tarmac and concrete
6) Other surfaces are to be removed by hand (paving etc.)
7) Where any sub base is not likely to contain roots and only on approval from project arboriculturist, it may also be carefully removed.
8) Underlying ground levels to be retained. No excavation to occur

[6] *BS3882:2007- Specification for topsoil and requirements for use.* London: British Standards Institute.

9) Any exposed roots and surrounding newly exposed areas to be covered with up to 100mm of topsoil, from elsewhere on site, or imported topsoil to BS3882[7] Soil may be placed in area by plant but must be spread by hand.

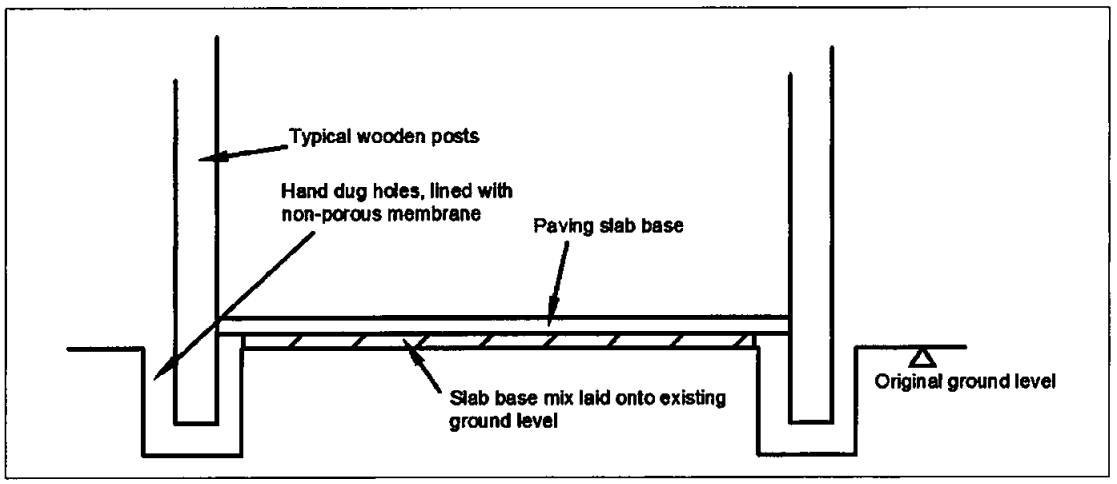
10) Tree protection fencing to be erected in final position as shown on plan

4.10.3. If the area around the retained trees is to be left following the removal of the existing hard surface, before a new hard surface is laid or soft landscaping implemented, then the line of protective fencing MUST be correctly re-established immediately the hard surface removal work has been completed.

4.10.4. If for whatever reason there is a delay before the area is left exposed prior to awaiting a new surface, then a temporary surface must be implemented or the area fenced off.

4.11. No-dig bin/cycle store construction

4.11.1. Structure to be installed as per engineers approved specification.



Indicative section of no-dig construction

4.11.2. Stages of construction:

[7] *BS3882:2007- Specification for topsoil and requirements for use.* London: British Standards Institute.

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
2) Dismantle TPF to allow access (TPF to be taken down only when commencement of work is imminent)
3) Excavation to establish root post-holes. To be carried out by hand or with an air excavation tool.
4) Insert posts and fill holes with concrete
5) Lay non-porous membrane over ground to be covered by base slabs
6) Spread slab mix on top of membrane and lay slabs.
7) Re-erected TPF to protect area until concrete is set
8) When post and slabs are dry dismantle fencing and finish off structure.

4.11.3. Arboricultural supervision will be employed during all work within the RPA

4.12. Resurfacing/repair of existing roads

4.12.1. Tree protection measures will remain in place until work commences and when removed all personnel to be working within the area are to be made aware of the extent and nature of the area.

4.12.2. All work within protected areas to be supervised at all times by project arboriculturist.

4.12.3. Stages of repair/replacement of existing hard surface within tree protection areas:

1) No plant machinery to be sited on any exposed rooting area
2) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
3) Remove TPF to allow access to area.
4) Plant machinery to run only on existing tarmac surface
5) Plant may be used to carefully peel up existing tarmac
6) Other hard landscape features are to be removed by hand (paving etc.) or carefully lifted with plant

7) Sub-base to be retained.
8) Sub-base to be enhanced if required
9) New tarmac surface to be installed

4.12.4. Should any roots over 25mm diameter be encountered during deconstruction of the old profile, their removal will only be carried out under arboricultural supervision and with the approval of the LPA.

4.12.5. Any new kerbing must be installed within the current hard construction profile.

4.12.6. No new excavation closer to the tree will be permitted.

4.13. Tree translocation

4.13.1. Stages for tree translocation using tree-spade:

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
2) Only the equipment capable of extracting a root ball of an appropriate size must be used. This should ideally be a tree spade or Newman tree frame. The diameter of the prepared root ball should be at least 10x the stem diameter measured at 1m from ground level[8].
3) The tree/s to be relocated are to be clearly marked and surrounding vegetation cleared with hand tool
4) The receiving hole is to be prepared. This should be by extracting an identical plug from the ground so the trees root ball will locate exactly in the pit. This can reduce the requirement for guying and staking.
5) Should the project arboriculturist feel that irrigation is required, typical perforated pipe can be dug into the ground outside of the root ball to an appropriate depth.
6) Strategic branch pruning to allow access to the moving equipment under and around the canopy is to be carried out.

[8] *BS4043:1989- Recommendations for transplanting root-balled trees.* London: British Standards Institute.

7) Tree to be lifted and placed in receiving pit (excavation and relocation must be carried out in one operation, resulting in minimal exposure of any roots to the air. If storage between operations is required, the tree must be stored out of extreme weather conditions and with the root ball protected from desiccation. If a significant period is to elapse between operations, then advice must be sought from the project arboriculturist)

8) If require the tree may be secured using over-ground guying methods or a more preferable underground methods, both are indicated in Appendix A of BS4043, shown below.

9) On completion and after initial watering, a layer of good quality organic mulch must be applied to the area of the root ball, to a depth of 50mm.

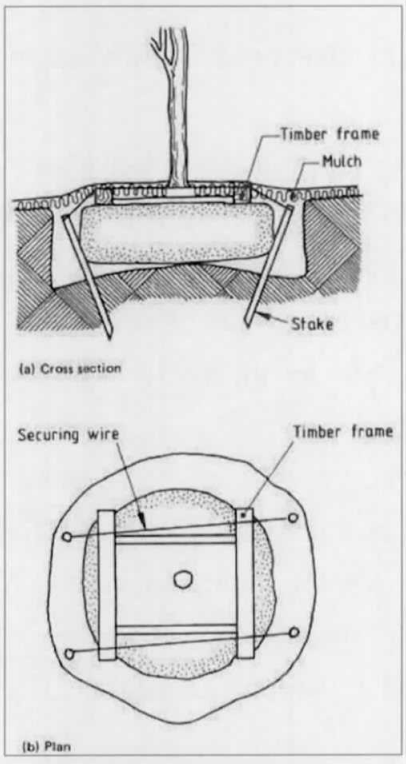


Figure 1 BS4043 Fig 6

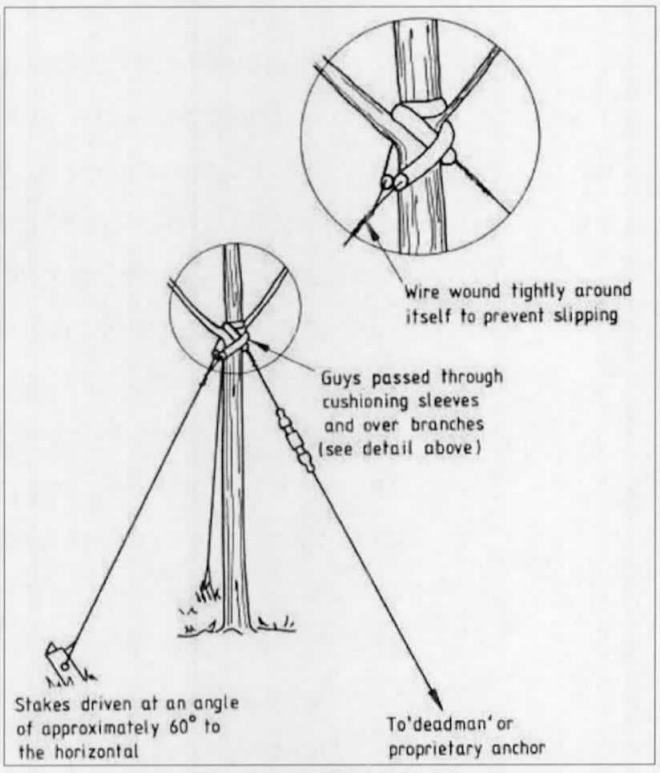


Figure 2 BS4043 Fig 2

4.13.2. To ensure that the water requirement of the tree is met, an irrigation schedule may be required. This is to be agreed between the project arboriculturist and client.

Details of any agreed schedule must be included in future management plans for the site.

4.13.3. Further reference can be made to BS4043 if required.

4.14. Excavation within RPAs

4.14.1. Stages of excavation within RPAs:

1) Contact project arboriculturist to hold pre-start site meeting, 'toolbox' talk and supervise the operation.
2) Remove TPF to allow access to area (if required).
3) Identify sensitive area.
4) Remove hard surface if necessary (see relevant section of this report).
5) Excavate with no-tines bucket, or by hand, under close supervision.
6) If roots are found, clear by hand around them.
7) If roots found are greater than 25mm diameter, then cover with damp hessian and keep moist until backfilled. If excavation requires all roots to be severed, then proceed as below.
8) Cleanly sever roots with bypass secateurs, loppers or pull cut saw at right angles to root. Avoid tearing or ripping the root.
9) Backfill as soon as possible to cover cut root ends.

24.2. If for whatever reason, the project arboriculturist feels that a tree's stability has been compromised during the operation, then the LPA shall be contacted and the arboricultural officer (or appropriate landscape officer) notified. A decision can then be made as to the best way forward.

4.15. Installation of boundary fencing within protected areas

4.15.1. Stages for installing wooden fence posts:

No plant machinery to be used in the area for whatever reason

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Remove TPF to allow access to area.
3) Dig postholes using hand tools, avoiding damage to the protective bark covering larger roots. Roots smaller than 25mm diameter may be pruned back using either secateurs or a hand saw, leaving a clean cut.
4) Damage or severance of roots above 25mm diameter must be avoided. If roots of this size are discovered, the hole should be relocated. If there are a large number of such roots it may be necessary to relocate the hole by half a fence panels length and adjust the fence panels accordingly.
5) Line hole with non-porous lining, for example, durable polyethene bag.
6) Insert post and fill post-hole with concrete to just below ground level.
7) Trim polyethene to ground level and fill with clean topsoil.

Robert Anderson FdSc, Nd Arb, MArborA
Arboriculturist

01 December 2016

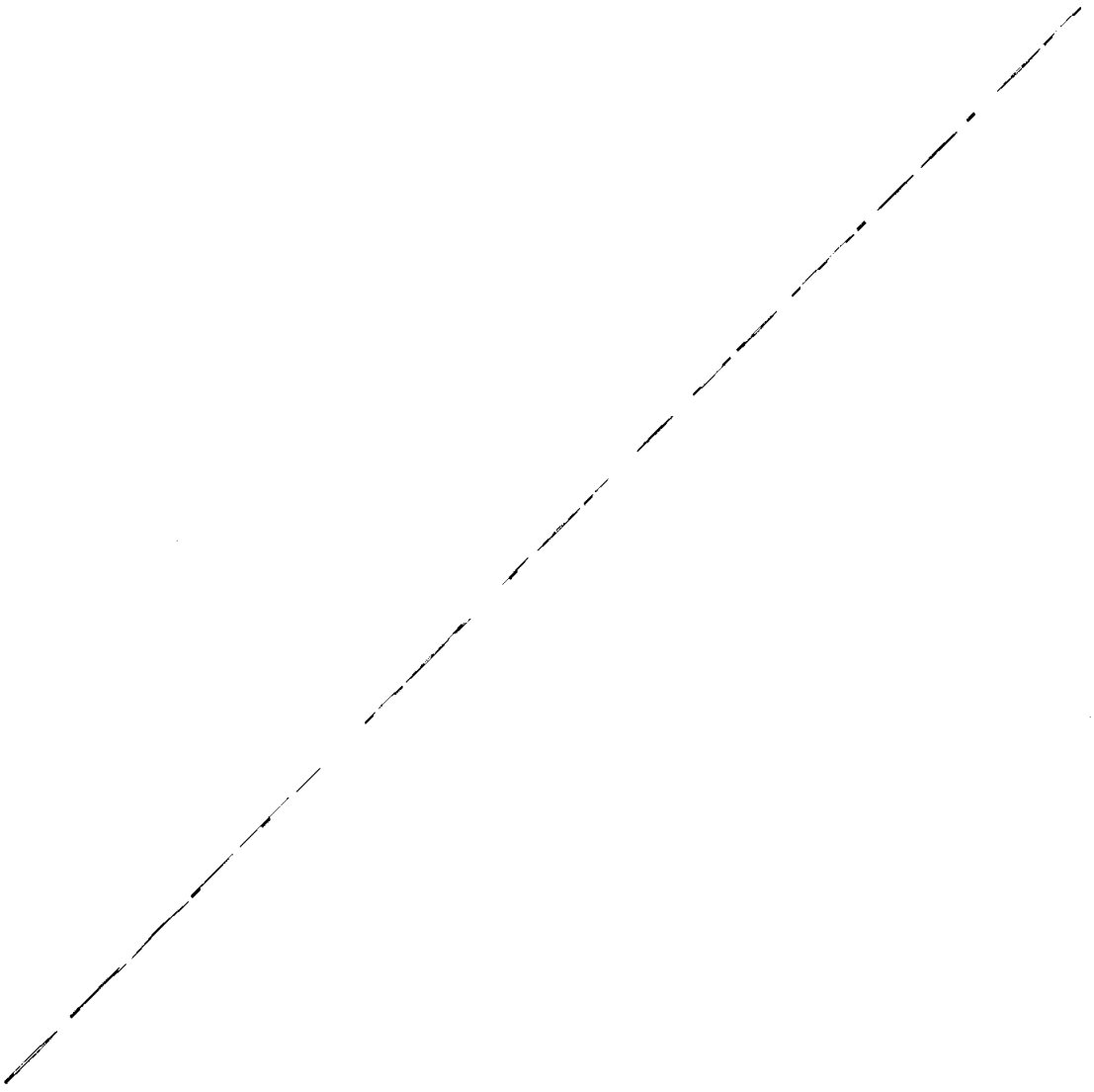
LIMITATIONS OF USE AND COPYRIGHT
All rights in this report are reserved. No part of it may be reproduced or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or stored in any retrieval system of any nature, without our written permission. Its content and format are for the exclusive use of the addressee in dealing with Insert site address. Until all invoices rendered by ACD Environmental to the Client have been paid in full, the copyright of any documents, forms, statements, maps, plans and other such material will remain vested in ACD Environmental and no unauthorised use of such material may be made by the Client or any person purporting to be acting on his/her behalf. It may not be sold, lent, hired out or divulged to any third party not directly involved in this site without the written consent of ACD Environmental ©

Appendix 1: Tree Work Schedule

No.	Name	Operation	BS Cat
T2	Crataegus Levigata 'Pauls Scarlett' (Hawthorn)	Remove or transplant	C1
T3	Crataegus Levigata 'Pauls Scarlett' (Hawthorn)	Remove or transplant	C1
T4	Crataegus Levigata 'Pauls Scarlett' (Hawthorn)	Remove or transplant	C1
T5	Fraxinus excelsior (Ash)	Crown lift to give 3m clearance	C1
G1	X Cupressocyparis leylandii (Leyland Cypress)	Prune back to boundary line	C3
G2	X Cupressocyparis leylandii (Leyland Cypress)	Prune back to boundary line	C2
G3	Beech (Fagus sylvatica)	Crown lift to give 3m clearance	C1
T6	Fraxinus excelsior (Ash)	Crown lift to give 3m clearance	C1
T7	Castanea sativa (Sweet Chestnut)	Crown lift to give 3m clearance	C1
T8	Ligustrum vulgaris (Privet)	Remove	C1

Appendix 2: Tree Protection Plan

PRI20814-03



WHY TREE PROTECTION IS NEEDED

1) **Soil compaction kills roots-** caused by plant movement and storage of materials within protected areas.
2) **Trenching severs roots-** many small roots grow within the top 600mm of soil. Even the removal of the top 200mm can cause damage.
3) **Soil pollution kills roots-** Dripping fuel storage or cement washings can contaminate the soil resulting in root death.
4) **Raising & lowering levels kills roots-** the soil used to increase levels can compact the underlying soil (see point 1). Lowering levels will remove roots causing damage to the tree.
5) **Bark and branch damage-** bark removal and branch damage can allow disease and fungi into the tree.

The impact of any of the above can take years to show- trees can have huge reserves of food and water.

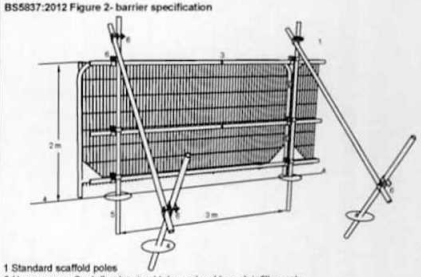
CONSTRUCTION EXCLUSION ZONE

Root protection areas (RPA) of retained trees within which all construction activity is restricted.

All trees that are being retained on site must be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers must be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection can be installed.

DEFAULT POSITION FOR THE TREE PROTECTION BARRIERS.

BS5837:2012 Figure 2- barrier specification



1 Standard scaffold poles
2 Heavy gauge 2m tall galvanized tube and weld 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 0.6m)
6 Standard scaffold clamps

Examples of alternative barrier designs can be found in the method statement. Should an alternative design be more viable and appropriate, it must be agreed with the project arboriculturist before its implementation.

SENSITIVE DEMOLITION

The existing feature(s) is within the RPAs of retained trees and therefore, to minimise impact on underlying roots is to be demolished as per the method statement & under the supervision of the project arboriculturist.

RESTRICTIONS WITHIN TREE PROTECTION AREAS

Inside the exclusion area of the fencing, the following shall apply:

- No mechanical excavation whatsoever
- No excavation by any other means without arboricultural site supervision
- No hand digging without a written method statement having first been approved by the project arboriculturist.
- No lowering of levels for any purpose (except removal of grass sward using hand tools)
- No storage of plant or materials
- No storage or handling of any chemical including cement washings
- No vehicular access
- No fire lighting

In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builders sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection areas of retained trees
- No fire shall be lit such that flames come within 5m of tree foliage.

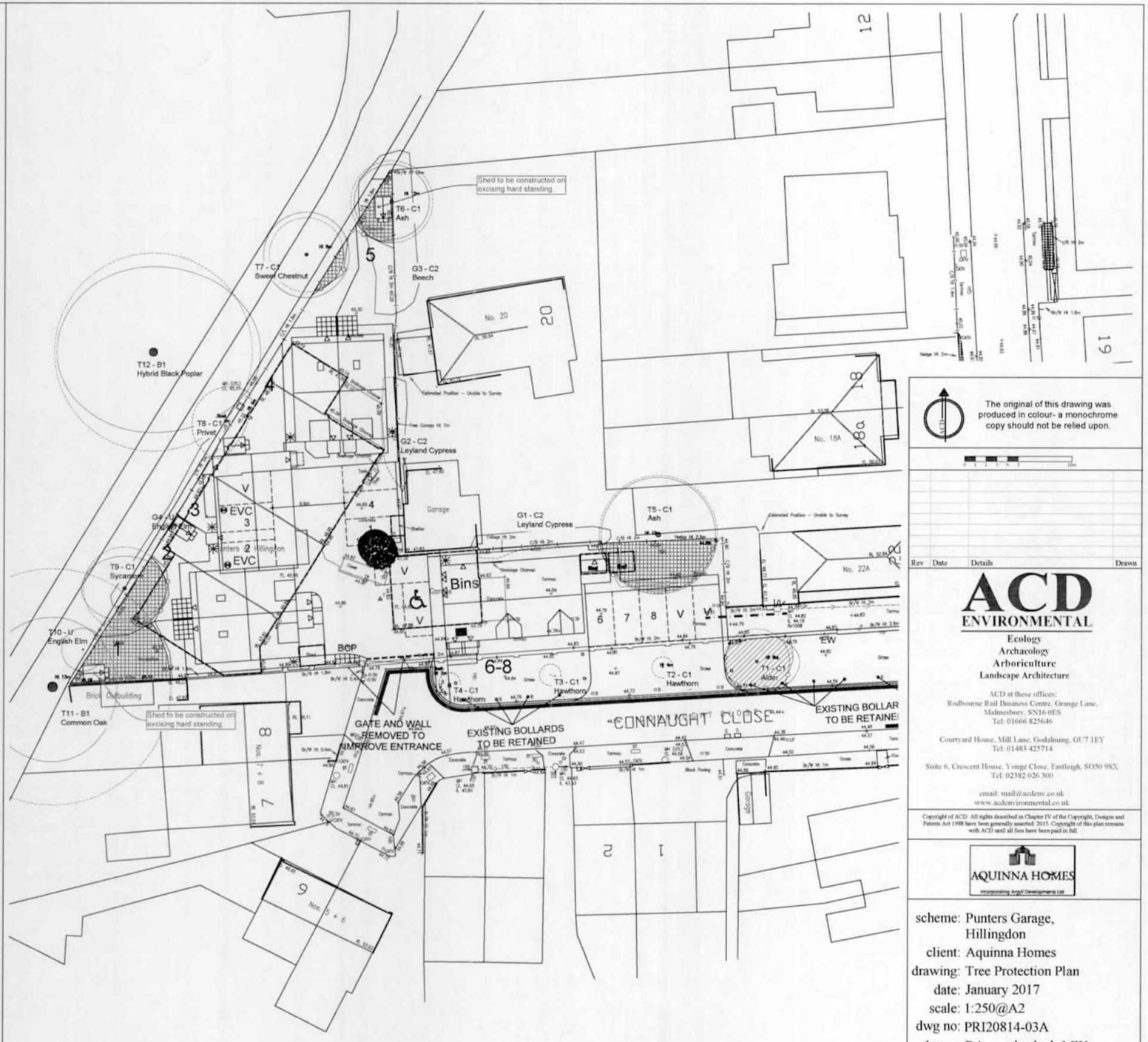
TREE TO BE REMOVED

A CATEGORY TREE
B CATEGORY TREE
C CATEGORY TREE
U CATEGORY TREE

ROOT PROTECTION AREA (RPA) FOR RETAINED TREES

Proposed layout

Existing Layout



The original of this drawing was produced in colour- a monochrome copy should not be relied upon.

Rev	Date	Details	Drawn

ACD ENVIRONMENTAL

Ecology
Archaeology
Arboriculture
Landscape Architecture

ACD at these offices:
Rodbourne Rail Business Centre, Grange Lane, Malmesbury, SN16 0ES
Tel: 01666 825646

Courtyard House, Mill Lane, Godalming, GU7 1EY
Tel: 01483 425714

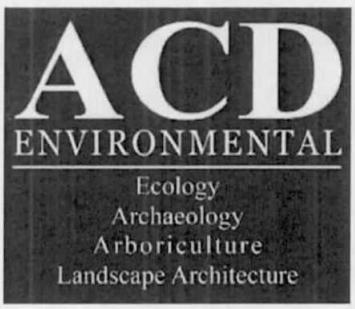
Suite 6, Crescent House, Yonge Close, Eastleigh, SO50 9SX
Tel: 02382 026 300

email: mail@acdenv.co.uk
www.acdenvironmental.co.uk

Copyright of ACD. All rights described in Chapter IV of the Copyright, Designs and Patents Act 1988 have been generally asserted. 2015. Copyright of this plan remains with ACD until all fees have been paid in full.

AQUINNA HOMES
Incorporating Argyll Developments Ltd

scheme: Punters Garage, Hillingdon
client: Aquinna Homes
drawing: Tree Protection Plan
date: January 2017
scale: 1:250@A2
dwg no: PRI20814-03A
drawn: RA checked: MW



Head Office
Rodbourne Rail Business Centre
Grange Lane
Malmesbury
SN16 0ES

Tel: 01666 825646

Surrey Office
Courtyard House
Mill Lane
Godalming
GU7 1EY

Tel: 01483 425714

Hampshire Office
Suite 6
Crescent House
Yonge Close
Eastleigh
SO50 9SX

East Anglia Office
PO Box 1272
CAMBRIDGE
CB1 0YR

Tel: 07825 868654

Email: mail@acdenv.co.uk
Website: www.acdenvironmental.co.uk

ECOLOGY * ARBORICULTURE
ARBORICULTURAL SITE MONITORING AND SUPERVISION * ARCHAEOLOGY
LANDSCAPE & VISUAL IMPACT ASSESSMENT * LANDSCAPE DESIGN & PLANNING
LANDSCAPE AUDIT * PROJECT MANAGEMENT * EXPERT WITNESS
LANDSCAPE MANAGEMENT