

LAND WEST OF STANHORN GROVE FELPHAM

ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT



WORTHING
HOMES

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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.. Protection can be provided to ensure all retained trees are protected throughout development.
- 1.2. The site is a small parcel of land within a much larger development that is nearing completion. The trees are located along the boundaries of the parcel. The development is to be located within the centre predominately away from retained trees.
- 1.3. There are incursions into the RPA's of trees T7 and T8 by proposed driveways and access point.
- 1.4. Two trees will need to be pruned to ensure suitable clearance to the proposed buildings.
- 1.5. Two tree preservation orders (TPO's) cover all the trees on site, with the references, TPO/FP/1/96 and TPO/FP/1/07.
- 1.6. The arboricultural method statement and tree protection plan include details of all tree protection measures required. Including Pre-commencement meeting and a monitoring program throughout the works on site.
- 1.7. 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.
- 1.8. 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.
- 1.9. **This Report is a revision (A) following Tree Officer comments on the 16.11.2018**

2.0 Introduction

- 2.1. Worthing Homes instructed ACD Environmental in September 2018 to prepare the following impact assessment.
- 2.2. Following the recommendations of the British Standard¹, 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: 17094-PL-2 received on the 5th October 2018 and The tree locations are based on the supplied tree survey from tree:fabrik ref: tf 1007/TS/100, dated February 2015.
- 2.5. The controlling authority is Arun District Council, who can be contacted at Arun Civic Centre, Maltravers Road, Littlehampton, West Sussex, BN17 5LF, Tel: 01903 737756.
- 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.

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

- 2.8. 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.
- 2.9. The RPA for each tree represents a minimum area in m² 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 site is a small parcel of land within a much larger development that is nearing completion. The trees are located along the boundaries of the parcel. The development is to be located within the centre predominately away from retained trees.

4.0 Planning Background

4.1.1. Comments have been received from the Tree Officer Mark Warwick dated 19th September 2018. Regarding trees in relation to the original layout. Since then ACD has discussed the layout with the design team, and amendments have been made to better retain the trees on site.

4.2. Tree Preservation Orders

4.2.1. ACD is aware of two tree preservation orders (TPO's) that cover all the trees on site, with the references, TPO/FP/1/96 and TPO/FP/1/07.

4.3. Trees proposed for removal & surgery

4.3.1. The following trees are proposed for removal:

No.	Name	BS Cat
T7	Quercus robur (Common Oak)	B1
T8	Quercus robur (Common Oak)	B1
T11	Quercus robur (Common Oak)	C1

4.3.2. All moderate to high-quality trees are to be retained.

4.3.3. With particular regard to tree T11, it was graded as category C with regards to its desirability for retention, and it lacked the necessary qualities for it to be a material constraint on the proposed development. This tree will be replaced with a

suitable replacement close by. This may be within the grass verge to Stanhorn Grove, subject to agreement with the local planning authority.

4.3.4. 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:

- 1) T7 reduction to the west of 3.3m leaving a crown radius to the west of 5m
- 2) T8 Crown reduction to the west of 1.8m leaving a crown radius of 3.7m

4.3.5. The lower two limbs of T7 have grown out of proportion to the rest of the crown, forming a one-sided crown bias to the west. The pruning back of this side of the crown will leave it with a more balanced crown shape.

4.4. Demolition, site clearance & archaeology

4.4.1. To ensure damage does not occur to trees highlighted for retention, tree protection fencing must be erected before ANY plant/vehicles entering site whatsoever.

4.4.2. No special demolition procedures need be observed on this site, other than respecting the tree protection fencing.

4.5. Construction within RPAs

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

4.6. Access and working room within RPAs

4.6.1. Space is required for scaffold erection and working room within the RPA of T8. Following the recommendations of 6.2.3 of the British Standard, ground protection could be employed to retain the underlying soil structure and avoid detriment to roots. However, given the operational issues with implementing ground protection, an alternative solution is proposed, in that the protected areas is extended

contiguous to the RPA² or greater. We are comfortable with this approach and that it will not be harmful to the health of the tree. Nonetheless, should the Council wish to see the installation of ground protection, this can be enforced by a suitably worded planning condition.

4.7. Permanent hard surfaces within RPAs

4.7.1. In section 7.4 of the British Standard, permanent hard surfacing within the RPAs of retained trees is addressed, and recommendations made.

4.7.2. In the case of T7 an offsite category B oak tree, there is to be an incursion into its RPA. This encroachment is considered marginal (<3% of the overall RPA) and will not be to the detriment of the tree. However, as recommended in section 5.3.1a) of BS5837 and to better aid the trees retention the protection fencing has been extended to cover an area greater than the tree's notional RPA.

4.7.3. In the case of T8, an offsite English oak tree, it has several incursions into its RPA due to the location of the highway access and its associated footpaths, this incursion equates to 18% of the normal RPA. Due to the issues on implementing the 'no-dig' surfacing with highways and highway paths, it has not been proposed in this instance. To ensure minimal impact to the rooting environment the road will be manually excavated under the on-site supervision of a competent person. Should any roots be found, they will be trimmed back with bypass secateurs. In addition, the TPF has been extended to an area greater than the notional RPA.

² Section 5.3a). *BS5837:2012 Trees in relation to design, demolition and construction- Recommendations*, London: British Standards Institute.

4.8. Protection fencing

4.8.1. 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.

4.9. Shade and future pressure to prune

4.9.1. Within the Tree Officer comments, future pressure to prune was cited as a concern, particularly with trees T1, T3 & T7.

4.9.2. The relationship between trees and dwellings is not subject to any definitive design advice and what individuals find acceptable is entirely subjective.

4.9.3. T7 and T8 will be reduced to by 2m and 2.5m respectively, to provide a suitable clearance to the proposed buildings. The relationship between the buildings and the trees is not uncommon within an urban environment.

4.9.4. Post-development pressure is often cited by LPAs as a reason for refusal. Usually based upon the opinion of the Tree Officer.

4.9.5. Trees are mentioned within a recent BRE publication³, within which it recommends that at least half the garden should receive a minimum of two hours of sunlight on 21st March:

- 1) Plot 1: The size and orientation of the garden is such that direct sunlight will be available to the house and garden in the afternoon. It is also considered that the trees are deciduous, and not in leaf on 21st March, then the test in the BRE publication is clearly met.
- 2) Plot 15: Given the orientation of the plot and the existing crown architecture of T8, the rear garden will not be hindered significantly by shading. Additionally the southern side of the property will have non-restricted sunlight for most of the day.

³ *Site Layout Planning for Daylight and Sunlight*. 2nd Edition. Littlefair. 2011

4.9.6. Notwithstanding the above, it is not unreasonable to prune trees in domestic environments. Therefore, if the LPA are concerned about the long-term landscape presence of the trees, a useful planning appeal decision (APP/C3620/A/09/2115285) outlines the strength of Tree Preservation Orders in ensuring the LPA have control in such situations and are able to restrict the level of pruning. The inspector clearly stated that ‘occupiers would be able to assess the situation prior to purchase and in relation to those trees subject to a TPO the Council would retain ultimate control’.

4.9.7. Trees are only one material consideration in planning applications and site layouts are designed to balance myriad constraints, often resulting in layouts where concessions need to be made to ensure housing numbers (and other needs) are met.

4.9.8. In summary, it is crucial to understand that the proposal can be built within the recommendations of the British Standard and that the acceptability of the juxtaposition of tree and building is something the future occupier needs to discern upon purchase.

4.10. Services

4.10.1. 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.

5.0 Arboricultural Method Statement

TO BE READ IN CONJUNCTION WITH THE APPENDED TREE PROTECTION PLAN REF: PRI21588-03

5.1. Phasing of operations & site supervision

5.1.1. 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	Pre-Start meeting	Site Manager, ACD, Arun DC Tree Officer	To check protection fencing is emplace and sign off.
4	Manual excavation for site entrance	Grounds contractor, site manager	See method statement
5	Construction	All groundwork staff and construction contractors, site manager	
6	Removal of protection barriers and landscape work	landscape contractor, site manager	See method statement

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

5.1.3. Bimonthly site visits will be undertaken by the project arboriculturist to check the tree protection measures. The findings of these visits will be relayed to the LPA Tree Officer, Site Manager and client via Email.

5.1.4. Supervision will require the arboriculturist to be present throughout the task, to ensure all the arboricultural objectives are met. If the task is to take a long period of time, provided the arboriculturist is satisfied, and after an initial 'tool-box talk', the

supervision may be reduced to telephone contact between the site foreman/contractor and arboriculturist.

5.2. Construction exclusions zone

5.2.1. 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.

5.2.2. 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.

5.2.3. 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.

5.2.4. 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.

5.2.5. 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.

5.2.6. 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.

5.3. Tree protection barriers

5.3.1. 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

5.3.2. 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

5.3.3. 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.

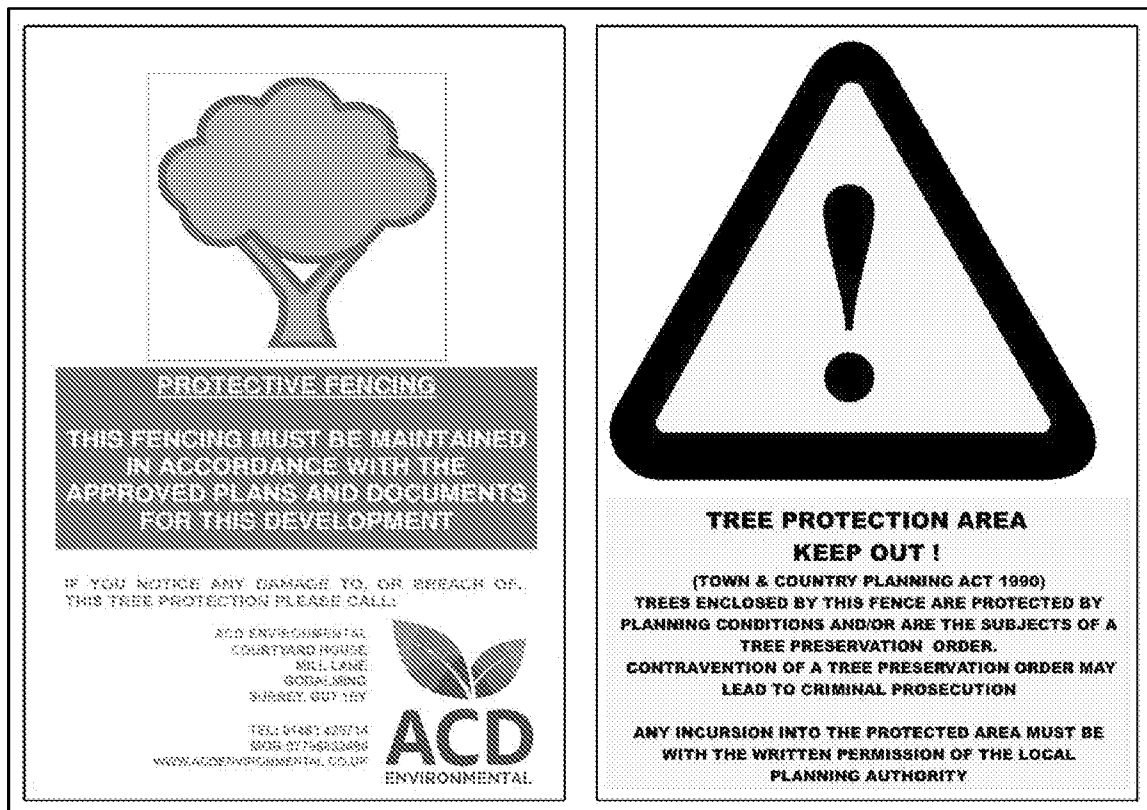
5.3.4. The default barrier construction is suitable for areas of high-intensity development and shall comprise of interlocking weld-mesh panels, well braced to

resist impacts by attachment to a scaffold framework that is set firmly into the ground. A detailed specification can be found on the TPP.

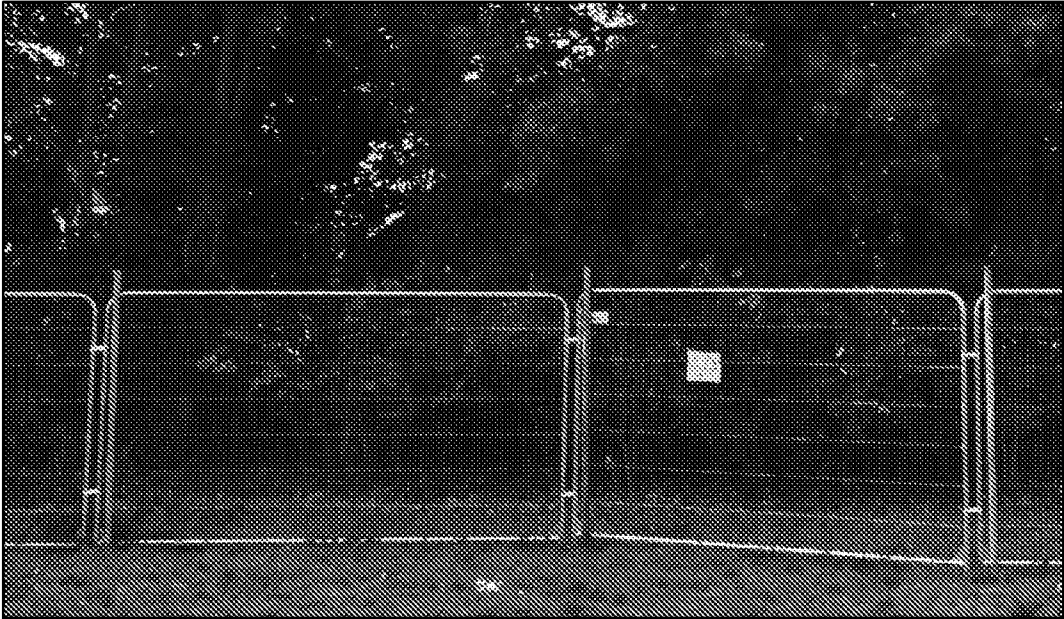
5.3.5. The images below are alternative barrier designs that have been successfully used on site and that ACD are happy to support if a variation from the default style is required. If such a variation is necessary, the approval of the project arboriculturist will be obtained prior to any implementation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

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

5.3.7. 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

5.4. Ground protection

5.4.1. 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.

5.4.2. Stages of ground protection installation:

- 1) No plant machinery to be used in the area of ground protection for whatever reason
- 2) 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

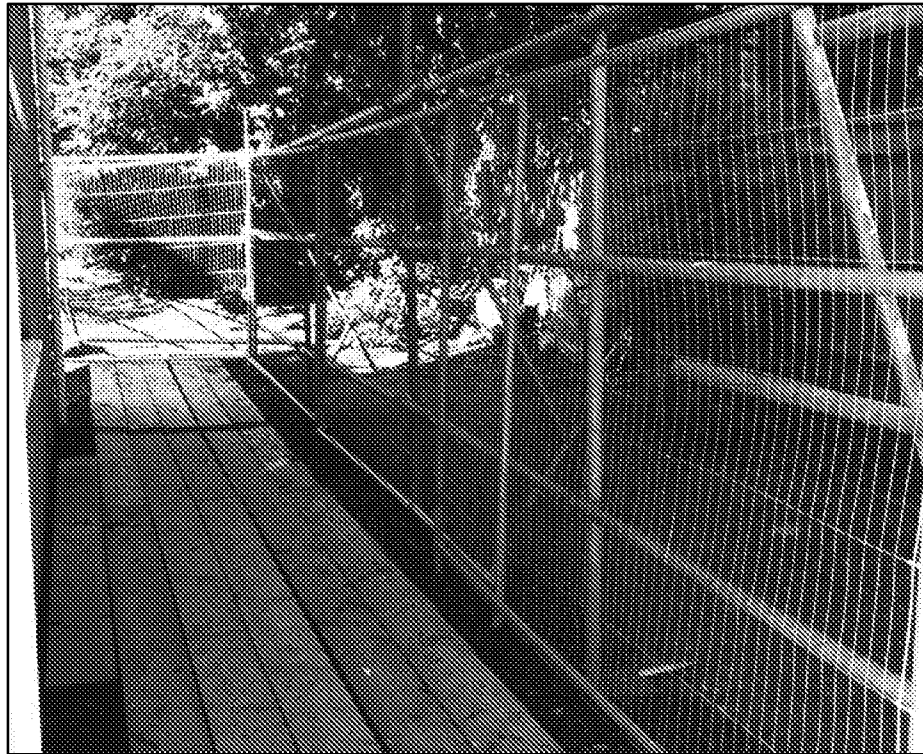
5.4.3. Any scaffolding required within the area will be erected with the uprights placed on spreader boards.

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

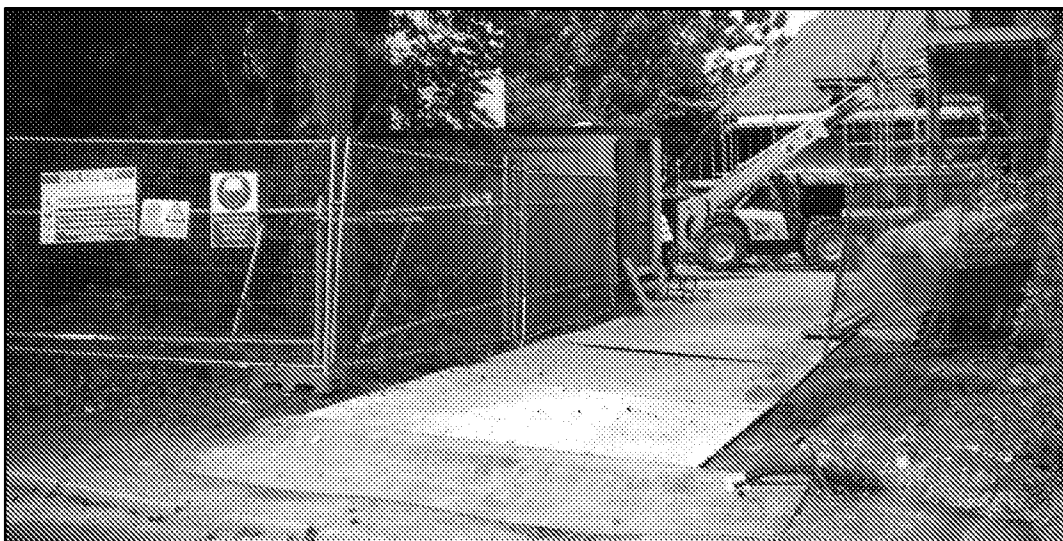
5.4.5. A single thickness of boarding laid on the soil surface will provide sufficient protection for pedestrian loads. However, for wheeled or tracked construction traffic movements within the RPA, ground protection will involve the use of temporary cellular confinement systems, reinforced concrete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

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

5.4.7. 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

5.5. Tree surgery and removal

5.5.1. All tree surgery are listed at Appendix 1

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

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

5.5.4. All work will be carried out in accordance with BS3998⁴ industry best practice and in line with any works already agreed with the council.

5.5.5. 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.

5.5.6. The statutory protection^{5 6} 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.

5.5.7. 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.

5.5.8. 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.

⁴ *BS3998:2010- Recommendations for Tree Work*. London: British Standards Institute

⁵ *Wildlife and Countryside Act*. (1981) London: HMSO.

⁶ *Countryside and Rights of Way Act*. (2000) London: HMSO.

5.6. Soft landscaping

5.6.1. 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.

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

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

5.6.4. 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.

5.6.5. 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)

5.6.6. 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.

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

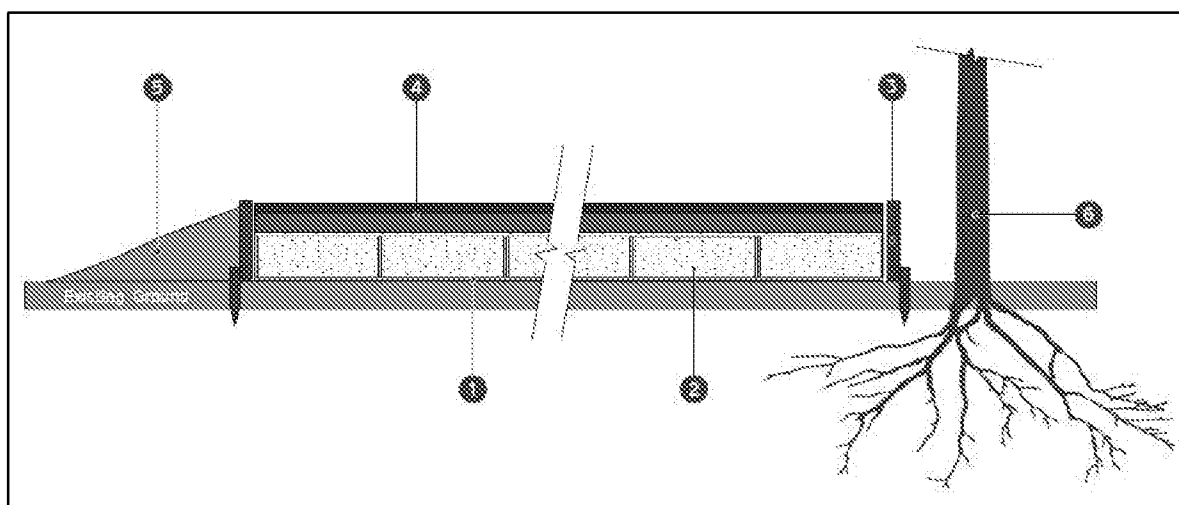
5.6.8. Any excavation for planting pits must be dug using hand tools only.

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

5.7. Installation of 'no-dig' surface

5.7.1. To ensure that tree roots, within the ground under this proposed surface, continue to survive during and after construction a cellular confinement system (CCS) such a ProtectaWeb⁷ of 75-200mm depth is to be used.

5.7.2. The following example CCS spec is courtesy of Wreckin Products and shows an asphalt finish. Other surfaces can be used, and similar CCS are available from other suppliers.



- 1 Root-tex 30 geotextile
- 2 70-200mm deep ProtectaWeb tree root protection system infilled with 4/20 clean angular stone to BS EN 13242 / EN 12620
- 3 Treated timber edging (or other edging detail acceptable)
- 4 Asphalt surface to engineer's details
- 5 Soil graded to edging (if required)
- 6 Existing tree

5.7.3. Stages for Installation of the cellular confinement surface:

- 1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work
- 2) Dismantle TPF and re-erect in secondary location as shown on TPP
- 3) Remove existing vegetation by using a specific herbicide (as advised by a specialist) or manual removal with hand tools only. Agreed

⁷ Wreckin Products, www.wreckinproducts.com, 01543 440440.

removal of shrubs, saplings or trees, within the protected areas of retained trees 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) Retain all original ground levels after vegetation removal. No excavation whatsoever.
- 5) Remove any existing hard surfaces (paving, tarmac etc.) Hand tools should be used if possible. If machinery is required for this operation, it must be used only on existing surfaces or outside the protection areas and tree canopies (approval from project arboriculturist must be sought before using machinery). The sub base of existing surfaces or foundations should be left in situ where possible to avoid unnecessary root disturbance and provide a base for the new surface.
- 6) Install a non-woven geotextile (such as Root-tex 30) directly over soil grade level (levelled where necessary, by non-compacted washed sand) and fix in place.
- 7) Lay the cellular system over the geotextile, which is secured open under tension during the infill process with steel staples or wooden pegs.
- 8) Install kerbs and edgings directly on top of existing soil grade level. For light structures, a treated peg and board may be acceptable. For more substantial structures, railway sleepers, haunched concrete with road pins, drilled kerbstones, gabions or cast in situ kerbs will be appropriate.
- 9) Fill the cellular system ensuring any machinery works only on already filled areas. Typical infill consists of no fines angular granular material 20-40mm, which will remain uncompacted.
- 10) Cover with a non-woven geotextile (Root-tex 30 or similar).
- 11) Install porous wearing surface.

5.7.4. Any variation to the above specification must meet the following design criteria for low-invasive surfaces to provide the conditions for continued tree survival and growth:

- Maintain oxygen diffusion through new surface to rooting area (5-12% by volume⁸)
- Maintain sufficient passage of water to the rooting area (12-40% by volume⁹)
- Avoid compaction by maintaining a soil structure sufficient to sustain root growth (soil bulk density below 1.4g/cc¹⁰).

5.7.5. Site analysis of the soil type and its structural characteristics will be required prior to determining the specific depth of products to be adopted for example, footpaths normally require a depth of 75mm and, 100mm to 200mm depths are used for residential driveways, while greater depths may be required for the passage of heavier traffic such as for construction access and delivery vehicles.

5.7.6. If ground levels are to be raised more than 150mm this should be achieved by the use of a granular material, which does not inhibit vertical gaseous diffusion. For example no-fines gravel, washed aggregate, structural soil (min. 20% sand content) or cobbles.

5.8. Installation of boundary fencing within protected areas

5.8.1. Stages for installing wooden fence posts:

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

- 1) Remove TPF to allow access to area.
- 2) Dig postholes using hand tools, avoiding damage to the protective bark covering larger roots. Roots smaller than 25mm diameter may

⁸ Smith, R. J. (2006). *Tree Roots in the Built Environment*. HSO

⁹ Coder, D. K. (2000). *Tree Root Growth Requirements*. University of Georgia

¹⁰ Harris, C. M. (2004). *Arboriculture, Tree Management of Shade Trees and Vines*.

be pruned back using either secateurs or a hand saw, leaving a clean cut.

- 3) 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.
- 4) Line hole with non-porous lining, for example, durable polyethene bag.
- 5) Insert post and fill post-hole with concrete to just below ground level.
- 6) Trim polyethene to ground level and fill with clean topsoil.

5.9. Installation of underground services

5.9.1. 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.

5.9.2. 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:

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

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

- 7) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
- 8) Remove just enough tree protection fencing to allow access to area and facilitate trenching.
- 9) Remove any surface vegetation or existing hard surfaces using hand tools.
- 10) Using an air-pick excavate the trench, keeping to minimum dimensions required.
- 11) 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.
- 12) Feed in services.
- 13) Backfill trench with 200-300mm depth of excavated soil, or a mixture of excavated and imported topsoil to BS3882: 2015, firming down with heels.
- 14) Repeat step 7 until trench is filled.
- 15) Re-erect tree protection fencing as per approved plan.

5.9.4. 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.

5.9.5. 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.

5.9.6. Reference can be made to NJUG Vol 4¹¹ for guidance, but any approach must be approved by the project arboriculturist and brought to the attention of the local authority tree officer.

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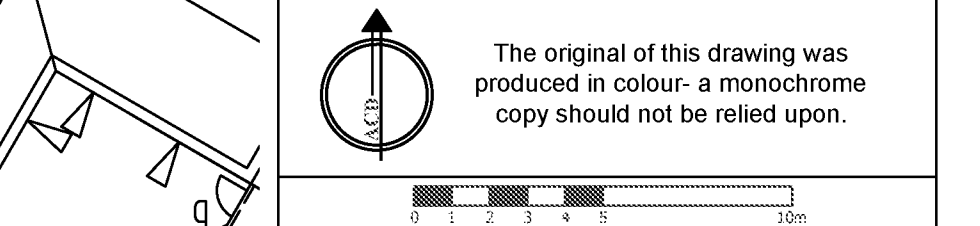
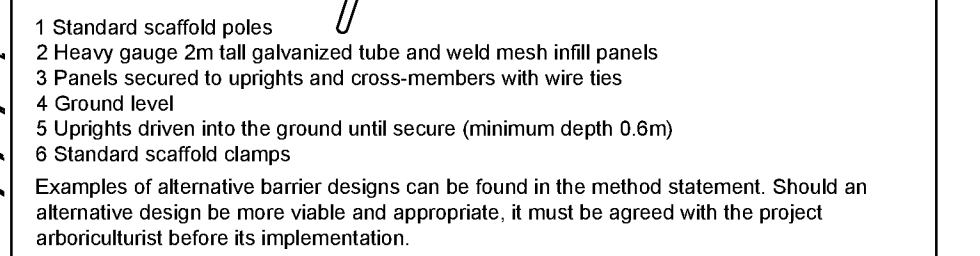
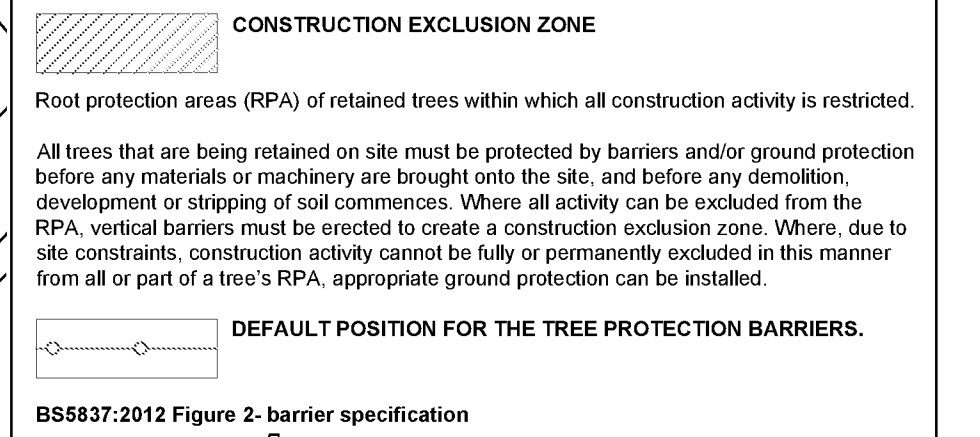
¹¹ National Joint Utilities Group. (2010). *Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook*. NJUG.

Appendix 1: Tree Work Schedule

No.	Name	Operation	BS Cat
T7	Quercus robur (Common Oak)	Reduction to the west side of the crown by 3.3m leaving a crown radius to the west of 5m.	B1
T8	Quercus robur (Common Oak)	Crown reduction to the west of 1.8m leaving a crown radius of 3.7m to the west. Crown lift on south side to provide a 3.5m clearance over proposed road.	B1
T11	Quercus robur (Common Oak)	Remove Tree	C1

Appendix 2: Tree Protection Plan

PRI21588-03



Rev	Date	Details	Drawn
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scheme: Land West of Stanhorn Grove,
Felpham
client: Worthing Homes
drawing: Tree Protection Plan
date: October 2018
scale: 1:200@A1
dwg no: PRI21588-03
drawn: RA checked: MW



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