

BONHAMS FIELD YAPTON

ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT

ACD
ENVIRONMENTAL

Ecology
Archaeology
Arboriculture
Landscape Architecture



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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.	Site clearance and construction.....	7
3.6.	Highways & visibility splays	7
3.7.	Protection fencing	7
3.8.	Shade and future pressure to prune	7
3.9.	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.....	10
4.4.	Site storage, parking, welfare facilities, etc.....	14
4.5.	Tree surgery and removal.....	14
4.6.	Soft landscaping	15
4.7.	Installation of underground services	16
4.8.	Installation of boundary fencing within protected areas	18
	Appendix 4: Tree Protection Plan	20

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 site currently comprises two open grass fields measuring about 3.2 hectares. Separating the fields and along some of the site boundaries are maintained hedgerows. All trees within the survey are either growing within boundary hedgerows or are off-site trees. The proposed development comprises of fifty-six residential units with associated road network and infrastructure.
- 1.3. Only two trees are proposed for removal, T26 Monterey Cypress and T13 Hawthorn, both are category U due to diminished vitality.
- 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 proposed layout has very little impact on existing tree within and neighbouring the site.
- 1.6. Trees covered by TPO TPO/Y/1/10 will not be affected by development.
- 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.

2.0 Introduction

- 2.1. Seaward Properties Limited instructed ACD Environmental in October 2016 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 sketch layout drawing, ref: SK02-G and site survey, ref: 1651/01A.
- 2.5. The controlling authority is Arun District Council, who can be contacted at: Civic Centre, Planning Services, Maltravers Road, Littlehampton, BN17 5LF, Tel: 01243 863141.
- 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. 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.
- 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 is implemented before any commencement on site.

3.0 Arboricultural Impact Assessment

3.1. Overview of proposed development

3.1.1. The proposed development comprises fifty-six units with associated road network and infrastructure. The development has a very limited impact on the existing tree stock.

3.2. Tree Preservation Orders

3.2.1. Along the eastern boundary, a tree preservation order TPO/Y/1/10 covers off-site trees T15 - T24. The southwestern section of the site falls within a conservation area. However, this section is devoid of on-site trees and has no construction works proposed.

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 U: T26 (Monterey cypress) very poor vitality
- Category U: T13 (Hawthorn) poor quality

3.4.2. Both the trees proposed for removal are purely for best arboricultural practice and reasons of safety.

3.4.3. The existing gap through H1 will have to be widened by 6.5m to facilitate the main access road and pathways. The removal of this section equates to only a small percentage (<6%) of the overall length of the retained hedge. The visual impact of this widening will be limited due to its positioning within the site.

3.5. Site clearance and construction

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

3.5.3. The construction of all buildings, roads and pathways is proposed outside the RPAs of all retained trees.

3.6. Highways & visibility splays

3.6.1. The highway entrance to the site is positioned that no remedial tree works or removals are required.

3.7. Protection fencing

3.7.1. 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.

3.8. Shade and future pressure to prune

3.8.1. ACD have worked with the design team from the start of 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.

3.9. Services

3.9.1. Full details of the service and utility provisions for the site remain to be finalised at the time of writing. 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: SEA20727-03

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	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	ACD, site manager, groundwork, foreman, demolition foreman	To 'sign-off' protection prior to any plant activity, demolition & groundworks on site
4	Construction works	All construction staff	
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 weldmesh 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 is 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. Site storage, parking, welfare facilities, etc.

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

4.4.2. 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.

4.4.3. 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.

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

4.5. Tree surgery and removal

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

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

4.5.3. All work will be carried out in accordance with BS3998² industry best practice and in line with any works already agreed with the council.

² BS3998:2010- *Recommendations for Tree Work*. London: British Standards Institute

4.5.4. 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.

4.5.5. 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.

4.5.6. 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.

4.5.7. 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.

4.6. Soft landscaping

4.6.1. 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.

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

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

4.6.4. 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.

4.6.5. 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)

³ *Wildlife and Countryside Act.* (1981) London: HMSO.

⁴ *Countryside and Rights of Way Act.* (2000) London: HMSO.

4.6.6. 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.

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

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

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

4.7. Installation of underground services

4.7.1. 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.

4.7.2. 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 the case, the following methodology must be followed:

4.7.3. 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 an 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.

4.7.4. 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.

4.7.5. 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.

4.7.6. Reference can be made to NJUG Vol 4⁵ for guidance, but any approach must be approved by the project arboriculturist and brought to the attention of the local authority tree officer.

4.8. Installation of boundary fencing within protected areas

4.8.1. 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 TechArborA
Arboriculturist

04 November 2016

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.

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Appendix: Tree Protection Plan

SEA20727-03

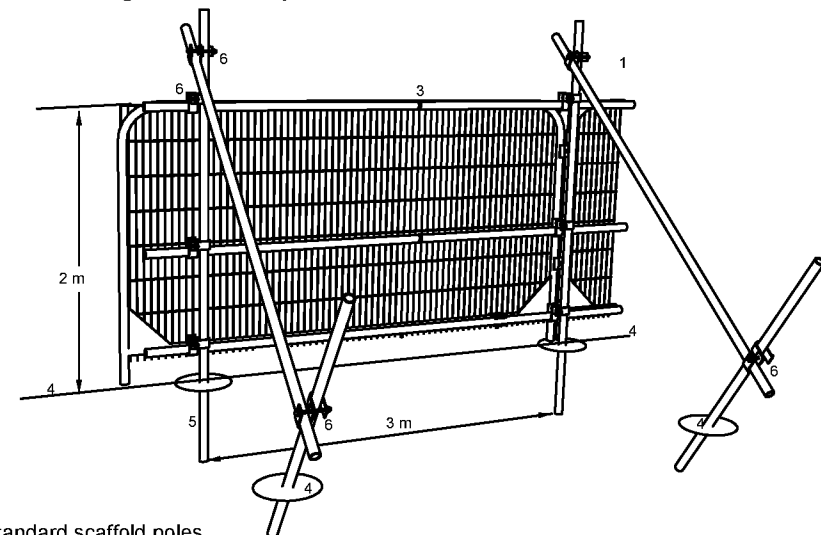
- 1) **Soil compaction kills roots-** caused by plant movement and storage of materials within protected areas.
- 2) **Trenching severs roots-** many small roots grow within the top 600mm of soil. Even the removal of the top 200mm can cause damage.
- 3) **Soil pollution kills roots-** Drilling fuel storage or cement washings can contaminate the soil resulting in root death.
- 4) **Leaving & lowering levels kills roots-** the soil used to increase levels gets compacted under the 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.

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

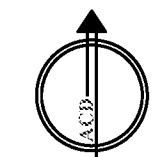
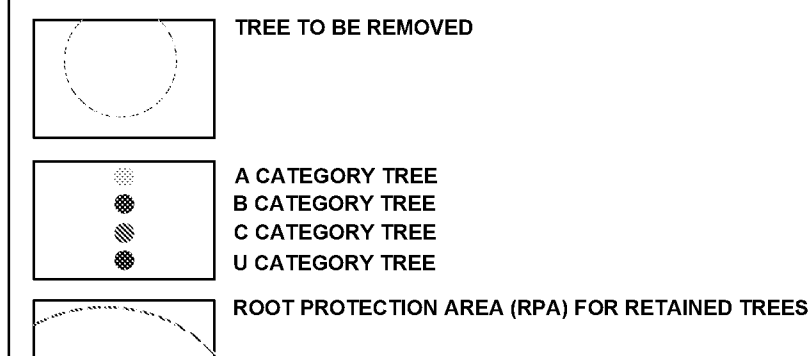
All trees that are being retained on site must be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers must 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 a or part of a tree's RPA, appropriate ground protection can be installed.

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.



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



Rev	Date	Details	Drawn
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scheme: Bonhams Field
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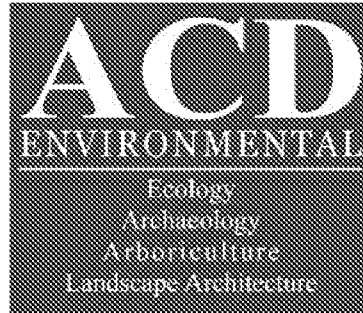
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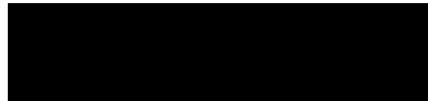
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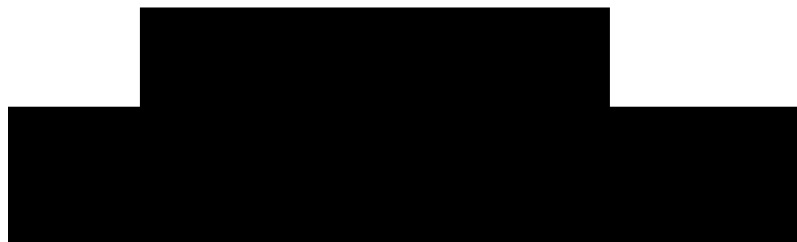


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