

# ARBORICULTURAL IMPACT ASSESSMENT

ABTEC LTD

LAND AT UPPER HORSEBRIDGE ROAD,  
LOWER HORSEBRIDGE,  
HAILSHAM,  
EAST SUSSEX,

REF NO.3936\_RP\_002

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## CONTENTS

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<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1. INTRODUCTION .....</b>	<b>3</b>
<b>2. SITE VISIT AND OBSERVATIONS .....</b>	<b>5</b>
<b>3. ARBORICULTURAL IMPACT ASSESSMENT .....</b>	<b>7</b>
<b>4. GUIDANCE FOR ARBORICULTURAL METHOD STATEMENT .....</b>	<b>9</b>
<b>5. CONCLUSION .....</b>	<b>12</b>
<b>6. RECOMMENDATIONS .....</b>	<b>12</b>
<b>7. APPENDIX 1 - TREE SURVEY KEY .....</b>	<b>13</b>
<b>8. APPENDIX 2 - TREE SURVEY SHEETS .....</b>	<b>15</b>
<b>9. APPENDIX 3 - TREE SURVEY PLAN .....</b>	<b>17</b>
<b>10. APPENDIX 4 – TREE PROTECTION PLAN .....</b>	<b>18</b>
<b>11. APPENDIX 5 – TREE SURGERY SCHEDULE .....</b>	<b>19</b>
<b>12. APPENDIX 6 TREE PROTECTION SPECIFICATION .....</b>	<b>20</b>

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## EXECUTIVE SUMMARY

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- S.1** This report is produced in connection with a planning application for the construction of 10 new residential properties with associated gardens, parking and access road on land adjacent to Upper Horsebridge Road, Lower Horsebridge, Hailsham, East Sussex.
- S.2** 14 individual trees, 10 groups and 1 hedge are the subject of this report which has been written in accordance with British Standard, BS 5837:2012 'Trees in relation to demolition, design and construction – Recommendations'.
- S.3** 2 C grade trees, 3 C grade groups, a section of 1 C grade group and a section of a C grade hedge will be removed to facilitate the development. All trees to be removed are C grade trees of low quality and value, while the higher quality trees are retained. To mitigate against this loss, replacement planting will be undertaken within the site as part of the landscape designs for the scheme.
- S.4** Excavation for the construction of garage foundations are required within the outer RPA of T6. This incursion is minor and traditional foundations can be used, however the excavations should be carried out under arboricultural supervision.
- S.5** New hard surfacing will be required on the edge of T6's RPA for the new driveways. These sections will be constructed using a minimal depth construction method, such as a cellular confinement system and topped with permeable surfacing.
- S.6** Where it is necessary to erect scaffolding within the RPA of T6 this will be protected using ground protection boards.
- S.7** Provided the tree protection and working methods detailed in this report are followed the impact on the retained trees will be minimal.

## 1. INTRODUCTION

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- 1.1. Brief:** Lloyd Bore have been instructed by Abtec Ltd to carry out a survey of significant trees on land adjacent to Upper Horsebridge Road, Lower Horsebridge, Hailsham, East Sussex, in accordance with the principles set out in British Standard BS 5837:2012, 'Trees in relation to design, demolition and construction – Recommendations' (The BS) and to prepare the following information to accompany a planning application:
- details of significant trees including an assessment of condition using BS 5837 categorisation.
  - a plan showing tree survey information, categorisation and root protection areas.
  - an assessment of the impact of the proposal on trees and any wider impact that it has on local amenity and any impact trees may have on the proposed development.
  - guidance for an arboricultural method statement dealing with the protection and management of the trees to be retained.
  - a schedule of tree works to facilitate construction.

- 1.2. The Proposal:** This report accompanies a planning application for the construction of 10 new residential properties, with associated gardens, parking and access road leading from Upper Horsebridge Road.
- 1.3. Site description:** The site is a roughly 'L' shaped plot of land located in the village of Lower Horsham, to the north of Hailsham. The site consists of open grassland with self-set scrubby trees and dense areas of undergrowth scattered throughout the area. Larger mature tree belts screen the site from the agricultural field to the south and the sports ground to the west, while a thick hedge screens the site from Upper Horsebridge Road, which runs along the eastern boundary. To the north the site borders the garden and car park of The King's Head public house, which sits in the middle of the village.
- 1.4. Summary of the general impact of development on trees:** Development can adversely impact upon trees in a number of different ways, if arboricultural issues are not considered at an early stage of the development process. Considered and careful planning will prevent valuable trees being lost to development, damaged during the demolition and construction phases, or lost following completion of development from pressures to prune or remove.
- 1.5.** Damage to the branches or trunk may be quite obvious, but it is damage caused to the below ground portion of the tree which is less obvious and may have the most devastating long term effect on the future health and safe retention of a tree.
- 1.6.** Tree roots can be asphyxiated and die if the rooting environment becomes compacted or soil structure damaged or contaminated. This can easily occur, particularly on clay soils, even with the passage of light vehicles or pedestrians. It is important, therefore, that the root protection area (RPA)<sup>1</sup> is left undisturbed. Where this is unavoidable the disturbance can be minimised by following a strict working methodology and through innovative engineering design. Building lines should be at least 2m outside the RPA to allow the movement of materials, the erection of scaffolding around the new structure and the installation of new services.
- 1.7.** Trees are long lived organisms, which take time to mature, and if their protection is considered at an early stage, they can complement and increase the value of a development. Construction and demolition activities, including removal of existing hard surfaces, changes of land levels and services routes, must be considered at the design stage to achieve an appropriate relationship between existing trees and new structures.
- 1.8. Legislation:** From a conversation with Nick Marshall from Wealden District Council's planning department on 17th October 2016, it is understood that none of the trees are subject to a tree preservation order (TPO) and that the site is not located within a conservation area. This information is correct at the time of writing this report but can be subject to change. It is therefore the responsibility of any persons undertaking tree work operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory checks.

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<sup>1</sup> Root protection area (RPA) - A layout design tool indicating the minimum area surrounding the tree that contains sufficient rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. RPAs are assessed on the basis of the formula set out in clause 4.6 of BS 5837, calculated by multiplying the radius squared by 3.142. Clause 4.6.2 of BS 5837 states that the RPA may be changed in shape, taking into account local site factors, species tolerance, condition and root morphology.

- 1.9. The Occupiers Liability Act (1957 and 1984) places a duty of care upon tree owners to ensure that no reasonably foreseeable harm takes place due to tree defects. Therefore this report recommends works for safety reasons as well as work required to facilitate the proposal.
- 1.10. Common law allows pruning back to the property boundary line, the overhanging branches and roots as long as this does not contravene any statutory protection. However if the work is not carried out in accordance with best practice and the tree(s) becomes unbalanced and/or diseased as a result of the work, the owner may take civil action. Whilst common law does not require the tree owner to be consulted, it is courteous to inform him/her of the proposed works.
- 1.11. **Ecological constraints:** The Wildlife and Countryside Act 1981, as amended, The Conservation of Habitats and Species Regulations 2010 and the Countryside and Rights of Way Act 2000, provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees. These could impose significant constraints on the use and timing of access to the site. It is the responsibility of the main contractor and tree surgery contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works. Unless competent to do so, the advice of an ecologist must be sought.

## 2. SITE VISIT AND OBSERVATIONS

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- 2.1. **Site visit:** A site visit was undertaken on 29th September 2016. The weather was overcast with intermittent rain.
- 2.2. **Methodology:** The trees are inspected from ground level only. Whilst every effort is made to ensure that the comments relating to the trees surveyed are accurate it must be noted that no climbing of trees, internal inspections or excavations of the root areas have been undertaken. All trees with a trunk diameter of 75mm or above are surveyed. All dimensions are accurately measured on-site unless otherwise indicated.
- 2.3. Hedges and shrub masses are identified where appropriate. Information collected is in accordance with recommendations in subsection 4.4.2.5 of BS 5837 and includes species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition and remaining contribution. Each tree is then allocated one of four categories (U, A, B or C) to reflect its suitability as a material constraint on development. Surveyed trees are identified with a prefix 'T' and a unique number on Tree Survey Plan 3936\_DR\_003. Groups of trees are identified with the prefix 'G' and hedges with the prefix 'H'. The tree canopies and their spread are shown with green shapes and Root Protection Areas (RPAs) are indicated by a solid blue line. The label attached to each tree shows the individual tree number and the grading of the tree
- 2.4. **Limitations:** Trees are a dynamic living organism and due to their changing nature and other site circumstances or weather events, this report and any recommendations made are limited to a 12 month period from the survey date. Any alterations to the site or the development proposals could change the current circumstances and may invalidate this report and any recommendations made.
- 2.5. The constantly changing nature of trees and their interactions with site conditions mean that no tree can be guaranteed 100% safe. Even trees in good condition at the time of an inspection can suffer damage by alterations to the site conditions or as a result of adverse weather. Regular inspections can help to identify potential problems before they become acute. Absence of recommendations for work to

a given tree within this report does not imply that a tree is safe, and likewise it should not be concluded that a tree will be made safe following the completion of any recommended work.

- 2.6. Tree survey plan:** Tree Survey Plan 3936\_DR\_003 is based on a topographical survey supplied by the client. Some trees not included on the topographical survey have also been included in the tree survey. Where this has occurred trees have been plotted by eye whilst on site. No liability for the accuracy of the plotting is accepted and distances should be checked on site. The Tree Survey Plan can only be used for dealing with the tree issues in relation to design. This can be found at Appendix 3. Below ground constraints are represented by the RPA (shown as a dashed blue line). Above ground constraints consist of the existing crown spreads of the trees and are represented by the solid outlines.
- 2.7. Soil type:** An assessment of soils on-site was carried out by a desktop analysis using the National Soil Resources Institute website which identified the soils as likely to be freely draining slightly acid loamy soils. This is a guide only and detailed on-site soil analysis should be undertaken by the project engineer to inform the foundation design.
- 2.8. The subject trees:** A total of 14 individual trees, 10 groups and 1 hedge are the subject of this report which has been written in accordance with BS 5837. 7 individual trees and 2 groups have been categorised as B grade trees of moderate quality and value. 7 individual trees, 8 groups and 1 hedge have been categorised as C grade trees of low quality and value. No trees have been categorised as A grade trees of high quality and value, or as U grade trees which should be removed for reasons of sound arboricultural management. The categories are explained in Appendix 1.
- 2.9. Comments on specific trees:** The highest quality trees on the site are T6, T8, T10, G5 and G8 which are located along the southern boundary. As well as being the tallest trees within the site, they provide a good screen and are prominent in the landscape, especially T6 and T10. Away from the site boundaries the majority of trees are low quality self-set trees, growing in dense areas, with G2 and G10 being particularly dense.

### 3. ARBORICULTURAL IMPACT ASSESSMENT

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- 3.1. Summary of the impact of the development upon trees:** 2 C grade trees, 3 C grade groups, a section of 1 C grade group and a section of a C grade hedge will be removed to facilitate the development. Replacement planting will be undertaken within the site as part of the landscape design for the scheme.
- 3.2.** Excavations for the construction of garage foundations are required within the very extremity of T6's RPA. This incursion is minor and as such traditional foundations may be used. Excavations should be carried out under arboricultural supervision.
- 3.3.** Where new hard surfacing is required within the RPA of T6 for the construction of the driveway and turning head, this will be constructed using a minimal depth construction method such as a cellular confinement system and topped with a permeable surface material.
- 3.4. Root protection areas:** The root protection areas shown on the tree survey plan show the theoretical root protection areas based on the ideal circular rooting area. The British Standard allows for the shape of the RPA of retained trees to be altered under certain circumstances (see below), but not reduce its area whilst still providing adequate protection for the root system:
- The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age and condition and presence of other trees.
  - The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services).
  - The soil type and structure.
  - Topography and drainage.
  - Where any significant part of a tree's crown overhangs the provisional position of tree protection barriers, these parts may sustain damage during the construction period. In such cases, it may be necessary to increase the extent of tree protection barriers to contain and thereby protect the spread of the crown. Protection may also be achieved by access facilitation pruning.
- 3.5. Tree protection plan:** The survey plan is an aid to design and should not be used on-site, following planning consent. The tree protection plan which shows trees to be retained, trees to be removed and tree protection measures should be used for this purpose. This can be found at Appendix 4 as drawing number 3936\_DR\_007A.
- 3.6. Trees to be removed:** Trees to be removed are identified on the tree protection plan (TPP) as red dashed circles with red centres. To facilitate the development the following trees will be removed: T4, T5, G2, G3, G4, a section of G6 and a section of H1. To mitigate against this loss, replacement planting will be undertaken within the site as part of the landscape designs for the scheme.
- 3.7. Trees to be pruned:** The crown of T6 will be pruned back to give 2m clearance from the building line of the new garage to facilitate the erection of scaffolding. All tree surgery works required to facilitate the development or for obvious safety or arboricultural reasons can be found in Appendix 5.
- 3.8. Incursions into the root protection area:** Excavations are required with the outer edge of T6's RPA for the foundations of a garage. The incursion is very minor and as such a traditional foundation may be used. The excavation will be carried out using a mechanical digger and a toothless bucket sited outside the RPA. The excavation should be carried out under arboricultural supervision and root

pruning carried out only where appropriate and necessary. The edges of the excavation will be lined with impermeable plastic sheeting to prevent alkali burn to roots within the soil.

- 3.9. Where new hard surfacing is required within the outer RPA of T6 for the construction of a new driveway and access road, this will be constructed using a minimal depth construction method such as a cellular confinement system and topped with a permeable surfacing.
- 3.10. Where it is necessary to allow access and erect scaffolding within the RPA T6, this will be protected using ground protection boards. Further guidance is detailed in section 4 of this report.
- 3.11. Roots of retained, removed and newly planted trees have the potential to cause damage to structures, foundations and services. This should be taken into consideration by the project engineer when designing these elements.
- 3.12. Although it should be avoided during the construction phase it may be necessary for machinery and materials to pass through the RPA of retained trees. Should such incursions be necessary they must either be restricted to existing roadways and entrances designed to bear the weight of vehicles, or specialist ground protection methods used such as those detailed in section 4 of this report.
- 3.13. Precautions must be taken during facilitating works (including tree works) to avoid compaction or contamination of the soil which may be detrimental to the long term health and retention of the tree.
- 3.14. **Protection of retained trees:** An arboricultural method statement that can be referred to in a planning condition can be used to ensure that trees are successfully retained on a development. To be effective, it must specify working procedures and methods of protection in a realistic and workable way for on-site personnel, and must be adhered to throughout the duration of the scheme.
- 3.15. The details for each section of the method statement should form a key part of the site induction process for any person undertaking works near retained trees, to ensure that each individual knows their responsibility with regard to tree protection issues.
- 3.16. Guidance for an arboricultural method statement for this site can be found in section 4 of this report. The location of protective measures, usually a combination of barriers and ground protection, can be found on the tree protection plan.
- 3.17. The layout of the tree protection measures should also take into account the layout of the site compound, parking, vehicular movements, movements and storage of materials and lifting operations.
- 3.18. **Impact on amenity:** Although a number of trees are to be removed, the vast majority of the trees on the site are retained within the scheme. All the trees to be removed are classed as C grade trees of low quality and value and with the exception of T4, T5 and the section of H1, all are self-set trees in dense groups. The loss of these trees will be mitigated by replacement planting as part of the landscape design for the scheme. The scheme has been specifically designed to retain the higher quality trees around the boundaries of the site and hence retain the screening they provide. Given the retained screening and the replacement planting with higher quality trees, in arboricultural terms the impact on amenity will be negligible.



## 4. GUIDANCE FOR AN ARBORICULTURAL METHOD STATEMENT

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- 4.1. An arboricultural method statement is intended to detail the protective measure to be put in place around the root protection area of all retained trees and to specify the working methodology where site operations may have an effect on the trees, including the requirement for arboricultural supervision if deemed appropriate. Once final plans, site compound locations and service runs have been finalised (usually post planning) a site specific arboricultural method statement should be prepared. This can also take into account any specific planning conditions stipulated by the local planning authority or protect areas for new planting.
- 4.2. **Tree protection plan (TPP):** The TPP (Appendix 4) is based on the information, measurements and layouts provided by the client and details the protection measures needed to protect the retained trees through the duration of the scheme. Its use should be limited to dealing with tree related issues only and measurements shown should be checked on site. The tree protection measures consist of tree protection barriers and/or ground protection measures which define the construction exclusion zone (CEZ). The CEZ is an area based on the theoretical RPA which is to be protected during the scheme and whose shape may change if known to be influenced by on-site factors.
- 4.3. **Tree protection barriers:** The approximate location of the tree protection barriers is shown on the TPP, however their precise location should be agreed upon by the arboricultural consultant, the building contractors and the local tree officer at a pre-commencement meeting. Guidance for the design of the protective measures is shown in Appendix 6. Where protective fencing does not entirely protect the crowns of retained trees care must be taken to protect them from the movement of plant, materials or high vehicles or from the use of cranes or piling rigs. When such movements occur near to the crowns of retained trees a banksman should be used to ensure that no damage occurs. Any damage should be reported to the project arboriculturist.
- 4.4. **Ground protection:** In areas where it is not possible or appropriate to install protective barriers, ground protection measures must be used within the CEZ. Where it has been agreed during the planning process that vehicles, pedestrians or materials require movement through the CEZ the retained trees should be protected through a combination of barriers and ground protection measures which together protects the entire CEZ. As above, the precise location of the ground protection measures should be agreed at a pre-commencement meeting before any works begin on site. Where scaffolding is to be sited within the CEZ, this will be erected on scaffolding boards on a layer of sharp sand. Builders sand must not be used due to the high salt content, which may cause burning of the tree roots. Further guidance for ground protection can be found in Appendix 6.
- 4.5. **Works within the CEZ:** Only works agreed with the local planning authority and addressed in the arboricultural method statement may be carried out within the CEZ of retained trees.
- 4.6. **Installation of new surfacing:** Where existing non permeable hard surfaces are to be repaired or renewed only the tarmac surface may be removed using hand held machinery and the sub base must be left intact. Other than where outlined in section 3 of this report, should any other new hard surfacing be required within the CEZ of retained trees, the excavations and disturbance to the tree roots must be kept to a minimum to avoid long term health issues for the tree. To avoid damage to tree roots from compaction or mechanical damage, a minimal depth dig construction method such as a cellular confinement system should be used. This spreads the surface pressure beneath the surface and helps prevent compaction of the soil. This no dig system should be topped with a porous surface to permit gaseous and water diffusion between the surface and the soil beneath. When non-

permeable materials are present above roots, the gas cannot diffuse out and is trapped in the soil around the roots. When concentrated, carbon dioxide is detrimental to the development and function of tree roots and consequently the whole tree. It is also essential that the tree roots are able to maintain an adequate supply of water and oxygen from the soil around it, which non-porous materials hinder. The use of bitumen along with the use of other non-permeable materials within the CEZ is therefore prohibited.

- 4.7. **Installation of new services:** It is often difficult to establish the exact routes of service runs until contractors are appointed and construction is in progress, however at the planning stage all efforts should be made to ensure that any new services run outside the CEZ of any retained tree. Where it is unavoidable for new services to be routed around the CEZ or existing services require upgrading, conventional trenching techniques are not acceptable. Ideally no dig methods such as directional drilling should be used, however if this is not possible the methodology used must comply with NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. This stipulates that hand digging must be used with roots worked around carefully and roots only cut as a last resort. No roots on excess of 25mm should be cut without referring to the project arboriculturist and roots less than 25mm should be pruned with a sharp saw or secateurs to leave a clean small wound. The cut end should then be wrapped in clean hessian sacking which should be removed before back filling. Ideally any excavations should be undertaken only under arboricultural supervision.
- 4.8. **Site hoardings:** Where site hoarding runs through the CEZ of a retained tree, it must be carefully positioned to avoid contact with the trunk or branches of the tree and allow room for movement in winds. Post holes should be dug using hand tools and the hole lined with impermeable plastic sheeting to prevent alkaline burn of roots in the soil. Site hoardings may form part of the tree protection barriers, if positioned in accordance with the TPP.
- 4.9. **Site storage, washing points and contamination:** During construction there should be no materials stored or dumped within the protective fencing and no vehicles or plant may be parked within the CEZ to avoid soil compaction. Where compaction has occurred, advice should be sought from an arboriculturist and a structural engineer on decompaction methods. Fuel storage areas should be outside the CEZ and no fueling or discharge of potential contaminants should occur within 10m of a retained tree or where there is a risk of surface run off into the CEZ.
- 4.10. **Site compound:** Site cabins and temporary buildings may be located within the CEZ, but only with the consent of the project arboriculturist and the Local Planning Authority. These must be placed on suitable ground protection measures and may form part of the protective barriers around the CEZ. Care must be taken to ensure there is no discharge of waste into the CEZ, or exhaust fumes or hot air into the canopy from generators or kitchen facilities to prevent damage to the retained trees.
- 4.11. **Landscape:** Landscape operations as part of the exterior works phase have the potential to cause significant damage to a tree protected through the building phase, if works within the CEZ are not carried out with care. In addition the removal of protective fencing to permit landscape works may inadvertently allow other contractors, vehicles or materials into the CEZ. Once the fencing is removed the outline of the CEZ should be marked with spray paint, road pins or another obvious means. All works must be carried out by hand and soil works kept to a minimum with the soil level not increased by more than 100mm to avoid suffocation of the roots or the ingress of pathogens into the trunk. Materials should be transported in wheel barrows running on boards within the CEZ and pedestrian movements minimised beyond the boards to reduce the risk of soil compaction.

- 4.12. Auditable system of arboricultural site monitoring:** Monitoring tree protection and supervising any agreed works within RPAs including a schedule of site specific events requiring input of supervision. Report on findings as an audit trail of compliance for the client and local authority (ref. subsection 6.3 of BS 5837).
- 4.13. Pre-commencement site meeting:** Before any site works including site clearance begin, a site meeting between the site manager and project arboriculturist should be held and to which the LPA tree officer will be invited. The purpose of the meeting will be to discuss tree protection measures detailed in this document and to agree the sequence of events where they can impact on trees. At this meeting a programme of tree protection will be agreed by all parties to form the basis of any monitoring and/or supervision arrangements between the project arboriculturist, the developer and the local authority.
- 4.14. Site management:** It is the responsibility of the main contractor to ensure that the details of this report are known, understood and followed by all site personnel. As part of the site induction, all site personnel who could have an impact on trees should be briefed on specific tree protection requirements. Copies of the report and plans should be available on site at all times.
- 4.15. Site monitoring and supervision:** Once work begins on site, the project arboriculturist should visit site at an interval agreed at the pre-commencement site meeting. The interval should be sufficiently flexible to allow the supervision of key works as they occur. These are likely to include the following although this is not an exclusive list:
- tree pruning and felling and site clearance close to trees;
  - installation of tree protection barriers;
  - installation of ground protection; and
  - any agreed works in root protection areas.

The project arboriculturist's role is to monitor compliance with arboricultural conditions and advise on any tree problems that arise or modifications that become necessary. Following every site visit, a report will be sent to the local authority tree officer and the client/developer. Tree site supervision reports are useful not only as an audit trail for the client and local planning authority, showing compliance to tree protection conditions, but also to provide evidence of retention and protection of 'ecological features of value'.

Should any issues or compromises occur during the development which have an impact on any retained tree it is the responsibility of the site manager to inform the project arboriculturist who will notify the LPA tree officer of the issue and any proposed remedial works.

- 4.16. Contact details for the relevant parties:** To include:
- The site manager or other person on site responsible for ensuring tree protection is in accordance with that agreed.
  - The LPA tree officer and/or case officer.
  - The project arboriculturist.
  - Any other relevant party.

## 5. CONCLUSIONS

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- 5.1. T4, T5, G2, G3, G4, a section of G6 and a section of H1 will be removed to facilitate the development. All are C grade trees of low quality and value. To mitigate against this loss, replacement planting will be undertaken within the site as part of the landscape design for the scheme.
- 5.2. Excavations in the outer edge of T6's RPA for the construction of a new garage will be undertaken using a mechanical digger operating outside the RPA. Under arboricultural supervision shallow scrapes will be taken and root pruning undertaken by the supervising arboricultural consultant only where appropriate and necessary. The edge of the excavation will be lined with impermeable plastic sheeting to prevent alkali burn to roots within the soil.
- 5.3. New hard surfacing will be required on the edge of T6's RPA for the construction of a driveway and turning head. This will be achieved using a minimal depth construction method such as a cellular confinement system and topped with a permeable surface.
- 5.4. Where it is necessary to allow access and erect scaffolding within the RPA of T6 the soil structure will be protected using ground protection boards.
- 5.5. Provided the tree protection and working methods detailed in this report are followed the impact on the retained trees will be minimal.

## 6. RECOMMENDATIONS

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- 6.1. The line of protective barriers and ground protection boards within the site must be in place as shown on the tree protection plan prior to any works beginning on site (other than tree works) and before any plant or materials are delivered to the site.
- 6.2. The routes of any proposed services must be assessed by the arboriculturist and a detailed arboricultural method statement must be written where the services run through the CEZ of any retained tree.
- 6.3. The proposed foundation design must take into account any tree to be retained, trees that have been removed and new trees to be planted.
- 6.4. A copy of this report and the detailed method statement must be kept on site and must be referenced as part of the site induction of any persons working near to, or within the CEZ of the retained trees.
- 6.5. The working methodology outlined in this report and detailed in the arboricultural method statement must be observed by all site personnel and supervised at key stages by the project arboricultural consultant. Short supervision reports should be written after each inspection in a format suitable for submission to the local planning authority if required.
- 6.6. Where archaeological or contaminated land reports and hard and soft landscape design plans are prepared for the site, these must be cross referenced with this arboricultural impact assessment to ensure there are no conflicts in land treatments, recommendations or retention plans.

## 7. APPENDIX 1 - TREE SURVEY KEY

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The schedule tree survey lists the trees and groups included in the survey and details the following:

- Species;
- Height (m);
- Trunk diameter generally at 1.5 m above ground level (mm);
- Branch spread (m);
- Height of crown clearance and height and compass direction of first significant branch(m);
- Age class (newly planted, Y , SM , M , over-mature, veteran);
- Physiological condition (good, fair, poor, dead);
- Structural condition (as determined from the ground);
- Estimated years remaining (<10, 10-20, 20-40, >40);
- Category grading (U or A to C).

**Species:** Species of tree with both common and botanical names.

**Ht:** Height in metres.

**Ult ht:** Ultimate height likely to be achieved for this tree in this location.

**Dia:** Diameter of stem in millimetres at 1.5m above ground level for single-stemmed trees or in accordance with Annex C of BS 5837 for multi-stemmed trees or trees with low forks or irregular stems.

**NSEW:** Crown spread at the four cardinal points.  $\emptyset$  = average crown radius.

**Cr ht 1:** Height of first significant branch above ground level and direction of growth.

**Cr ht 2:** Height of canopy above ground level.

**Cond:** Physiological and structural condition. G = good; F = fair; P = poor; D = dead.

**Life exp:** Estimated remaining contribution in years.

**Age Class:**

**NP** = Newly planted.

**Y** = Young - an establishing tree that could be easily transplanted.

**SM** = Semi-mature - an established tree still to reach its ultimate height and spread and with considerable growth potential.

**EM** = Early mature - a tree reaching its ultimate height and whose growth is slowing, however it will still increase considerably in stem diameter and crown spread.

**M** = Mature - a tree with limited potential for further significant increase in size although likely to have a considerable safe useful life expectancy.

**OM** = Over mature - a senescent or moribund tree with a limited useful life expectancy.

The report includes the following categories as indicated in BS 5837:2012.

To be assessed in respect of arboricultural, landscape and/or cultural (incl. conservation), values.

**Category A:** Those of high quality and value, those in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

**Category B:** Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).

**Category C:** Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm.

**Category U:** Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

**Criteria (subcategories):**

1. mainly arboricultural value.
2. mainly landscape value.
3. mainly cultural value.

## 8. APPENDIX 2 - TREE SURVEY SHEETS

Tree Ref No.	Common name	Species	Height (m)	No. of Stems	Stem diam. (mm)	Canopy Spread				Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading
						N (m)	E (m)	S (m)	W (m)							
T1	Ash	Fraxinus excelsior	11.0	1.0	550.0	7.0	7.0	8.0	7.0	0.1	EM	F	F	Off-site tree growing on edge of pub car park. Very low crown. Ivy on stem. Twin stemmed above 1.5m with included union. Growing above scrubby area.	20+	B2
T2	Wild cherry	Prunus padus	7.0	2.0	200; 250	4.0	6.0	6.0	4.0	1.0	EM	F	F	Off-site tree growing 0.2m from sub-station and partially in contact with electrical equipment.	10+	C2
T3	Apple	Malus domestica	4.0	1.0	190.0	2.0	3.0	3.0	4.0	0.2	SM	F	F	Small tree growing approx. 6m inside site. Uneven crown shape. Low screening and amenity.	20+	C2
T4	Oak	Quercus robur	7.0	1.0	340.0	5.0	4.0	6.0	6.0	0.5	SM	F	F	Tree growing 2m inside boundary, ditch 1m to east of tree. Low form, moderate amenity.	20+	C2
T5	Oak	Quercus robur	8.0	1.0	330.0	4.0	2.0	3.0	5.0	1.0	SM	F	F	Tree growing above dense group of self-set trees. Very uneven crown due to overtopping by T6. Deadwood in crown.	20+	C2
T6	Oak	Quercus robur	14.0	4.0	400; 350; 450; 400	8.0	8.0	8.0	9.0	2.0	M	F	F	Tree growing above boundary line group. Triple stemmed from base with central stem bifurcating again at 1.3m. Included unions in structure. Ivy on stems prevents full inspection and very dense in upper crown. Ditch immediately to north of tree. Good screening and amenity.	40+	B2
T7	Ash	Fraxinus excelsior	10.0	1.0	290.0	6.0	5.0	1.0	2.0	2.5	SM-EM	F	F	Tree growing 2.5m inside hedge line. Overtopped by T8. Tree supplements screening provided by G5	20+	B2
T8	Ash	Fraxinus excelsior	11.0	3.0	250; 280; 300	9.0	7.0	4.0	6.0	3.0	M	F	F	Boundary line tree above G5. Overhangs into site. Canker in union at 1m with minor decay. Ditch immediately of tree. High amenity and screening value. Lean to north. Consider removal to allow younger oak to rear room to grow.	20+	B2
T9	Oak	Quercus robur	9.0	1.0	390.0	5.0	6.0	5.0	5.0	2.0	SM	G	F/P	Tree growing above scrappy group approx. 8m inside boundary line. Minor deadwood. Tree has lost leader and crack formed in remaining union at 4m. Crack extends 20cm below union. Good shape but poor long term retention.	10+	C2
T10	Oak	Quercus robur	18.0	1.0	1300.0	11.0	11.0	10.0	10.0	1.0	M	G	G/F	Boundary line tree growing between site and sports field. Part of screen. Largest tree on site and key feature of the area. Deadwood in crown typical of species and age.	40+	B2
T11	Oak	Quercus robur	8.0	1.0	440.0	6.0	6.0	6.0	4.0	1.0	SM-EM	G	F	Tree growing approx. 6m inside boundary line. Low form with spreading crown. Uneven crown due to competition from trees in G9. Good long term potential.	20+	B2
T12	Oak	Quercus robur	8.0	1.0	340.0	5.0	6.0	5.0	4.0	0.5	SM	F	F	Tree growing approx. 1m inside site boundary forming part of screen between site and sports ground. Good screening and good long term potential	20+	B2
T13	Beech	Fagus sylvatica	9.0	1.0	520.0	6.0	8.0	5.0	4.0	0.1	EM	F	F/P	Tree growing above boundary group. Congested crown above 2.5m with crossing limbs. Good screening 20+	20+	C2
T14	Ash	Fraxinus excelsior	9.5	2.0	180; 220	5.0	5.0	2.0	4.0	2.0	SM	F	F	Tree growing above boundary line group providing screening and amenity. Twin stemmed from 1m with included union.	20+	C2
G1	Mixed group	Mixed group	4.0	1.0	100.0	2.0	2.0	2.0	2.0	0.1	SM	F	F	Group of elder, hawthorn and ash growing along boundary with pub. Ash is growing from old stump. Low screening and amenity value.	10+	C2
G2	Mixed group	Mixed group	7.0	1.0	150.0	2.0	2.0	2.0	2.0	0.1	Y-SM	F	F	Group of self-set elm, blackthorn and damson growing within site boundary. Dense growth in areas provides some screening.	20+	C2
G3	Blackthorn and hawthorn	Prunus spinosa and Crataegus monogyna	5.0	1.0	100.0	2.0	2.0	2.0	2.0	0.1	Y-SM	F	F	Group of self-set trees growing up to 5m into site. Minimal screening and amenity as view obstructed by boundary hedge.	20+	C2
G4	Mixed group	Mixed group	6.0	1.0	150.0	2.0	2.0	2.0	2.0	0.1	Y-SM	F	F	Self-set mixed group of hawthorn, blackthorn, damson, elder and hazel growing within site. Low screening and amenity. Obscured from outside by boundary group. Some dead stems and failed stems in group.	10+	C2

3936\_RP\_002A | ARBORICULTURAL IMPACT ASSESSMENT  
FOR: LAND AT UPPER HORSEBRIDGE ROAD

STATUS: PLANNING

Tree Ref No.	Common name	Species	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread				Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading
						N (m)	E (m)	S (m)	W (m)							
G5	Mixed group	Mixed group	10.0	1.0	250.0	4.0	4.0	4.0	4.0	0.1	EM	G	F	Boundary line group of hazel, hawthorn, field maple, ash, oak and elm growing between site and access road for sub-station. Provides good screening and amenity to site. Slightly patchy in places. Ditch immediately to north of group. Some trees leaning in with decay at base of old coppice stools.	20+	B2
G6	Mixed group	Mixed group	10.0	1.0	150.0	3.0	3.0	3.0	3.0	0.1	SM-EM	F	F	Group of hawthorn, blackthorn, hazel and ash growing inside boundary line. Likely self-set trees and overtopped by neighbouring trees in G5. Low screening and amenity value due to location and form. Multiple dead stems and trees.	20+	C2
G7	Oak	Quercus robur	6.0	1.0	200.0	5.0	5.0	5.0	5.0	0.1	Y-SM	F	F	Small group of oaks growing within the site. Uneven crowns due to group pressure. Overtopped by T8 Low screening value.	40+	C2
G8	Mixed group	Mixed group	10.0	1.0	300.0	5.0	5.0	5.0	5.0	0.1	EM	F	F	Boundary line group of field maple, ash, hawthorn and hazel growing on small bank at top of ditch. Growing as continuation of G5. Majority multi-stemmed. Overhang site by up to 7m. Good screening and amenity.	20+	B2
G9	Mixed group	Mixed group	6.0	1.0	100.0	2.0	2.0	2.0	2.0	0.1	SM-EM	F	F	Boundary line group of oak, hawthorn, blackthorn, elm, elder, hazel and field maple growing between site and sports ground. Good screening and amenity.	20+	C2
G10	Mixed group	Mixed group	5.0	1.0	100.0	2.0	2.0	2.0	2.0	0.1	Y-SM	F	F	Dense group of self-set elder, blackthorn and hawthorn growing along edge of site behind boundary line group. Low amenity.	20+	C2
H1	Hawthorn	Crataegus monogyna	3.0	1.0	75.0	0.5	0.5	0.5	0.5	0.1	SM	G	G/F	Well maintained dense boundary hedge growing between site and road. Some elder stems within hedge. Provides good screening to the site.	20+	C2



## 9. APPENDIX 3 - TREE SURVEY PLAN

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Please see attached plan 3936\_DR\_003

## 10. APPENDIX 4 – TREE PROTECTION PLAN

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Please see attached plan 3936\_DR\_007A

**11. APPENDIX 5 – TREE SURGERY SCHEDULE**

Tree Ref. No.	Common Name	Proposed works	Reason
T1	Ash	No Works required.	-
T2	Wild cherry	No Works required.	-
T3	Apple	No Works required.	-
T4	Oak	Fell and grind out stump.	To facilitate development.
T5	Oak	Fell and grind out stump.	To facilitate development.
T6	Oak	Prune back to give 2m clearance from garage.	To facilitate erection of scaffolding.
T7	Ash	No Works required.	-
T8	Ash	No Works required.	-
T9	Oak	No Works required.	-
T10	Oak	No Works required.	-
T11	Oak	No Works required.	-
T12	Oak	No Works required.	-
T13	Beech	No Works required.	-
T14	Ash	No Works required.	-
G1	Mixed group	No Works required.	-
G2	Mixed group	Fell and grind out stumps.	To facilitate development.
G3	Blackthorn and hawthorn	Fell and grind out stumps.	To facilitate development.
G4	Mixed group	Fell and grind out stumps.	To facilitate development.
G5	Mixed group	Fell and grind out stumps.	To facilitate development.
G6	Mixed group	Fell section and grind out stumps.	To facilitate development.

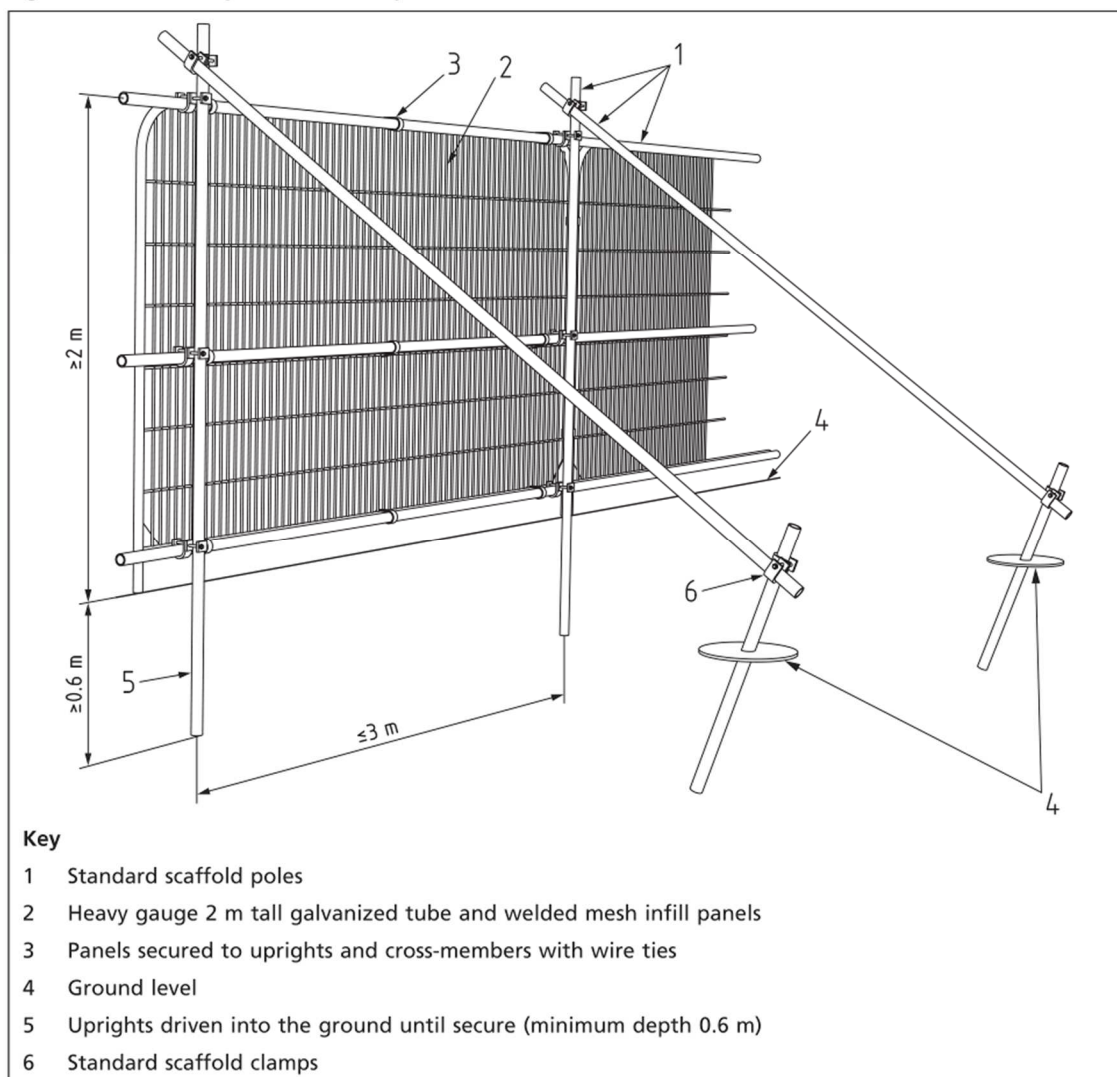
Tree Ref. No.	Common Name	Proposed works	Reason
G7	Oak	No Works required.	-
G8	Mixed group	No Works required.	-
G9	Mixed group	No Works required.	-
G10	Mixed group	No Works required.	-
H1	Hawthorn	Fell section and grind out stumps	To facilitate development

## 12. APPENDIX 6 TREE PROTECTION SPECIFICATION

### DESIGN OF WELDED MESH, HERAS TYPE TREE PROTECTION BARRIERS

- 12.1. Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place. The default specification should be in accordance with 6.2.2.2 of BS 5837, as set out below.
- 12.2. **Specifications:** Barrier shall be a minimum 2 m high. It shall consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated below. The vertical tubes should be spaced at a minimum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. See Figure 2 below.

Figure 2 Default specification for protective barrier

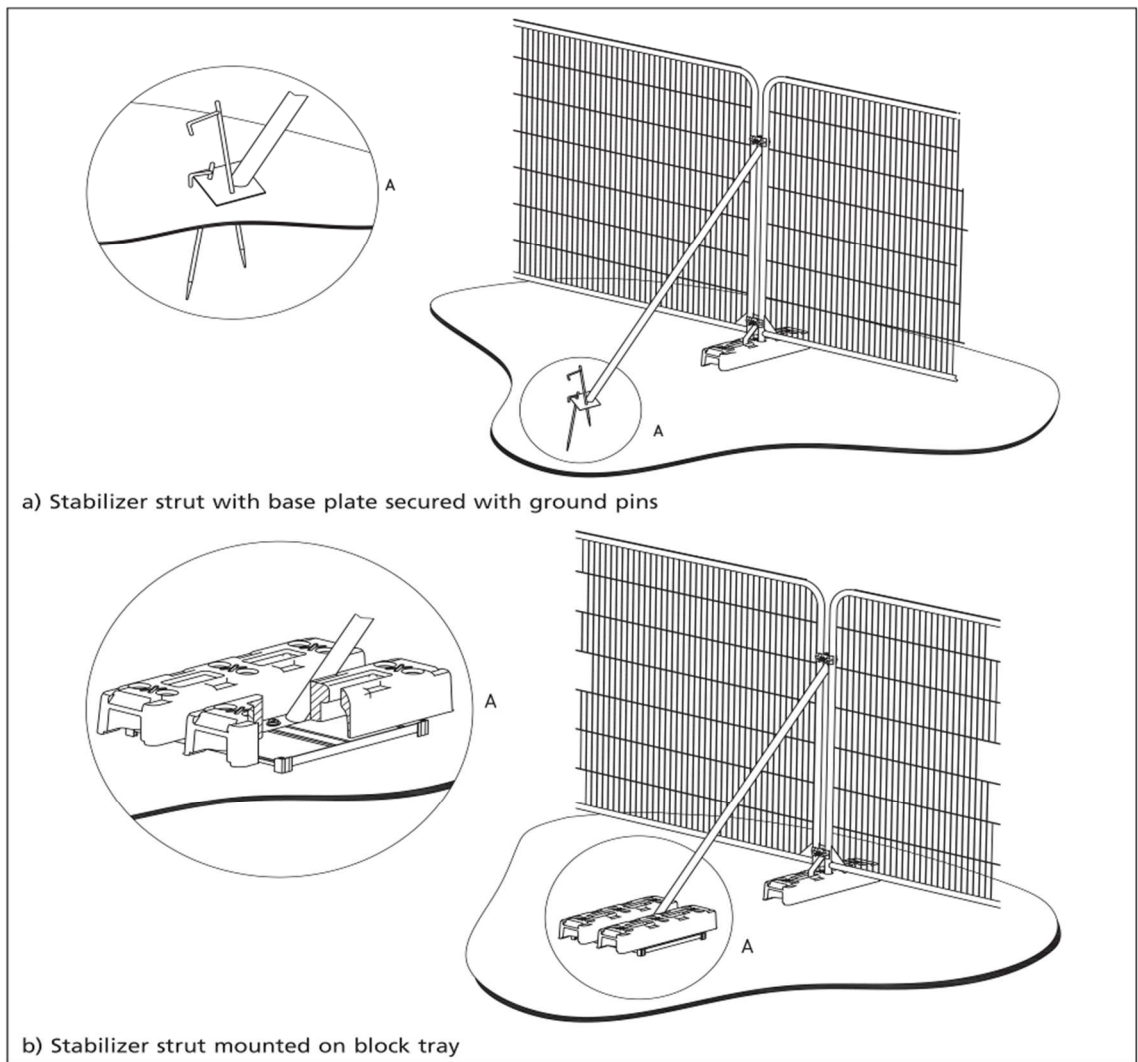


12.3. Where site circumstances and associated risk of damaging incursions into the CEZ do not necessitate the default level of protection, an alternative specification may be used if agreed with the local authority. An example would be 'Heras' type welded mesh panels on rubber or concrete feet. The panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The panels should be supported on the inner side by stabiliser struts. See Figure 3 below. All-weather notices should be attached to the barrier with words such as **'CONSTRUCTION EXCLUSION ZONE - NO ACCESS'**.

12.4. **Location:** Fencing shall be positioned on the perimeter of the Root Protection Area to define the Construction Exclusion Zone or as specified in the Tree Protection Plan.

**Shown on the Tree Protection Plan by a dashed black line**

Figure 3 Examples of above-ground stabilizing systems



### GROUND PROTECTION

- 12.5. In areas where it is not possible to erect protective fencing, ground protection must be used to protect the CEZ of trees. Where it has been agreed during the design stage, and as shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the CEZ, the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be within the CEZ at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the CEZ should be protected with ground protection. This must be installed before any site activity takes place to protect soil structure and tree roots.
- 12.6. For pedestrian movements or the erection of scaffolding within the CEZ the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer of sharp sand or woodchip laid onto a geotextile, may be acceptable.
- 12.7. For wheeled or tracked construction traffic movements within the CEZ, the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems of metal, polymer or wooden panels or reinforced concrete slabs, examples of which follow. Cellular confinement no-dig systems can also be used.



Fig 1. Cellular confinement system



Fig 2. Ground-Guard board protection system.