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ARBORICULTURAL IMPACT ASSESSMENT

MR AND MRS T. LEE & MR AND MRS R. WALTERS

LAND AT ABBEY WAY
CANTERBURY,
WILLESBOROUGH, ASHFORD

REF NO. 3460_RP_001

STATUS: PLANNING

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3460_RP_001 | ARBORICULTURAL IMPACT ASSESSMENT
FOR: MR AND MRS T. LEE & MR AND MRS R. WALTERS

STATUS: PLANNING

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EXECUTIVE SUMMARY

- S.1 This report accompanies a planning application for the construction of 26 new residential properties with associated access road, garages, gardens and an ecological meadow on land off Abbey Way, Willesborough, Ashford, Kent.
- S.2 A total of 37 individual trees, 13 groups, 1 hedge and 1 wooded area 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 3 C grade groups will be removed to facilitate development. To compensate for the loss of these trees, replacement planting will be undertaken as part of the landscape designs for the scheme.
- S.4 One U graded tree is potentially of high ecological value and may either be removed for sound arboricultural management or retained within the ecological meadow but with its crown reduced.
- S.5 The construction of the foundations for the property in the RPA of T31 will be done using minimal dig foundations or by using a micropile HouseDeck system.
- S.6 Footings for boundary walls within the RPAs of trees T5, T18 and T31 will be excavated using hand tools only and kept to a minimal depth, with the arboricultural consultant undertaking suitable root pruning. If a root cannot be cut, a lintel will be installed to bridge over the root. The edges of the excavations will be lined with impermeable plastic sheeting to prevent alkali burn to roots in the soil from the concrete.
- S.7 In order to allow the erection of scaffolding around the new structures and allow construction access trees T7, T31, T32 and T37 will be pruned back. Groups G8 and G10 will also be pruned back and managed as a hedge.

1. INTRODUCTION

- 1.1. **Brief:** Lloyd Bore have been instructed by BDB Design LLP on behalf of Mr and Mrs T. Lee & Mr and Mrs R. Walters to carry out a survey of significant trees on land off Abbey Way, Willesborough, Ashford, Kent in accordance with the principles of 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 26 new residential properties with associated access road, garages, gardens and the establishment of an ecological meadow area.
- 1.3. Site description:** The site is a roughly boot shape plot of land located on the edge of the residential area of Willesborough, to the north east of the M20 motorway. Currently the site is unmanaged and overgrown, making access to some parts difficult. The site is surrounded on all sides by a boundary drainage ditch, with some patchy hedging on either sides of the ditch. To the north the site bordered to the north by an arable field, while to the south the site backs onto residential gardens of houses along Waltham Close. To the east the site borders a large grassed garden area with large trees growing along the garden side of the boundary. The west of the site abuts a wooded area on a rising bank, which forma as visual and noise barrier from the M20 motorway beyond.
- 1.4. Scope of this report:** This report covers trees on and adjacent to the site. It is concerned with the impact the development may have on nearby trees and the effect retained trees may have on the development. Its purpose is to allow the local planning authority (LPA) to assess the tree information as part of the planning submission.
- 1.5. 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.
- 1.6.** 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. 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)¹ 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 information on Ashford Borough Council's website it is understood that none of the trees on the site is the subject of a tree preservation order (TPO) and that the site is not located within a conservation area (CA). However trees to the east of the pond on the far side of the ditch are covered by a TPO and a small section of land in the same location is covered by a conservation area. The tree protection status is correct at the time of report production but can be subject to change. It is

¹ 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. Assessed according to the recommendations set out in clause 4.6 of BS 5837. It is 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.

therefore the responsibility of any persons undertaking operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory checks.

- 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

- 2.1. **Site visit:** A site visit was undertaken on 12th March 2015. The weather was cloudy with sunny spells.
- 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.
- 2.2. 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 3460_DR_001 which also includes a tree survey schedule. Groups of trees are identified with the prefix 'G', hedges with the prefix 'H' and the wooded area with a 'W' prefix. 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.
- 2.3. **Tree survey plan:** Tree Survey Plan 3460_DR_001 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 solid blue line). Above ground constraints consist of the existing crown spreads of the trees and are represented by the solid outlines.

- 2.4. **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.
- 2.5. **The subject trees:** A total of 37 individual trees, 13 groups, 1 hedge and 1 wooded area are the subject of this report which has been written in accordance with BS 5837. 24 individual trees and 1 wooded area have been categorised as 'B' grade trees of moderate quality and value. 12 individual trees and 13 groups have been categorised as 'C' grade trees of low quality and value, while 1 individual tree has been categorised as a 'U' grade tree which should be removed for reasons of sound arboricultural management. The categories are explained in Appendix 1.
- 2.6. **Species and age distribution:** The most common species within the survey are hybrid black poplar, ash and the understorey trees and groups consisting of damson, blackthorn and goat willow. The majority of the large individual trees are classed as early-mature or mature trees with very few young or semi-mature specimens. This indicates an ageing population which would benefit from additional planting.
- 2.7. **Comments on specific trees:** The highest quality trees surveyed are the hybrid black poplar along the eastern boundary and the wooded area along the western boundary. These trees provide significant noise reduction and visual screening and despite being located outside the boundary, define the character of the site.

3. ARBORICULTURAL IMPACT ASSESSMENT

- 3.1. **Summary of the impact of the development upon trees:** 3 C grade groups of scrubby trees will be removed to facilitate development.
- 3.2. Construction of foundations and a patio is required within the RPA of 1 tree. This will be achieved by using minimal excavations foundations such as a Housedeck system and under arboricultural supervision.
- 3.3. Excavations for the construction of boundary wall footings are required in the RPA of 3 off-site trees. This will be achieved by undertaking hand excavations under arboricultural supervision and root pruning undertaken only where appropriate and necessary.
- 3.4. In order to provide appropriate clearance for the development 4 trees and 2 groups will require minor pruning works.
- 3.5. **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.
- 3.6. **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 3460_DR_002.
- 3.7. **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 construction the following trees require removal: G2, G9 and G12. T30 has been categorised as a U grade tree which would normally be removed as part of arboricultural management, however this tree may be retained (with the agreement of Ashford Borough Council) by undertaking a crown reduction as it is to be included within the ecological meadow area. If retained, T30 may provide valuable habitat due to the cavities and standing deadwood it provides.
- 3.8. **Trees to be pruned:** In order to give 2m scaffolding clearance around the building lines the following trees will require pruning: T7, T31 and T32. In addition groups G8 and G10 should be pruned back and managed as hedges. All tree surgery works required to facilitate the development or for obvious safety or arboricultural reasons can be found in Appendix 5.

- 3.9. Incursions into the root protection area:** The construction of foundations for one of the new properties is required within the RPA of T31. This will be achieved using a minimal depth excavation foundation such as a raft, or by using an above ground foundation such as the HouseDeck System which suspends the foundations on micropiles. All works within the RPA will only be undertaken under arboricultural supervision and root pruning only carried out by the arboricultural consultant where appropriate and necessary. Although there is a minor encroachment into the RPA of T6 for the construction of a garage, the extent of this encroachment is very minor. This minor impact is further reduced as the off-site trees are behind a boundary ditch which will either have acted as a physical barrier preventing tree root encroachment, or forced the roots to grow at a greater depth. As such no special measures will be required.
- 3.10.** Where the new patio for this plot is to be constructed in the RPA this will be constructed using a no-dig construction method such as Cellweb, with a permeable surfacing.
- 3.11.** Where boundary walls are to be constructed within the RPAs of T5, T18 and T31 these will be constructed during the external works phase. The excavations for the footings will be undertaken using hand tools and kept to a minimum depth. Root pruning will only be carried out by the arboricultural consultant where appropriate and necessary. Excavations should then be lined with impermeable plastic sheeting to avoid alkali burn to the roots by the concrete.
- 3.12.** 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.
- 3.13.** Where the erection of scaffolding is required within the RPA of T31 this should either be erected on the existing hard surfacing or on suitable ground protection to prevent compaction of the soil structure.
- 3.14.** During the construction phase it may be necessary for machinery and materials to pass through the RPA of retained trees, though this should be avoided. 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 5 of this report.
- 3.15.** 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.
- 3.16. 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.
- 3.17.** 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.
- 3.18.** Guidance for an arboricultural method statement for this site can be found in Section 5 of this report. The location of protective measures, usually a combination of barriers and ground protection, can be found on the tree protection plan.
- 3.19.** 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.

3.20. Impact on amenity: The site is currently overgrown, disused and of low amenity value. To facilitate the development 3 C grade groups of low quality and value will be removed. All 3 groups consist of small scrubby trees which are internal to the site and largely screened from public views by other trees or fence lines. All other trees are to be retained. To mitigate for the loss of these trees, designs show extensive planting throughout the site, providing higher quality and more species diverse trees on the site. Given these factors it is considered that the proposals will have a minimal negative impact upon the visual amenity of the site and may result in an overall improvement. This is further boosted by the creation of the ecological meadow.

4. GUIDANCE FOR ARBORICULTURAL METHOD STATEMENT

- 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
- 4.2. **Tree protection plan (TPP):** The tree protection plan (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 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. Where new hard surfacing is to be installed within the CEZ 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 no 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 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.

5. CONCLUSIONS

- 5.1. 3 C grade groups will be removed to facilitate development. To compensate for the loss of these trees, replacement planting will be undertaken as part of the landscape designs for the scheme.
- 5.2. Although graded as a U grade tree, T30 is potentially of high ecological value. Given its location in the ecological meadow area, a relatively low target area, this tree may be retained with a reduced crown to provide habitat. Alternatively this tree may be removed for reasons of sound arboricultural management.
- 5.3. The construction of the foundations for the property in the RPA of T31 will be done using minimal dig foundations or by using a micropile HouseDeck system. All such works will only be undertaken under arboricultural supervision and will require a specialist arboricultural method statement.
- 5.4. Footings for boundary walls within the RPAs of trees T5, T18 and T31 will be excavated using hand tools only and kept to a minimal depth, with the arboricultural consultant undertaking suitable root pruning. If a root cannot be cut, a lintel will be installed to bridge over the root. The edges of the excavations will be lined with impermeable plastic sheeting to prevent alkali burn to roots in the soil from the concrete.
- 5.5. In order to allow the erection of scaffolding around the new structures and allow construction access trees T7, T31, T32 and T37 will be pruned back. Groups G8 and G10 will also be pruned back.
- 5.6. Provided the tree protection and working methods detailed in this report are followed the impact on the retained trees will be minimal.

6. RECOMMENDATIONS

- 6.1. The routes of any proposed services must be assessed by the arboriculturist and a detailed arboricultural method statement written where the services run through the CEZ of any retained tree.
- 6.2. The proposed foundation design must take into account any tree to be retained, trees that have been removed and new trees to be planted.
- 6.3. 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.
- 6.4. 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.
- 6.5. Where archaeological or contaminated land reports and hard and soft landscape design plans are prepared for the site, these should 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

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.

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8. APPENDIX 2 - TREE SURVEY SHEETS

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Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading
T11	Oak	<i>Quercus robur</i>	8.0	1	300	6.0	0.5	4.0	8.0	0.5	SM	F	F/P	Off-site tree growing on far side of ditch. Growing from base of T10 in unsustainable position. Poor form.	10+	C2
T22	Hybrid black poplar	<i>Populus canadensis</i>	18.0	4	120, 180, 200, 280, 150	8.0	8.0	4.0	5.0	9.5	EM	F	F	Multi-stemmed tree with included unions. Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Uneven crown due to group pressure.	20+	B2
T3	Common Ash	<i>Fraxinus excelsior</i>	14.0	2	350, 400	7.0	6.0	6.0	8.0	1.0	M	F	F	Off-site on opposite side of ditch. Twin stemmed from base. Ivy on stems preventing full inspection and hiding potential defects. Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Uneven crown due to group pressure.	10+	C2
T13	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	350	7.0	3.0	0.5	7.0	6.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Uneven crown due to group pressure.	20+	B2
T4	Hawthorn	<i>Crataegus monogyna</i>	4.0	1	100	2.0	1.0	2.0	3.0	0.0	Y	F	F/P	Tree growing on edge of bank inside site. Suppressed by T5. Low aesthetic value.	20+	C1
T34	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	960	5.0	4.0	3.0	8.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Uneven crown due to group pressure. Deadwood in crown.	20+	B2
T6	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	600	9.0	9.0	6.0	10.0	5.0	M	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Part of a line of trees providing screening from adjacent site. Uneven crown due to group pressure.	10+	C2
T15	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	420	1.0	3.0	7.0	4.0	7.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.	20+	B2
T7	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	550	2.0	7.0	3.0	4.0	8.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown.	20+	B2
T16	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	500	5.0	8.0	7.0	8.0	8.0	M	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.	20+	B2
T8	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	520	2.0	6.0	2.0	7.0	8.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.	20+	B2
T9	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	520	3.0	8.0	4.0	8.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.	20+	B2
T17	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	490	7.0	7.0	4.0	8.0	8.0	M	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.	20+	B2
														Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown. Restricted rooting to rear from pond.		
Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading

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T18	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	450	3.0	8.0	5.0	6.0	5.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown.	20+	B2
T19	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	450	2.0	8.0	5.0	8.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown.	20+	B2
T20	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	350	4.0	4.0	5.0	8.0	8.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Broken hung up limb in crown. Previous limb removals.	20+	B2
T21	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	300	4.0	7.0	1.0	2.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Previous limb removals.	20+	B2
T22	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	390	4.0	7.0	3.0	9.0	6.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Major deadwood in crown.	20+	B2
T23	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	360	4.0	6.0	1.0	6.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Previous limb removals.	20+	B2
T24	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	320	2.0	3.0	1.0	5.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Previous limb removals and group pressure leading to uneven crown.	20+	B2
Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading

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T25	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	450	3.0	7.0	3.0	7.0	6.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown.	20+	B2
T26	Hybrid black poplar	<i>Populus canadensis</i>	17.0	1	550	7.0	6.0	4.0	7.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Deadwood in crown.	20+	B2
T27	Hybrid black poplar	<i>Populus canadensis</i>	16.0	1	800	9.0	7.0	6.0	8.0	2.0	EM	F	F	Off-site tree growing on far side of ditch. Part of a line of trees providing screening from adjacent site. Previous limb removals.	20+	B2
T28	Ash	<i>Fraxinus excelsior</i>	8.0	1	260	5.0	5.0	5.0	5.0	3.0	EM	F	F	Off-site tree growing on far side of ditch. Slight lean to east. Low quality. Growing above hedge line.	10+	C2
T29	Oak	<i>Quercus robur</i>	7.0	1	380	4.0	4.0	5.0	7.0	0.1	EM	F	F	Boundary tree with barbed wire passing through trunk. Uneven crown shape. Some screening value.	20+	B2
T30	Ash	<i>Fraxinus excelsior</i>	9.0	1	1200	6.0	6.0	8.0	7.0	1.0	OM	F/P	F/P	Tree growing on bank of ditch along boundary. Cavity at base up to 2m. Tree may be retained for ecological reasons if low target area beneath, otherwise should be removed.	<10	U
T31	Oak	<i>Quercus robur</i>	15.0	1	1110	6.0	8.0	9.0	9.0	1.0	M	G	F	Off-site tree growing on bank of ditch. Arable field to rear. Good visual amenity.	20+	B1
Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading

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T32	Goat willow	<i>Salix caprea</i>	8.0	8	8 x 200	5.0	5.0	5.0	5.0	0.0	M	F	F/P	Tree growing in ditch. Multi-stemmed from base with included unions. Low aesthetic value.	10+	C2
T33	Ash	<i>Fraxinus excelsior</i>	11.0	2	400, 320	7.0	7.0	7.0	2.0	2.0	M	F	F	Off-site tree growing on edge of wooded area. Twin stemmed from base with included union. Part of group providing screening from motorway.	10+	C2
T34	Norway maple	<i>Acer platanoides</i>	8.0	1	250	5.0	5.0	5.0	5.0	1.5	EM	G/F	F	Off-site garden tree behind ditch. Good form and aesthetic value.	20+	B2
T35	Wild cherry	<i>Prunus avium</i>	7.0	4	80 x 4	3.0	3.0	3.0	3.0	1.0	SM	F	F/P	Off-site garden tree growing through chain link fence. Some screening but low quality.	10+	C1
T36	Eucalyptus	<i>Eucalyptus gunnii</i>	11.0	1	250	3.0	4.0	4.0	5.0	3.0	SM	F	F	Off-site garden tree growing next to boundary line. Uneven crown shape.	10+	C1
T37	Ash	<i>Fraxinus excelsior</i>	7.5	1	190	5.0	5.0	5.0	4.0	1.8	EM	F	F	Off-site garden tree growing 0.1m from base of boundary wall. Low quality.	10+	C1
G1	Ash	<i>Fraxinus excelsior</i>	4-9	-	150	2.0	2.0	2.0	2.0	0.0	Y-SM	F	F	Off-site boundary trees growing next to access road and turning head. Majority growing behind ditch. Low value.	10+	C2
Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading

G2	Blackthorn	<i>Prunus spinosa</i>	5-7	-	200	3.0	3.0	3.0	3.0	0.0	EM	F	F	2 small trees growing to north of pond. Multi-stemmed from base. Low quality and value.	10+	C2
G3	Mixed group	Mixed group	3-7	-	100	2.0	2.0	2.0	2.0	1.0	Y-SM	F	F	Understorey group of sycamore, oak and elm located off-site on far side of ditch. Low value, partially suppressed.	20+	C2
G4	Elder	<i>Sambucus nigra</i>	2-3	-	75	1.5	1.5	1.5	1.5	0.0	SM	F	F	Self set trees growing along bank of ditch. Low quality, minimal screening value.	10+	C2
G5	Damson	<i>Prunus domestica</i>	2-3	-	75	1.5	1.5	1.5	1.5	0.0	SM	F	F	Off-site trees growing on far side of ditch. Understorey trees with some screening value.	10+	C2
G6	Mixed group	Mixed group	2-5	-	100	2.0	2.0	2.0	2.0	0.0	Y-EM	F	F/P	Scrappy group of damson, hawthorn, hazel, blackthorn, elder and goat willow growing on both sides of ditch. Most located off-site. Some fallen stems. Some screening and habitat value.	10+	C2
G7	Mixed group	Mixed group	4-7	-	150	3.0	3.0	3.0	3.0	0.0	SM-EM	F	F	Small boundary trees consisting of goat willow, oak and hazel in area next to ditch. Some screening value but low quality.	10+	C2
G8	Blackthorn	<i>Prunus spinosa</i>	5	-	80	1.0	1.0	1.0	1.0	0.0	SM	F	F	Self set group growing along ditch. Limited aesthetic value but some screening effect.	10+	C2
Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem diam.(mm)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Height of crown clearance (m)	Age class	Phys. Cond.	Stru. Cond.	Comments	Est. Rem. Contr. (Yrs)	Cat. Grading

G9	Mixed group	Mixed group	2-7	-	100	2.0	2.0	2.0	2.0	0.0	SM-EM	F	F/P	Low quality scrubby group of elder, goat willow, hawthorn, blackthorn and damson, mostly self set. Some fallen stems in group.	10+	C2
G10	Hawthorn and elder	<i>Crataegus monogyna</i> , <i>Sambucus nigra</i>	4-7	-	150	3.0	3.0	3.0	3.0	0.0	M	F	F	Remnant of boundary hedge inside site along the ditch. Patchy growth in places and spreading up to 4m into the site. May be retained, managed or removed.	10+	C2
G11	Mixed group	Mixed group	3-7	-	100	2.0	2.0	2.0	2.0	0.0	SM-EM	F	F	Off site boundary trees consisting of holly, goat willow, hazel, birch and hawthorn. Some overhang into site by up to 3m. Offers screening from neighbouring gardens.	10+	C2
G12	Hawthorn and blackthorn	<i>Crataegus monogyna</i> , <i>Prunus spinosa</i>	3-6	-	100	2.0	2.0	2.0	2.0	0.0	EM	F	F/P	Multi-stemmed boundary trees with poor, scrubby form.	10+	C2
G13	Mixed group	Mixed Group	1-5	-	80	2.0	2.0	2.0	2.0	0.0	SM	G/F	F	Off-site mixed group consisting of field ample, privet, cotoneaster and pyracantha growing in shrub bed between garden wall and footpath. Only larger tree in group is a single field maple with a stem diameter of 120mm. Some screening and aesthetic value.	10+	C2
H1	Mixed hedge	Mixed hedge	3-6	-	100	2.0	2.0	2.0	2.0	0.0	Y-EM	F	F	Scrappy hedge consisting of hawthorn, blackthorn and hazel growing on either side of ditch. Scrappy with large gaps in places. Unmanaged and sprawling into the site. Low value for screening or aesthetic value in present state.	10+	C2
W1	Mixed woodland	Mixed woodland	5-12	-	300	4.0	4.0	4.0	4.0	0.0	SM-M	F	F	Off-site wooded area consisting of oak, birch and ash with an understorey of goat willow and hawthorn. Trees are growing on a gently rising bank on the far side of a ditch and provide an effective screen from the adjacent motorway. Crowns overhang site by up to 4m in places, mainly from the goat willow in the understorey.	20+	B2

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9. APPENDIX 3 - TREE SURVEY PLAN

Please see attached plan.

10. APPENDIX 4 – TREE PROTECTION PLAN

Please see attached plan

11. APPENDIX 5 – TREE SURGERY SCHEDULE

Tree Ref. No.	Common Name	Proposed works	Reason
T1	Goat willow	No works required.	-
T2	Goat willow	No works required.	-
T3	Common Ash	No works required.	-
T4	Hawthorn	No works required.	-
T5	Hybrid black poplar	No works required.	-
T6	Hybrid black poplar	No works required.	-
T7	Hybrid black poplar	Prune back to give 2m clearance from building lines.	To allow erection of scaffolding.
T8	Hybrid black poplar	No works required.	-
T9	Hybrid black poplar	No works required.	-
T10	Hybrid black poplar	No works required.	-
T11	Oak	No works required.	-
T12	Hybrid black poplar	No works required.	-
T13	Hybrid black poplar	No works required.	-
T14	Hybrid black poplar	No works required.	-
T15	Hybrid black poplar	No works required.	-
T16	Hybrid black poplar	No works required.	-
T17	Hybrid black poplar	No works required.	-
T18	Hybrid black poplar	No works required.	-
T19	Hybrid black poplar	No works required.	-
T20	Hybrid black poplar	No works required.	-

Tree Ref. No.	Common Name	Proposed works	Reason
T21	Hybrid black poplar	No works required.	-
T22	Hybrid black poplar	No works required.	-
T23	Hybrid black poplar	No works required.	-
T24	Hybrid black poplar	No works required.	-
T25	Hybrid black poplar	No works required.	-
T26	Hybrid black poplar	No works required.	-
T27	Hybrid black poplar	No works required.	-
T28	Ash	No works required.	-
T29	Oak	No works required.	-
T30	Ash	Remove tree or reduce crown and retain within ecological meadow area.	For sound arboricultural management
T31	Oak	No works required.	-
T32	Goat willow	Prune back to give 2m clearance from building lines.	To allow erection of scaffolding.
T33	Ash	No works required.	-
T34	Norway maple	No works required.	-
T35	Wild cherry	No works required.	-
T36	Eucalyptus	No works required.	-
T37	Ash	Prune back to give 2m clearance from building lines.	To allow erection of scaffolding.
G1	Ash	No works required.	-
G2	Blackthorn	Fell and grind out stumps.	To facilitate development.
G3	Mixed group	No works required.	-
G4	Elder	No works required.	-
G5	Damson	No works required.	-

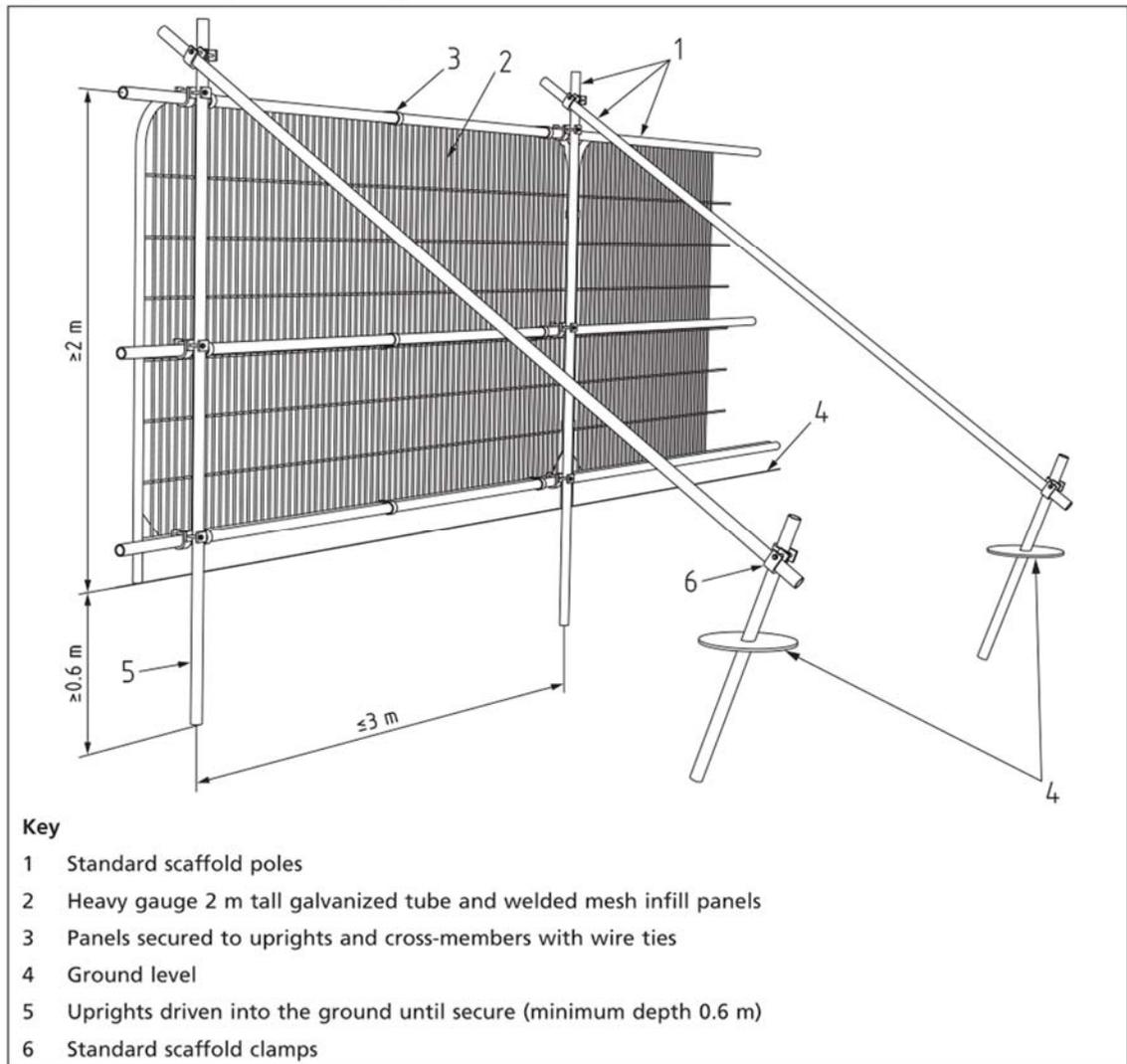
Tree Ref. No.	Common Name	Proposed works	Reason
G6	Mixed group	No works required.	-
G7	Mixed group	No works required.	-
G8	Blackthorn	Prune back to manage as a hedge.	For long term management and to allow access for construction works.
G9	Mixed group	Fell and grind out stumps.	To facilitate development.
G10	Hawthorn and elder	Prune back to manage as a hedge.	For long term management.
G11	Mixed group	No works required.	-
G12	Hawthorn and blackthorn	Fell and grind out stumps.	To facilitate development.
G13	Mixed group	No works required.	-
H1	Mixed hedge	No works required.	-
W1	Mixed woodland	No works required.	-

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

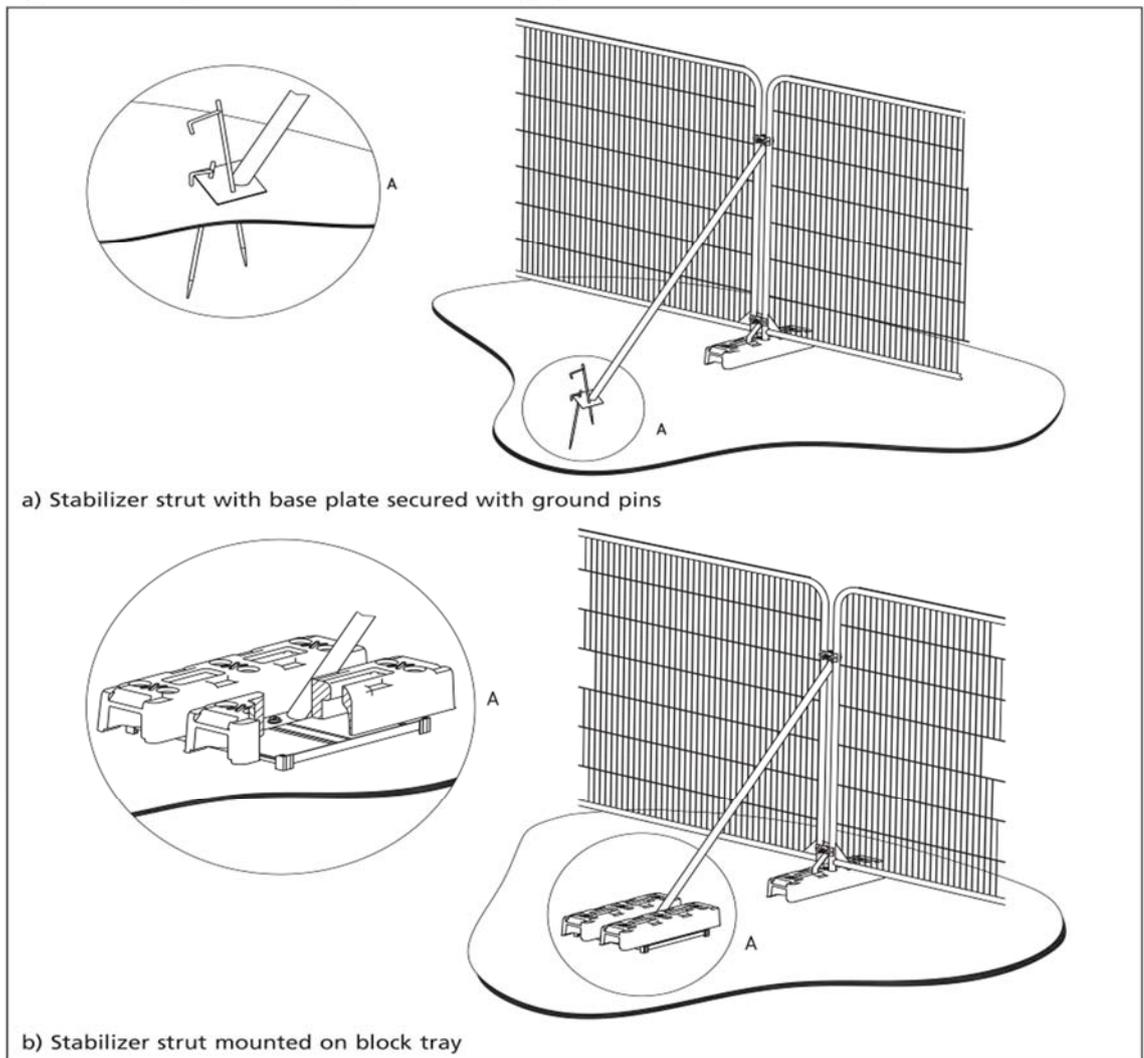


12.3. Where site circumstances and associated risk of damaging incursions into the CEZ do not necessitate the default level of protection, an alternative specification may be used if agreed with the local authority. An example would be 'Heras' type welded mesh panels on rubber or concrete feet. The panels 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.