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Arboricultural Constraints Survey,
Impact Assessment, Protection
Plan and Method Statement
Game Engineering
LN6 9TW

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1 SUMMARY

1.1 Report

This report is concerned with the arboriculture associated with development at Game Engineering, centred on grid reference SK89536271. It identifies the arboricultural constraints and advises, in general terms, how they might be overcome or mitigated.

A site visit was carried out on 16th February 2024 by Kay Richardson BA (Hons) who is an Ecologist at Ecosurv Ltd. The trees were inspected visually from the ground. The weather at the time of the inspection was dry and calm which was suitable for the purposes of the visit. A total of 15 trees and one hedgerow were recorded. The trees were assessed and consisted of native and naturalised species. The trees were assigned mostly category B due to their presence in groups and impact on the landscape and screening properties, one trees were assigned category C due it's limited cultural value.

1.2 Development and site description

The site comprised primarily of an existing industrial building with hard standing car parking areas and vehicular access routes to the perimeter. To the east of the site is an area of bare ground, some of which is colonised with various herb, grass and forb species. Scattered trees and ornamental shrubs are present within gravel borders at the entrance to the site. An unmanaged hedgerow with trees is present to the northern site boundary.

The proposals are for a new industrial unit with associated hard and soft landscaping to be constructed to the north of the existing facility. The new development will be constructed within an area of existing bare/derelict ground. The landscaping proposals incorporate new trees and amenity and species-rich grassland areas including 21no new trees to be planted within an area of scrub outside of the red line boundary, but within the client's ownership. The existing hedgerow to the north of the site will be retained and improved.

No trees or hedgerow will be removed to facilitate the development, however construction will be required within close proximity to RPAs and tree canopies therefore tree protection by arboricultural methodology, barriers and ground protection should be implemented throughout the works. Consideration should also be given to trees outside the site boundary in areas close to the proposed works.

Specifications for tree protection barriers and ground protection are provided, along with general advice on tree retention. Tree protection and methodology shall be deployed where indicated on the Tree Protection Plan.

1.3 Root Protection Areas (RPAs)

The Root Protection Areas (RPA's) of all trees surveyed were calculated and recorded in the Tree Survey Schedule (see results) where they are expressed in linear metres; it would normally be at this distance that tree protective barriers should be erected. In some instances, particularly for groups of trees, an indicative RPA has been given including area extent to account for the presence of hardstanding and buildings near the trees.

1.4 Tree Protection Orders (TPOs)

The trees within the site are not situated within a conservation area, nor are they subject to any Tree Preservation Orders (TPO)s however the Local Planning Authority (LPA) should be consulted prior to undertaking any significant tree works.

1.5 Potential ecological impacts

Trees have an ecological value to any site providing nesting sites for birds, roost sites for bats and habitat for insects which play an important part in local biodiversity. The trees surveyed do provide potential for nesting birds as do the hedgerows and shrubs elsewhere on the site.

Any tree works should start outside of the bird breeding season (March – August inclusive). Should this not be the case, a survey of these should be undertaken by a suitably qualified ecologist to identify if nesting is taking place and an appropriate buffer identified where works should not take place until the young have fledged.

2 INTRODUCTION

Ecosurv Ltd were commissioned by LHL Group to undertake an Arboricultural Survey of trees at Game Engineering, Witham St Hughes. The land is centred on grid reference SK89536271 and the survey was conducted in order to assess the site for potential arboricultural constraints.

2.1 Objectives

The survey has been conducted in accordance with BS 5837:2012 – ‘Trees in relation to design, demolition and construction – Recommendations’, to provide a written report of the findings. The report covers all trees within, or adjacent to the site boundaries and assesses their current status.

A topographical plan was provided illustrating the existing site layout and location of existing trees and canopy extent. In addition, a proposed development plan was also provided to give an indication of the development footprint.

The survey only includes trees / groups of trees with a trunk diameter of 100mm or more (measured at a height of 1.5m above ground level), located within the extents of the development and land surrounding the site. All advice is given in connection with this plan. The report provides information for the retention and protection of trees on the development site.

2.2 Location

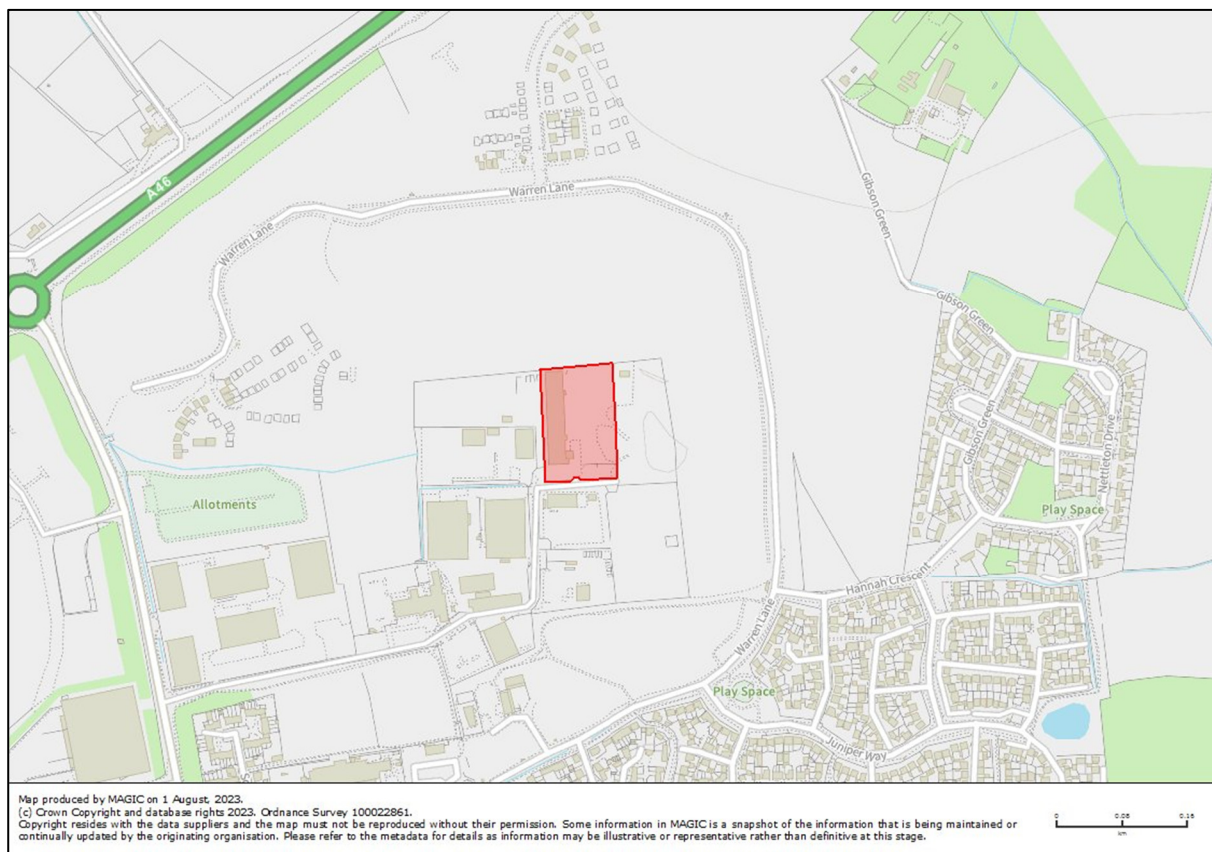


Figure 1: Map showing survey area, the site (in red) and surrounding area.

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3 LEGISLATION

The following is given as standard general advice:

3.1 Conservation Areas and Tree Preservation Orders

Trees and hedgerows can be subject to statutory control and severe penalties can result from unauthorised works or damage. It is recommended that prior to commencement of any tree works the LPA are contacted. When proposing to do works to trees within a Conservation Area, with some exceptions, six weeks written notice must be given to the LPA. This notice is often referred to as a Section 211 Notice. Having received such a notice, the LPA has essentially only one of two options at its disposal, these are:

Impose a TPO in respect of those trees/some of those trees subject to the notice. This prevents any works being carried out without the express, written consent of the LPA.

Or

Do nothing. It is considered best practice for an LPA to acknowledge receipt of the notice but there is no obligation for it to do so. After six weeks of serving the notice the tree owner may proceed with the works detailed in the Section 211 Notice.

The LPA cannot, in response to a Section 211 Notice, issue a conditional consent.

TPO's are made in the interests of preserving amenity, usually taken to mean public visual amenity. Trees largely removed from public view and which have little visual impact are not usually made the subject of a TPO. Subject to certain exemptions e.g. trees which are dead, dying or dangerous, the written consent of the LPA must be obtained prior to undertaking works to trees subject to TPO.

3.2 Trees and Wildlife

Trees provide valuable habitat for nesting birds and roosting bats. It is a criminal offence under normal circumstances to disturb or destroy, either intentionally or unintentionally, the nesting sites of birds and roosting sites of bats. Nesting birds and bats are afforded protection under The Wildlife and Countryside Act 1981(as amended). The Conservation of Species and Habitat Regulations 2010 affords additional protection to all UK bat species. Significant tree works should be avoided during bird nesting season (March – August inclusive) and trees should be professionally surveyed for signs of bat roosting and activity, prior to any tree work commencing.

3.3 Hedgerows

The Hedgerow Regulations 1997 provide protection by prohibiting the removal of countryside hedgerows if they are assessed as 'important' according to a specific set of criteria. In particular, older hedgerows, species-rich hedgerows and those associated with large trees, water or public rights of way are more likely to meet the criteria for Importance. Hedgerows generally fall outside of the scope of BS5837:2012 as such; no comprehensive assessment of the hedgerow stock was made. Further advice should be sought from the project ecologist.

3.4 Non-statutory Considerations

3.2.1 Implementation of Tree Works

Guidance on hiring an Arborist is available from the Arboricultural Association's Register of Contractors is available free from Ampfield House, Romsey, Hants, SO51 9PA (Telephone 01794 368717, www.trees.org.uk). Any appointed contractor should carry out all tree works to BS 3998 (1991) 'Recommendations for Tree Work' as modified by research that is more recent. Ecosurv Ltd can assist with both the appointment of a tree surgeon and provide on-site supervision.

3.2.2 New Planting:

It is likely that any planning permission issued will carry a condition requiring new tree planting, particularly in instances where a proposal involves the removal of trees. Further advice is available upon request.

4 GENERAL ADVICE FOR TREE PROTECTION

Since development layouts are subject to change, the following is given as general guidance.

4.1 Below Ground Constraints

To successfully complete development, various construction activities are required, and great care and consideration needs to be given as to how such activity can proceed whilst avoiding damage to retained trees.

“Damage can occur as a result of direct impact between construction machinery and parts of a tree. Often greater damage and even destruction occurs quite invisibly due to the deformation of the soils in which the trees root. Soil stripping, trenching and compaction all have serious effects on trees and if such trees are to be successfully retained in the long term it is necessary to protect the soil during construction.”

In order to avoid damage to their roots, trees should be protected using protective barriers as are detailed in British Standard 5837, (2012), ‘Trees in Relation to Construction: Recommendations’ and as illustrated in appendix 1. This should be erected around the RPA prior to the commencement of the demolition/construction activity and must remain in situ and intact until completion. The area within these barriers should be considered sacrosanct, and no work should ordinarily be permitted within them. To ensure any tree protective barriers remain during construction, it is further advised that they carry signage as per appendix 3 and that the Site Agent is briefed accordingly. On sites which are particularly ‘tree sensitive’, the Local Planning Authority (LPA) may apply conditions to a planning permission requiring arboricultural supervision.

4.2 Hard Surfacing

Where hard surfacing exists within the area defined as the RPA, it is acceptable to erect protective barriers at the extent of that hard surface, since the surface itself will afford protection to tree roots. However, care must be taken to avoid collision between overhanging tree branches and passing construction traffic. Where it is proposed to remove/regrade existing hard surfacing, it is advised that an arboricultural method statement should be sought.

4.3 Services

Careful consideration must be given to the siting of underground services e.g. drains, electricity, gas etc. and, ideally, they should not be sited within the RPA. As specified in the National Joint Utilities Group (NJUG) Publication Volume 4, ‘Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees’ (Issue 2), digging within the RPA should only be carried out with hand tools, preferably by compressed air soil displacement. Great care should be taken to preserve and work around roots greater than 25mm in diameter and clusters of smaller roots to avoid damaging the bark. Where it is necessary to sever roots greater than 25mm in diameter, arboricultural advice should be sought. Where smaller roots must be severed, they should be cut back using secateurs or a sharp pruning saw.

Where possible, services laid through protected areas should be installed at a depth greater than 600mm using a trenchless insertion method, in order to preserve the maximum number of roots and avoid conflict between the tree roots and the service.

5 SURVEY LIMITATIONS

Trees are living organisms whose health and condition can change rapidly and all trees, even healthy ones are at risk from unpredictable climatic and man-made events. The assessment of risk for any tree is based upon factors evident at the time of the inspection and the interpretation of those factors by suitably qualified inspectors. The health, condition and safety of trees should be checked on a basis commensurate with the level of risk.

The findings and recommendations contained within this report are, assuming its recommendations are observed, valid for a period of twelve months from the date of survey. Trees are living organisms subject to change – best practice dictates they are inspected on an annual basis for reasons of safety.

Tree rooting characteristics and soils are both enormously variable as are their interactions. This makes attempts to quantify subsidence risk assessment impossible. No effort has been made to assess subsidence risk potential nor should any be construed.

Whilst every effort has been made to detect defects within the trees inspected, no guarantee can be given as to the absolute safety or otherwise of any individual tree. Extreme climatic conditions can cause damage to even apparently healthy trees. All recommendations are given in the context of the site's current usage; any change will dictate a re-inspection.

This report represents a survey and should not be construed to be a detailed tree inspection report; such is available upon request.

6 TREE SURVEY

6.1 Site Visit

A site visit was carried out on 16th February 2024 by Kay Richardson BA (Hons) who is an Ecologist at Ecosurv Ltd. The trees were inspected visually from the ground, no drilling or excavation was carried out. The weather at the time of the inspection was calm and visibility was acceptable for the purposes of the visit.

6.2 Tree Survey Methodology

The survey was undertaken in accordance with the guiding principles of British Standard 5837 (2012) '*Trees in Relation to Construction: Recommendations*' and the trees were assessed objectively and without reference or influence being given to any proposed site layout. Using 'Visual Tree Assessment' techniques the trees were surveyed from the ground; this is the method generally adopted and is appropriate in this instance. All trees surveyed are listed in the Tree Survey Schedule and numbered on the plan provided (see results).

Trees have been identified as such in instances as are defined in BS 5837 (2012) '*Trees in Relation to Construction: Recommendations*' i.e. where, by virtue of the fact that trees are in such close proximity they function as a unit, in visual terms, aerodynamically or culturally they are identified in the Tree Survey Schedule and on the associated plan with the prefix 'G'. In the case of groups, the principal species are recorded, other minor species may be omitted. Trees and shrubs which were considered to be insignificant have been omitted from this survey.

An existing site plan showing the locations of individual trees was made available for the survey. This survey has plotted the location of tree stems and the canopy extent, however due to the density of planting within some tree groups, canopy extent for individual trees should be treated as indicative.

The following features of each tree, group of trees or woodland have been recorded and are presented within the Tree Survey Schedule:

6.2.1 Species

The species identification is based on visual observations and the common English name (with a key provided to scientific names) of what the tree appeared to be. In the case of groups only the principal species are recorded, other minor species may be omitted.

6.2.2 Height

Height is measured in metres from the stem base. Where the ground has a significant slope, the higher ground is selected. Estimated mature heights are given in brackets where identified. In the case of groups, the maximum is recorded. Tree heights were measured using a clinometer and recorded to the nearest 1m.

6.2.3 Stem Diameter

Measured at 1.5 metres above ground and recorded in millimetres to the nearest 10mm. However, where the trunk of any tree breaks below 1.5 metres it is considered a multi-stemmed tree and, in accordance with British Standard 5837 (2012), '*Trees in relation to Construction: Recommendations*' it is measured immediately above the root flare. In the case of groups of trees,

the maximum diameter was recorded. In some instances, the trunk of the tree could not be accessed, for example where dense vegetation exists, in this instance the trunk diameter was estimated. Stem diameters were measured using a rounded down diameter tape to avoid variations due to stem irregularity and shape.

6.2.4 Crown Spread

Crown spread is measured in metres and taken at the four cardinal points to derive an accurate representation of the crown. Where accessible, crown spreads have been measured from the edge of the crown to the stem using a tape measure; inaccessible crown spreads were estimated. All crown spreads are recorded at the cardinal points north, east, south and west.

6.2.5 Crown Clearance

Height above ground level of tree canopy in metres.

6.2.6 Significant Branch

Height and direction of growth of first significant branch.

6.2.7 Life Stage

Age class of the tree is described as young, semi-mature, early-mature, mature, or over-mature.

6.2.8 Physiological Condition

Physiological condition is classed as good, fair, poor, or dead. This is an indication of the health of the tree and takes into account vigour, presence of disease and dieback.

6.2.9 Structural Condition

Structural condition is classed as good, fair or poor. This is an indication of the structural integrity of the tree and takes into account significant wounds, decay and quality of branch junctions.

6.2.10 Estimated Remaining Contribution

Life expectancy is classed as: less than 10 years (<10) (Very Short); 10-20 years (Short); 20-40 years (Medium); or more than 40 years (40+) (Long). This is an indication of the number of years before the removal of the tree is likely to be required.

6.3 Tree Categorisation

Following guidance as set out in BS5837:2012 '*Trees in relation to design, demolition and construction – Recommendations*', trees are impartially assigned a category which determines their retention value within any future development. These are described below:

6.3.1 Category A

Category A trees are of high quality and value with a significant life expectancy, normally over 40 years, and should be retained within the development. These trees are identifiable on the Tree Location and Constraints Plan as light green. They may be further sub-divided as follows:

A1 - Trees that are particularly good examples; perhaps rare or unusual species, or forming an essential part of arboricultural features;

A2 - Trees, groups or woodlands having a significant landscape impact or with excellent screening properties, or those softening the effect of existing structures; and

A3 - Trees, groups or woodlands are those having a significant conservation or historical value.

6.3.1 Category B

Category B trees are of moderate quality and value with a reasonable life expectancy, at least 20 years, and should be retained where possible within the development. These trees are identifiable on the TLCP as mid blue. They may be further sub-divided as follows:

B1 – Trees that might be included in the high category but are downgraded because of their impaired condition;

B2 - Trees that are usually present in groups forming distinct landscape features, thereby attracting a higher collective rating than they might as individuals; and

B3 - Trees with clearly identifiable conservational or cultural benefits.

6.3.2 Category C

Category C trees are of low quality and value and are currently in adequate condition to remain until new planting could be established. These trees should not constrain development, although relocation should be considered where possible. They are identifiable on the TLCP as grey. They may be further sub-divided as follows:

C1 - Trees that do not qualify in the higher categories;

C2 - Trees that are present in groups or woodlands that do not form a distinct landscape feature; and

C3 - Trees with very limited conservational or other cultural benefits.

6.3.3 Category U

Category U trees are those considered unsuitable in their current state for retention within a development. They should ideally be removed prior to the commencement of construction unless otherwise stated. They are identifiable on the TLCP as dark red. These trees are in such a condition that any existing value would be lost within 10 years.

A single tree or group can come under one or more sub-headings. This does not confer on it a higher value than a tree with a single value.

6.4 Additional Comments

Comments include a brief description, if required, of the tree with comments on the form, vitality, health and any significant defects that may be present.

6.5 Root Protection Areas (RPAs)

In respect of all trees surveyed the RPA has been calculated and is given in the Tree Survey Schedule. The figure given represents the radial distance, from the tree's trunk, at which the barriers should be erected. However, it must be borne in mind that the figure derived from this calculation, whilst compliant with BS 5837, is merely notional. RPA's are much more effectively represented on plan, where the shape of such can be manipulated, so as to reflect the anticipated rooting area of each

subject tree/group; tree roots can be greatly constrained by adjacent watercourses, highways, retaining walls, buildings etc, meaning a reduced radial distance on the side of such features and a greater distance being required on the opposite side in order to achieve the RPA.

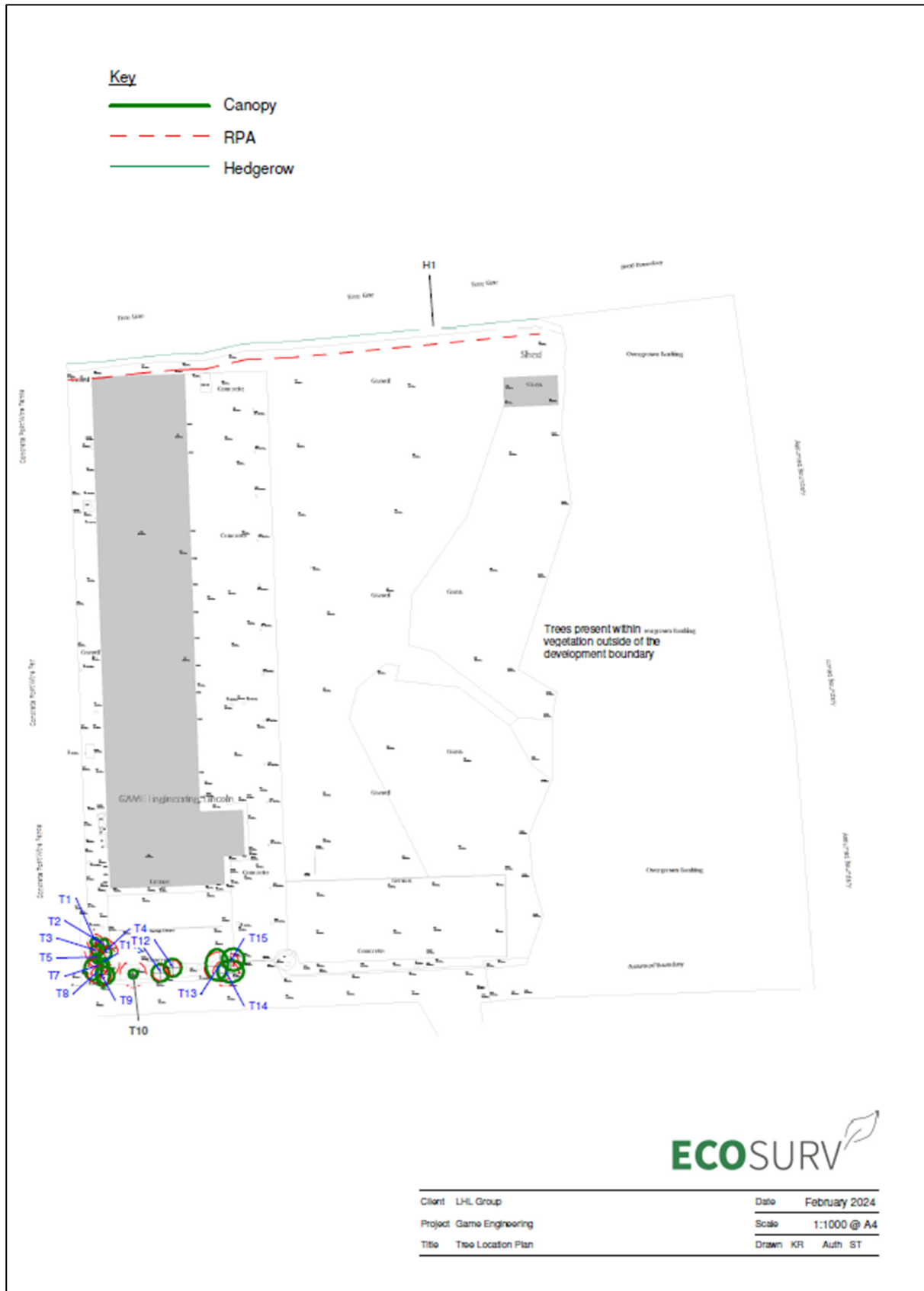
Root protection areas have only been calculated for those trees found within the vicinity of the proposed development.

The RPA is calculated thus:

Trees with a single stem:	Stem diameter x 12 = RPA radius
Trees with 2 – 5 stems the combined stem dia. is calculated as follows:	$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$
Trees with more than 5 stems the combined stem dia. is calculated as follows:	$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$

7 RESULTS

Tree Location Plan





Tree Survey Schedule

ID	Species	Height (m)	Diameter (mm)	Crown Spread				First Stem (m)	Crown Clearance (m)	Age	Physiological Condition	Structural Condition	Estimated Remaining Contribution	Nest	Bat	Comments	Retention Category	RPA (m)
				North	East	South	West											
Trees																		
T1	Holly <i>Ilex aquifolium.</i>	2	150	1	1	1	1	0.5	0.5	Early mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	1.8
T2	Ornamental Cherry <i>Prunus sp.</i>	3.5	150	1	1	1	1	1	1.5	Early mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	1.8
T3	Ornamental Cherry <i>Prunus sp.</i>	4.5	200	1.5	2	1	1	1	2	Early mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	2.4
T4	Cypress <i>Cypressus sp.</i>	5.5	250	1.5	1.5	1.5	1.5	1.5	1	Early mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	3.0
T5	Cypress <i>Cypressus sp.</i>	4.5	170	1	0.5	1	1	1	1	Early mature	Fair	Fair	Moderate	No	No	Well maintained, ornamental Lack of foliage to the south and west	B2	2.0

T6	Cypress <i>Cypressus sp.</i>	5.5	300	1	1	1	0.5	1	1	Early mature	Fair	Fair	Moderate	No	No	Well maintained, ornamental Leans to the east	B2	3.6
T7	Silver Birch <i>Betula sp.</i>	4.5	180	2	1	3	33	3	2	Mature	Good	Good	Long	No	No	Well maintained, pollarded	B2	2.2
T8	Silver Birch <i>Betula sp.</i>	4	170	-	3	3	3	2	2	Mature	Good	Good	Long	No	No	Well maintained, pollarded	B2	2.0
T9	Silver Birch <i>Betula sp.</i>	5	190	2	3	2	1	3	1	Mature	Good	Good	Long	No	No	Well maintained, pollarded	B2	2.3
T10	Elder <i>Sambucus nigra</i>	2.5	250	1	1	1	1	-	1	Mature	Fair	Fair	Moderate	No	No	Maintained	C3	3.0
T11	Purple Leaved Cherry Plum <i>Prunus cerasifera nigra</i>	6	150	2	2	2	2	1.5	2	Mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	1.8
T12	Purple Leaved Cherry Plum <i>Prunus cerasifera nigra</i>	6	150	2	2	2	2	1.5	2	Mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	1.8
T13	Sycamore <i>Acer pseudoplatanus</i>	7	280	4	2	3	3	1.5	2	Mature	Good	Good	Long	No	No	Leans to the east, maintained	B2	3.4



T14	Whitebeam <i>Sorbus aria</i>	7	250	3	4	2	2	2	2	Mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	3.0
T15	Cherry <i>Prunus sp.</i>	7	150	3	3	2	2	2	2	Mature	Good	Good	Long	No	No	Well maintained, ornamental	B2	1.8
Hedgerows																		
H1	Hawthorn <i>Crataegus monogyna</i> Elder <i>Sambucus nigra</i> Bramble <i>Rubus fruticosus</i> Dog-rose <i>Rosa canina</i> Bird cherry <i>Prunus padus.</i> Bramble	4	300	-	-	-	-	-	-	Mature	Good	Good	Long	Yes	No	Hedgerow with trees to the northern site boundary	-	3.6

8 TREE PROTECTION SCHEME

It is important to ensure all parties involved in the planning and design of the proposed development is aware of this report and has access to a copy as soon as it is released.

8.1 Arboricultural Impact

The trees near to areas of demolition and where new surfaces encroach into the RPA are most susceptible to damage as a result of the development. Tree protection should be installed as per the Tree Protection Plan and contractors should be mindful of vehicular movement over RPAs and around canopies as not to cause damage and plan vehicular access routes accordingly. Due to their proximity to the works some trees are more likely to be directly impacted by the development as shown;

Trees impacted by the development	
T1	No direct impact
T2	No direct impact
T3	No direct impact
T4	No direct impact
T5	No direct impact
T6	No direct impact
T7	No direct impact
T8	No direct impact
T9	No direct impact
T10	No direct impact
T11	No direct impact
T12	No direct impact
T13	No direct impact
T14	No direct impact
T15	No direct impact
H1	RPA and Canopy in close proximity to areas of construction

8.2 Responsibilities

Successful implementation of tree protection measures and long-term tree retention depends on co-ordination between the client and key personnel involved in the development.

The client and agent shall ensure that:

- the site manager and all other personnel are provided with this document;
- all planning conditions relating to underground works, services, trees and landscaping are cleared before development commences;
- all requirements of this Tree Protection Scheme are adhered to;

- the site manager is updated of any approved changes or variations to this document.

The client and site manager shall ensure that:

- A copy of this document with the plan in the results section is easily accessible for site personnel to refer to before and during the time construction activity is taking place;
- All personnel working on the site are made aware of the tree protection plan and arboricultural method statements covering any activities they will undertake. This duty includes delegating the task of briefing personnel in the absence of the site manager.
- The tree protection measures are left in place until the construction phase of development is completed, except with the written consent of the LPA.
- Site personnel are updated of any approved changes or variations to the approved tree protection measures.

All personnel must work in accordance with this document at all times, or in accordance with any approved variation.

8.3 Procedures for incidents:

If any breach of the approved tree protection measures occurs:

- The Local Planning Authority Tree officer or other Planning Officer and Ecosurv Ltd shall be notified.
- The site manager must be informed immediately.
- Swift action must be taken to halt the breach and prevent any further breach.
- Damage mitigation measures appropriate to the scale of the incident will be deployed where required.

8.4 Prohibited Activities

The following must not be carried out under any circumstances:

- Cutting down, uprooting, damaging or otherwise destroying any retained tree.
- Lighting a fire within 10 metres of the canopy of any retained tree.
- Equipment, signage, fencing, tree protection barriers, materials, components, vehicles or structures shall not be attached to or supported by a retained tree.
- Mixing cement, chemical toilets and other use or storage of anything that would be harmful to trees shall not take place within, or close to a Root Protection Area (RPA).
- The distance away from the RPA must be sufficient, and the slope of the site must be such that contamination of soil in the RPA would not occur if there were spillage, seepage or displacement.
- No plant or equipment or vehicle with a hydraulic arm such as a mini digger shall be operated within striking distance of the stem and branches or the RPA of any retained tree unless otherwise specified in this report.

No alterations or variations shall be made to the approved tree protection measures without written approval from the LPA.

8.5 Timing and order of operations

The development must be carried out in the following order unless otherwise agreed in writing with the LPA. Each step must be completed before moving onto the next:

1. Installation of tree protection barriers and temporary ground protection in areas indicated on plan and areas of special engineering.
2. Construction
3. Removal of the remaining ground protection and barriers.
4. Landscaping

8.6 Protective barriers and ground protection

Barriers

The barriers shall be installed and removed in accordance with the timing of operations above and laid out in accordance with the Tree Protection Plan. The appended notice should be used to create all weather notices that must be added to the tree protection barriers or suitable intervals. For this site, the existing boundary fence may be used as a tree protection barrier. In the event of any panel or support becoming damaged, this must be immediately reinforced by adding panels with the designs below as appropriate.

The default specification is a vertical and horizontal scaffold framework, braced to resist impacts, as per appendix 1. The vertical tubes are spaced at a maximum interval of 3m and these are driven securely into the ground. Welded mesh panels are securely attached to the frame. During installation it is important to consider the position of below ground services and structural roots, which must not be damaged. Where these constraints prevent the use of this specification, an alternative specification may be implemented.

Alternative tree protection barrier

2m tall welded mesh panels standing in rubber or concrete feet joined using a minimum of two anti-tamper couplers installed so they can only be removed from inside the protected area. The fence couplers should be spaced at least 1 m apart, but uniformly across the whole barrier. These panels must be supported within the protected area with struts attached to a base plate secured by ground pins as per appendix 2.

Where the fencing is installed above retained hard surfacing and / or it is otherwise not feasible/unfeasible to use ground pins (e.g. due to underlying services or structural roots), the struts can be mounted on a block tray as per appendix 2.

Ground protection

The ground protection might comprise one of the following:

- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

- b) for pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;
- c) for wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

8.7 Tree Protection Plan



9 ARBORICULTURAL METHOD STATEMENT

The most significant consideration throughout the works is to protect the existing trees and roots during the demolition and construction works.

To avoid disturbance to the physical protection of the trees, it is essential to make allowance for and plan all construction operations which will be undertaken in the vicinity of trees. Factors that need to be considered include, but are not limited to:

- Site construction access;
- The intensity and nature of the construction activity;
- Contractors' car parking;
- Phasing of construction works;
- The space needed for foundation excavations and construction works;
- The availability of special construction techniques;
- The location and space needed for all temporary and permanent apparatus and service runs, including foul and surface water drains, land drains, soakaways, gas, oil, water, electricity, telephone, television or other communication cables;
- All changes in ground level, including the location of retaining walls, steps and making adequate allowance for foundations of such walls and backfillings;

The trees near to areas of construction and where new surfaces encroach into the RPA are most susceptible to damage as a result of the development. Tree protection should be installed as per the Tree Protection Plan and contractors should be mindful of vehicular movement over RPAs and around canopies as not to cause damage and plan vehicular access routes accordingly. Due to their proximity to the works some trees are more likely to be directly impacted by the development as shown -

- New construction in close proximity to the RPA and canopies trees in H1, a nominal RPA of 3.6m has been determined by the maximum stem size of trees within the hedgerow;
 - Barriers should be installed in the areas adjacent to these trees to protect tree roots from impact by any machinery and operatives working in the area. (See section 8).
 - Access facilitation pruning should be applied before construction works commence to ensure collision between machinery, vehicles and the trees does not occur.
- New construction in close proximity to trees outside the site boundary;
 - The impact on individual trees should be assessed on an individual basis. However, generally the scattered trees beyond the eastern boundary of the works area have a stem diameter of ~150mm. Therefore, the trees are anticipated to have RPAs which extend ~1.8m into the site as shown indicatively on the Tree Protection Plan.
- The RPAs of all other trees can be safely protected from compaction or other disturbance using barrier and/or avoidance.

- Access facilitation pruning required to facilitate the works should be applied before construction works commence to ensure collision between machinery, vehicles and the trees does not occur.
- A designated storage area is to be created away from retained trees. All materials for construction purposes are to be stored in this compound. Care must be taken to avoid the leakage or leaching of noxious materials into the soil.

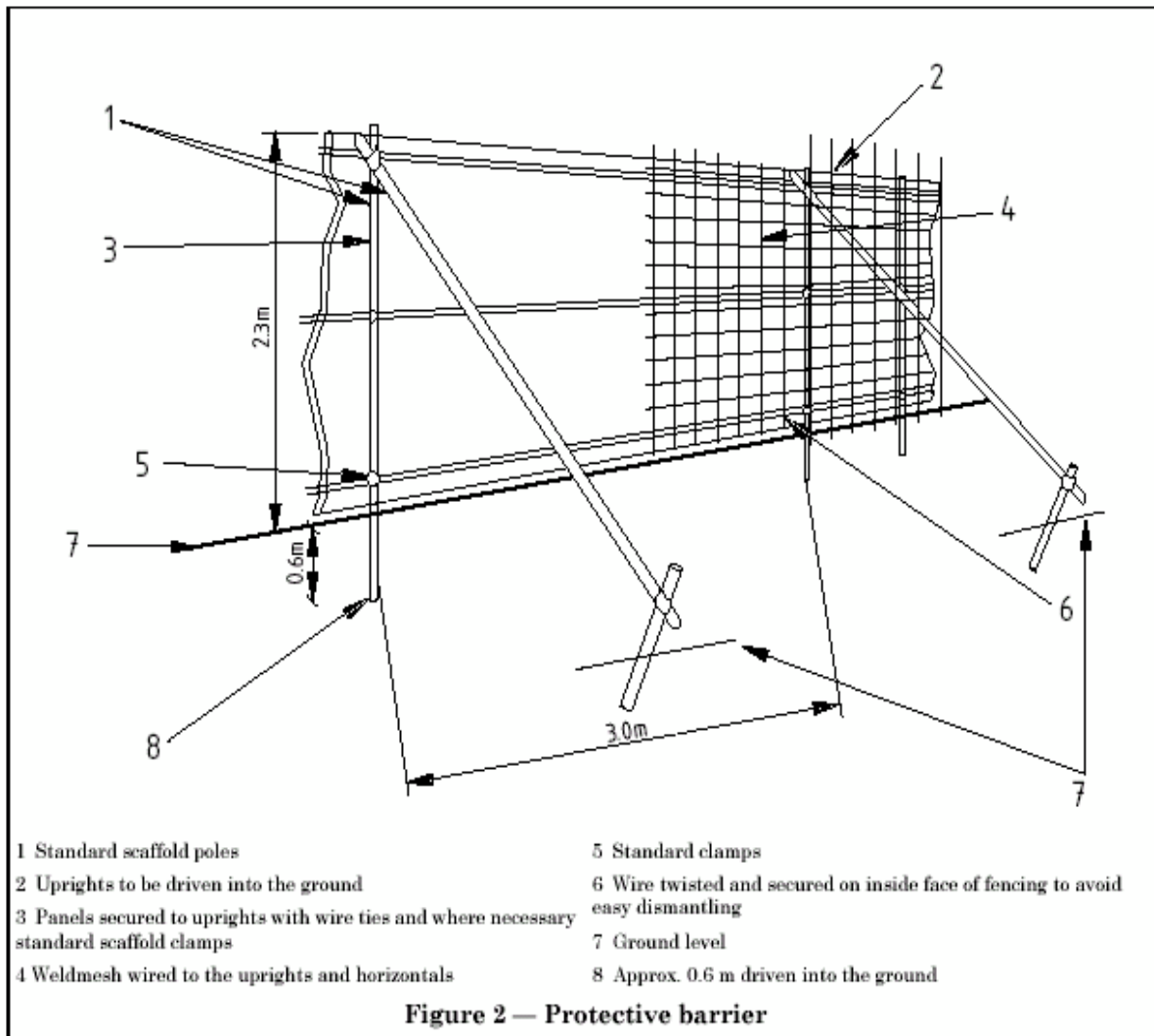
The arboricultural impact is relatively low and can be mitigated with tree works, protective barriers, ground protection and arboricultural methodology.

10 REFERENCES

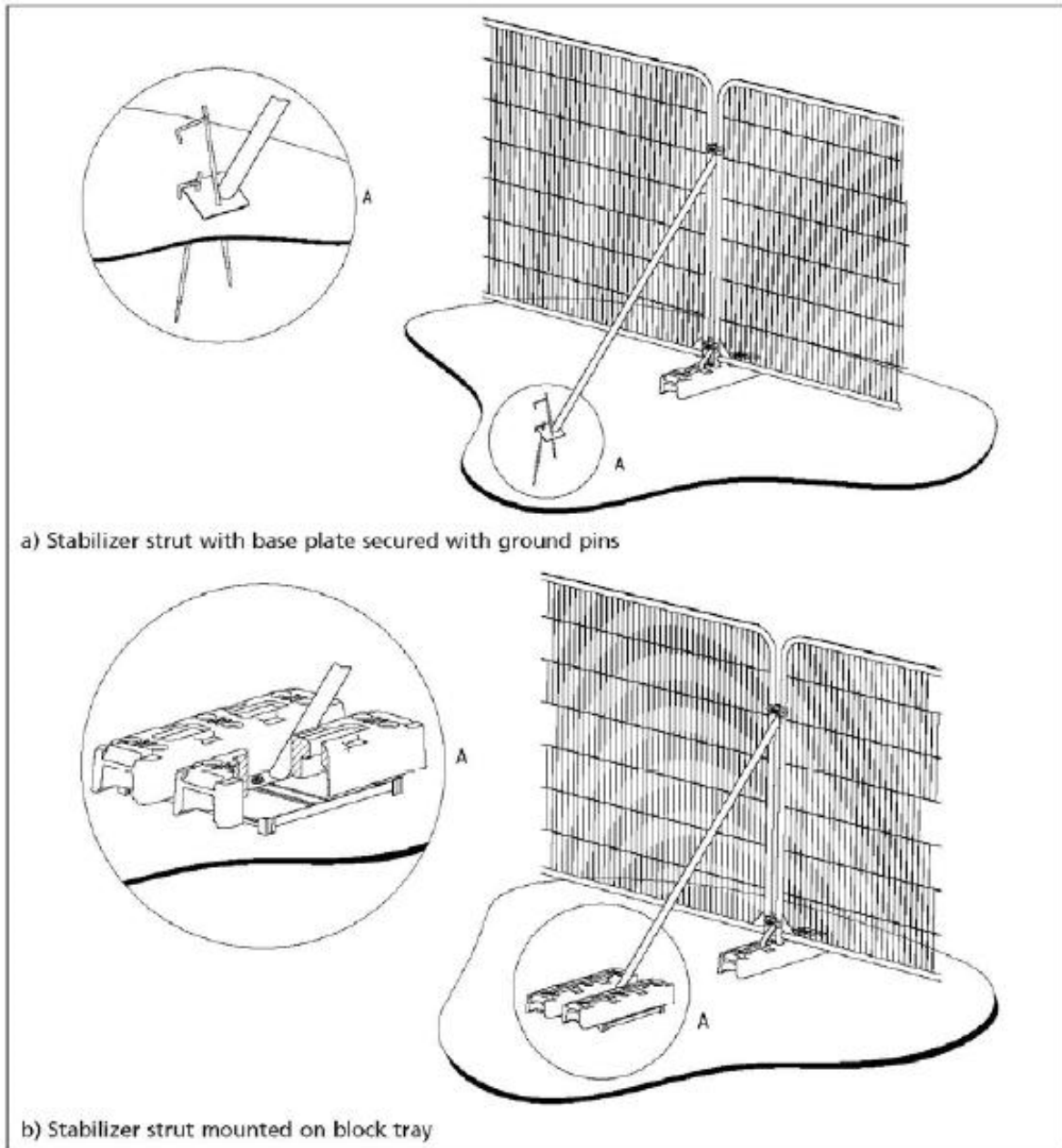
- British Standard 5837:2005 'Trees in Relation to Construction: Recommendations.'
- British Standard 3998:1989 'Recommendations for Tree Work'.
- The Body Language of Trees, C Mattheck, H Breloer.
- Mattheck, C. (2007), Updated Field Guide for Visual Tree Assessment

11 APPENDICES

Appendix 1: Typical barrier to protect trees



Appendix 2: Above ground stabilising system



Appendix 3: Typical barrier notice



PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.








**TREE PROTECTION AREA
KEEP OUT !**
(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION
ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Appendix 5: Satellite Image (Google Earth)



Appendix 6: Site Images

No.	Description	Image
1.	T1 - T9	
2.	T1 - T9	
3.	T11 & T12	

4.	T2013, T14 & T15	
5.	H1	
6.	Trees outside the eastern site boundary	