

Arboricultural Implications Assessment and Method Statement

In accordance with
BS: 5837:2012

At

Flying Start, Dowlais

On the instructions of

Paulo Santos (Blaenau Gwent County Borough Council)

Dated

Original - December 2020

Revision 1 - August 2021

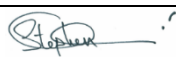


Inspected by - Mr. S J Ambler. Tech.Arbor.A, Dip.Arb. (RFS). F.ARBORA.

Of

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Signed Steve Ambler	
Date	Revision 1 - August 2021

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INTRODUCTION, SCOPE AND BACKGROUND

This assessment is undertaken by Stephen Ambler, the Company founder, a professional arboriculturalist and a Fellow of the Arboricultural Association with over 40 years' experience in the arboricultural industry, serving 19 of those years in local government as a principal arboricultural and woodlands officer. His Consultancy Practice was established in 1999 and later expanded in 2006 with the launch of a specialist 'Tree Contracting Unit' under the revised name - Steve Ambler & Sons Tree Specialists Ltd. Stephen holds the relevant qualifications: -

- a) Certificate in Arboriculture (Royal Forestry Society)
- b) Professional Technician in Arboriculture (Arboricultural Association)
- c) Professional Diploma in Arboriculture (Royal Forestry Society)
- d) Fellow Member of the Arboricultural Association.

This is the second, combined evaluation of the revised proposal undertaking an Arboricultural Implications Assessment (AIA) and producing an Arboricultural Method Statement (AMS). It follows on to an earlier Tree Survey, Tree Categorisation, and Tree Constraints Plan¹ in which the trees were scored and assessed for their suitability for retention within the proposed development. The trees are clearly marked on the Tree Protection Plan which is attached as an appendix.

The AIA review is a desktop study of the current proposal to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees.

The AMS considers the physical and structural requirements of the retained trees and their requirements to maintain their good health and stability during construction activities. It identifies any perceived conflict and proposes a tree friendly working method to reduce damage and injury.

The boundary surrounding the proposed development site and identified by plan attached hereto, in which the trees are contained and form the contents of this Report, is hereafter referred to as 'the site'.

The provision and acceptance of this Report are subject to the general terms and conditions of Steve Ambler & Sons Tree Specialists Ltd.

PLANNING CONDITIONS

None issued as yet

LIST OF DRAWINGS SUPPLIED

This assessment is carried out based on information provided by the client in the following –

- Blaenau Gwent CBC Drawing – Community Services Architects – Building Relocation Option 4 - TS1428 SK-09

¹ S. Ambler - Tree Survey, Tree Categorisation, and Tree Constraints Plan at the Flying Start Centre

SITE DESCRIPTION

The site is situated off High Street on the north-eastern edge of Merthyr Tydfil in Dowlais, near the Heads of the Valley corridor. A large residential development sits to the northeast, east and west, with redundant industrial land to the north northwest.

The site under investigation is enclosed within the boundary and outfield of the Primary School which are clearly defined with fencing and masonry walls. The existing school building is situated to the south of the site whilst the northern portion contains a large woodland group and a large field. The site is rectangle in shape and predominantly level, situated at an elevation of 328 metres above sea level.

ARBORICULTURAL IMPLICATIONS ASSESSMENT

The following matters are considered under this Arboricultural Implications Assessment -

- A) Site Designation - Tree Preservation Order and Conservation Area protection
- B) The above and below ground constraints
- C) The construction of the proposed development
- D) Whether design can be modified to accommodate tree retention
- E) Infrastructure requirements, easements for above or below ground services; highway safety and visibility splays and other infrastructure provisions such as lighting, CCTV and signage.
- F) The end use of the space
- G) Whether tree losses from the development proposal can be mitigated
- H) A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.
- I) The relationship of windows to trees which may obstruct light considered
- J) The fact that large trees can sometimes cause apprehension to occupiers of nearby buildings especially during windy weather
- K) Leaves, fruits and pests associated with some species may cause problems. Falling leaves in autumn blocking gullies and gutters. Fruit can cause slippery patches on hard surfaces such as footpaths and driveways. The accumulation of honeydew from the pest aphid may cause slippery patches on paving and be damaging to some manufactured surfaces and vehicles.
- L) The effects that development proposals may have on the amenity value of the trees both on and near the site

TREE PRESERVATION ORDER AND CONSERVATION AREA PROTECTION

I am informed by email² that no Tree Preservation Order designation affects this site although the Author is unaware if the area is covered by a designated Conservation Area (refer to Legal Constraints Page 34).

TREES - THE ABOVE AND BELOW GROUND CONSTRAINTS

The RPA offers the below ground constraints presented by trees and that specific distance for each tree or group is provided within the Tables in both the Tree Constraints Plan and Report ¹. It is reproduced below in Figure 1. This distance given is a radial distance which should be measured from the centre of the trees stem. These distances are shown in the column highlighted in yellow.

In the attached Tree Constraints Plan (Appendices), the RPA' s are shown as solid orange lines whilst the canopy spreads of the trees are shown as solid green, blue or grey lines (subject to their category rating).

² Email dated 9th December 2020 from Paulo Santos incorporating comments from Matt Davies

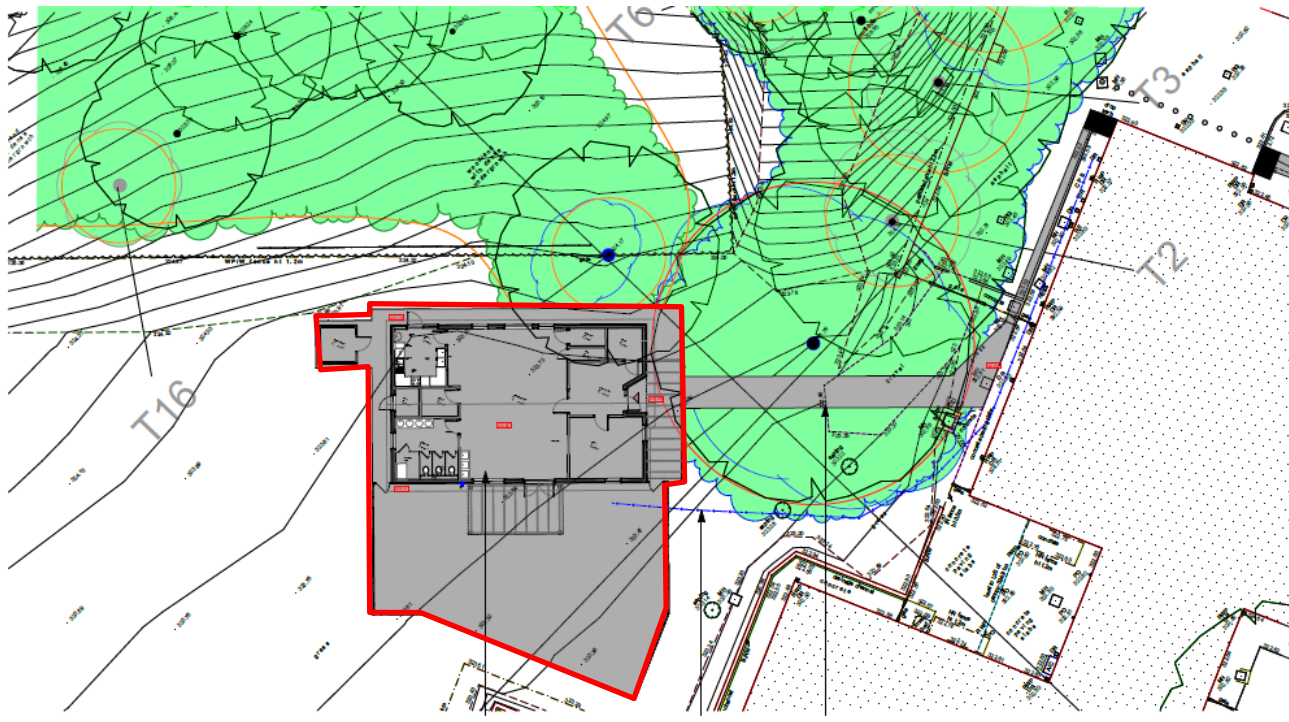
Figure 1 - Tables

Group Number	Tree Number	Species	Height (M)	Effectual Diameter (mm)	Branch Spread				1st Significant Branch	Canopy Clearance	Life stage	Remaining Contribution (years)	Retention Category	Root Protection Radius (M)	Root Protection Area (M2)
					N	S	E	W							
G1		Sycamore (Acer pseudoplatanus) Whitebeam (Sorbus aria) Lime (Tilia x euchlora)	9-18	340-840	/	/	/	/	1.5	1.5	M	20-40	B2	↓	↓
	T1	Sycamore	18	840	11	12	9	9	3	1.5	M	40	B2	10.2	327
	T2	Whitebeam	9	340	5	5	6	4	1.8	1.5	M	20	C2	4.20	55
	T3	whitebeam	10	460	4	5	3	5	1.6	1.6	M	20	C2	5.7	102
	T4	sycamore	14	500	5	9	9	7	1.7	1.7	M	40	B2	6.0	113
	T5	Lime (Tilia x euchlora)	12	460	4	5	7	5	1	1	EM	40	B2	5.7	102
	T6	6 x sycamore	12	250 av	5	5	5	5	1.7	1.7	EM	20	C2	3.0	28
G2		Field maple (Acer campestre), Oak (Quercus robur) Downy Birch (Betula pubescens) Hawthorn (Crataegus monogyna), Mountain Ash (Sorbus aucuparia), Wild cherry (Prunus avium), Ash (Fraxinus excelsior)	5-15	350 av	/	/	/	/	0.2	0.2	EM	40	A2 A3	4.2	55
	T7	Sycamore	11	280	4	2	3	5	2	2	EM	40	B2	3.6	41
	T8	Common Alder (Alnus glutinosa)	10	300	5	4	3	5	1.7	1.7	EM	40	C2	3.6	41
	T9	Norway maple (Acer platanoides)	11	350	6	6	5	5	1.5	1.0	EM	20-40	C2	4.2	55
	T10	Field maple	13	450 #	4	3	5	3	3	2	EM	20-40	C2	5.4	92
	T11	Golden Lawson Cypress (Chamaecyparis 'Winston Churchill')	10	300 #	2	2	2	3	0	0	EM	20-40	C2	3.6	41
H12		Leyland cypress (x Cupressocyparis leylandii)	3-6	200 #	/	/	/	/	0	0	EM	10	C2	2.4	18
	T13	Mountain Ash	8	140	3	2	3	3	2	1.5	EM	20-40	C2	1.8	10
	T14	Mountain Ash	8	180	3	3	4	3	2	1.5	EM	20-40	C2	2.4	18
	T15	Sycamore	16	510	8	8	8	9	2	1.8	M	40	B2	6.6	150
G2	T16	Field maple	14	280 240 210	4	4	4	4	1	1	EM	40	C2	3.6	41

THE PROPOSED DEVELOPMENT FOOTPRINT AND TREE LOSSES

The proposed Flying Start Building footprint is highlighted in red and overlaid with the Tree Constraints Drawing (S. Ambler) as shown in Plan Extract 1 below. It is evident that the positioning of the building footprint and its paved areas compromise the RPA and canopy of T1 and G2. The close position to T7 will become problematic as its crown develops to maturity.

Plan Extract 1



Conflict is noted with T1, a mature Sycamore (*Acer pseudoplatanus*), which was reported in the earlier document¹. The RPA is compromised by the paving, and the lower crown will require resilience pruning to permit the construction. The future relationship will require regular trimming to control crown size to prevent contact with the building.

Under the current proposal, no trees are lost to this proposal.

TRIMMING AND FELLING WORKS

Under normal circumstances, the 'approved³' tree surgery and/or felling works should be completed prior to the erection of the Tree Protective Barrier Fencing although must come within the Watching Brief element.

Access facilitation pruning is necessary to T1 & T7 to prevent injurious contact between plant and equipment and the proposed structure. In some cases, working space may be provided by temporarily tying back tree branches. Pruning or tying should be undertaken in accordance with a specification prepared by the Project Arborist (PA).

Pruning will be required to permit adequate space for implementation of this proposal. From the plan above, it suggests that a crown reduction of T1 will be required on the west side by 2 metres. A very slight reduction of T7 (G2) may be necessary on the south side to permit space plant and equipment and perhaps the erection of scaffolding.

³ Approved by the Local Planning Authority

Method Statement Tree surgery and Felling

All approved tree works should only be undertaken by a competent arboricultural contractor who shall be made known to the LPA in writing 5 days prior to commencement for their approval.

Contractors should be made aware of planning conditions relating to trees within and adjacent to the site and of any Tree Preservation Order or other site designation which may be relevant, through providing 'toolbox talks.

Tree works shall be supervised by the Project Arborist through the Watching Brief element, (see Item 5)

All trees approved for surgery works should be clearly marked by the Project Arborist beforehand.

All works must be in full accordance with the specifications within the British Standards 3998:2010 Tree Work - Recommendations

Tree surgery should be undertaken with caution to prevent damage to retained trees and particularly their roots underground. Crush injuries will occur to roots of retained trees if felled within their RPA. In such instances, crash-matts should be used. No vehicles are permitted within the RPA of any retained tree, without the use of load spreading material.

Any 'approved⁴' tree surgery or felling works should be completed prior to the erection of the Tree Protective Barrier Fencing.

NOTE - Legal issues relating to tree felling should also be observed – see Item 7.0

WHETHER DESIGN CAN BE MODIFIED TO ACCOMMODATE TREE RETENTION

The repositioning of the proposed building several metres beyond the limits of the RPA to the northwest is likely to remove all the present conflicts with T1, T7 and G2.

TREE PROTECTIVE BARRIER FENCING

Following necessary and approved tree surgery and felling works, and before any materials or machinery are brought onto site, demolition, stripping of soil or development of any kind commences, all trees to be retained must be protected using robust physical barriers (as shown in Appendix A) and where necessary, ground protection plates positioned.

The correct location for the Tree Protection Barriers is shown in the Tree Protection Plan in the Appendices

Prior to any construction activity and where due to site constraints construction activity cannot be fully or permanently excluded from all or part of a tree's RPA, appropriate ground, tree stem, and low crown protection must be installed (see 6.2.3), under the guidance of the Project Arborist.

Barriers should be checked and signed off by the PA prior to commencement of any site works or occupation by construction team monitored and maintained throughout the entire construction phase to ensure they remain rigid, complete, and fit for purpose

⁴ Approved by the Local Planning Authority

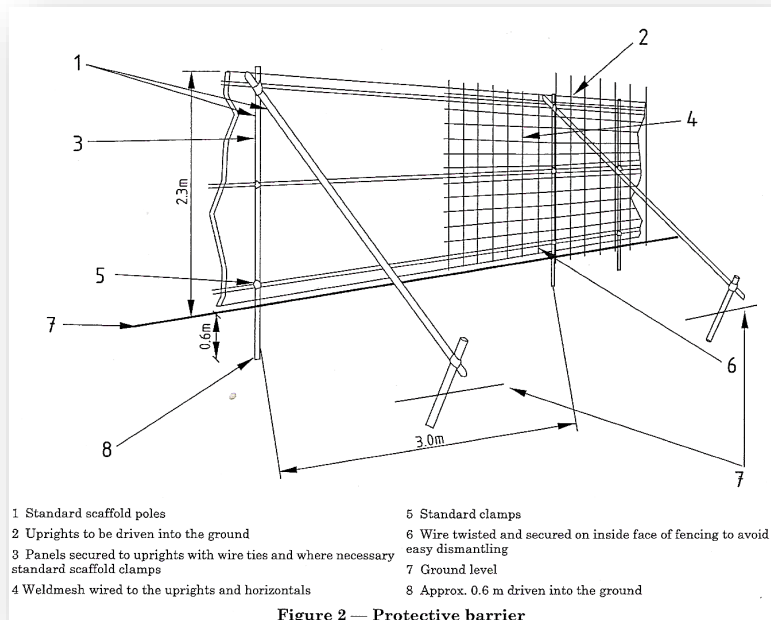
NOTE

1. Any works occurring within any RPA **must** be covered by an 'Approved' ⁵ Arboricultural Method Statement and may only proceed under the supervision of the Project Arborist.
2. Where required, pre-development tree work may be undertaken before the installation of tree protection measures under the guidance of the PA and with the agreement of the Local Planning Authority. However, no vehicles will be permitted within any unprotected RPA of retained trees and works must be carried out with due consideration and without causing injury to any retained tree.
3. It should be confirmed by the PA that the barriers and any necessary ground protection are installed correctly prior to the commencement of any other operation and the LPA informed who may wish to attend site and view it first-hand.
4. Set back in the positioning of the barrier fencing to install ground plates should only be done under the supervision of the PA and immediately prior to the construction work and the barrier fencing reinstalled immediately upon completion of that element of construction.

The default tree protection fencing specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2 (below and Appendix B). The vertical tubes should be spaced at a maximum interval of 3 metres and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

NOTES

1. It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.
2. All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE - NO ACCESS".



⁵ Approved by the Local Planning Authority



DEMOLITION OF EXISTING STRUCTURES AND HARD SURFACES

No demolition is required. The current proposal retains all existing buildings, hard surfaces, and structures.

INSTALLATION OF TEMPORARY GROUND PROTECTION

It is most likely temporary ground protection will be required during construction in respect of T1, T7 and Group 2 where the RPA is likely to be needed for access particularly to the northern and eastern elevation. Refer to statement below-

Method Statement Ground Protection

All required ground protection must be positioned and agreed with the PA before materials or machinery are brought onto site. Where construction works or temporary access is justified within the RPA, this should be facilitated by a set-back in the alignment of the barrier fencing.

Temporary ground protection is to act as a load spreader to avoid soil compaction and compressive root injury it and must be suitable for the weights intended. In all cases, the objective should be to avoid compaction of the soil and injuries to the roots occurring which can arise from even a single passage of a heavy vehicle especially in wet conditions. Ground protection must be positioned before any materials or machinery is brought onto site.

Where construction works or temporary access is approved within the RPA, this may be facilitated by a set-back in the alignment of the barrier fencing. Such a setback in the alignment of fencing must only occur immediately prior to the works commencing and which must be installed at the first opportunity immediately following completion of the works under the guidance of an AMS and the PA.

A product such as Trackmats or a similar product should be used which **must** be agreed with the Project Arborist. 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 2 t, 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 2-ton gross weight, an alternative system (e.g., proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with an engineer and arboriculturalist, to accommodate the likely loading to which it will be subjected.

1. Following any approved tree felling, the barrier fencing should be installed in accordance with the Tree Protection Plan (Appendix A) and set back in accordance with that mentioned above.
2. Laying the ground protection material over the exposed RPA should be carried out immediately prior to the works preferably during dry weather.
3. Laying the ground protection layers should be done in a reverse working fashion to avoid compaction so any vehicle involved in the process will always be situated on top of the ground protection.
4. Take care not to damage any part of the tree stem or branches. Tie back branches or prune in accordance with an approved ³ tree surgery schedule.
5. Removal of the ground protection at the end of the construction phase should also be done in a reverse working fashion.

INFRASTRUCTURE REQUIREMENTS AND SERVICE SUPPLIES

Services

Following a review of the earlier Report ¹ the proposed service installation corridor is relocated outside of the RPA although it is positioned quite closely to the north and east which is indicated on the drawing Plan Extract 2 below. This service trench will intercept minor roots during the excavation although will have no effect on tree stability. However, the following working method below should be observed –

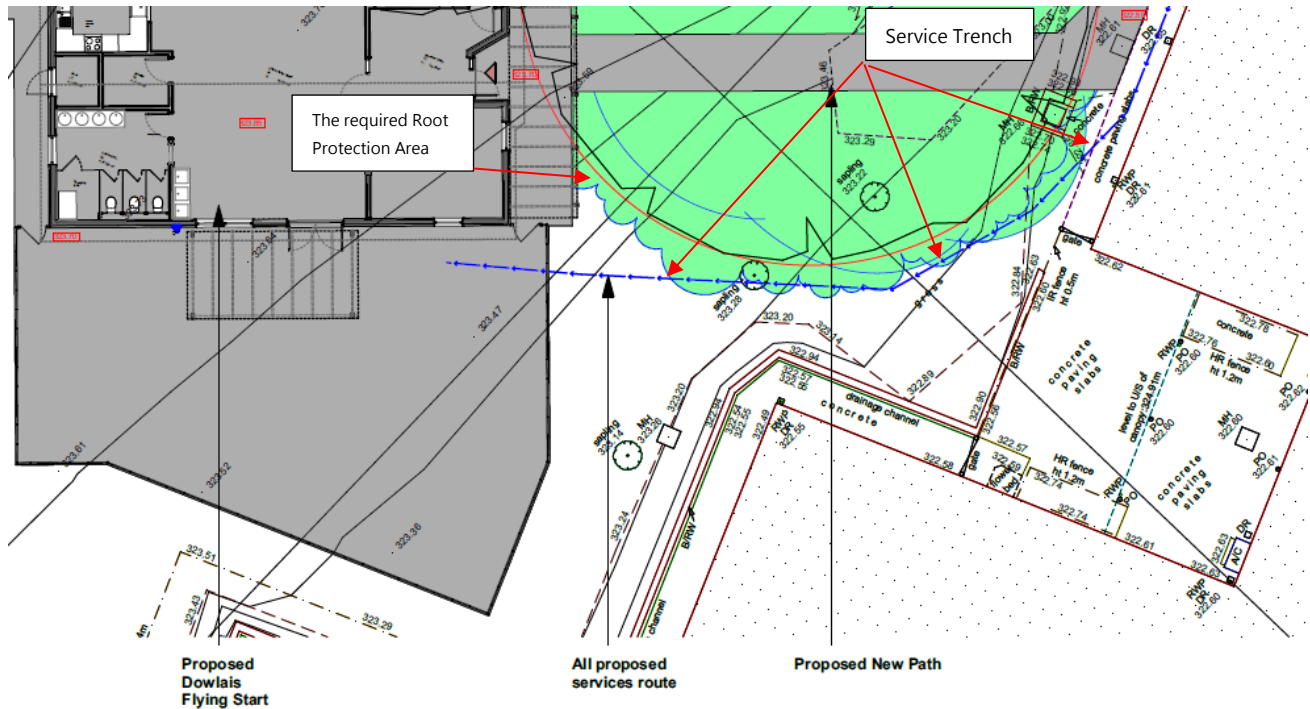
Tree roots can be damaged where services are installed within the RPA of any retained tree. Also, disruption to underground services may occur if they are placed within the root-plate zone as tree roots can cause damage to underground services through displacement. The RPA therefore should be taken as a minimum constraint to the development with regards the installation of underground services although greater distances should be allowed where possible to allow for further root-plate development.

The trees crown is also a constraint to the development and should be considered when seeking to install services or when operating plant and equipment. Sometimes the crown of a tree exceeds the RPA. Both matters will be considered in detail within the Arboricultural Method Statement.

Arboricultural Method Statement

- Arborist to oversee operation
- Barrier fencing to be installed prior to and throughout the construction phase and no access to the RPA permitted
- Ensure branches are not damaged using appropriately sized plant and equipment when installing trench and services. Branches may be tied back if necessary.
- Any damaged roots should be cut cleanly using secateurs or pruning saw prior to backfilling
- Consideration should be given to lining the service trench with a root barrier to prevent root intrusion and possible complications later in maintaining services.

Plan Extract 2 showing line of Service Trench and RPA



Single and CCTV

CCTV and signage are unlikely requirements and not proposed as part of this scheme.

Vision Splays

No trees are to be removed to achieve necessary vision splays to satisfy highway requirements under this scheme.

Level Changes

The drawing information provided does not suggest that level changes will occur within the RPA of any tree.

Drainage ditches

None recommended as part of this proposal

INSTALLATION OF NEW HARD SURFACING - MATERIALS, DESIGN CONSTRAINTS

A resin bond footpath is proposed running through the RPA of T1, although it avoids the RPA of G1 and G2.

Paving areas are shown affecting the RPA of T1 and T7 as shown in Plan Extract 3 below, overlaid as blue and white shading within a blue boarder. See Plan Extract 3 below.

The creation of footpaths and hard surfaces is acceptable within an RPA where it can be constructed above the existing ground level and that it follows the following working method statement as below.

The proposed asphalt play yard and surrounding pavours just enter the tip of G2. Trimming of G2 may be necessary.

Plan Extract 3



GENERAL INFORMATION FOR LIGHTWEIGHT, HARD SURFACE DEVELOPMENT WITHIN THE ROOT PROTECTION AREA OF TREES

The information provided here is based on design recommendations taken from ⁶.

It is critical that the design should not require excavation or soil stripping into the ground, within the RPA of the retained tree – No digging or even scraping is permitted unless using hand tools to remove turf or vegetation layers whilst under the supervision of a Project Arborist (PA).

The structure of the hard surface should be designed to avoid localised compaction by evenly distributing the loading over the track width or wheelbase of any vehicle expected to use the access. Similarly, for the width of the pedestrian footfall.

If the new surface is expected to be subject to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the rooting area. Run-off should be directed away from the RPA.

Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.

Permeable hard surfacing can result in soil volume moisture content remaining at or near field capacity for long periods. Where there is a risk of waterlogging, the design should incorporate appropriate land drainage. Land drainage within the RPA should be designed to avoid damage to the tree and the soil structure, e.g., sand slitting formed by compressed air soil displacement with the slits set radially to the tree.

⁶ Arboricultural Practice Note 12. Arboricultural Advisory Information Service. Through the Trees to Development. Derek Patch and Ben Holding

The hard surface should be resistant to or tolerant of deformation by tree roots and should be set back from the stem of the tree and its above-ground root buttressing by a minimum of 500-mm to allow for growth and movement. Resulting gaps may be filled using appropriate inert granular material.

NOTE 1- *Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems. Alternatively, piles, pads or elevated beams can be used to support surfaces to bridge over the RPA or, following exploratory investigations to determine location, to provide support within the RPA while allowing the retention of roots greater than 25 mm in diameter.*

NOTE 2- *The use of two-dimensional load suspension systems is not recommended for surfaces intended for use by vehicles but is adequate for pedestrian designed usage.*

If a permeable surface is to be used by construction traffic, this should be protected with a temporary sacrificial surface laid over a geotextile separator to ensure that its permeability is retained (i.e., interstices should not become blocked during construction).

Edge supports

The excavation needed for the placement of kerbs, edgings, and their associated foundations and haunchings can damage tree roots. Within the RPA, this should be avoided either using alternative methods of edge support or by not using supports at all.

NOTE 3- *For example, where kerbing is required for light structures, such as footpaths, above-ground peg and board edging might be acceptable. Where areas of hard surface require edge support, the use of sleepers (pinned in place where required), gabions or other non-invasive ground-contact structures, including the use of proprietary products, can provide appropriate solutions.*

Precautions

The soil structure including the area beneath the proposed new hard surface should be protected from compaction during installation. This may be achieved by a) the use of temporary ground protection to safeguard the working area; b) constructing the new surface with machinery working forward from the surface as it is constructed (known as "rolling out").

Where herbicide is used to control vegetation prior to construction of hard surfacing, the manufacturer's guidance should be strictly followed, and care should be taken to avoid any damaging effects on trees or other vegetation to be retained. The ground should not be skimmed to establish the new hard surface at the former ground level. Loose organic matter and/or turf should be removed carefully using hand tools. The new surface should then be established above the soil.

NOTE 4- *The use of appropriate geotextiles can provide a barrier that inhibits weed growth but allows water and gases to pass freely.*

Raising levels should be achieved using a granular material with no-fines which remains gas and water-permeable throughout its design life.

Due to the highly alkaline leachate produced during the curing of wet concrete, concrete should not be poured within the RPA unless an impermeable liner has been installed.

New permanent hard surfacing should not exceed 20% of existing unsurfaced ground within the RPA

Construction should incorporate these two main components:

- A synthetic load spreading material
- A no-fines aggregate sub-base

NOTE 5- *a **geotextile**, which is usually used to prevent layers of different materials mixing while allowing water to pass through, is not designed to be load bearing. 'Load Spreading' materials, are synthetic grids or webs designed to support roads on soft ground by distributing the load of a wheel over a larger area than would normally occur. Such load spreading materials may be two or three dimensional.*

When placed on a **two-dimensional grid**, appropriate, no-fines granular sub-base material penetrates the mesh, but is unable to pass through it, forming a positive interlock (Figure 4). This interlock between aggregate and grid provides a reinforced platform and efficient load spread into the ground over a wider area than the footprint of the wheel on the surface. A suitable geogrid/aggregate combination constructed with the grid under tension should prevent rutting of the ground beneath construction.

NOTE 6– *two dimensional grids are not to be used where vehicles access is required.*

The **three-dimensional load spreading products** (Cellular Confinement System) create cells into which the subbase material is placed (Figure 5). Such a construction does support the sub-base material; it confines the material in discrete cells. Manufacturers recommended, therefore, that a geotextile (see note above) is placed between the ground and load spreader to prevent the cell-contained mineral material being pressed down on the underlying soil.

A no-dig construction above ground level will need to be contained to prevent outward creep under the weight of vehicles. This may be achieved with an edging support provided its construction does not involve excavation. A suitable material may be long-life timbers pinned through the load-spreader into the underlying soil (See Figure 6). This could add strength to the structure because the pressure of vehicles forcing the sub-base downwards and outwards will tend to increase the tension on the grid and tendency to rutting.

The granular sub-base material should have a 'no-fines' content which means that even when it is compacted it should be freely draining and will allow oxygen to diffuse into, and damaging gases (e.g., carbon dioxide and methane) out of the soil.

NOTE 7 - *For site-specific prescriptions and material specifications, advice should be sought from a qualified geotechnical or civil engineer who should work in consultation with an arboriculturalist.*

Figure 4

Two-Dimensional Load Spreader

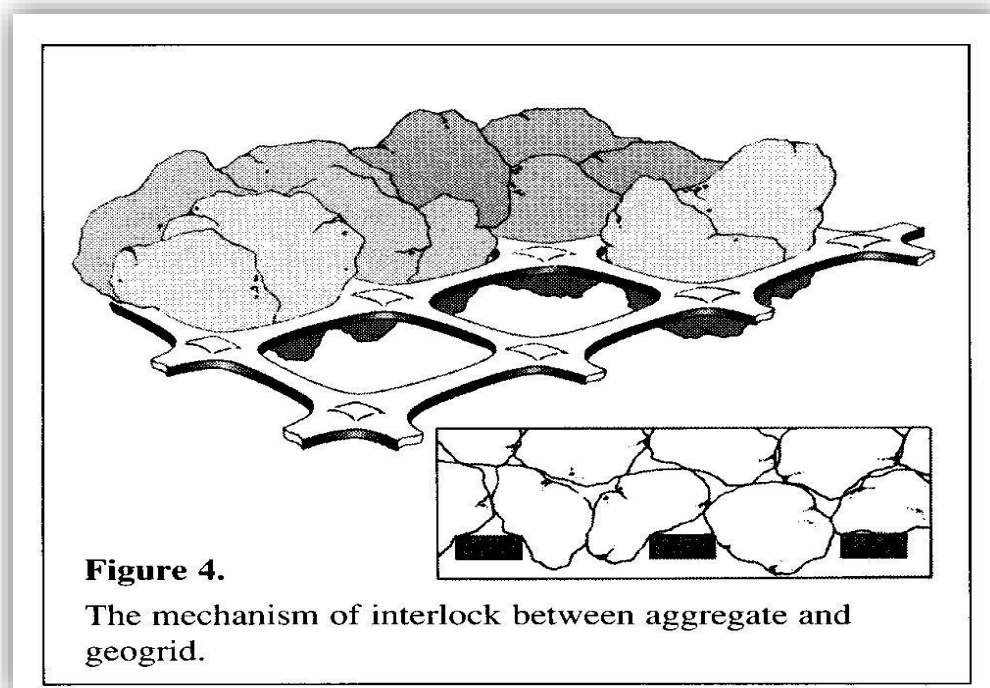


Figure 5

Method for Constructing Access within RPA

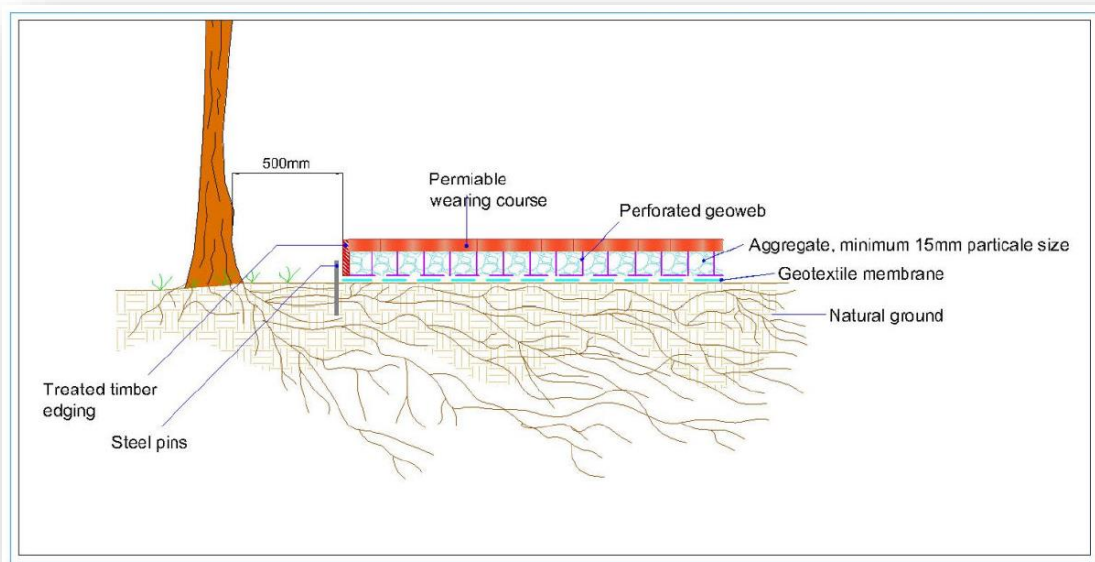


Figure 6

Three-Dimensional Load-Spreader



ARBORICULTURAL METHOD STATEMENT

- 1) Project Arborist to supervise these works
- 2) Construction should ideally be undertaken between May and October when the ground is driest and least prone to compaction.
- 3) Take care when constructing not to compact the soil or cause root damage. There **must not** be any movement within the root protection area before the ground is protected by the load spreader and the subbase. Then movement must only be along the construction.
- 4) Begin construction at the entrance to the site and 'roll-out the driveway in front of the machinery which always remains over the sub-base.
- 5) Kill ground vegetation using a translocated herbicide such as glyphosate⁷. After some time, gather up the dead organic material; this will prevent the build-up of anaerobic conditions beneath the construction, which might otherwise occur as vegetation begins to decompose.
- 6) Remove major protrusions such as rocks and tree or shrub stumps (stumps should be ground out rather than excavated to minimise soil disturbance).

⁷ Pesticides can be dangerous...refer to manufactures instructions and follow the advice on the label carefully. Pesticides should only be used by competent personnel.

- 7) Fill major hollows with sharp sand. DO NOT GRADE-OFF HIGH SPOTS
- 8) If necessary, for example when using three-dimensional cellular confinement products as a 'load spreader' , a geotextile should be spread over the area of the driveway or car park.
- 9) Lay a geotextile membrane over the whole of the driveway/parking area prior to the application of the three-dimensional load spreader.
- 10) Lay the 'synthetic load spreader' directly onto the level ground or the geotextile as appropriate.
- 11) Secure the synthetic load spreader under tension using long pins driven into the ground through the grid. **NOTE-** before driving pegs or pins into the ground, check for underground services that could be damaged.
- 12) Construct an edging which is secured through the load spreader so that pressure on the running surface will force the edging outwards and so increase the tension on the load spreader. With boards attached to pegs driven into the ground through the geogrid. Pegs should be long enough to give sufficient support for the construction. **NOTE** - before driving pegs or pins into the ground, check for underground services that could be damaged.
- 13) Cover the load spreader with a minimum of 100 mm of no-fines aggregate. This should not be tipped straight onto the synthetic material but should be placed at one end and then pushed onto the grid so that machinery moves on the spread sub-base, not directly on the geogrid or the ground either side of it.
- 14) Compact the sub-base to ensure binding with the geogrid and to minimise future rutting.
- 15) A further geotextile may be placed over the sub-base to prevent dry bedding materials or surfacing merging with the subbase.
- 16) Place the final surface which is likely to consist of gravel or tarmacadam, although paving slabs and brick paviours may be acceptable provided, they are dry bedded on the sub-base and the joints are not sealed with grout, to allow for infiltration of water and gaseous diffusion.

RETAINING STRUCTURES TO FACILITATE CHANGES IN GROUND LEVELS

None indicated as part of this proposal

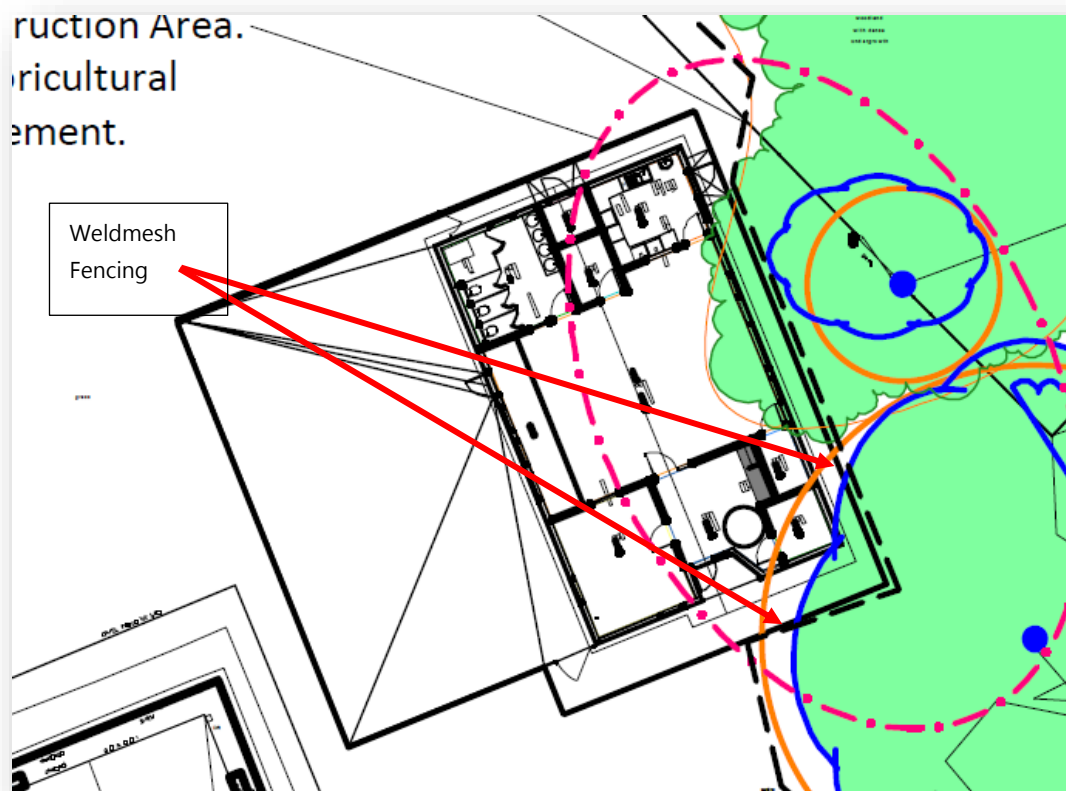
BOUNDARY TREATMENTS

1.4-metre-high weldmesh fencing is planned to surround the Flying Start Centre which will impact on the fringe of G2. Some trimming may be necessary as discussed earlier above.

The erection of fencing within RPA has the potential to damage tree roots, stability, and long-term survivability. Damage may be caused in several ways although the most common is during excavations for the support posts, which can sever structural roots, that occur within several metres of the tree. To sever these can cause immediate or longer-term stability and physiological issues and certainly provide entry points for decay organisms.

The Method Statement below will ensure that no structural roots are damaged resulting in tree instability.

Plan Extract 4 – showing position of 1.4-m high weldmesh fence. Orange lines indicate the required RPA.



Method Statement

Project Arborist to assess route of fence line and assess tree stem diameters and correlating Mechanical Effective Root-plate Radius (MERR).

Where possible, excavations should not occur within the MERR which is a radial measurement established during work undertaken by Claus Mattheck⁸ and refers to the critical distances required to maintain the structural roots and stability of a tree. Structural roots differ from the finer feeding roots protected by the somewhat larger RPA. The MERR of any tree directly correlates to its trunk diameter when measured just above the root buttress flare.

When working within the RPA, excavations for post holes should not occur within the MERR or exceed 200-mm in diameter, be cut cleanly with a posthole borer and must be carefully positioned. They should not be spaced any closer than 1 metre apart.

If working in the MERR is unavoidable, it may only proceed using hand tools to excavate the hole under the supervision of the PA adjusting the positioning of the fencepost to avoid large roots. These are often visible just along the surface close to the trunk and they should not be damaged during expletory works.

⁸ Mattheck. C. & Breloer. H. The Body Language of Trees. A Handbook for Failure Analysis

A posthole auger will be necessary to excavate the postholes and care should be taken when using any mechanical driven rig within the RPA.

- 1) Project Arborist to assess route of fence line and assess tree stem diameters and correlating MERR.
- 2) The auger operation should limit the diameter of the holes to 200-mm or below, with a minimum distance between the edge of each pile of 1000-mm where possible.
- 3) Auguring must avoid the Mechanically Effective Root-plate Radius (MERR) of any retained tree.
- 4) The barrier fencing should be altered to accommodate the works immediately prior to the operation and reinstated immediately upon completion of the operation where it applies.
- 5) Where using a rig, the auger operation should be carried out whilst on top of 'load spreaders' sufficient to support the weight of the plant to protect the RPA from compaction and the underlying roots from compressive injury, this protection should include tracking inwards and outwards from the RPA.
- 6) Consider the height of the Rig to prevent damage to overhanging branches.
- 7) The augured excavated material shall be collected carefully and removed from the RPA
- 8) Take precautions to prevent soil contamination, which may involve using a non-permeable sheet below the rig during its operation to prevent leaking fuel and hydraulic oil onto the soil.
- 9) Spill kits should be carried and in the event of any contamination, it shall be collected immediately and disposed of in a proper manner and the Arboriculturalist and Site Manager informed
- 10) Where concrete is being used the augured holes should be lined with anon-permeable sleeve to prevent leachates entering the soil and great care shall be taken not to spill and contaminate the soil.
- 11) The Project Arborist shall be informed of the dates of these operation.

PREPARATORY WORKS FOR NEW LANDSCAPING

There are no landscape proposals for this scheme.

WHETHER TREE LOSSES FROM THE DEVELOPMENT PROPOSAL CAN BE MITIGATED

Whilst there are no tree loss associated with this scheme, there is sufficient room on site to provide some screening through to the development in the open space to the west and north of the larger school site. Visual enhancement would be achieved through planting along the western boundary of the playing field alongside the highway. This will provide some screening into the site, provide scale and seasonal variation, refer to Plan Extract 4 below. Suggested species Lime (*Tilia x euchlora*) 12-14 Cm Girth and supplied as root-balled

See Plan Extract 5 below -

Plan Extract 5 – proposed mitigation planting



IMPACT ASSESSMENT OF DEVELOPMENT ON TREES.

A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.

The building is proposed within the RPA and canopy space of T1. The earlier recommendation¹ to remove the tree is rejected by the LPA. This proposal is likely to have some effect on the trees physiology as some root/soil disturbance is unavoidable. Also crown modification is required to promote space for the structure and to allow room for plant and equipment which may leave the trees crown unbalanced. The current crown height above ground level is measured at 1.5 metres with the first substantial limb at 3 metres above ground level. The extent of surgery is unknown until marking out on site is complete so it is unknown if the required surgery will be excessive. Future pruning of the crown will be required to control its size and it restores back to the original canopy size and is likely to contact the building. Due to its close positioning, this Sycamore will cast shade, produce leaf litter and honeydew from aphids, making any surface slippery during wet weather conditions.

The current proposal occurs close to the edge of Group 2 in which the trees are early mature and will develop further in height and spread over the next 20 years. This will bring about the need for tree cutting maintenance on a regular basis to control growth that encounters the side of the building and due to shade, leaf litter and honeydew from aphids making any surface slippery during wet weather conditions.

Leaf litter is likely to be an issue for footpath surfaces, rainwater gullies, roof gutters and play areas. Gutter guards should be used along with gully grills.

Regular surface cleaning will be necessary to prevent slipping, trips and falls.

The trees will have a constant target area and more intense maintenance is likely along with the frequency of tree inspections.

Recommendation – relocate the building several metres northwest

A more robust maintenance of the wooded Groups 1 and 2 is required where they will directly benefit from a long-term management approach. Intervention works to re-space the stand will help structure and wind firm characteristics develop. The removal of some basal growth and crown lifting of the leading-edge trees will create views into the woodland and improve amenity. The situation with the disease Ash dieback that is currently spreading throughout the UK will require monitoring and action will become necessary as trees become affected. An assessment of the woodland will be required every 12 months to assess this situation.

Recommendation – A long-term woodland management plan is highly recommended to cover a minimum of 20 years. annual tree inspections by a professional Arborist on a 12 monthly cycle.

Any potential damage to the proposed building because of the trees would consider (a) indirect damage through subsidence or heave (a matter related to geology), (b) Direct damage, physical damage caused by incremental growth, (c) The disruption to underground services, (d) Displacement, lifting or distortion, (e) The impact on branches on the super structure or (f) Structural failure of a tree. they are considered below –

- a) **Indirect Damage.** The likelihood of damage occurring to the structure because of ground movement occurring through soil swelling and shrinking is dependent on local geological conditions and the presence of shrinkable clay soils beneath the foundations. This report has not considered the soil type in any detail or undertaken a laboratory soil analysis as part of this brief. The potential for direct damage should be taken into consideration throughout the design and construction process. For guidance on avoiding indirect damage by trees to structures, refer to NHBC Chapter 4.2.
- b) **Direct Damage.** This can sometimes occur through the annual incremental growth of the trunk or root buttresses through a process called ‘secondary thickening’. The greatest risk of direct damage occurs when trees are close to building structures and occur with the expanding growth of the main trunk and roots although any likelihood of such damage diminishes rapidly with distance. Table A.1 of BS:5837 is produced below and provides advice on minimum distances to avoid damage.
- c) **Displacement, lifting or distortion.** This can occur where lightweight structures are within influencing distance of trees and annual incremental growth of roots and buttresses can disturb paving, walls, porches, and garages. Advice in Table A1 should be followed (see below) when planting new trees or controlling seedling growth.
- d) **Wind Dynamics.** As far as wind dynamics are concerned, the following matters are noted. Air deflected over or around such solid structures will be locally accelerated to create turbulence. The proposed development is within influencing distance of the trees as buildings or solid structures can influence leeward wind patterns for a distance more than 30 times

their height⁹, although the effects of the more damaging wind turbulence in respect of trees is much shorter than this with the more dramatic influence being at least twice the height of the structure. It is usually a problem where retained trees have thin stems without adequate stem taper, and which have usually resulted where they have developed at close spacing' s and under mass shelter and particularly where a number of those trees have been removed. In considering this, a management plan is considered necessary for the woodland Groups 1 and 2 to promote windfirm characteristics, as mentioned previously.

- e) **Large trees can sometimes cause apprehension to occupiers of nearby buildings especially during windy weather.** Whilst this is true in some instances, structural failure amongst trees is most common where a specimen is diseased or structurally defective or a stand is undermanaged. Well managed trees offer little risk to residences where under routine arboricultural inspections providing remedial works recommended during such an inspection are carried out by a competent tree surgeon. The level of risk exposure (target occupancy) for these trees will increase and impose a ¹⁰duty upon landowners and managers to manage the trees. However, this is a reasonable expectation and should not be seen as detrimental to the health or long- term future of the trees or to the outcome of this application. Appropriate tree management under the guidance of an Arboriculturalist should be beneficial; it may however suggest that management is required from time to time which up until now has been somewhat neglected.
- f) **Leaves and fruits of some species may cause problems** and the accumulation of honeydew may be damaging to surfaces and vehicles. Here, the species of Lime (*Tilia x euchlora*) and Sycamore (*Acer pseudoplatanus*) is noted which is associated with aphid activity and the production of honeydew excretions, although situated within the wooded area to the east and not in proximity to car parking facilities. Falling leaves are likely to impact on this development and Gutter Guards should be built into the scheme to prevent gutters from becoming blocked. There are no species found on this site that produce large fruits.
- g) **The relationship of windows to trees which may obstruct light need to be considered.** Windows on the eastern elevation will be devoid of sunlight due to the trees of Groups 1 and 2

THE EFFECTS THAT DEVELOPMENT PROPOSALS MAY HAVE ON THE AMENITY VALUE OF THE TREES

This development has a minor impact on tree coverage with the effects of surgery and disturbance to T1, mature Sycamore (*Acer pseudoplatanus*), T7 and a portion of G2. However, this is seen as having only as negligible impact in terms of amenity which is not affected generally as the large grouping of trees on the eastern boundary form a cohesive landscape element which remains unbroken.

The woodland management recommended above would enhance amenity in the long term, nurturing the development of a solid and well-structured woodland group which would have a positive effect on the landscape. To leave the woodland devoid of such management will bring about is demise and potential loss of the woodland feature due to windblow.

Some recommendations for planting have been made to help screen the development from the adjacent highway.

⁹ Patch. D. Trees, Shelter and Energy Conservation. Arboricultural Research and Information Note 145/ARB/98

¹⁰ Failure Criteria for Solitary non-decayed trees Arboricultural Journal Volume 26 Number 1 April 2002.

BRITISH STANDARD

BS 5837:2012

Allowance needs to be made for the swaying of stem and branches during storm conditions. Branches which are liable to strike the structure need to be removed or pruned back to a suitable branching point as appropriate (see BS 3998:2010).

Table A.1 Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm ^{A)}	Stem dia. 300 mm to 600 mm ^{A)}	Stem dia. >600 mm ^{A)}
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

^{A)} Diameter of stem at 1.5 m above ground level at maturity

A.1.3 Allowance for future growth

Where the installation of paths or light structures such as walls is unavoidable near to trees, the design and construction specification needs to take account of future growth.

If it is necessary to build a wall or similar structure over a root greater than 50 mm diameter, provision for future diameter growth needs to be made by surrounding the root with uncompacted sharp sand, void-formers, or other flexible fill materials, and by laying an adequately reinforced lintel or raft over the surface.

GENERAL MATTERS

To prevent damage to the trees, including their roots, within the fenced area (RPA) there must be no...

- φ Alteration of ground levels, including soil stripping.
- φ Installation of drainage or services using conventional open trenching methods which would not be in accordance with BS:5837. (Any works should be in accordance with the National Joint Utilities NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees Volume 4)
- φ Excavation of any kind.
- φ Storage of any materials or equipment, even on a temporary basis.
- φ Storage of oil, bitumen, cement, or other harmful materials, mixed or discharged within 12-m of the trunk of any retained tree and making further allowances for any slope of the ground so prevent running contamination. Phytotoxic materials would include any mineral oil, fuels, cement mortar washings concrete washings, mortar.
- φ Fires must not be lit beneath or within 12-m of any tree canopies.
- φ Site operations such as deliveries, site machines, crane jibs etc should be organised to avoid damaging the trunk or crown of trees. Where this conflict is unavoidable then facilitation pruning should be carried out in advance, rather than after damage has occurred. This may also be required to allow demolition operations.
- φ Mechanical cultivation of the soil as part of landscaping operations.

Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs, and counterweights (including drilling rigs), in order that they can operate without encountering the RPA, trunks stems or branches of any retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any movement of plant or machinery in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is always maintained. Access facilitation pruning should be undertaken where necessary to maintain this clearance if in accordance with good arboricultural practice (see note 2 below).

NOTES

1. In most instances, local planning authority consent for pruning will be required.
2. Fires on sites must be avoided within 30 metres of the edge of any tree crown.
3. Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA.

Drainage

New development can influence the existing drainage pattern and ground water levels of a site, due to level changes, increased areas of hard surface and new drainage installations. The root systems of mature trees do not generally adapt as well as younger specimens to alterations to groundwater. Expert advice on both drainage and trees should be taken where groundwater conditions are liable to change.

NOTE

1. It is both good practice and, in many cases, a regulatory requirement to maintain existing groundwater conditions within, and reduce run-off from, a development site. This can be achieved, for example, using permeable hard surfaces and techniques associated with sustainable urban drainage systems (SUDS). Such techniques can be designed and implemented to benefit both existing and new trees. (SUDS water might need to be treated/filtered and/or tree rooting areas protected from direct contamination in risk areas.)

AUDITABLE SYSTEM OF ARBORICULTURAL SITE MONITORING, INCLUDING A SCHEDULE OF SPECIFIC SITE EVENTS REQUIRING INPUT OR SUPERVISION.

Successfully retaining trees on any development site depends on several controls being in place. A determination and willingness by all parties is required but primarily the Site Manager will have overall responsibility to ensure that control measures are observed. Communication early in the procedure between the client, site manager, Arborist and Local Authority Tree Officer or other appointed staff, which is fundamental in maintaining a level of care.

The engagement of a Project Arborist is probably the single most essential component towards ensuring success. This should involve regular 'drop-in' visits by an appointed Arborist who will be responsible for monitoring tree protection measures and offer advice when needed.

A line of communications must be in place between Project Arboriculturalist, Site Manager, and Local Planning Authority Tree Officer as a minimum requirement. Details are provided below. Should any queries arise in relation to the protection of trees on this development site then please contact the Arborist on call, during normal office hours.

Such visits must be recorded to form an auditable trail and regular Reports submitted to the Local Planning Authority. The number of visits will be dependent on the type and density of the development and the matters requiring arboricultural input. The number of visits required may also be stated or altered by the LPA at any time during the permitted development.

Schedule of Watching Brief Visits

- Tree surgery works to commence prior to erection of barrier fencing.
- Barrier fencing to be erected in accordance with the Approved Tree Protection Plan and assessed and signed off as Fit-for-Purpose by the Project Arborist (PA)
- All required ground protection must be positioned and agreed with the PA before materials or machinery are brought onto site
- The Project Arborist should attend site on a weekly basis for the first 4 weeks after which on this scheme once monthly is likely to be sufficient, although will be under review.
- Watching Brief Reports must be submitted to the LPA at the end of each month.
- The Report will include details of the visits throughout the month, list any concerns, and to provide and recommend remedial action to protect trees where necessary and a time frame in which to complete. This report will include photographic evidence.
- The suitability of the root protection fencing will be assessed.
- The PA must supervise all approved works that occur within any RPA
- The PA must supervise all those items listed as Site Specific, Arboricultural Events mentioned in Item 15.

Site Specific Arboricultural Events

- (1) Tree surgery works
- (2) Erection of tree protective barrier fencing
- (3) Installation of ground load spreader plates
- (4) Installation of service trench
- (5) Construction of the building
- (6) Construction of footpath through RPA of T1
- (7) Paving within the RPAs of T1, T7 and G2
- (8) Fencing within the RPA of T1

FURTHER ARBORICULTURAL INPUT

- Undertake a tree condition survey of the site and particularly the woodland G1 and G2 prior to commencement of the scheme, once the scheme is complete and enter the trees into annual routine tree inspections.
- Produce a woodland management plan for G1 and G2

COMMUNICATIONS LIST

Mr. Vaughan Lewis (Principal Project Arborist)
Steve Ambler & Sons Tree Specialists Ltd
Email - vaughan@steveambler-trees.com
Mobile – 07961 322 908

Mr. Scott Ambler (Project Arborist)
Steve Ambler & Sons Tree Specialists Ltd
EMAIL – steve@steveambler-trees.com
TELEPHONE – 07813 310 826

Site Manager - To be confirmed

Local Authority Tree Officer and Planning Officer – to be confirmed

LEGAL CONSTRAINTS

Tree Preservation Orders and Conservation Area Status in Wales

In Wales, the law on TPOs is in Part V111 of the Town and Country Planning Act 1990 Town and Country Planning (Trees) Regulations 1999. When any tree/s are protected by a TPO or are situated within a Conservation Area, it is an offence (1) cut down (2) uproot (3) top (4) lop (5) wilfully damage or (6) wilfully destruct a tree without the express written permission from the Local Planning Authority (LPA), there are exceptions. An LPA may grant permission, if considered reasonable, following the submission of an application for consent to undertake the works, or where in accordance with an

Approved Planning Application or under the exemptions within the Town and Country Planning Act 1990 of dead, dying, or dangerous. It is advisable to consult the LPA and an Arborist prior to conducting any tree works under these exemptions.

Felling License

A Felling Licence may be required in certain felling operations, and these are administered by the Forestry Commission where more than five cubic metres of wood are felled in one calendar quarter and when selling more than two cubic metres. There are exceptions and these are in the Forestry Act 1967 and Regulations made under this Act. Contravention of the felling licence controls can incur substantial penalties. Tree felling forming part of a Local Authority Planning Approval is exempt.

The Wildlife and Countryside Act 1981 protects nesting birds and to disturb nesting birds can be a criminal offence. Therefore, caution must be aired if tree works are programmed during the nesting season, between March and August. Should nesting birds be present then all but essential works will be postponed. If in undertaking essential works a nest or nests are found to be present, then further advice will be sought from the Countryside Council for Wales.

Bats...Summary of Current Relevant Legislation

There are some 17 species of bat which are known to breed in the British Isles, all are insectivorous and depend to some extent on habitat in which trees are a significant element. Bats are a protected species and are in decline both globally and nationally. Therefore, they are to be fully considered before any tree work commences and particularly if the trees are mature. If a bat roost is known to be in any tree that is to be removed or worked on, a license must be obtained from the Welsh Assembly Government beforehand.

The European Habitats Directive (passed in 1992) provides the principal legal protection for bats in the UK, and this is currently enacted into British legislation through the Conservation of Habitats and Species Regulations 2010 in England and Wales; the Conservation (Natural Habitats &c) Amendment (No. 2) (Scotland) Regulations 2009 in Scotland; and the Conservation (Natural Habitats &c) Regulations (Northern Ireland) 1995 (as amended) in Northern Ireland. These regulations relate to all animals which are identified as European Protected Species (EPS) which includes all bat species.

The different countries of the UK have domestic legislation which also provides protection (by varying degrees) to bats; however, this has largely been superseded by the Regulations specified above.

Under the Regulations it is illegal to:

- kill, injure, or capture a bat
- disturb bats
- damage or destroy a bat's breeding site or resting place (roost)
- possess a bat (live or dead) or offer one for sale or exchange.

This is a simplified summary of the legal position relating to bats and is intended for guidance purposes only. If further assistance is required, the primary legislation should be referred to or legal advice sought.

The legislation makes it an offence to intentionally or recklessly damage, destroy or obstruct access to a site used by bats whether bats are present at the time or not. This can include work on trees whether it is surgery, felling, the covering, or filling of cavities or the installation of rod braces and flexible cable braces, where a bat roost is present.

Where there is a risk bat roosts may be present, it is incumbent upon the owner or manager to commission a specialist bat survey to identify bat roosts before instructing tree surgery to commence. Failure to do so and in the event of disturbing a roost site or injuring any bats is an offence. Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/ 1991 (i.e., £5000 in April 2001) per roost or bat disturbed or killed, or to both.

Statute and Common Law.

A landowner or land manager should be aware that both statute and common law dictates regular inspections of trees on land in their control are necessary where such trees could cause injury or damage in the event they should fall or shed any parts. A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended should be carried out within the time constraints specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections. Arboricultural Association, the Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire, GL10 3DL. Telephone 01242 522152. www.trees.org.uk can provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

LIMITATIONS OF THIS REPORT

It must be stressed that this report is a desktop, pre-development assessment and not a risk assessment or a detailed report on the health and condition of the trees. Tree/s should be subject to regular tree condition inspections and a full tree condition inspection and appropriate management appraisal is strongly recommended and particularly on completion of any development.

The effect this new development may have on localised wind turbulence has not been assessed during this inspection. As trees grow, they respond and mechanically adapt to their surroundings and exposure limits. With the erection of dwellings near existing trees, new turbulence is created. The author accepts no liabilities to any failure subsequent upon such new imposed, artificial conditions.

Unless stated in writing, the inspection shall not include any underground parts of the tree. It does not consider **indirect** damage resulting from the extraction of moisture from shrinkable clay soils by tree roots causing **subsidence** or by **heave** occurring through soil rewetting following removal of trees on this site. Such problems are almost entirely restricted to areas of shrinkable clay soils and as I have **not** considered a soil analysis as part of my present brief, this aspect is **not** addressed at this time.

Unless otherwise stated in writing and in the absence of altered circumstances, a report on the health and safety of a tree or trees cannot be relied on after a period of 12 months. Following such a period, a further inspection is required.

Further and more general report limitations are set out in the authors Terms and Conditions and copies are available upon request

GLOSSARY OF TERMS

Adventitious; Latent or dormant bud on stem or root often invisible until stimulated into growth which occurs from an unusual place i.e., not a twig, leaf or bud.

Anchorage; in trees, the holding of the root system within the soil, involving the flow of forces from the stem through the branches of the root system to the cohesive root/soil interface.

Arboricultural Implication Assessment (AIA) study, undertaken by an arboriculturalist, to identify, evaluate and possibly mitigate the extent of direct and indirect impact on existing trees that may arise because of the implementation of the site layout.

Arboricultural Method Statement; methodology for the implementation of any aspects of development that has the potential to result in loss of or damage to a tree.

Arboriculturalist; person who has, through relevant education, training, and experience, gained recognised qualifications and expertise in the management of trees generally and in relation to construction.

Arboriculture; the culture and management of trees as groups and individuals, primarily for amenity and other non-forestry purposes.

Architecture; in a tree, a term describing the pattern of branching of the crown or root system.

Assessment; in relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)

Assym; This abbreviation means...asymmetric...and refers to the tree having an asymmetric or unbalanced crown. This is usually preceded by a measurement in metres which provides the extent of crown asymmetry and is measured from the centre of the trunk. It may also have a correlation to the lever arm

Bole; (trunk) the main stem of a tree below its first major branch

Branch; a limb extending from the main stem or parent branch of a tree

Buttress zone; the region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper sides of the junctions

Canopy; the topmost layer of twigs and foliage in a woodland, tree, or group of trees

Construction Exclusion Zone: area based on the RPA (meters as a radial measurement and sometimes a m²), identified by an Arboriculturalist, to be protected during development, including demolition and construction work, by use of barriers and/or ground protection fit for the purpose to ensure the successful long-term retention of a tree.

Crown; in arboriculture the main foliage-bearing portion of a tree containing the leaves and branches

Defect; in relation to tree hazards, any feature of a tree that detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

Diameter (DBH) The diameter for each tree is in millimetres based on the diameter or circumference of the trunk measured at a height of approximately 1.5 metres above ground level, unless otherwise stated. All measurements are approximate

Dysfunction; in woody tissues, the loss of physiological function, especially water conduction.

Energy; the capacity to do work (THROUGH PHOTOSYNTHESIS, GREEN PLANTS ABSORB ENERGY FROM SUNLIGHT AND STORE IT IN THE FORM OF CHEMICAL COMPOUNDS WHICH ARE USED IN ENERGY-DEPENDANT PROCESSES SUCH AS GROWTH)

Failure; in connection with tree hazards, a partial or total fracture within woody tissues or loss of cohesion between roots and soil. (IN TOTAL FAILURE THE AFFECTED PART SNAPS OR TEARS AWAY COMPLETELY. IN PARTIAL FAILURE, THERE IS A CRACK OR DEFORMATION WHICH RESULTS IN AN ALTERED DISTRIBUTION OF MECHANICAL STRESS)

Group; the term 'group' is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally including for biodiversity (e.g. parkland or wood pasture).

Heave; in relation to a shrinkable clay soil, expansion due to re-wetting, sometimes after the felling or root severance of a tree which was previously extracting moisture from the deeper layers; also, in relation to root growth, the lifting of pavements and other structures by radial expansion; also, in relation to tree stability, the lifting of one side of a wind-rocked root plate.

Leader; in a tree, a topmost shoot that has apical dominance.

Preventive action; in a tree hazard management, action that helps to prevent injury to persons or damage to property.

Pruning; the removal or cutting back of twigs, branches, or roots; in some contexts, applying only to twigs or small branches only, but more often used to describe all kinds of work involving cutting.

Pruning; the removal or cutting back of twigs, branches, or roots; in some contexts, applying only to twigs or small branches only, but more often used to describe all kinds of work involving cutting.

Retained Tree: a tree that has been considered suitable by an Arborist for retention and which during the design stage is selected for retention and incorporated within the development.

Risk: the likelihood of the potential harm from a particular hazard becoming actual harm.

Root Protection Area (RPA); layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree, shown in plan form in m². This is a protection area established around the base of each tree to prevent physical, chemical or compaction damage occurring. Protection to the RPA is achieved through the erection of fencing or another suitable barrier.

Soil heave: see heave

Special Precaution Area: this is an area, usually within the root protection area, where construction or other activity may be permitted but only under the direction of a 'Arboricultural Method Statement' and the supervision of an Arborist.

Species: The species is the given name of the tree which is usually provided in both the common and scientific names.

Subsidence: in relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight.

Subsidence: in relation to soil or structures resting in or on soil, a sinking due to shrinkage when clay soils dry out, sometimes due to extraction of moisture by tree roots.

Targets: in a tree hazard assessment (and with somewhat incorrect terminology), persons or property or other things of value, which might be harmed by mechanical failure of the tree or by objects falling from it.

Tree Constraint Plan (TCP); plan prepared by an Arboriculturalist for the purpose of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade dominance, etc.

Tree Preservation Order: in Great Britain, an order made by a local authority, whereby the authority's consent is generally required for the cutting down, topping, or lopping of specified trees.

Tree Protection Plan: scale drawing prepared by an arboriculturalist showing the final layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

Tree: a woody plant, which typically has a single main stem and, in maturity, attains a height of at least four metres and a stem diameter at breast height of at least 75-mm.

Trunk: the single main stem of a tree.

Vigour: in tree assessment, an overall measure of the rate of shoot production, shoot extension or diameter growth (cf. vitality)

Visual Tree Assessment (VTA): in addition to the literal meaning, a system expounded by Mattheck & Breloer (1995) to aid the diagnosis of potential defects through visual signs and the application of mechanical criteria.

Wind exposure: the degree to which a tree or other object is exposed to wind, with regard both to duration and velocity.

Wind pressure: the force exerted by wind on a tree or other object.

Wind snap: the breaking of a tree stem by wind.

Windthrow: the blowing over of a tree at its roots.

LEGAL CONSTRAINTS

The legal constraints of any site should be considered in early planning and well before any work commences on site. Such legal constraints should be fully considered from the outset to avoid time delays. The legal constraints referred to here are general constraints relating to arboriculture only and not any other legal matter that may arise.

Tree Preservation Orders and Conservation Area Status

The law on TPOs is in **Part V111 of the Town and Country Planning Act 1990 Town and Country Planning (Trees) Regulations 1999**. When any tree/s are protected by a TPO or are situated within a Conservation Area, it is an offence (1) cut down (2) uproot (3) top (4) lop (5) wilfully damage or (6) wilfully destruct a tree without the express written permission from the Local Planning Authority (LPA), there are exceptions. An LPA may grant permission if considered reasonable following the submission of an application for consent to undertake the works or where in accordance with an Approved Planning Application or under the exemptions within the Town and Country Planning Act 1990 of dead, dying, or dangerous. It is advisable to consult the LPA and an Arborist prior to conducting any tree works under these exemptions.

Statute and Common Law.

A landowner or land manager should be aware that both statute and common law dictates regular inspections of trees on land in their control are necessary where such trees could cause injury or damage in the event they should fall or shed any parts. A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended should be carried out within the time constraints specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections. The **Arboricultural Association** at Ampfield House, Ampfield, near Romsey, Hampshire. Telephone 01794 368717 can provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

REFERENCES

1. BS 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations
2. Ambler SJ – Tree Survey, Categorisation & Constraints Report Flying Start Centre Dated March 2020

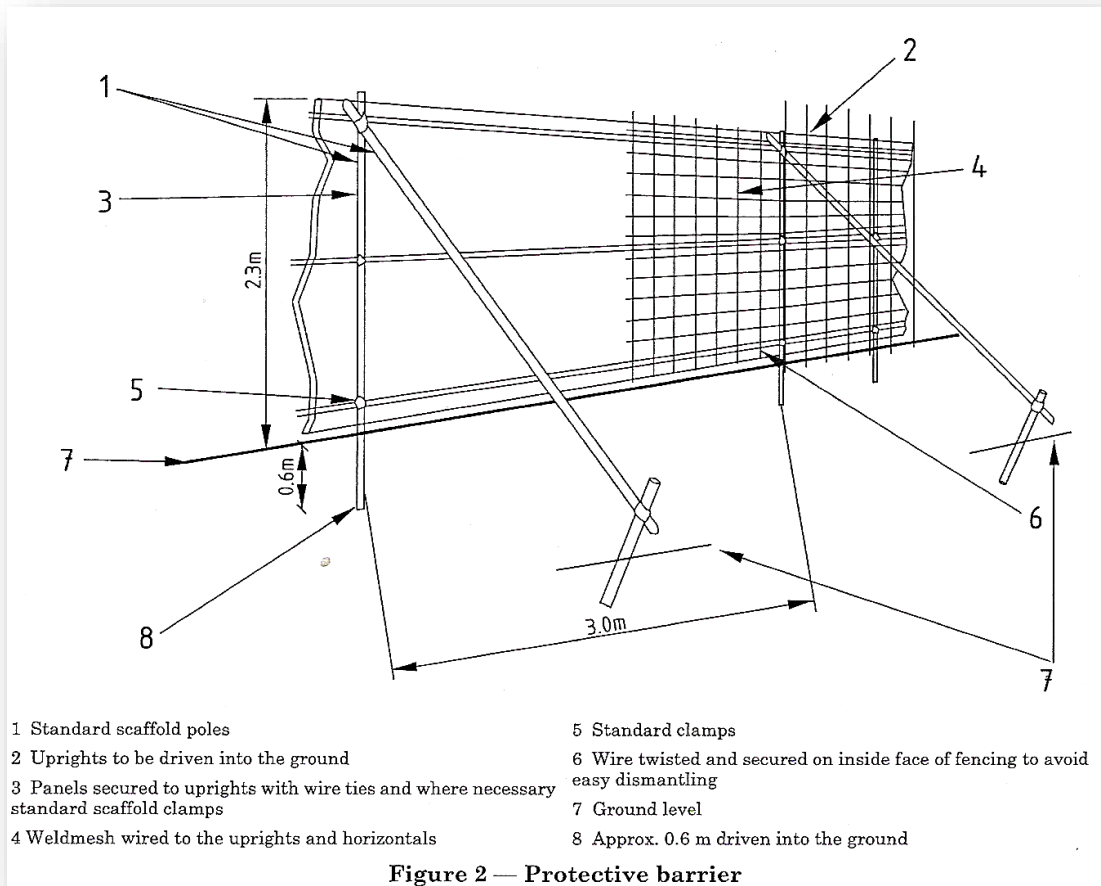
APPENDICES

Figure 2 – Protective Barrier Fencing detail

Flow Diagram – Planning for trees in Development

Tree Protection Plan Showing Tree Removal and Retention

FIGURE 2 – PROTECTIVE BARRIER



FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

BS 5837:2012

BRITISH STANDARD

**Annex B
(informative)**

Trees and the planning system

Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications. Where trees are statutorily protected, it is important to contact the local planning authority and follow the appropriate procedures before undertaking any works that might affect the protected trees.

The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. Table B.1 provides advice to both developers and local authorities on an appropriate amount of information. The term “minimum detail” is intended to reflect information that local authorities are expected to seek, whilst the term “additional information” identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.

Table B.1 Delivery of tree-related information into the planning system

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions)	Existing and proposed finished levels
	Tree retention/removal plan (finalized)	Tree protection plan
	Retained trees and RPAs shown on proposed layout	Arboricultural method statement – heads of terms
	Strategic hard and soft landscape design, including species and location of new tree planting	Details for all special engineering within the RPA and other relevant construction details
	Arboricultural impact assessment	
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method	Arboricultural site monitoring schedule
	Dimensioned tree protection plan	Tree and landscape management plan
	Arboricultural method statement – detailed	Post-construction remedial works
	Schedule of works to retained trees, e.g. access facilitation pruning	Landscape maintenance schedule
	Detailed hard and soft landscape design	

TREE PROTECTION PLAN WITH TREE RETENTION / REMOVAL (Draft)



Tree Number	Tree Tag	Height	Effective Diameter	Crown Spread				Retention Category	Protection Area m ²	Protection Radius (m)
				N	S	E	W			
G1	9-18	340-840	/	/	/	/	/	B2	10.2	327
T1	18	840	11	12	9	9		B2	4.2	55
T2	9	340	5	5	6	4		C2	5.7	102
T3	10	460	4	5	3	5		B2	6	113
T4	14	500	5	9	9	7		B2	5.7	102
T5	12	460	4	5	7	5		C2	3	28
T6	12	250	5	5	5	5		C2	4.2	55
G2	5-15	350	/	/	/	/	/	A2	3.6	41
T7	11	280	4	2	3	5		B2	5.4	92
T8	10	300	5	4	3	5		C2	4.2	55
T9	11	350	6	6	5	5		C2	2.4	18
T10	13	450	4	3	5	3		C2	1.8	10
T11	10	300	2	2	2	3		C2	2.4	18
H12	3-6	200	/	/	/	/	/	C2	6.6	150
T13	8	140	3	2	3	3		C2	3.6	41
T14	8	180	3	3	4	3		C2	2.4	18
T15	16	510	8	8	8	9		B2	3.6	41
G2	T16	280	4	4	4	4		C2		
		240								
		210								

(Please check all RPA's on site.)

Key

Trees to be considered for retention.

- A - High
- B - Moderate
- C - Low
- Root Protection Area

Trees unsuitable for retention.

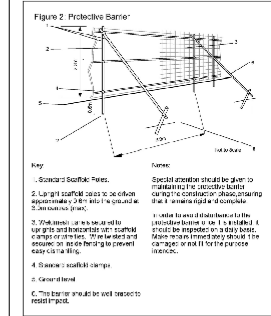
- U - Fail
- Tree lost to development
- Barrier Fencing
- Special Construction Area

Tree Key

Crown Spread. Measured in North, South, East and West side of tree.

Tree number. T - Individual Tree, G - Group, A - Tree area, W - Woodland, H - Hedgerow

Root Protection Area (RPA) A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.



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Client	BGCBC
Surveyed by	SJA
Date surveyed	November 2020
Drawn by	LP
Scale	1:500 when printed at A1
OS Grid Ref	307000 (E) 207950 (N)

INDICATIVE ONLY.
PLEASE REFER TO ROOT PROTECTION TABLE.
DO NOT SCALE FROM THIS DRAWING
CHECK ALL DIMENSIONS ON SITE

REF. DRAWINGS	Topographical Survey
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TITLE
Tree Protection Plan showing
Trees for Retention & Trees for Removal
Dowlais Flying Start

DRAWING NO:
21-027a

This plan should be read in conjunction with the
Dowlais Flying Start
Tree Survey & Categorisation Report
November 2020 (Ambler SJ.)

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