

Arboricultural Impact Assessment

BS5837 Trees in Relation to design, demolition and construction – Recommendations

Client:

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**NORTH WALES
TREE CONSULTANCY**

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1 SCOPE AND ADMINISTRATIVE INTRODUCTION

I, Peter Gardner have been commissioned by Edgeplan Ltd to conduct a BS5837 Trees in Relation to design, demolition and construction – Recommendations, arboricultural survey and report for a proposed development at 38 Pen y Bryn, Wrexham.

This report consists of:

- 1 A survey data sheet which records all relevant information for assessing the retention of trees and any impacts the proposed development may have on the trees. This document should be read in conjunction with Tree Constraints Plan (TCP) which details the location of the trees surveyed, their crown spread, estimated rooting zone and their retention category.
- 2 An Arboricultural impact assessment, detailing the impact the proposed development may have on the trees, on and within influencing distance of the site. The above and below ground constraints of the trees is discussed and mitigation measures are provided and illustrated in the Tree Protection Plans (TPP1 & TPP2). Tree management recommendations are made to facilitate the current design of the development as per the architects topographic drawing provided.
- 3 An Arboricultural Method Statement, detailing the timing and measures to be taken to protect the retained trees for the duration of the development. This section is to be read in conjunction with the Tree Protection Plans (TPP1 & TPP2) which identifies the areas of the site that require protecting to prevent damage to the trees for the duration the development.
- 4 Site photographs in appendix 4
- 5 A planting plan (PP) to mitigate for the loss of removed tree post development

These sections combine to provide the relevant information needed by the Local Planning Authority to assess the trees in the context of the proposed development.

2 TREE SURVEY

The assessment of the trees has been carried out in accordance with the guidance provided in Annex C of BS5837:2012. In summary this requires that any tree on or within influencing distance of the site with a stem diameter (dbh) $\geq 75\text{mm}$ at 1.5m above ground level is recorded.

The survey was carried out on the 19/10/2022 from ground level by Peter Gardner BSc (Hons), LANTRA PTI, a qualified arboricultural consultant. Trees were assessed objectively using a methodology guided by *BS5837:2012 Trees in Relation to design, demolition and construction – Recommendations*.

Under The British standard the assessment of trees is made objectively, the categorisation method identifies the quality and value of the existing tree stock.

A topographic site plan provided by the client and was used to record the position of trees and vegetation, North Wales Tree Consultancy takes no responsibility if this information is inaccurate. No trees were plotted as groups. T3 was not plotted on the topographical survey provided, therefore its location has been estimated using onsite measurements. A tree labelled G1.2 on the existing site plan has since been removed. Tree diameters were measured using a calibrated surveyor's tape at a height of 1.5m, a laser hypsometer was used for recording distance and height.

A total of 5 individual trees (T1- T5) were surveyed, all arboricultural information recorded during the survey is presented in Appendix 1. Trees were inspected visually from ground level, trees were not climbed or inspected below ground level.

The nature of soils on site was not assessed, the possibility of minor soil movement due to tree root activity cannot be discounted. Prior to any soil disturbance the exact location of all tree root protection areas (RPA) should be measured.

The weather at the time of survey was clear visibility was good

Tree Categorisation

In accordance with the *BS5837:2012*, trees and groups are categorised objectively based on their quality and assigned a category designed to quantify their value within any future development. Table 2 presents a summary of the categories from the British Standard. The full table has been reproduced in Appendix 2.

Table 1 Summary of BS5837 tree quality categorisation criteria

Category A	Trees of high quality, good examples of their species, especially if rare or unusual, with an estimated remaining life expectancy of at least 40 years
Category B	Trees of moderate quality, possibly with impaired condition due to unsympathetic past management, with an estimated remaining life expectancy of at least 20 years
Category C	Trees of low quality of very limited merit, with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm
Category U	Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

Additionally, *BS5837:2012* provides subcategories 1-3 within the category system outlined in table 1 which indicate the area(s) in which a tree or group retention value lies.

1. Mainly arboricultural
2. Mainly landscape
3. Mainly cultural, including conservation

Table 2 Summary of the tree population quality at 38 Pen y Bryn, Wrexham

Category A	Category B	Category C	Category U
0	2	3	0

3 CONSTRAINTS

3.1 Statutory Protection

3.1.1 Tree Preservation Orders & Conservation Area Designations

Consultation with the Jon Brewin, the Wrexham County Council Arboricultural Officer confirmed there are no statutory designation in place on the site.

3.1.2 Protected Species – Bats

Mature trees can contain features of significant habitat value for roosting bats which are protected under Schedule 5 of the *Wildlife and Countryside act 1981* and Schedule 2 of the *Conservation of Species and Habitats Regulations 2010*. Therefore, disturbing a roost site is an offence.

A preliminary ground level appraisal of the habitat potential of each tree was made, the site contains 2 mature goat willows which bats infrequently exploit for roosts, no features suitable for bat roost habitat were observed. This report concludes that the proposed development will not negatively impact any arboreal bat roosting potential.

3.1.3 Protected Species - Birds

Trees are potential habitat for nesting birds, which are protected under *Wildlife and Countryside act 1981*. It is therefore a criminal offence to intentionally or recklessly damage or destroy an active bird nest.

Due to the suitability of T1 and T4 for nesting birds, any recommended works should be undertaken outside of British nesting birds season **March – August inclusive**. If this is not possible then a detailed inspection of each tree by the project ecologist should be undertaken immediately prior to the arboricultural works. Should an active nest be found then all work must stop until chicks have fledged and the nest is inactive.

3.2 Constraints posed by existing trees

3.2.1 Above Ground Constraints

Where the current and/or ultimate height of a Category A, B or C tree will cause an obstruction to the proposed development, this must be considered as a constraint. This is usually considered in terms of issues relating to shade and light. However, it can also include leaf litter and potential branch drop.

3.2.2 Below Ground constraints Root Protection Area (RPA)

The below ground constraints are defined as the likely spread and disposition of the root system of the tree and are plotted in the TCP and is termed the **Root Protection Area (RPA)**.

As per BS 5837:2012, the **RPA** is calculated using the trees diameter at 1.5 metres (refer to appendix 2) and represents the **minimum** area around each tree that must be left undisturbed to ensure their survival.

Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present.

The majority of tree roots are found in the top 600 mm of soil and most of the fine roots that absorb water and nutrients are found in the top 100 mm. Compaction of soil removes air within the soil and causes root death, this subsequently leads to tree decline. Compaction of soils on construction sites is a major cause of tree decline, the effects of which are often not realised until after the construction phase.

The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in their extent and the **RPA** may not be a circular area centred on the tree stem.

On this site all rooting zones have been restricted by the steep retaining wall on the west and south of the site, as such the estimated RPAs drawn have been offset and extended into areas of the site more favourable to root development. This amendment is still an estimate, and in this instance likely an overestimate as the existing buildings on the site will have also likely restricted root development. The RPAs drawn are to be used as a guide along with common sense to determine the most practical solution to protecting the retained trees. The true extent of the rooting zones can only be determined through subterranean investigation which is not deemed necessary for this site.

4 ARBORICULTURAL IMPACT ASSESSMENT

4.1 Site Description

The site is located at 38 Pen y Bryn, Wrexham. The property is a Polish supermarket comprised of 2 buildings, the main store to the east and a bakery and storage area at the rear of the shop in the west separated by an external courtyard. All trees on the site are located at the rear of the property on the west boundary which borders a residential parking area that serves an apartment building. There is a significant height difference between the parking area and the bank within which the trees are located, the tree bases are ~ 2m above the ground level of the car park (figure 3 appendix 4) suggesting the ground level was significantly altered at the time the car park was developed, approximately 18 years ago. This ground level change and the installed retaining wall on the boundary has created a physical barrier eliminating any potential for lateral root development along this boundary. It is likely the tree roots extend deeper into the soil in this section than the expected 600mm due to the barriers present. The tree crowns overhang the site buildings to the east and the car park to the west, a boundary fence separates the trees from the adjacent residential property. The area around the tree bases has become a dumping ground for waste and rubble and has low amenity value and is suitable habitat for vermin.

4.2 Development proposals

1. Demolish the existing pitched roof single story building at the rear of the site that currently houses the bakery and storage area.
2. Build a new building directly connected to the rear of the existing shop
3. Use the existing footprint of the storage area to create an open-air plant storage space to house a condensing unit and air conditioning evaporators on a concrete base.
4. Install a perimeter fence
5. Landscape the area around the removed bakery with bark chippings

4.3 Impact of development Overview

The proposed removal of the bakery and storage area will likely compliment and improve the condition and amenity value of the trees if the development is conducted with consideration during the construction phase. These existing buildings to be removed currently sandwich the trees between the retaining wall to the west and the building fabric to the east, restricting root and crown development and easy access to the trees. This has resulted in the area becoming a dumping ground for waste overgrown with vegetation. The proximity of this area to food storage necessitates it being improved on hygiene grounds as the area is a perfect environment for vermin to inhabit. Removing the building waste, rubble and ameliorating the soil around the tree bases will greatly improve the condition of the retained trees and extend their safe useful life expectancy (SULE), in turn this will also improve the general condition of this section of the site. The proposal to replace the bakery building with bark chippings will greatly increase the available rooting and crown area for T1 and make the tree visible from the north improving the amenity of the site. The proposed plant area is to be built on the exact footprint of the existing building, therefore, root development into this area has already been restricted by the existing building so it can be concluded that the construction of this area is unlikely to have a further negative impact on the rooting zones of the retained trees. Furthermore, the proposed plant area will pose less conflict with the tree crowns of the retained trees as the elevation of the plant stored will be considerably less than the current pitched roof elevation. The main challenge of this development will be to protect potential rooting zones of the retained trees while also creating a reasonable working space to facilitate the construction of the new buildings and provide a suitable space for the storage of building materials and machinery.

4.4 Trees that require removal to facilitate development

4.4.1 T2 – Ash

A self-seeded small diameter tree of low quality C1 (figure 4), exhibiting early signs of ash die back (*Hymenoscyphus fraxineus*), the tree is heavily suppressed by the adjacent goat willow crowns and is therefore unlikely to significantly contribute to the site. Removal of this tree will facilitate the demolition and constructions of the proposed buildings.

4.4.2 T3 – Sycamore

As above, a self-seeded small diameter tree of low quality C1, suppressed by the adjacent goat willow crowns and therefore unlikely to significantly contribute to the site. Removal of this tree will facilitate the demolition and constructions of the proposed buildings.

4.4.3 T5 – Hawthorn

A low-quality tree categorised C1, (figures 5 & 6) retention of this tree is optional however it is unlikely its condition will improve with management, and it will likely cause future conflict with the proposed plant store. Its removal will facilitate demolition of the existing buildings and the construction of the proposed buildings as well as facilitating the future crown development of T4.

4.5 Trees to be retained that require work to facilitate development

4.5.1 T1 – Goat willow

A mature tree of significant girth for the species, the tree has been poorly pruned and has a poor rooting environment due to its close proximity to the existing building (figure 1), this has resulted in a significant lean of the stem to the south at ~45 degrees. However due to its considerable size for the species it has been categorised B1 therefore an effort must be made to retain the tree, furthermore the proposed works will likely improve the growing conditions for T1 in the long term and increase its SULE. The previous pruning on T1 has resulted in a congested scaffold of crossing contorted branches all naturally bracing one another with no dominant leader. It is not necessary to rectify this unusual branch arrangement as this would cause unnecessary stress and remove the beneficial structural role these crossing branches play. Instead, the crown size and canopy height should be managed to ensure the crown remains a suitable size for its location and does not pose an above ground constraint to the demolition of the existing buildings and construction of the proposed plant area. Goat willow are a resilient species it is therefore considered the tree will tolerate and recover from the proposed development.

Recommended work

- Crown reduce by 2m or to most appropriate growth point to manage crown size
- Target prune previous pruning stubs to aid occlusion of wounds
- Crown raise to 2m to facilitate access around the tree for demolition and construction

4.5.2 T4 - Goat willow

A mature tree of significant diameter for the species categorised B1 (figure 3). T4s girth is not as large as T1s however it exhibits better form with a straight stem and large well-formed open crown. T4 has a similar contorted scaffold structure to T1 also likely the result of poor previous pruning. T4 is located in close proximity to the southwest corner of the current storage building which will become the proposed plant storage area. Root development to the northeast will have been restricted by the presence of the existing building, it is unlikely roots are completely absent from the current storage area however fine surface roots vulnerable to compaction are more likely to have developed into more favourable surrounding soil in the bank. Therefore, the estimated RPA of T4 presents a below ground constraint to the construction of the proposed plant area. Due to the historical barriers to root development in the proposed plant area and the good physiological condition of the tree it is concluded that the construction of the plant storage area will not have a long-term negative impact on T4. As with T1 the crown size and canopy height should be managed to ensure the crown remains a suitable size for its location and does not pose an above ground constraint to the demolition of the existing buildings and construction of the proposed plant area.

Recommended work

- Crown reduce by 2m or to most appropriate growth point to manage crown size
- Target prune previous pruning stubs to aid occlusion of wounds
- Crown raise to 2m to facilitate access around the tree for demolition and construction

4.6 Trees recommended for removal regardless of the development

None

4.7 Trees impacted by the proposed development

T1 and T2 summarised in section 4.5

Table 3 Summary trees and groups to be retained or removed

	Tree quality category			
	A	B	C	U
Trees and groups to be retained that require no work to facilitate development				
Trees and groups to be retained that require work to facilitate development		T1, T2		
Trees and groups that require removal to facilitate development			T2, T3, T5	
Trees and groups recommended for removal regardless of the development				

5 TREE PROTECTION REQUIREMENTS

5.1 Root Protection Boards

The use of root protection boards such as ground guards <https://www.ground-guards.co.uk/> laid on a bed of 150mm of woodchip has been recommended to reduce the compaction of the soil around T1 and T4 this will need to be done in 2 phases. The Tree Protection Plan phase one (TPP1) outlines the alignment of the protective boards for the initial demolition of the bakery and storage area. Once demolished a further set of protective boards with woodchip underlay should be installed to reduce the compaction of the soil around T1 and create a practical, safe working area to facilitate the construction of the proposed design (TPP2).

5.2 Protective Heras fencing

Due to the nature of the site and location of the retained trees it is not practical to protect the rooting zones with fencing to create Construction Exclusion Zones (CEZs) without severely restricting the available working space needed to undertake the development. Instead, Heras fence panels should be used to prevent accidental damage to the tree stems. It will not be possible to install protective fence panels around T1 until the bakery building has been demolished (ref TPP1 & TPP2), fence panels should be installed around T4 before the demolition phase begins. Examples of protective fencing are shown in appendix 3.

5.3 Excavations within the RPA

Demolition of the existing buildings and the existing floors will require minor excavations within the RPAs of T1 & T4 to remove the building waste back to the soil level. As previously discussed this may cause minor disruption to roots present, however in the long term removal of this building waste will improve the rooting environment. The proposed application of woodchip to landscape the area will further improve the suitability of the substrate for root development, this woodchip also compliments the proposed use of protective root boards and it can be left in situ post development.

5.4 Ground Contamination

Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any trees on or within proximity to the site due to the risk of soil contamination caused by accidental spillage. Particular care must be taken when working on or close to sloping ground to avoid unintentional runoff into the rooting areas of retained trees.

5.5 Ground Level Changes

A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment. Existing ground levels should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

5.6 Site access

Site access is restricted to a 1.3m alley to the north of the main store building suitable for small plant such as micro diggers. The restricted access will prevent large machinery accessing the site which will have a positive impact through reduced compaction of soil due to the reduced weight of the machinery. A larger potential access route is from the residential car park to the south, in part this is another justification for the removal of T5.

5.7 Post development Protection

Consideration should be given to the continued protection of all trees on the site, building waste should be removed from site and storage of materials post development in and around the tree rooting zones should be avoided

Work recommendations have been made for the trees on this site detailed in the survey data sheet (appendix 1), these recommendations are to prolong the trees useful contribution to the site. Regular inspection and management of mature trees in a location such as 38 Pen y Bryn are essential to ensure the trees remain in good condition and do not pose an unacceptable risk.

Recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structures constantly change. Even those in good condition can suffer from damage or stress.

6 ARBORICULTURAL IMPACT ASSESSMENT SUMMARY

- The survey conducted in accordance with BS5837:2012 identified 5 individual trees within influencing distance of the proposed development site.
- At the time of survey, the site trees were not subject to any statutory designations
- Trees T2, T3 and T5 are recommended for removal to facilitate the development
- Trees T1 and T4 are to be retained due to their unusual size for the species and potential future contribution to the site. They require remedial pruning to facilitate access to the work area.
- Due to the nature of the site, it is not practical to create CEZs as this will unnecessarily restrict the development. Instead, root protection measures have been proposed, the development will likely impact the retained trees however due to the species and their current condition it is the opinion of this report they will tolerate the development if the proposed protection measures are adhered to.

7 ARBORICULTURAL METHOD STATEMENT

7.1 Pre-start Meeting

To reinforce the required tree protection measures and avoid the requirement for ongoing arboricultural supervision, a pre-start meeting should be arranged between the site contractor and a qualified Arboricultural Consultant. During the meeting the alignment of protective fencing and RPAs will be marked out and any technical or logistical issues discussed.

7.2 Timing of operations

Tree protection and retention post development can only be achieved if a logical timeline of operations is established and adhered to, as follows:

- 1 Undertake **all** tree works recommended to facilitate the development outlined in **section 4** before the demolition/construction phase of the development begins. These works must account for statutory constraints such as bird nesting season outlined in **section 3.1.3**. It is the responsibility of the developer to ensure no legislation is breached.
- 2 Remove waste rubble and dense vegetation along the western fence line and from around the tree bases of T1 and T4.
- 3 Lay 150mm of woodchip along this corridor and install root protection boards to reduce compaction of the soil (ref TPP1).
- 4 Install protective Heras fence panels around T4, ref TPP1 for alignment
- 5 Remove existing building fabric of the bakery and storage area. Removal of the wall in close proximity to the stem of T1 should be conducted using hand tools from the west side to prevent damage to the tree.
- 6 Once existing the floor of the bakery has been removed, lay 150mm of woodchip and install second phase of root protection boards ref TPP2
- 7 Install protective Heras fence panels around T1, ref TPP2 for alignment
- 8 Construct proposed development aiming where practical to work away from the root protection boards.
- 9 Completion of development, all materials, machinery and construction waste removed from the site.
- 10 Remove protective fence panels
- 11 Remove root protection boards
- 12 Landscaping and replacement planting of trees shall be undertaken post construction to ensure no damage to the newly planted trees is incurred. Ref PP2 for proposed planting locations and species.

APPENDIX 1 ARBORICULTURAL SURVEY DATA SHEETS

Tree No.	Tree species	Tree height (m)	DBH (mm)		Crown spread (m)		1 st sign branch (m/dir)	Life Stage	General Observations		Recommendations	Priority	Remaining contribution	BS5837 Cat.
			D1	D4	N	E								
			D2	D5	S	W							Canopy height (m)	
			D3	D Ave.										
								Structural Condition	Physiological condition			RPA diameter (m)		
T1	Goat willow <i>Salix caprea</i>	10	830		5	5	2 W	M	Large diameter willow anchored into steep bank and against buildings to E Stem leans 45 degrees to S Dense contorted branching structure providing natural structural branching throughout crown Crown extends E over building Stubs present throughout crown from poor previous pruning Roots and stem conflicting with building fabric to NE		- Crown reduce by 2m - Crown raise to 2m - Remove pruning stubs to aid occlusion of wounds - Protect as outlined in section 5 for duration of development	Med	>20	B1
					5	5	2							
									SC – Fair	PC – Fair				
T2	Ash <i>Fraxinus Excelsior</i>	10	170		1	2	2 W	EM	ADB stage 1 2 x ash stems self-seeded poor crown development due to suppression from adjacent trees Stems drawn up and slender No major defects of concern Poor rooting environment due to raised bank proximity to buildings to E and waste rubble present		Remove to facilitate development	Med	<10	C1
					1	2	2							
									SC - Good	PC - Good				

T3	Sycamore <i>Acer pseudoplatanus</i>	5	80		1	0	2 W	EM	Small diameter tree suppressed by adjacent trees Poor crown development to E Apical leader has died back Poor rooting environment due to raised bank proximity to buildings to E and waste rubble present	Remove to facilitate development	Med	<10	C1
					0	3	2	SC- Good/Fair	PC- Fair			0.96	
T4	Goat willow <i>Salix caprea</i>	10	670		5	5	2 W	M	Large open well-formed crown Dense internal crossing branch structure Stubs and pollard heads in lower S and W crown from previous pruning Crown breaks at 2m into 3 large diameter branches with well-formed unions Crown extends E over building Poor rooting environment due to raised bank proximity to buildings to E and waste rubble present RZ conflicting with building to E	- Crown reduce by 2m - Crown raise to 2m - Remove pruning stubs to aid occlusion of wounds - Protect as outlined in section 5 for duration of development	Med	>20	B1
					5	5	0	SC - Good	PC - Good			8.04	
T5	Hawthorn <i>Crataegus monogyna</i>	8	320		3	3	2 S	SM	Asymmetric crown biased S N crown overhangs building to N Pruning stubs from previous pruning Twin stemmed branching structure is contorted with crossing branches present throughout acting as natural bracing Poor rooting environment due to raised bank proximity to buildings to E and waste rubble present	Remove to facilitate development	Med	20+	C1
					5	2	0	SC - Fair	PC - Fair			3.83	

APPENDIX 2 SURVEY METHODOLOGY

Data field	Definition/ description
Tree No.	Recorded as either individuals e.g. T1 or groups e.g. G1
Species	Common tree name and taxonomic name recorded in italics in brackets e.g. Wild cherry (<i>Prunus avium</i>)
Age Class	Young Recently planted or establishing tree i.e., less than 150mm DBH
	Semi- Mature An established tree, but with some growth to make before reaching its potential maximum height. A tree within the first third of its lifespan
	Early Mature A tree that is reaching its ultimate height potential, who's growth rate is slowing but if healthy will still increase in stem diameter and crown spread. A tree within its second third of its lifespan
	Mature A specimen with limited potential for any significant increase in size. A tree within its final third of its lifespan
	Over Mature A senescent or moribund specimen of low vigour. A tree within the final third of its lifespan. Possibly also containing sufficient structural defects with safety/duty of care implications
	Veteran Specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Height (m)	Measured from ground level using Nikon Forestry Pro hypsometer
DBH (mm)	Diameter of tree stem at 1.5m. For multi stemmed trees all stems are measured, and an average taken. Where trees fork before 1.5 the measurement was taken below the fork
Crown spread (m)	Measured from the base of the stem to the extreme of the tree crown in all 4 cardinal point directions and used to plot the crown shape of the tree or group
1st significant branch (m/dir)	The height and direction of the first significant branch from the tree stem
Canopy height (m)	Distance from the ground to the main bulk of the tree crown
General Observations	A brief description of the tree and any noteworthy observations to aid identification of the tree(s) and to provide context, N E S W used refer to the cardinal points. Accompanied by an assessment of the trees structural conditions SC and physiological condition PC as good fair or poor
	Good Generally, in good health typical of the species needing little if any attention. Few minor defects of little overall significance such as physical damage or suppressed branches. Showing no obvious adverse risk of failure/defects
	Fair A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover. Showing minor signs of deterioration. Tree that may require work to remove or improve defect.
	Poor A tree or trees with major structural and or physiological defects or stressed such that it would be a risk to retain in its current situation. Unlikely to return to a good condition given time or remedial work



Recommendations	Management required to improve the trees condition and or reduce the risk it poses to an acceptable level. Sometimes more than one option is recommended
Priority	The time frame within which the work recommendations should be carried out Urgent – As soon as possible High – Within 3 months of survey Medium – Within 1 year of survey Low – Within 2 years of survey
Remaining Contribution (years)	An estimate of the remaining life expectancy as a healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey. < 10, 10 – 20, >20, >40
Root Protection Area RPA diameter (m)	RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m ²) and as the radius of a circle (m) typically plotted from the centre of the stem. The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.6 and Table D.1) and is based on a trees stem diameter. In some cases the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion.
BS5837 Cat.	See Table 1

BRITISH STANDARD

BS 5837:2012

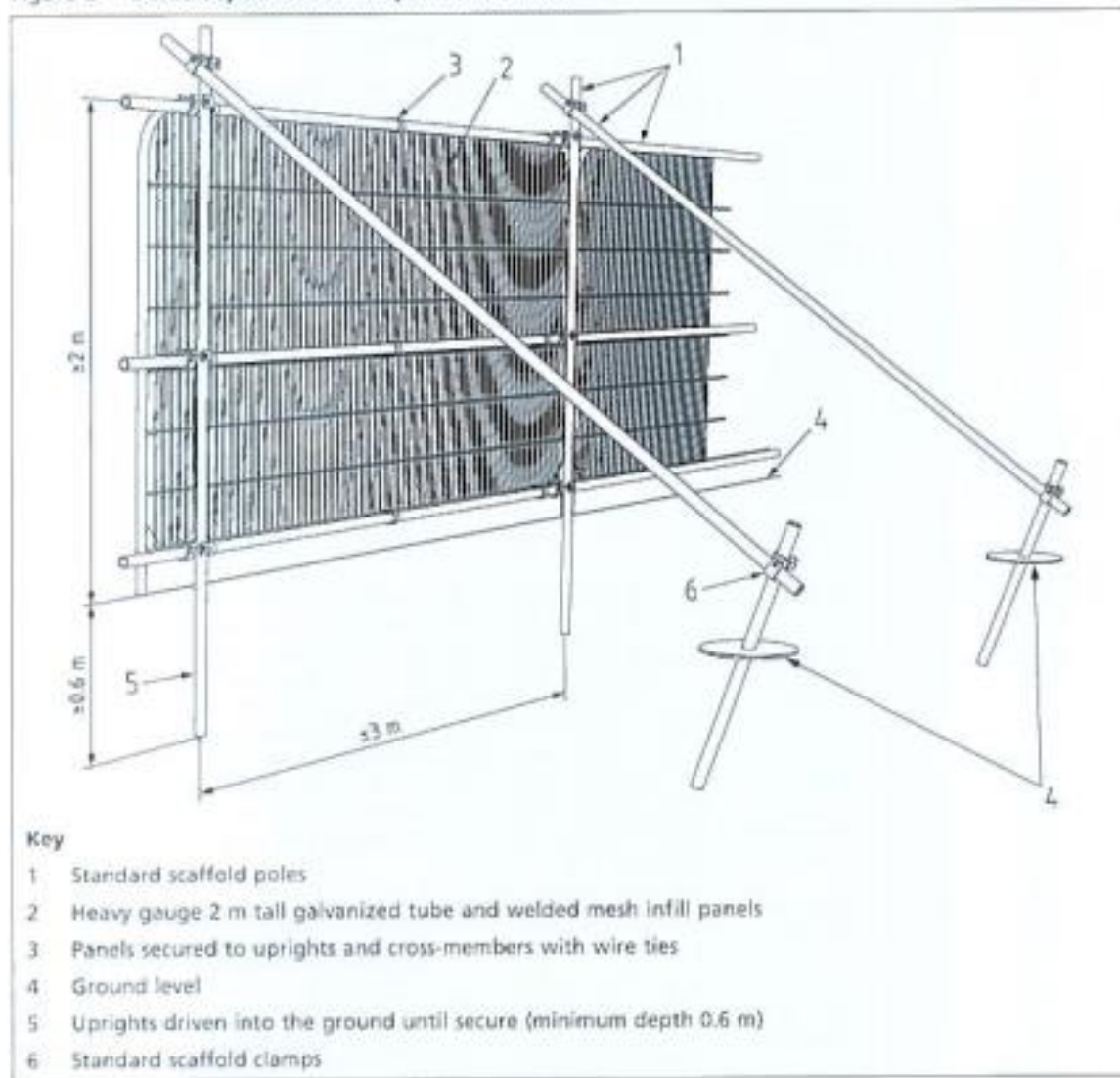
Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
Trees unsuitable for retention (see Note)		
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unstable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.	See Table 2
Trees to be considered for retention		
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	1 Mainly arboricultural qualities Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	3 Mainly cultural values, including conservation Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees with material conservation or other cultural value
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees with no material conservation or other cultural value

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APPENDIX 3 PROTECTIVE FENCING EXAMPLES

Figure 2 Default specification for protective barrier

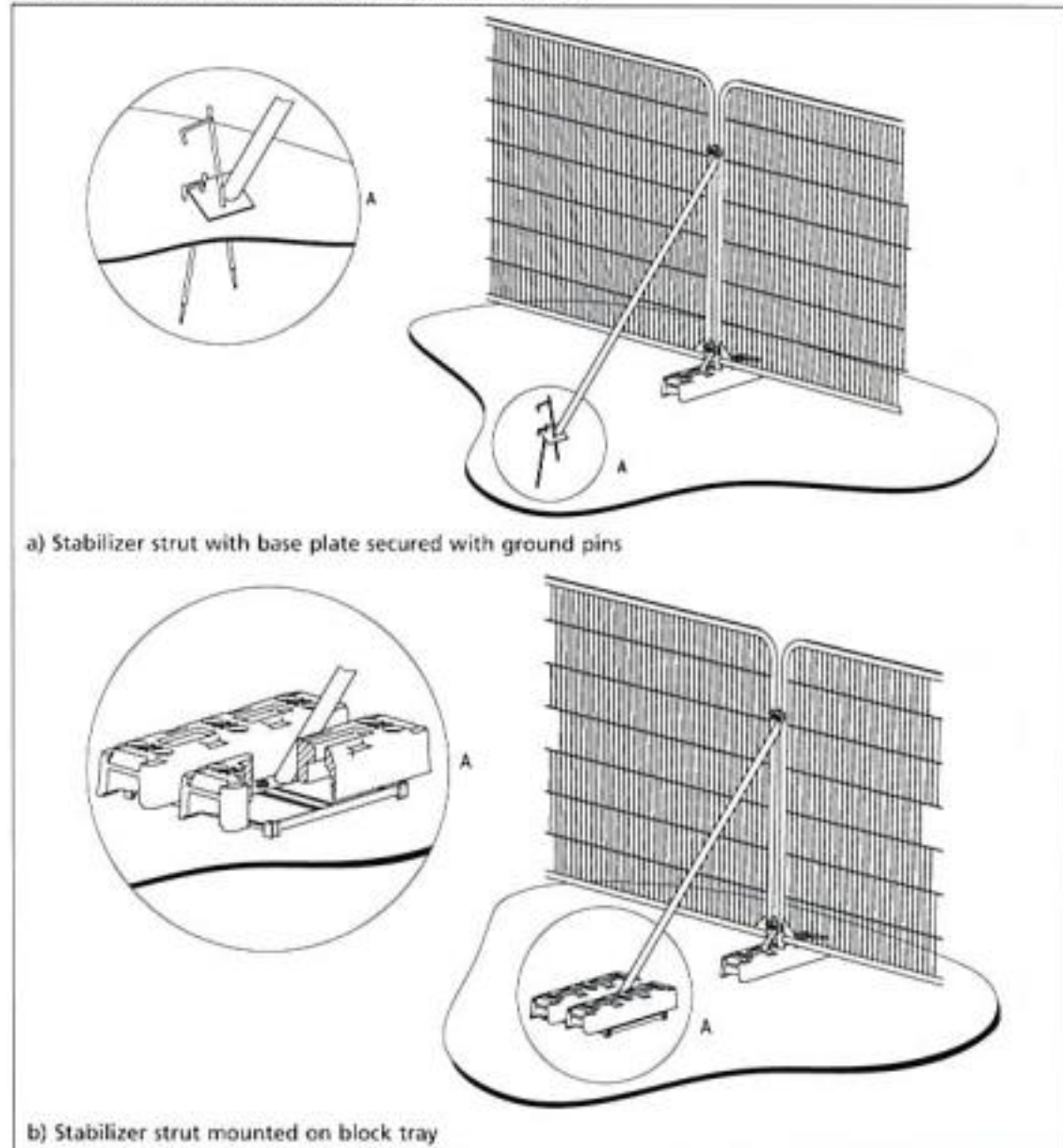


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Figure 3 Examples of above-ground stabilizing systems



TREE CONSTRAINTS PLAN TCP, TREE PROTECTION PLAN TPP1 & TPP2 AND PLANTING PLAN PP (ATTACHED AS SEPARATE DOCUMENTS)

APPENDIX 4 SITE PHOTOGRAPHS



Figure 1 T1 Goat willow, contorted branch structure, growing in close proximity to buildings waste present around tree base



Figure 2 T1 Goat willow crown, elevated position from car park, picture taken from west looking east



Figure 3 showing tree crowns of T1 T2 T3 and T4, picture take from west looking east



Figure 2 Stem of T2 self seeded ash, building waste around tree base



Figure 4 T4 Goat willow left and T5 hawthorn right. picture taken south looking north

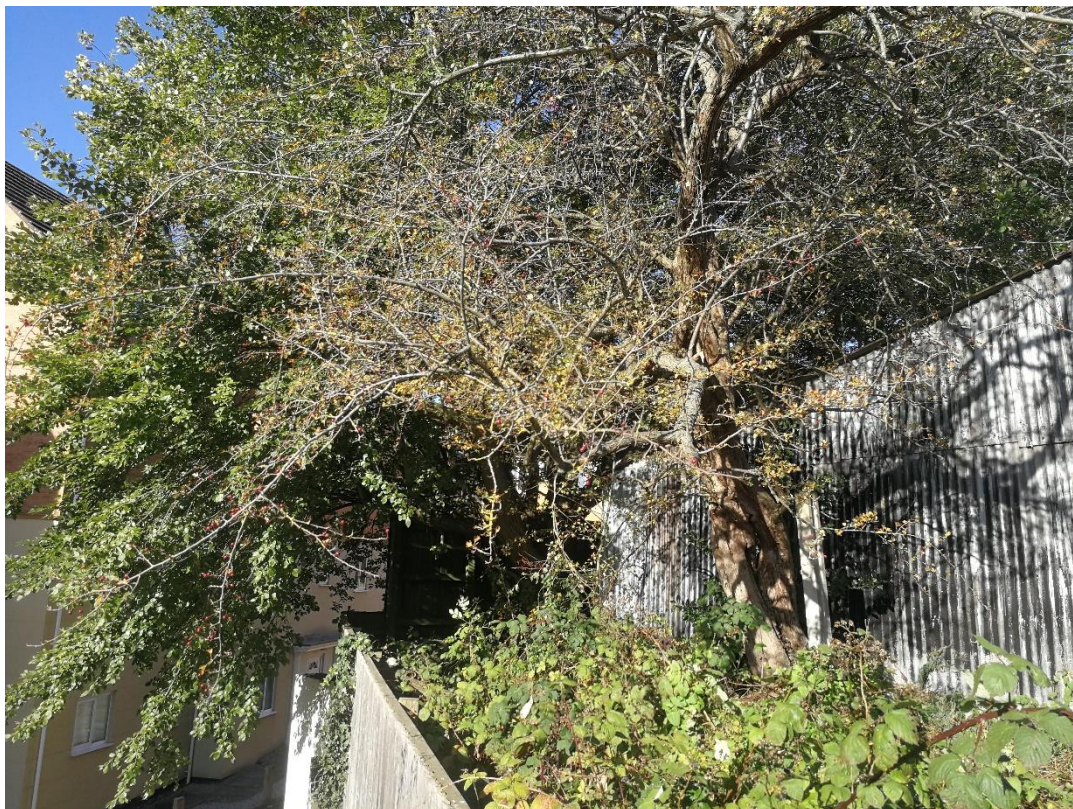


Figure 3 T5 hawthorn growing in close proximity to existing building to north

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