



NIGHTINGALE HOUSE HOSPICE, WREXHAM; ARBORICULTURAL IMPACT ASSESSMENT

Report Ref: RTA.12.001
October 2020

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**Nightingale House Hospice, Wrexham
Arboricultural Impact Assessment
Report Reference: RTA.12.001
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**NIGHTGALE HOUSE HOSPICE, WREXHAM
ARBORICULTURAL IMPACT ASSESSMENT**

CONTENTS	PAGE
1.0 INTRODUCTION	3
2.0 THE SITE AND SURROUNDINGS	4
3.0 STATUTORY PROTECTION	4
4.0 TREE POPULATION	6
5.0 IMPACTS OF THE PROPOSED DEVELOPMENT	8
6.0 TREE PROTECTION REQUIREMENTS.....	9
7.0 MANAGEMENT RECOMMENDATIONS.....	10
8.0 SUMMARY	13

APPENDICES

Appendix 1:	Arboricultural Survey Data Sheets
Appendix 2:	Survey Method
Appendix 3:	Temporary Tree Protection Fencing Example

DRAWINGS

Drawing 1:	Tree Constraints Plan:	D.RTA.12.01
Drawing 2:	Tree Implications and Protection Plan:	D.RTA.12.02

1.0 INTRODUCTION

- 1.1 Enfys Ecology has been commissioned by TACP Architects to conduct an arboricultural survey of land adjoining Nightingale House Hospice in Wrexham, North Wales. This report details the arboricultural impact of developing the site, subsequent mitigation recommendations and protective measures.
- 1.2 The survey was carried out on the 25th of September 2020 by means of inspection from ground level by Rob Taylor FdSc, a qualified Arboricultural Consultant. Trees were assessed in accordance with *BS 5837:2012 Trees in Relation to design, demolition and construction – Recommendations*.
- 1.3 Under the British Standard the assessment of trees is made objectively. The categorisation method identifies the quality and value of the existing tree stock.
- 1.4 A site plan was used to record the position of trees and vegetation (19071_Car Park Plan_SO3). Where the age distribution and species mix of tree cover was relatively uniform, trees were plotted as groups. A number of trees were not plotted on the site plan, in which case, Precise tree locations were not shown on the site plan, in which case, on-site measurements and estimations were used to plot their locations.
- 1.5 A total of 22 individual trees (T1-T22) and 5 groups of trees (G1-G5) were surveyed and mapped (refer to Drawing 1). All arboricultural information recorded during the survey is presented at Appendix 1.
- 1.6 The nature of the soils on site was not assessed during the survey.
- 1.7 This report provides the results of the survey and includes the following:
 - A schedule of all trees located on, or within influencing distance of the proposed development site (Appendix 1);
 - An assessment based on *BS 5837:2012*, of trees in terms of their potential value within any future development. On the basis of this assessment trees have been categorised into one of four categories: A, B, C or U (Appendices 1 & 2);
 - An assessment, based on *BS 5837:2012*, of the requirement for protection of trees during the demolition and construction phase (Section 5);
 - Advice on removal, retention and management of trees based on their current condition (Section 6);
 - A Tree Constraints Plan detailing tree quality categories, canopy spreads and Root Protection Areas (**RPA**) for all trees surveyed (Drawing 1); and
 - A Tree Implications and Protection Plan detailing the development proposals, trees to be retained and removed, tree protection fencing alignment and areas of specialised ground treatment (Drawing 2).

2.0 THE SITE AND SURROUNDINGS

- 2.1 The site lies off Grove Road, to the immediate north of Wrexham, approximately 0.5km north of Wrexham town centre, North Wales. The immediately surrounding area is characterised by buildings and car parks associated with health centres and care facilities.
- 2.2 A mowed lawn area occupies the majority of the site which is flanked to the south and east by mature trees. The southern facades of Nightingale House Hospice lie on the southern boundary and Coed Celyn care centres stands on the western side,
- 2.3 The survey area is mainly flat with minor undulations along the eastern and southern boundaries.
- 2.4 Weather conditions during the survey were dry and sunny.

Development Proposals

- 2.5 The proposed development includes the construction of a new 1000m² car park area. A gated vehicular entrance is proposed in the south east corner of the new car park.
- 2.6 New pedestrian access from the car park to Nightingale House Hospice with steps, a ramp and associated retaining walls is proposed in the north of the site.
- 2.7 Detail of the proposals is shown on Drawing 2 and is based on the proposed site plan (Ref: 19071-Car Park Plan) supplied by TACP Architects.

3.0 STATUTORY PROTECTION

Tree Preservation Orders & Conservation Area Designations

- 3.1 Where it is considered expedient to do so, local authorities reserve the right to create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in force, lopping, topping, felling, uprooting or wilful damage caused to a tree is prohibited and such actions may be prosecuted and incur an unlimited fine. Works to TPO protected trees must only be undertaken with the written consent of the local authority.
- 3.2 Trees also have a significant role in complimenting and enhancing the character, history and architectural form of those areas which have been designated with Conservation Area status. Prior to undertaking any tree work within a Conservation Area, there is a legal obligation to submit a six week 'Notice of Intent' to the LPA in accordance with section 211 of the Town & Country Planning Act 1990.

- 3.3 Consultation with Wrexham County Borough Council confirmed that at the time of writing, the site lies within Grosvenor Road Conservation Area. No trees on or immediately adjacent to the site were subject to Tree Preservation Orders.

Protected Species – Bats and Barn Owls

- 3.4 Mature trees often contain cavities, crevices and hollows which are a potential habitat for roosting bats. Bats are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010 (as amended), and as such causing damage to a bat roost constitutes an offence.
- 3.5 Tree cavities, crevasses and hollows are also potential nesting sites for owl species, including barn owls; a species included on the 'Amber List' of Birds of Conservation Concern in the UK owing to habitat loss.
- 3.6 A preliminary ground level appraisal of the wildlife habitat value of each tree was undertaken by a trained layperson of the arboricultural survey. A number of mature trees standing on the southern site boundary were found to be heavily ivy clad which may potentially be a feature of interest to bats, however, the extent of any bat roost or owl nest potential in trees should be determined by the project ecologist.
- 3.7 Should the presence of a bat roost or owl nest be suspected whilst undertaking works on any other trees and groups on site, operations must be halted until a licensed bat handler or ecologist can provide advice.

Protected Species - Birds

- 3.8 Trees are a potential habitat for nesting birds, which (as well as their nests and eggs) are protected under the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly, damage or destroy an active birds nest or any part thereof.
- 3.9 Due to the suitability of the trees within the survey boundary for nesting birds, all tree work should ideally be undertaken outside the bird nesting season (British bird nesting season: March to September inclusive).
- 3.10 If this is not possible then a detailed inspection of each tree should be undertaken by a qualified ecologist immediately prior to the arboricultural works. Should an active nest be found (being built, containing eggs or chicks) then any work likely to affect the nest must be halted until chicks have fledged.

4.0 TREE POPULATION

- 4.1 22 individual trees (T1-T22) and 5 groups of trees (G1-G5) were recorded within influencing distance of the site. A schedule of all trees and groups in terms of species, condition, age management recommendations and *BS 5837:2012* quality categories is provided at Appendix 1.
- 4.2 The site contains a continuous crescent of trees along the eastern and southern edges of the lawn area. The majority are broadleaved species and of a semi-mature to mature age class. Collectively the trees contribute significantly to the local landscape, softening the local aesthetic of red brick medical buildings.
- 4.3 The eastern edge of the lawn area features trees growing atop a slightly raised strip of grassed land. This section is dominated by six mature sycamore trees (T1, T2, T4, T5, T8 and T9). The majority of the sycamore are in good health although displaying unbalanced crown form typical of a densely spaced group. Trees T4, T5 and T8 have codominance in their stems, meaning two or more main stems compete for growth, often leading to weak attachment at the unions. At present, stem unions appear stable. The crown of one sycamore (T8) is notably sparser in foliage than its neighbours and displays moderate deadwood throughout. Beneath the sycamore are a number of smaller, suppressed coniferous trees including Lawson cypress and juniper.
- 4.4 The crescent of trees continues to flank the southern edge of the lawn area. Here, a mix of semi-mature and mature beech, sycamore, common lime, London plane and horse chestnut were recorded. Tree T11 is a mature horse chestnut of notable ornamental value, displaying a well-balanced and vigorous crown for its age and species. It has minor pockets of branch decay at old pruning wound sites and leaf miner moth infestation was noted although these are to be expected and do not significantly reduce its value.
- 4.5 The remaining trees to the west are densely spaced and heavily clad in ivy, rendering a detailed survey of stem and crown condition difficult. Tree T13 is a mature London plane tree. Although the presence of basal decay was noted, it presents a stable and vigorous crown. Tree T19 is a mature sessile oak; its proximity to the tall and dense sycamore and beech to the immediate south has resulted in a significantly asymmetric form with stem and crown weighted notably to the north. No significant visible defects were recorded for the remaining trees of this section, although in places their branches do hang low over the parking bays to the south.
- 4.6 Two semi-mature birch trees (trees T14 and T17) and a hawthorn (T18) stand within the lawn area. They are both in good health, display no significant visible defects and derive ornamental value through adding variety to the site's tree population.
- 4.7 Slightly beyond the northern site boundary stand two sycamore trees (T21 and T22). The crown of T21, although displaying good vigour, is suppressed by T22 and weighted notably to the south. T22 is a mature, dominant sycamore in good health with a broad and vigorous crown.

- 4.8 Tree and group locations, their quality categories and canopy spreads are shown on Drawing 1.

Tree Quality Categorisation

- 4.9 Under *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* trees and groups are objectively assigned a quality category designed to quantify their value within any future development. Table 1, overleaf, presents a summary of the categories presented in the British Standard. The full table has been reproduced at Appendix 2.
- 4.10 Table 2, below, details which of those trees surveyed come under each tree quality category.

Table 1: Summary of BS 5837 tree quality categorisation criteria

Category A	Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value
Category B	Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value
Category C	Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits
Category U	Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infection pathogens that threaten other trees

Table 2: BS 5837:2005 Quality Categorisation for surveyed trees

Category A	Category B	Category C	Category U
<u>Trees</u>			
T11, T22	T1, T2, T4, T5, T9, T10, T12, T13, T14, T15, T16, T17, T18, T19, T29, 21	T3, T6, T7, T8	-
TOTAL: 2	TOTAL: 16	TOTAL: 4	TOTAL: 0
<u>Groups</u>			
-	G3, G4	G1, G2, G5	-
TOTAL: 0	TOTAL: 2	TOTAL: 3	TOTAL: 0

5.0 IMPACTS OF THE PROPOSED DEVELOPMENT

- 5.1 Table 3, overleaf, lists the number and quality of trees that will require removal in order to facilitate the development proposals and those that can be retained. This is the result of an assessment based on the proposed site plan and discussions with the client regarding their application strategy.

Table 3: Arboricultural implications of the proposed development

	Tree Quality Category			
	A	B	C	R
Trees and groups that can be retained	T11, T22	T1, T2, T4, T5, T9, T10, T12, T13, T15, T16, T19, T20, T21	T3, T6, T8, G5	-
Trees and groups that require removal to facilitate development	-	T14, T17, T18	T7, G1, G2	-

See Appendix 1, Arboricultural Data Sheets for subcategories

- 5.2 4 individual trees and 2 tree groups must be removed to facilitate the development proposals. Three of the individual trees stand within the lawn and garden areas in the central area of the site and are moderate arboricultural value (Category B). The remaining trees that must be removed stand within the proposed new entrance driveway to the car park and are of low arboricultural value (Category C)
- 5.3 The entrance driveway to the proposed new carpark will incur on the Root Protection Area (see Section 6) of a number of retained trees in the southeast corner of the site. Similarly, new car parking bays are proposed within the RPAs of trees standing in the southern site boundary. This will not exceed the maximum threshold of 20% incursion into the RPA of retained trees as stipulated in *BS5837: 2012* and it is the recommendation of this report that the proposals may be implemented without significant adverse impact on retained trees. This will however necessitate the production of an Arboricultural Method Statement (AMS) (see Section 7) which will detail sensitive construction techniques adopted to maximise the likelihood of healthy and stable tree retention.
- 5.4 Fencing and temporary ground protection will be necessary to safeguard the healthy retention of existing trees. This will reduce the useable area for works and storage of materials during development.
- 5.5 Where planning permission is granted, the retention schedule shown in Table 3 and Drawing 2 would normally form a part of that permission. Any change to this schedule would therefore be likely to require an application to vary the consent.

6.0 TREE PROTECTION REQUIREMENTS

Root Protection Areas

- 6.1 As per *BS 5837:2012*, the **Root Protection Area (RPA)** is calculated using the trees diameter at 1.5 metres (refer to Appendix 1) and represents the minimum area around each tree that must be left undisturbed to ensure their survival.
- 6.2 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.
- 6.3 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.
- 6.4 On this site the majority of trees are growing in relatively homogeneous material. The only barriers to growth are likely to be the existing road and hard standing, car parking areas and footpaths. Roots are unlikely to be absent in all these areas but where unfavourable conditions exist, growth will certainly be impeded. The **RPA** may be adjusted or offset to most accurately represent the likely spread of roots for each individual tree (refer to Drawing 1).
- 6.5 It is likely that trees standing on the mounded grassed section on the eastern side of the lawn area will have the large majority of major structural roots concentrated within the raised land between the existing paved footpath and access road. This will make the proposed car park construction to the west less likely to impact these trees although protective and precautionary measures will be necessary.

Protective Fencing and Exclusion Zones

- 6.6 Temporary protective barrier fencing will be required to demarcate a **Construction Exclusion Zone (CEZ)** around retained trees. This must be put in place prior to the commencement of any development works, including bringing machinery or materials onto site, the erection of site huts or demolition of the existing house.
- 6.7 The **CEZ** acts to protect both tree roots and branches and has been extended to incorporate canopy spread where appropriate.
- 6.8 Protective fencing alignment is shown on Drawing 2.
- 6.9 The fencing must be fixed into the ground to withstand accidental impact from machinery and to ensure that a sufficient protective area is maintained. A weatherproof notice stating 'Construction Exclusion Zone – Keep Out' must be fixed to each fencing panel. Details of recommended protective fencing are shown in Appendix 3.

- 6.10 Any alteration to the fencing alignment to allow for approved activities will be made in agreement with the council's Arboricultural Officer.
- 6.11 The protective fencing must not be removed until the physical construction phase has been completed and all vehicles have been removed from site, to the satisfaction of the council's Arboricultural Officer.

Temporary Ground Protection

- 6.12 Construction access will be required within the RPAs of trees in the southeast corner of the site. This may be facilitated by a set-back in the alignment of the tree protection barrier. New temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.
- 6.13 Ground protection must be fit for the purpose of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil and be installed in the alignment shown on Drawing 2.
- 6.14 Ground protection should remain in place until proposed hard surface construction commences in these areas.

Ground Contamination

- 6.15 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.
- 6.16 Particular care must be taken when working on or close to sloping ground to avoid unintentional runoff into the rooting area of retained trees.

Ground Level Changes

- 6.17 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.
- 6.18 Existing ground levels within the **Construction Exclusion Zone** should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

7.0 MANAGEMENT RECOMMENDATIONS

Tree Work

- 7.1 In addition to the tree removals required to facilitate the development proposals, the arboricultural operations presented in Table 4 are also recommended.

Table 4: Recommended Tree Surgery Works

Feature Reference	Tree Work Description
T1	Reduce overextended branches in upper crown by 3m.
T2	Reduce branches growing towards building by 3m.
T4, T5, T8	Monitor stem unions (every two years)
T8, T12	Remove dead wood
T19	Monitor signs of root plate movement (every two years).
T21	Prune away from the building by 2.5m
T15, T16, G4	Crown raise above parking areas by 4m.

- 7.2 All tree surgery work should be carried out by a qualified contractor in accordance with *BS 3998:2010 Tree work – Recommendations*.

Arboricultural Method Statement

- 7.3 An **Arboricultural Method Statement (AMS)** will be required where construction activities are proposed within the Root Protection Areas (RPA) of retained trees. Under the current proposals this applies to trees standing in the southeast corner of the site (T8, T9, T10, T11 and T12) and trees standing on the southern boundary (T13, T15, T16 and T19).
- 7.4 The purpose of an **AMS** is to demonstrate that the proposed operations can be undertaken with minimal risk of adverse impact on trees to be retained. It will detail a precautionary approach towards tree protection that will be adopted and any operations, including access, proposed within the RPA in order to demonstrate that the operations can be undertaken with minimal risk of adverse impact on trees to be retained.

- 7.5 Removal of existing soil and hard surfaces, temporary ground protection and installation of new permanent hard surfacing, including material, design constraints and implications for levels will all be addressed in detail in the **AMS**. This will likely be the result of collaboration between an Arboricultural Consultant and other project specialists. This process may result in the use of un-conventional materials to allow more control over soil and root disturbance.

Pre-start Meeting

- 7.6 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, a qualified Arboricultural Consultant and the council's Arboricultural Officer.
- 7.7 During the meeting the alignment of protective fencing and RPAs will be marked out and any technical or logistical issues discussed.

Mitigation Planting & Landscaping

- 7.8 4 individual trees and 2 tree groups must be removed to facilitate the development proposals. Mitigation for their loss and associated habitat should take the form of replacement tree planting.
- 7.9 Shrub and tree planting of species with a small compact mature size is proposed to take place in the centre of the new car park area.
- 7.10 Supplementary tree planting of trees of a medium mature size may also take place within the mounded grass section to the east of the existing lawn area. Suitable species include silver birch (*Betula pendula*), black locust (*Robinia pseudocacia*) and hazel (*Corylus avellana*).
- 7.11 The extent of mitigation planting will ultimately be determined in agreement with Wrexham County Borough Council.

Post Construction Tree Care

- 7.12 Hazard recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structure is constantly changing. Even those in good condition can suffer from damage or stress. Following site development, regular (annual or biennial) inspections of all retained trees should be undertaken by a qualified Arboricultural Consultant.

8.0 SUMMARY

- 8.1 Based on an objective assessment made in accordance with *BS 5837:2005 Trees in Relation to Construction – Recommendations*, there are 2 Category A, 18 Category B and 7 Category C trees and groups on or within influencing distance of the site. Tree locations, their quality categories, Root Protection Areas (RPA) and canopy spreads are shown on Drawing 1 - Tree Constraints Plan.
- 8.2 4 individual trees and 2 tree groups must be removed to facilitate the development proposals. The majority of these lie within the lawn and garden areas in the central area of the site centre and are of low to moderate arboricultural value.
- 8.3 At the time of the survey no trees within or immediately adjacent to the site were subject to Tree Preservation Orders. As the site lies within Grosvenor Road Conservation Area and a six week 'Notice of Intent' must be submitted to the LPA prior to carrying out any tree works.
- 8.4 Temporary fencing and ground protection will be necessary to safeguard the healthy retention of existing trees. This will reduce the useable area for works and storage of materials during development.
- 8.5 An **Arboricultural Method Statement (AMS)** will be required where construction activities are proposed within the Root Protection Areas (RPA) of retained trees. Under the current proposals this applies to trees standing in the southeast corner of the site and trees standing on the southern boundary.
- 8.6 Mitigation for the loss of tree cover and associated habitat may be achieved through replacement tree planting. There is sufficient space for ornamental planting of small sized species within the car park area and supplementary planting of medium mature size within the mounded grassed section to the east of the existing lawn area.
- 8.7 A pre-start meeting between the site contractor, a qualified Arboricultural Consultant and the council's Arboricultural Officer will allow any technical or logistical issues to be discussed.

APPENDIX 1

ARBORICULTURAL SURVEY DATA SHEETS

No.	Species	Age class	Height (m)	DBH	FSB	N	S	E	W	Comments	SULE	Category	Recommendations
T1	Sycamore (<i>Acer pseudoplatanus</i>)	MA	13	470	2	4	3.5	7.5	2	Vigorous epicormic growth on main stem. Asymmetric crown due to previously removed tree to the south.	Long	B,1,2	Reduce overextended branches in upper crown by 3m.
T2	Sycamore (<i>Acer pseudoplatanus</i>)	M	12	720	1	6	2	3	7	Asymmetric crown due to proximity to neighbouring trees. Reasonable vitality. Stems bifurcate at 1m.	Long	B,1,2	Reduce branches growing towards building by 3m.
T3	Lawson cypress (<i>Chamaecyparis lawsoniana</i>)	MA	6	420	1	1.5	2	2.5	1	Heavily suppressed and asymmetric crown due to position beneath T2. Reasonable vitality.	Medium	C,2	Monitor stem unions (every two years)
T4	Sycamore (<i>Acer pseudoplatanus</i>)	M	13	990	3	3.5	3	6.5	4	Existing tag number 03969. Stems trifurcate at 1.2m. Included bark at stem unions. Good vitality. Crown asymmetric due to previously removed tree to the north.	Long	B1,2	
T5	Sycamore (<i>Acer pseudoplatanus</i>)	M	13	730	3	0	6	6.5	5.5	Stems bifurcate at 1.2m. Included bark at unions. Exposed surface roots with minor mower damage. Crown weighted to the south due to proximity to T4.	Long	B1,2	Monitor stem unions (every two years)
T6	Portugal laurel (<i>Prunus lucitanica</i>)	MA	1.5	210	0.5	1.5	1.5	1.5	1.5	Multi-stemmed, vigorous shrub.	Long	C,2	

No.	Species	Age class	Height (m)	DBH	FSB	N	S	E	W	Comments	SULE	Category	Recommendations
T7	Lawson cypress (<i>Chamaecyparis lawsoniana</i>)	MA	9	570	0.5	2.5	3	2.5	3.5	Dense, vigorous crown. Slightly asymmetric due to proximity to T5. No significant visible defects.	Long	C,2	
T8	Sycamore (<i>Acer pseudoplatanus</i>)	M	13	810	3	5	5	6.5	3	Existing tag number 03964. Stems trifurcate at 2m. Included bark at unions. Crown density sparse. Moderate dead wood throughout crown.	Medium	C,1,2	Remove dead wood. Monitor stem unions (every two years).
T9	Sycamore (<i>Acer pseudoplatanus</i>)	MA	10	340	3	1.5	4.5	4.5	3	Tree suppressed beneath T8. Dense and vigorous crown. No significant visible defects.	Medium	B,1,2	
T10	Sycamore (<i>Acer pseudoplatanus</i>)	M	16	580	5	6	2	8.5	3	Existing tag number 03961. Asymmetric crown weighted to the north due to proximity to T11. Notably curved stem growth. Good vitality. No significant visible defects.	Long	B,2	
T11	Horse chestnut (<i>Aesculus hippocastanum</i>)	M	16	1080	4	6.5	6	8.5	6.5	Existing tag number 03956. Broad, spreading and dominant tree. Good balanced form and vitality. Stem in good condition. Minor cavity development at pruning wounds.	Long	A,1,2	
T12	Common lime (<i>Tilia x europeae</i>)	M	15	680	2	2	4.5	3.5	3	Existing tag number 03960. Slightly asymmetric crown due to T11.	Long	B,1,2	Remove dead wood.

No.	Species	Age class	Height (m)	DBH	FSB	N	S	E	W	Comments	SULE	Category	Recommendations
T13	London plane (<i>Platanus x hispanica</i>)	M	15	1150	4	9	7.5	4	7	Vigorous epicormic growth on main stem-typical of species. Moderate dead wood above parking areas.			
T14	Silver birch (<i>Betula pendula</i>)	MA	13	490	3	4.5	2.5	2.5	3	Densely ivy clad restricting full survey. Asymmetric crown weighted to the west due to T11. Good vitality. Moderate basal decay. Long, over-extended limbs.	Long	B,2	
										Existing tag number 03966. Crown slightly weighted due to neighbouring trees. Good vitality. No significant visible defects.	Long	B1,2	
T15	Beech (<i>Fagus sylvatica</i>)	M	16	950	2	5	7.5	3	3	Dense ivy and vegetation restricting thorough survey. Stem in good condition. Dense, vigorous crown.	Long	B,1,2	
T16	Beech (<i>Fagus sylvatica</i>)	M	16	770	2	5	5	5	5	Existing stem number 03953. Iron fence in stem. Vigorous crown. Dense ivy restricting thorough survey.	Long	B,1,2	
T17	Silver birch (<i>Betula pendula</i>)	MA	13	480	3	3	3	3	4.5	Good, open grown form. Good vitality. No significant visible defects.	Long	B,1,2	

No.	Species	Age class	Height (m)	DBH	FSB	N	S	E	W	Comments	SULE	Category	Recommendations
T18	Hawthorn (<i>Crataegus monogyna</i>)	MA	4	240	1.5	2	3	3	2.5	Ornamental garden tree. Good form and vitality. No significant visible defects.	Long	B,1,2	
T19	Sessile oak (<i>Quercus petraea</i>)	M	13	640	6	10	0	8	4	Tree heavily weighted to the north. No sign of root plate lifting. Dense ivy restricting thorough survey. Reasonable vitality.	Medium	B,2	Monitor signs of root plate movement (every two years).
T20	Beech (<i>Fagus sylvatica</i>)	M	16	1070	4	6.5	6	4	4	Dense ivy restricting thorough survey. Good balanced form and vigorous, dense crown.	Long	B,2	
T21	Sycamore (<i>Acer pseudoplatanus</i>)	MA	8	390	4	0	6.5	5	6	Growing on raised area and dislodging retaining dry stone wall. Crown weighted to the south due to proximity to T22. Stems bifurcate at base. Good vitality.	Medium	B,1	Prune away from the building by 2.5m
T22	Sycamore (<i>Acer pseudoplatanus</i>)	M	12	910	4	6	5	5	7	Good balanced open grown form. Spreading, multi-stemmed crown at 3m. Good vitality. Paladin fence across stem base. No significant visible defects.	Long	A,1,2	
G1	Juniper (<i>Juniperus communis</i>)	MA	To 5	150 and 310						Suppressed due to proximity to neighbouring sycamores. Moderate crown die back. Exposed	Medium	C,2	

No.	Species	Age class	Height (m)	DBH	FSB	N	S	E	W	Comments	SULE	Category	Recommendations
										surface roots on embankment.			
G2	Holly (<i>Ilex aquifolium</i>); Laurel (<i>Prunus laurocerasus</i>)	Y-MA	To 5	To 140						Dense, vigorous ornamental shrubs.	Medium	C,2	Crown raise above parking areas by 4m.
G3	Common lime (<i>Tilia x europeae</i>)	MA	To 7	300; 150; 180						3 trees beside car parking area. Minor basal epicormic growth at old pruning wound. Overhanging parking bays. Good vitality. No significant visible defects.	Long	B,1,2	
G4	Sycamore; beech	M	To 17	510; 540; 590						Dense ivy restricting thorough survey. Tall and slender trees due to close spacing. Iron fence occluded within main stems. Overhanging parking bays. No significant visible defects. Reasonable vitality	Long	B,1,2	
G5	Elder (<i>Sambucus nigra</i>); laurel	MA	To 3	To 260						Dense vigorous ornamental shrubs. Laurel regrowth from dead stump.	Medium	C,1,2	

APPENDIX 2

SURVEY METHODOLOGY

The survey of trees is conducted from ground level only. The nature of the soils on site is not assessed. Trees are dynamic living organisms with a constantly changing structure; even trees in good condition can suffer from damage or stress. The information recorded is presented as being correct at the time of survey. The following features of each tree, group of trees or wood may have been recorded in the Arboricultural Survey Data Sheets at Appendix 1.

Species	Common name and scientific name is given.
Height	Top height of tree recorded in metres.
Stem Diameter	For single-stemmed trees the measurement is taken at 1.5 metres above ground level and recorded in millimetres. For multi-stemmed trees an average all stems measured at 1.5m above ground level is used. For tree groups a range from minimum to maximum diameters is provided based on measurements taken using one of the aforementioned methods.
Crown Spread	The N, S, E and W branch spreads are recorded in metres to provide a representative crown shape.
First Significant Branch (FSB)	Crown clearance above ground level recorded in metres.
Age	Young Middle Age Mature Trees that can reasonably be relocated or replaced like for like, without undue cost; Trees in the established growth stage of their life with the potential to continue increasing in size; Trees that have reached their ultimate size, given their location and surroundings;
Comments	A brief evaluation and description of the tree with comments on form, vitality, health and any significant defects or symptoms of ill-health.

BS 5837 Tree Quality Assessment

The tree quality assessment is based on the Cascade Chart from of BS 5837:2012 (See below). Four categories (A, B, C and U) are used to denote tree quality (A= High, B = Moderate, C = Low, U= Unsuitable for retention). Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category (the subcategories may be used in combination but do not accumulate collective weight).

Root Protection Area (RPA)

RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m²) 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.

Recommendations

Recommendations for arboricultural works, etc. are based on the **current** land use, and take into account the tree or group attributes without bias to the proposed development.

Safe Useful Life Expectancy (SULE)

An estimation of the life expectancy as healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey.

Long > 40 years
Medium 20 – 40 years
Short less than 20 years

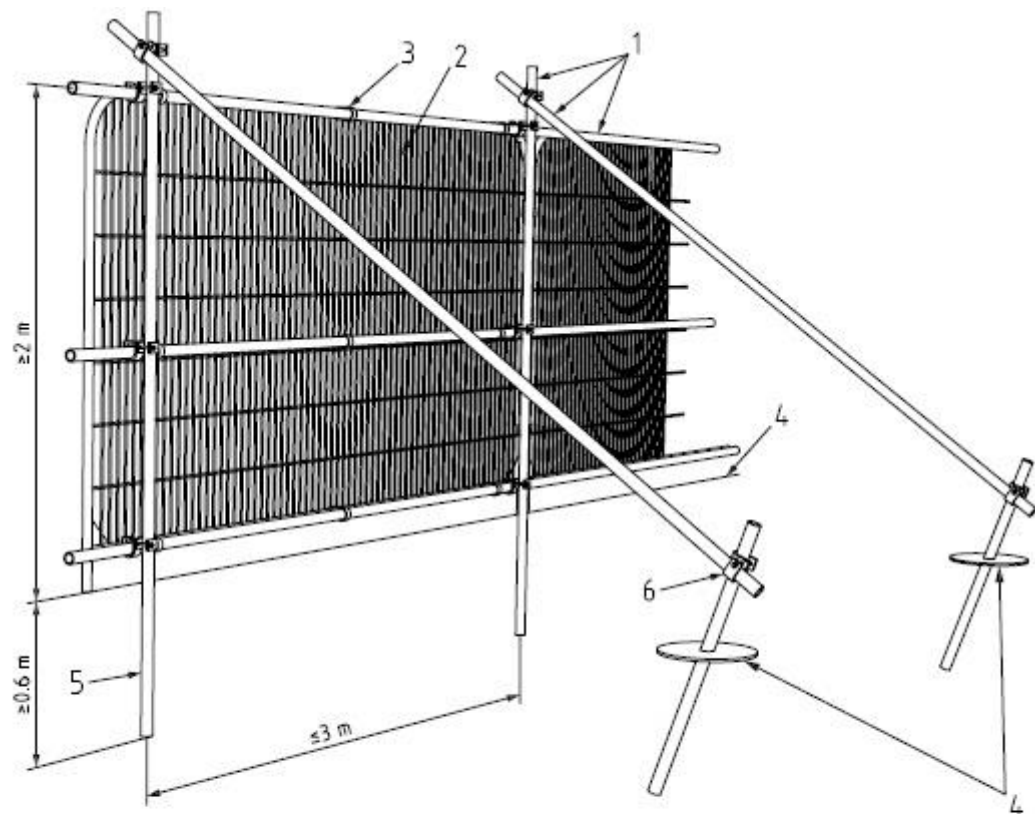
Table 1 Cascade chart for tree quality assessment

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 unviable 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 <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	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)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
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 present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
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 present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

British Standards Institute (2012) BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*

APPENDIX 3

TEMPORARY TREE PROTECTIVE FENCING EXAMPLE



Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

DRAWING 1

TREE CONSTRAINTS PLAN

DRAWING 2

TREE IMPLICATIONS AND PROTECTION PLAN