BS 5837:2012 Arboricultural Survey

Kendray Hospital, Barnsley

Presented to: Trent Architecture and Design

Issued: December 2023

Delta-Simons Project No: 100023.587207

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Report Details

Client	Trent Architecture and Design
Report Title	BS 5837:2012 Arboricultural Survey
Site Address	Kendray Hospital, Doncaster Rd, Barnsley S70 3RD
Project No.	100023.587207
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Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
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Executive Summary

Purpose	Delta-Simons Limited was instructed by Trent Architecture and Design ('the Client'), to undertake a Tree Survey to BS 5837:2012 standard of an area of land situated at Kendray Hospital, Doncaster Road, Barnsley S70 3RD ('the Site'). The survey was undertaken on 20th November 2023. The survey was undertaken to inform a planning application for the Site.
Current Site Status	The Site comprises a central area of managed modified grassland bounded by ornamental shrubs, native trees and a car parking area. It is located within the northern extent of the Kendray Hospital building complex. A brick wall approximately 1.5 m in height, bounds the Site to the north and west beyond which lies an area of broadleaved woodland which separates the Site from Doncaster Road to the north. The Site lies within a sub-urban landscape to the north of Kendray, Barnsley, characterised by surrounding residential and commercial development and associated roads, gardens, areas of grassland, trees and scrub.
Proposed Development	It is understood that an electrical substation and associated infrastructure is to be installed at the Site.
Results	A total of eight trees, a single tree group and two ornamental shrub groups were identified and assessed as part of the Tree Survey. The results of the desk search undertaken on Barnsley Metropolitan Borough Council inter-active mapping system indicate that no trees on-Site or immediately adjacent to the Site are covered by Tree Preservation Orders (TPOs), or are within a Conservation Area.
Recommendations	<u>Recommendation 1 (Adequate Tree Protection)</u> Those trees identified within the proposed development plan for retention will need to be adequately protected during any approved development works. Measures to protect trees should follow the best practice principles set out in BS 5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the Root Protection Area (RPAs) of individual trees to be retained should be marked out. Marking out should be completed by a competent person with arboricultural expertise. All trees retained on-Site and adjacent to the Site should be protected by barriers or ground protection around the calculated RPA, and as indicated on the Tree Constraints Plan (TCP) produced in association with this survey.
This Tree Survey Executive Summary is intended as a summary of the assessment of the Site based on information received by Delta-Simons at the time of production. This Executive Summary should be read in conjunction with the full Report.	

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1.0 Introduction

1.1 Purpose and Scope of the Survey

Delta-Simons Limited was instructed by Trent Architecture and Design (the 'Client') to undertake an Arboricultural Survey to BS 5837:2012 standard. The survey was undertaken at Kendray Hospital, Doncaster Road, Barnsley S70 3RD (hereafter referred to as 'the Site'). The survey was undertaken on 20th November 2023. The Site location and the area surveyed are shown in Figure 1. The survey was undertaken in order to inform a planning application for infrastructure works at the Site.

The aims of the Tree Survey were to:

- Identify the individual tree species present at the Site by means of visual inspection;
- To define the approximate age, condition and canopy spread of all individual mature trees identified and the value of these within the development;
- To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the Site and recommend actions to remove this risk; and
- Recommend tree management or mitigation measures where appropriate.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference SE 36121 05688, to the south-east of Barnsley, South Yorkshire. The Site comprises a central area of managed modified grassland bounded by ornamental shrubs, native trees and a car parking area. It is located in the northern extent of the Kendray Hospital building complex. A brick wall approximately 1.5 m in height bounds the Site to the north and west, beyond which lies an area of broadleaved woodland which separates the Site from Doncaster Road to the north.

The Site lies within a sub-urban landscape to the north of Kendray, Barnsley, characterised by surrounding residential and commercial development and associated roads, gardens, areas of grassland, trees and scrub.

The Site layout and area surveyed is shown in Figure 2.

1.3 Proposed Development

It is understood that an electrical substation and associated infrastructure is to be installed at the Site.

2.0 Legislation

2.1 Trees

Local Planning Authority (LPA) look upon trees as being highly beneficial to the locality. To ensure that any important specimens, or significant groups of trees are retained, they may place Tree Preservation Orders (TPOs) on them. In other situations, villages or whole districts may be classified as conservation areas. In these instances certain trees in the designated area will be protected. When trees are protected, legal procedures must be followed before any work is carried out.

When trees are protected by Preservation Orders, no work should be carried out on them without prior written consent from the LPA. Once an application is made, the Authority personnel must inspect the trees, and make a decision within a statutory eight-week period as to whether work can go ahead. If no decision is made within the eight weeks period, the appellant can appeal to the Office of the Deputy Prime Minister for non-determination. If the LPA refuses the application the appellant still has the right to appeal.

If a tree protected by a Preservation Order is either killed or wilfully destroyed, the owners of the tree, and the contractor who did the work, can both be prosecuted. The fines for killing or wilfully destroying a tree can be high, i.e. the current maximum is £20,000 per tree, and there is an automatic requirement to re-plant. The current maximum for minor unlawful infringements, such as pruning, is £2,500.

Trees which are dead, dying, or dangerous are exempt from the legislation, although if such trees are removed, the onus on proving they fell into one of these categories lies with the tree owner. Whenever possible it is strongly recommended that the LA be given at least five days' notice before any work on such trees is carried out.

Trees in a conservation area that are already protected by a TPO are subject to the normal procedures and controls for any tree covered by such an Order.

Trees in a conservation area that are not protected by a TPO are protected by the provision in Section 211 of The Town and Country Planning Act (1990). These provisions require people to notify the LPA, using a 'section 211 notice', six weeks before carrying out certain works on such trees, unless an exception applies. The works may go ahead before the end of the six-week period if the LPA gives consent. This notice period gives the Authority an opportunity to consider whether to make an Order on the tree.

3.0 Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This Report has applied the methodology to all significant individual trees or groups of trees present at or near to the Site. Trees below 15 cm trunk diameter were generally excluded from the survey. All floral names follow the nomenclature of Stace (2010).

3.1 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 Trees in Relation to Design, Development and Construction. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction works) and the means of incorporating trees into the developed landscape.

Trees on or adjacent to the Site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within Table 1. This gives an indication as to the tree's importance in relation to the Site, the local landscape and, also, the value and quality of the existing trees on-Site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below).

Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, the presence of any serious disease or tree–related hazard is taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- Trees which are particularly good examples of their species, especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- Trees, or groups of trees, which provide a definite screening or softening effect to the locality in relation to views into or out of the Site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups); and
- Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;

- Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the Site and have little visual impact beyond the Site; and
- Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained but are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150 mm and may comprise:

- Trees not qualifying in higher categories;
- Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value and or trees offering low or only temporary screening benefit; and
- Trees with very limited conservation or other cultural benefits.

Category (U): Trees that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or removed for reasons of sound arboricultural management. Trees within this category are:

- 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;
- Trees that are dead or are showing signs of significant, immediate or irreversible overall decline; and
- 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.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

- The health, vigour and condition of each tree;
- The presence of any structural defects in each tree and its life expectancy;
- The size and form of each tree and its suitability within the context of the proposed scheme; and
- The location of each tree relative to existing Site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

- Y: Young trees age less than 1/3 life expectancy;
- SM: Middle age trees 1/3 – 2/3 life expectancy;
- M: Mature trees over 2/3 life expectancy; and
- OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule:

- G **Good:** A sound tree or trees needing little, if any, attention;

- F **Fair:** A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover;
- P **Poor:** A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain; and
- D **Dead:** A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming or have become dangerous.

Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branch material	-	Up to 5 cm in diameter.
Minor dead wood	-	5 cm to 10 cm in diameter.
Major dead wood	-	10 cm in diameter and above.

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

3.2 Tree Plans and Tree Schedules

The extent and positions of significant individual trees or groups of trees close to the Site are shown on the Arboricultural Survey Plan (Figure 2). The Root Protection Areas (RPA) of the key trees of value identified for, or recommended for, retention have been marked within the Constraints Plan (Figure 3) using the RPAs provided in the Tree Schedule within Table 1.

A summary that includes the trees identified on or near to the Site is included in the Tree Assessment Report detailing information on each group of trees. This is also provided in Table 1. Within the summary table maximum RPAs (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The RPAs are formulated as described below and assist when designing layouts in relation to trees.

3.3 Root Protection Area

Below ground constraints to development are represented by the root plate around a tree, which needs protecting in order for the tree to be incorporated into a proposed scheme without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is illustrated by the RPA and is calculated according to the formula set out in BS 5837:(2012). This area is equivalent to a circle with a radius 12 x the stem diameter for single stem trees or the basal diameter for trees with more than one stem arising less than 1.5 m above ground level.

RPA (m²) = (stem diameter (mm) x 12/1000) ² x 3.142

This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides

Taken from Table 2: Calculating the RPA, BS 5837 (2005).

4.0 Results

4.1 Data Search

The results of the desk search undertaken on Barnsley Metropolitan Borough Council interactive mapping system indicate that all trees within the proposed development Site are outside of any Conservation Area. No trees on-Site nor on land adjacent to the Site are covered by a TPO.

4.2 Survey Details

The tree inspection took the form of a walkover inspection completed by Peter Morrell TechArbA on 20th November 2023. Each individual semi-mature or young tree of significance that could be impacted upon by any proposed development was identified and visually inspected and classified. The trees identified during the survey at the Site have been individually noted and identified within this Report and are shown in the Tree Survey Plan within Figure 2, and within the Photograph Section of this Report (Appendix B).

4.3 Semi-Mature and Young Trees

A total of eight trees (T), a single tree group (TG) and two ornamental shrub groups (SG) have been identified and assessed as part of the tree survey. All trees surveyed with the exception of one tree group and two trees were within the Site boundary.

4.3.1 Species and their Arrangement in the Landscape

There are a limited range of tree species on, and immediately adjacent to, the Site, with sycamore *Acer pseudoplatanus* being the dominant species. Ash *Fraxinus excelsior*, holly *Ilex aquifolium* and cherry *Prunus* sp. are present in multiple numbers with horse chestnut *Aesculus hippocastanum* and common lime *Tilia x europaea* represented as single specimens.

The distribution of the trees and tree groups across the Site is limited to being randomly dispersed around an area of amenity grassland, along the northern boundary of the hospital and at the edge of an internal access road and area of carparking. Two individual trees and a tree group are present off-Site immediately adjacent to the northern boundary with canopies that extend up to and into the Site.

4.3.2 Height and Significance in the Landscape

Tree 1, T3 and T6, standing up to 16 m in height, are by their positions adjacent to the Site's northern boundary at the top of a slope, highly visible when viewed from Doncaster Road. While not as prominent as the aforementioned trees, Trees T7, T8 and T9 do provide amenity value to the hospital Site. For these reasons these trees are placed within Category B (see Table 1).

The remaining trees (T2, TG4 and T5) on Site and adjacent to it are less prominent in the wider landscape, though dominate the area within which they stand. They combine with the adjacent trees to provide screening to the Site from Doncaster Road. For these reasons the trees are placed within C mainly due to their condition.

If retained, these trees will require protection measures to ensure no impact occurs as a result of any development.

4.3.3 Age and Condition

All trees present within the Site are semi-mature or young. Several of the trees within the Site boundary show signs of past management, with historic pruning wounds from crown lifting that are occluding. All on-Site trees appear to be in fair to good condition.

4.3.4 Environmental Condition

Given the Site's current use and the semi-mature age of the majority of the trees, it is surmised that limited damage to the root system of boundary and on-Site trees has been sustained through any recent on-Site working practices. This would be through compaction of the ground during grass cutting operation on the

area of amenity grassland around which several trees are located. The trees on-Site and immediately adjacent to the Site are not in an exposed position, having been protected from prevailing winds by the surrounding buildings.

Groundwater conditions are not assessed to be a significant factor in present or future growth or health of trees since the generally flat Site appears to be well drained and this situation will probably improve further following completion of any development.

4.4 Tree Schedule

Table 1 – BS 5837:2012 Tree Schedule

Tree No.	Species Name	Botanical Name	Ht (m)	Stem dia (mm)	No of Stems	Crown Spread				Crown Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Comment	Cat Grading	Estimated remaining contribution (yrs)	Radius of RPA (m)	Recommendations
						N	E	S	W									
T1	Sycamore	*Acer pseudoplatanus*	16	300 300 450	3	6	6	6	6	2	SM	Good	Good	Multi-stemmed from base. Rounded canopy	B	40+	7.5	
T2	Ash	*Fraxinus excelsior*	15	450	1	6	4	7	9	3	SM	Fair	Poor	Main stem twisted at 8 m. Scattered dead wood	C	20+	5.4	
T3	Sycamore	*Acer pseudoplatanus*	15	400 400 300 250	4	8	8	3	3	3	SM	Good	Good	Multi-stemmed from base. Rounded canopy	B	40+	8.1	
TG4	Sycamore	*Acer pseudoplatanus*	Av 8	Av 150	MS	0	4	4	4	4	Y	Fair	Moderate	Phototropic growth. Canopies read as one	C	20+	1.8	
T5	Sycamore	*Acer pseudoplatanus*	11	425	1	7	5	2	4	4	SM	Fair	Poor	Canopy impacted by surrounding trees. Historic pruning wounds.	C	20+	5.1	
T6	Ash	*Fraxinus excelsior*	15	500	1	6	6	7	6	3	SM	Fair	Fair	Stem leaning to south. Historic pruning wounds.	B	40+	6.0	
T7	Holly	*Ilex aquifolium*	8	200 x 3 150 x 3	5	3	3	3	3	2	SM	Good	Good	Conical canopy. Multi-stemmed from base. Historic pruning wounds.	B	40+	7.2	
T8	Common lime	*Tilia x europaea*	16	650	1	6	6	6	6	4	SM	Good	Good	Bifurcated at 3 m. Rounded canopy. Historic pruning wounds.	B	40+	7.8	
T9	Horse chestnut	*Aesculus hippocastanum*	13	650	1	5	5	5	5	3	SM	Good	Good	Trifurcated at 2 m. Rounded canopy. Historic pruning wounds.	B	40+	7.8	
SG1	Mock orange Wilson's honeysuckle Euonymus 'Silver Queen'	*Philadelphus coronarius* *Lonicera nitida* *Euonymus radicans*	Av 2.5	Av 75	Ms	2	2	2	2	0	SM	Fair	Fair		C	20+	0.9	
SG2	Rhododendron Spotted laurel Portuguese laurel Holly Cherry Mock orange Wilson's honeysuckle	*Rhododendron sp.* *Aucuba japonica* *Prunus lusitanica* *Ilex aquifolium* *Philadelphus coronarius* *Lonicera nitida*	Av 2.5	Av 75	MS	2	2	2	2	0	SM	Fair	Fair		C	20+	0.9	

Table 2 – Key to Tree Schedule

BS 5837: 2012 Tree Survey Key to Terminology		
Term	**Explanation**	**Notes**
Tree Ref.	Sequential reference number for individual tree or distinct tree in hedgerow	The measurement conventions are as follows. Height, crown spread, and crown clearance are recorded to the nearest half metre (crown spread is rounded up) for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m Stem diameter is recorded in millimetres, rounded to the nearest 5 mm Estimated dimensions (e.g. for off-site or otherwise inaccessible trees where accurate data cannot be recovered) should be clearly identified as such (e.g.suffixed with a "#") RPAr – Radius of nominal circle of Root Protection Area in metres from centre of tree stem. Figures used originate from Annex D BS5837: 2012 (p.40). Provided as a minimum distance and calculated in accordance with section 4.6 BS5837: 2012 (p.10) RPAm2 – Extent of root protection area * signifies dimensions have not been recorded
Common Name	Tree species listed by common name	
Height	Overall tree height measured in metres (m)	
Branch Spread	Taken as a minimum at the four cardinal points (North, South, East & West) to derive a representation of the crown spread	
Stem Diameter	Diameter of single stem trees on level ground measured at 1.5m above ground level. Diameters of other commonly encountered tree stems should be measured in accordance with Annex C (BS5837 2012 p39)	
Existing Height Above Ground Level – FSB/DG	Height of first significant branch (FSB) and its direction of growth (DG) identified as height in metres and direction of growth (e.g. 2.4-N)	Measurements taken to provide information relating to ground clearance, crown/stem ratio and shading of site
Life Stage	Young (Y)	Tree within the first one quarter of life expectancy
	Semi mature (SM)	Tree in second quarter of life expectancy
	Early mature (EM)	Tree in third quarter of life expectancy
	Mature (M)	Tree in final quarter of life expectancy

	Over mature (OM)	Tree having reached the anticipated maximum height and spread typical for its species and setting and which has entered a period of stasis where physiological processes maintain a functional status quo.
	Veteran tree (V)	Tree that, by recognized criteria, shows 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. NOTE: These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem. Veteran trees may be subject to a tree preservation order (TPO). Clients are responsible for determining whether a TPO is present.

General Observations	To provide information on the structural and/or physiological condition (e.g. the presence of any decay and physical defects), and/or preliminary management recommendations	
Physiological Condition - An assessment of the physiological condition (i.e. health/vitality) of the tree	GOOD FAIR POOR DEAD	Tree in a healthy condition with no significant problems Tree generally in good health with some problems that can be remediated Tree in poor health with significant problems that can't be remediated Tree without sufficient live material to sustain life
Structural Condition - An assessment of the structural/safe condition of the tree	GOOD MODERATE POOR	Tree in a sound condition with no significant defects Tree in a sound condition at present but with defects or with significant defects that can be remediated Tree with significant defects that can't be remediated
Notes related to both physiological and structural condition follow the categorisation in order support		the statement and give greater detail on the true quality and value of the tree
Preliminary Management Recommendations	These may include further investigations for the presence or extent of decay or climbed inspections, ivy removal or pruning works when access is a nonmoveable aspect etc. (NB this is not intended to be a specification for	

	tree work and further advice maybe required prior to implementation). Trees assessed as being in apparently immediately hazardous condition will be notified to the client separately as soon as practicable	
Estimated remaining contribution (yrs)	An estimate of the remaining life contribution in years that the tree or group of trees is expected to have based on species, condition on the site in its current context	<10 - Tree is dead or dying and unlikely to contribute beyond 10 years 10+ - Tree is assessed as being able to contribute to the site for 10+ years 20+ - Tree is assessed as being able to contribute to the site for 20+ years 40+ - Tree is assessed as being able to contribute to the site for 40+ years
Category grading	Category of tree in accordance with BS5837 2012 Cascade Chart (Source BS5837 2012 p9)	'U' Unsuitable for retention, within the context of the current land user 'A' Trees of high quality with 40yr remaining lifespan 'B' Trees of moderate quality and remaining lifespan of at least 20yrs 'C' Trees of low quality with an estimated remaining lifespan of at least 10 yrs or young trees with a stem diameter below 150mm Categories A-C are further classified as 1 (mainly arboricultural qualities), 2 (mainly landscape qualities), 3 (mainly cultural values, including conservation). For further details refer to Cascade Chart in BS 5837 2012 p. 9

5.0 Tree Management

5.1 Arboricultural Assessment

Both within, and adjacent to, the Site are a number of individual trees and a tree group, together with two ornamental shrub groups that could be impacted by any proposed re-development. It may be possible to retain and incorporate certain trees and tree groups currently present within the Site into the design proposals.

It appears that limited management has taken place to the trees present on-Site, with evidence of historic crown lifting present in the form of occluding wounds on several of the older trees.

To ensure that the root areas and canopy extremities of the individual trees and the tree groups that may be retained are not damaged, a Constraints Plan has been prepared to show the locations where protective fencing should be erected for any trees selected for retention (see Figure 3). Any tree surgery required is best carried out towards the conclusion of the development so that, if necessary, any known root damage can be corrected by the appropriate crown thinning to restore root/shoot balance.

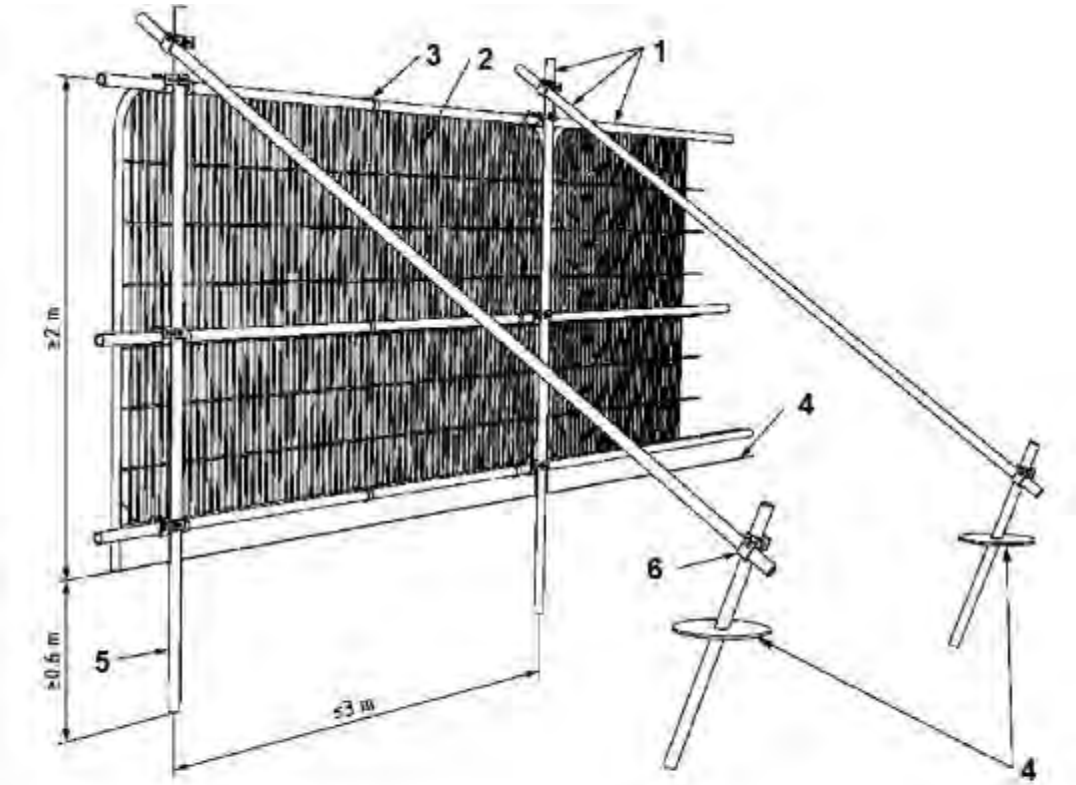
5.2 Recommendations

Recommendation 1 (Adequate Tree Protection)

Those trees identified within any development plan for retention will need to be adequately protected during any approved development works. As a general rule at this Site, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPAs of individual trees to be retained should be marked out using the distances provided in the Table 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances would need to be made to accommodate this.

The best practice principles have been broadly summarised below:

- All trees retained adjacent to the Site should be protected by barriers or ground protection around the calculated RPA and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment;
- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor;
- Arrangements should be made for an arboriculturist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points;
- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority;



1. Standard scaffold poles
2. Heavy Guage 2m tall galvanised tube and weld mesh infill panels
3. Panels secured to uprights and cross members with wire ties
4. Ground Level
5. Uprights driven into ground until secure (up to 0.6m)
6. Standard scaffold clamps

- All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on-Site and be inspected annually (where overall condition requires) or every two years and after any major storm events, with safety a priority;
- Fencing should be clearly visible and suitable for the location, type and proximity of construction activity;
- It may be appropriate on some sites to use temporary site offices as components of the protection barriers;
- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems;
- Once areas around trees have been protected by fencing, any works on the remaining Site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area;
- Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc where this is in close proximity to retained trees;

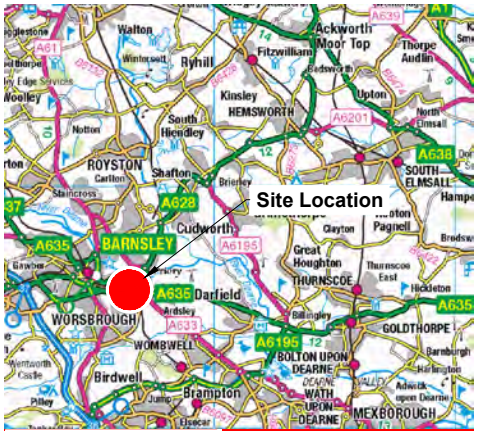
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10 m of a tree bole. No concrete mixing should be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree;
- No fires should be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire;
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree;
- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited, tree surgery be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturist;
- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact;
- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development; and
- All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

6.0 Limitations of the Tree Survey

The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.0 of this Report, exercising the duty of care required of an experienced Environmental Consultant.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Figure 1 – Site Location Map



Scale: 1 / 500,000 @ A4

LEGEND

Development Boundary

Scale: 1 / 2,500 @ A4

DeltaSimons
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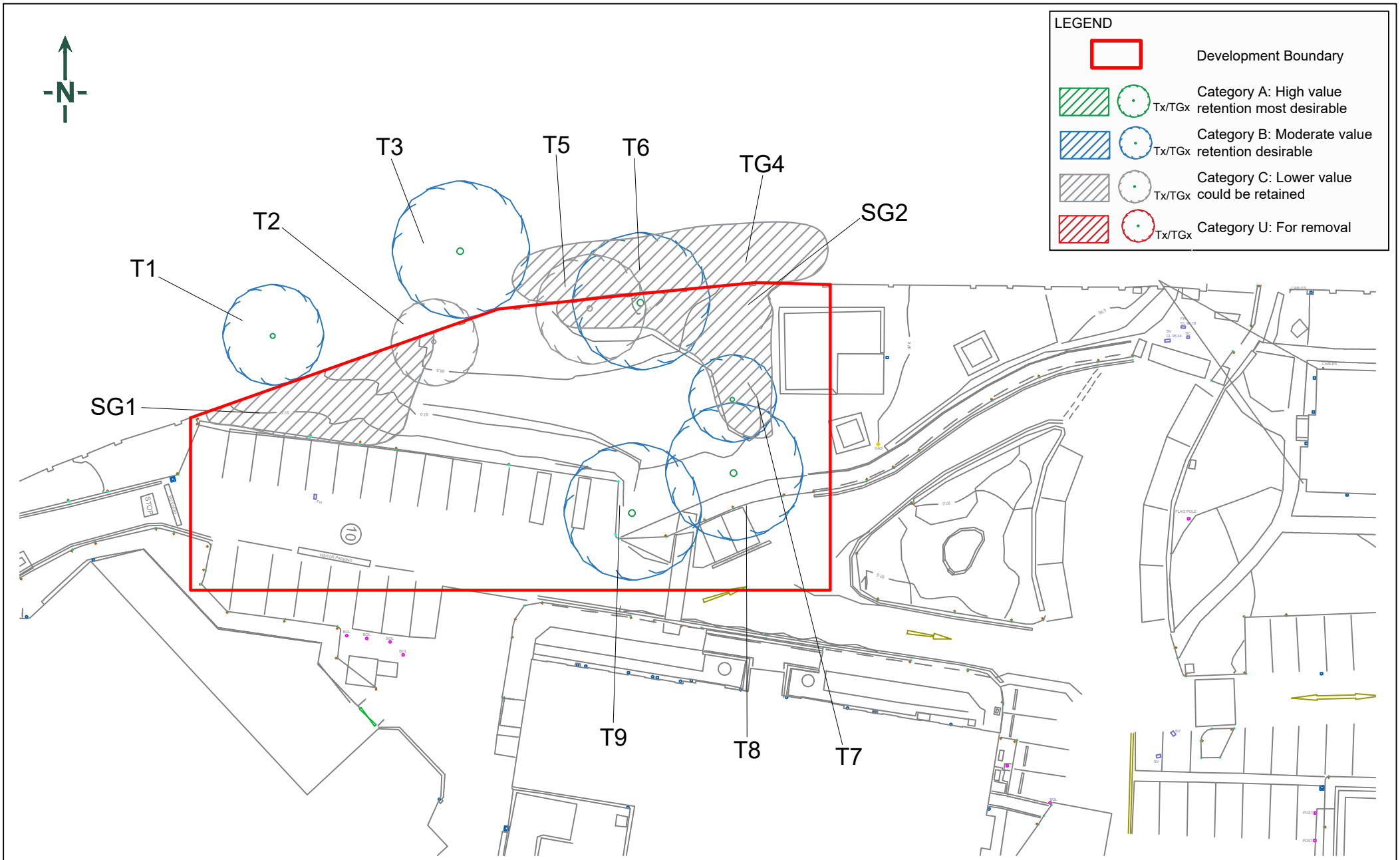
TITLE:
Site Location Map
Kendray Hospital

DRAWN BY: GC	SCALE: To Scale@A4	PROJECT NO: 100023.587206
CHECKED BY: PM	REVISION: 1	FIGURE NO: 1
DATE: 6 December 2023		

Figure 2 – Tree Survey



Site Plan Provided by Client

DeltaSimons
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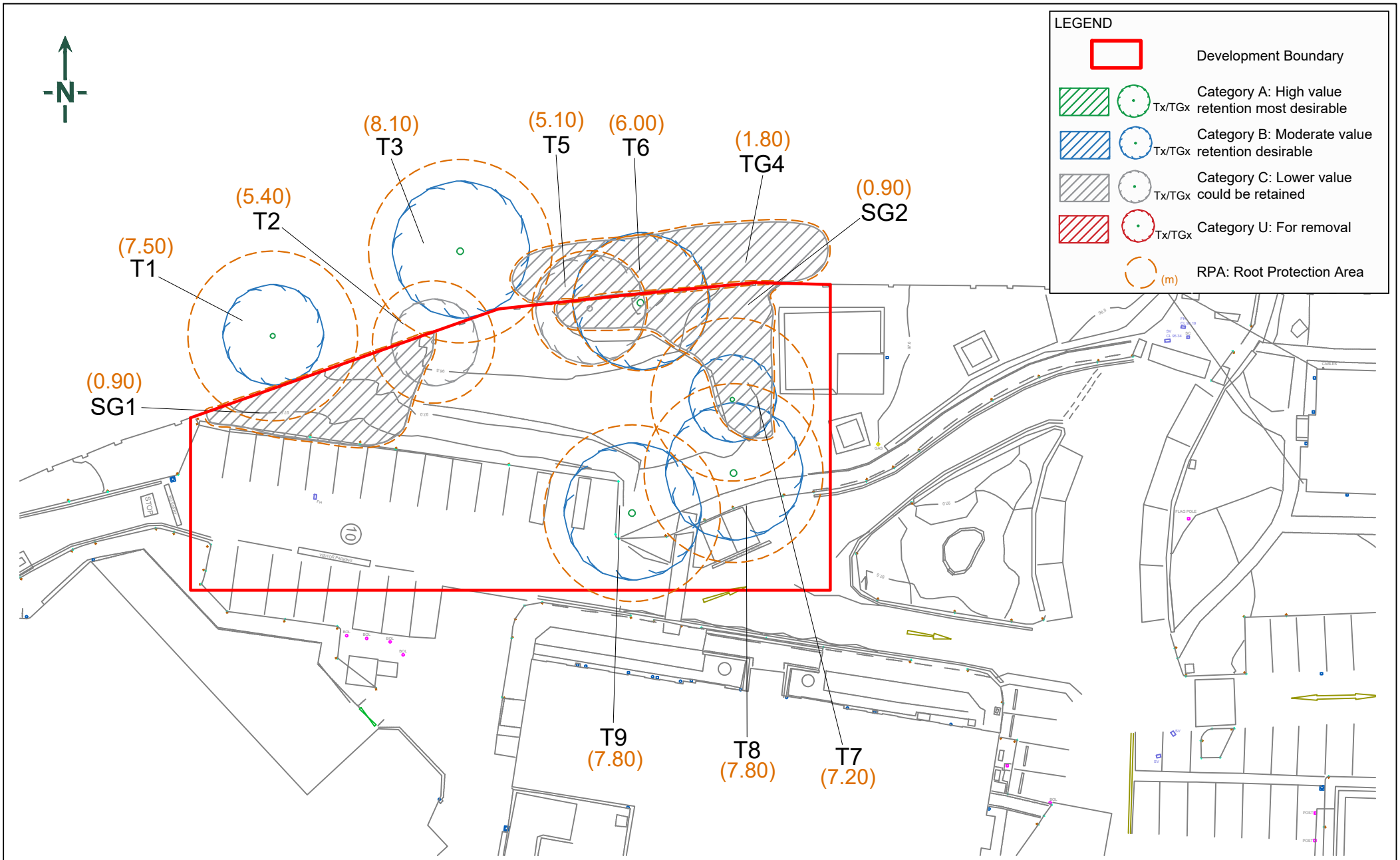
TITLE:
Tree Survey
Kendray Hospital

DRAWN BY: GC	SCALE: Not to Scale	PROJECT NO: 100023.587206	
CHECKED BY: PM	REVISION: 1	FIGURE NO: 2	
DATE: 6 December 2023			

Figure 3 – Tree Constraints Plan



Site Plan Provided by Client

DeltaSimons
Protecting people and planet

TITLE:
Tree Constraints Plan
Kendray Hospital

DRAWN BY: GC	SCALE: Not to Scale
CHECKED BY: PM	REVISION: 1
DATE: 6 December 2023	

PROJECT NO: 100023.587206

FIGURE NO: 3

Appendix A – References

References

BSI Publication BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.

BSI Publication BS 5837:2005 Trees in Relation to Construction - Recommendations.

Stace, C. (2010). *New Flora of the British Isles 3rd edition*. University Press, Cambridge.

Appendix B – Site Photographs

Site Photographs

Photograph 1 – Tree (T)1

Photograph 2 – T2

Photograph 3 – T3

Photograph 4 – Tree Group (TG)4

Photograph 5 – T5

Photograph 6 – T6

Photograph 7 – T7

Photograph 8 – T8

Photograph 9 – T9

Photograph 10 – Shrub Group (SG) 1

Photograph 11 – SG2