Twickenham Riverside
Arboricultural Survey

LONDON BOROUGH OF
RICHMOND UPON THAMES

July 2021

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Twickenham Riverside

Arboricultural Survey

For

London Borough of Richmond upon Thames

Project No.: A-ALP-152/001

July 2021

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Project Number	Report No.
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Revision No.	Date of Issue	Author	Reviewer	Approver
001	22/07/2020	Neil Francis	Neil Francis	Simon Mackrell
002	27/05/2021	Andy Poynter	Neil Francis	Simon Mackrell
003	30/07/2021	Andy Poynter	Neil Francis	Simon Mackrell

Contents

1. Summary

1.1.1 London Borough of Richmond is proposing the redevelopment of 1, 1A, 1B and 1C King Street; 2-4 Water Lane; the site of the former swimming pool and associated buildings, The Embankment; the Diamond Jubilee Gardens, Twickenham. (see Figure 1).

1.1.2 Arcadis LLP commissioned Thomson Environmental Consultants (Thomson) to undertake an arboricultural survey of up trees within and adjacent to the site. The arboricultural survey was carried out in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'* (BS5837:2012).

1.1.3 All trees were categorised in accordance with the cascade chart for tree quality assessment in BS5837:2012 (see Appendix 2). Trees were given a ranking of A, B or C in descending order of value and assigned one or more subcategories qualifying the basis of that value as either arboricultural, landscape or cultural. Trees with only short-term remaining value or that require immediate removal for safety or management reasons are given a U rating.

1.1.4 A total of 65 individual trees and four groups of trees were recorded during the survey and are listed in the Tree Schedule. The surveyor recorded seven Category A trees, 27 Category B trees three Category B groups of trees, 26 Category C trees, one group of Category C trees and eight Category U trees located within or adjacent to the site (see Figure 2).

1.1.5 Category A, B and C trees represent a material consideration to development. Concerted effort should be made to retain A and B category trees within the development. While Category C trees should be retained where possible, they should not be retained where they would present a serious constraint to development.

1.1.6 In order to meet the requirements of the Local Planning Authority, an Arboricultural Impact Assessment and Arboricultural Method Statement should be undertaken once detailed plans of the proposed development are available.

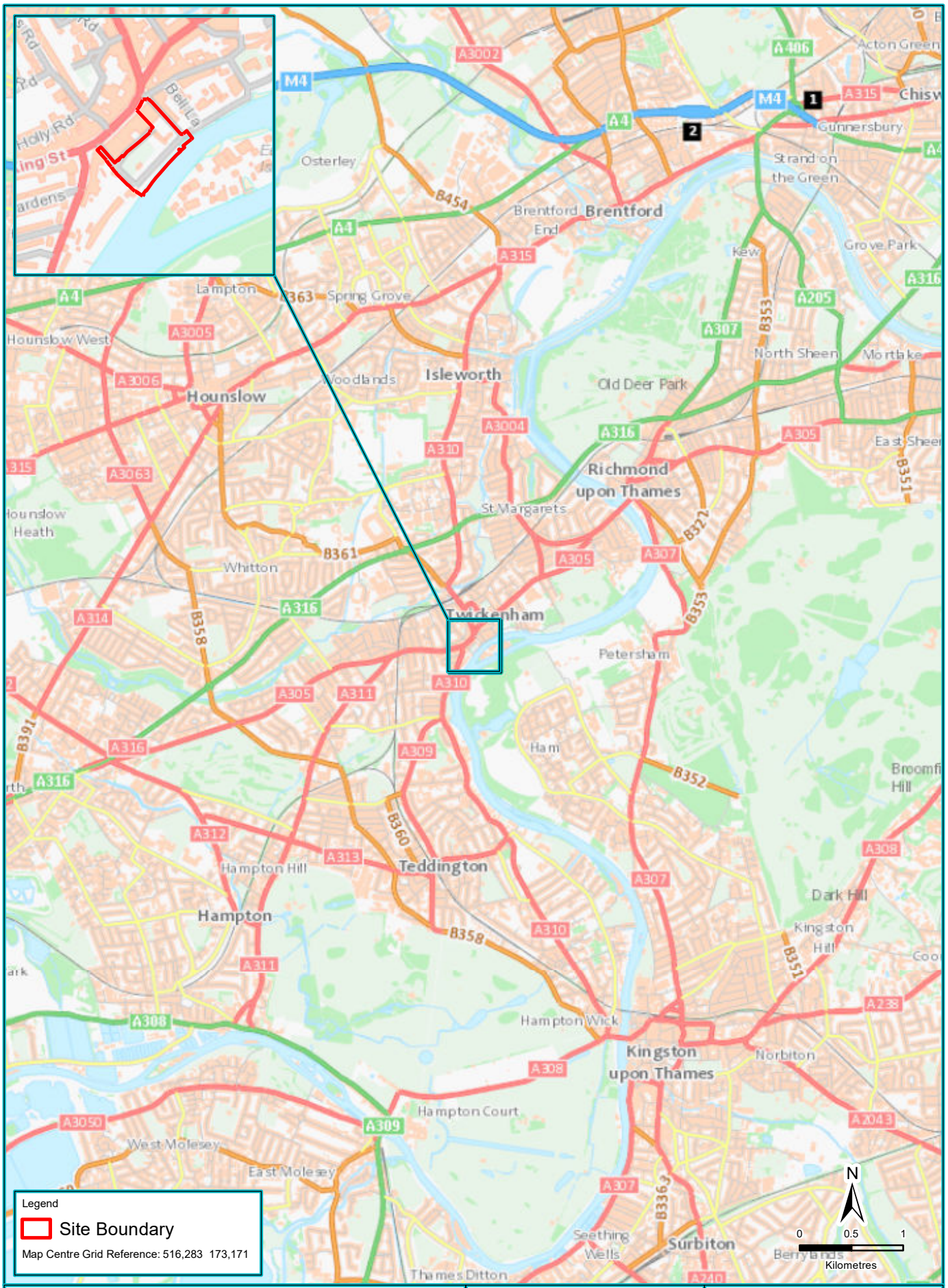

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Figure Title: Site Location		Drawn: EA	Checked: AS
		Date: 21/07/2020	Date: 21/07/2020

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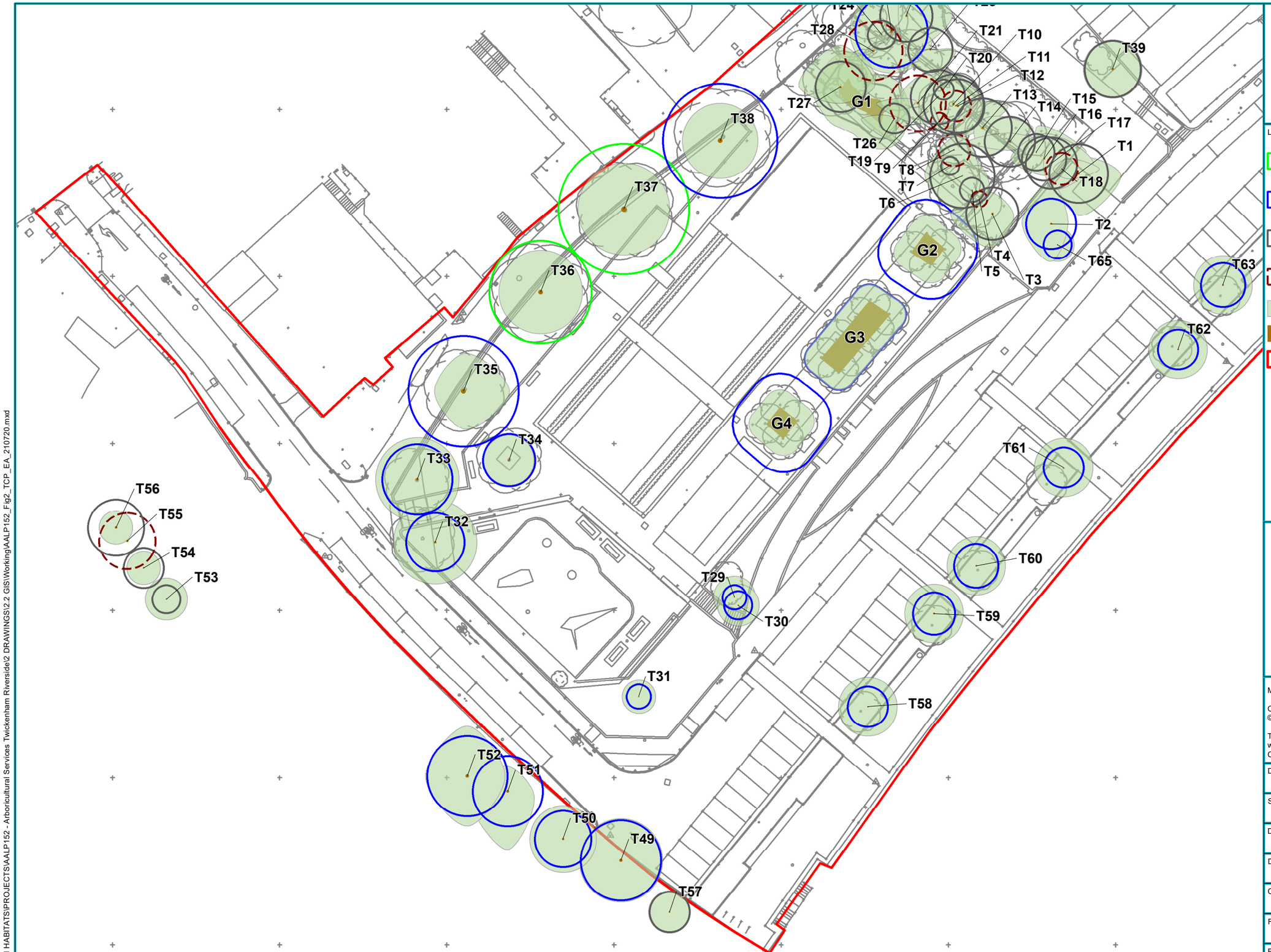

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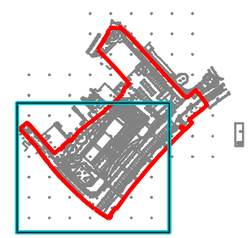
Legend

- Root Protection Area of Category 'A' Tree
- Root Protection Area of Category 'B' Tree
- Root Protection Area of Category 'C' Tree
- Root Protection Area of Category 'U' Tree
- Tree Canopy Extents
- Tree Stem Location
- Site Boundary



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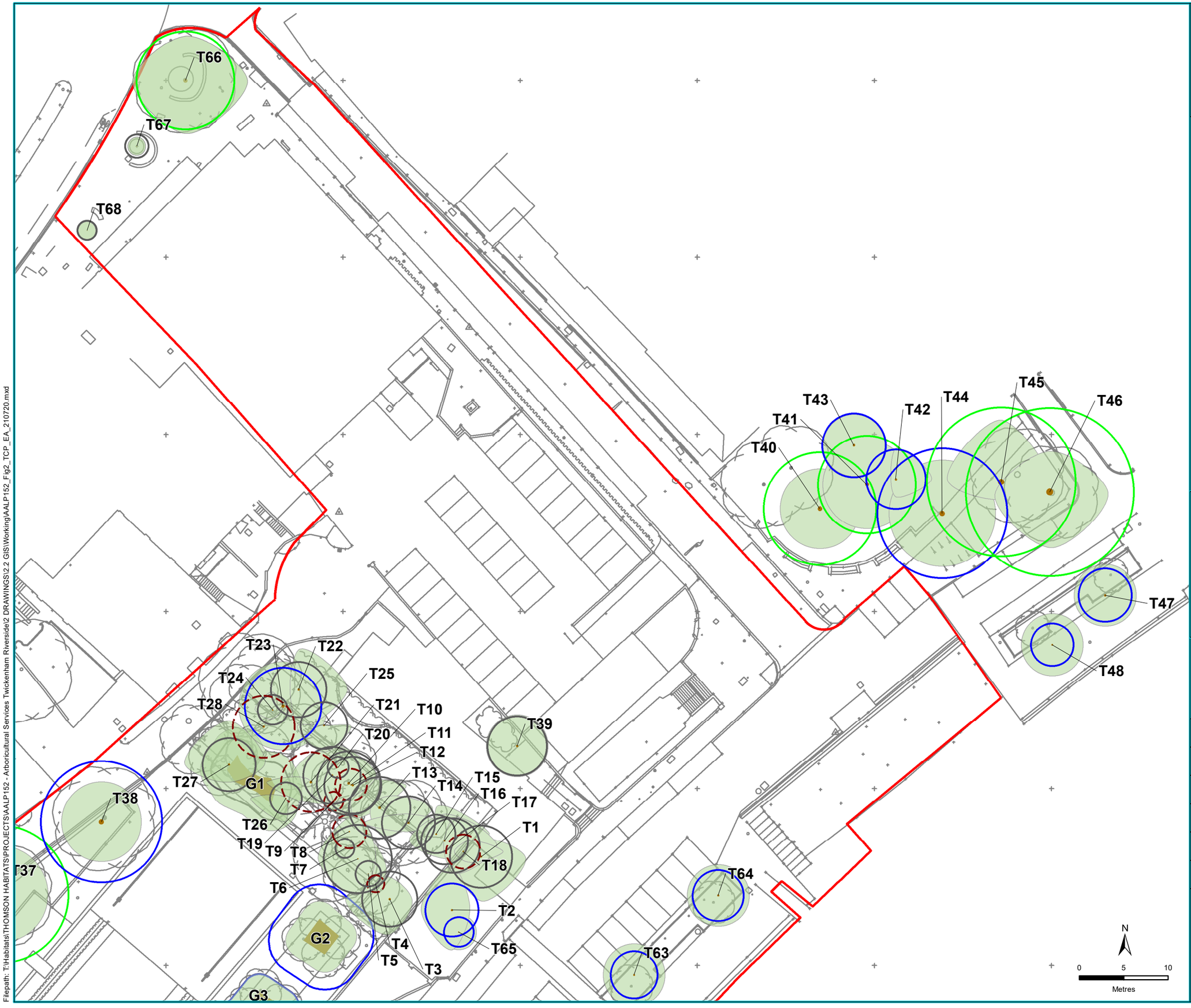
Client	Arcadis LLP
Figure Number	2a
Figure Title	Tree Constraints Plan (TCP01)



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- Root Protection Area of Category 'A' Tree
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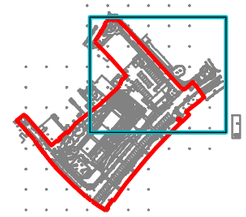

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Date: 26/05/2021	Date: 26/05/2021
Client	Arcadis LLP
Figure Number	2b

Figure Title

Tree Constraints Plan (TCP01)

2. Introduction

2.1 Development Background

2.1.1 Arcadis LLP is involved in the development of a site located at Twickenham Riverside, London. Proposals include the Demolition of existing buildings and structures and redevelopment of the site comprising residential (Use Class C3), ground floor commercial/retail/cafe (Use Class E), and public house (Sui Generis), boathouse locker storage and floating pontoon with associated landscaping, restoration of Diamond Jubilee Gardens and other relevant works. These proposals are hereafter referred to as 'the development'.

2.1.2 The development is located on an approximately 1.34ha area of land (grid reference TQ163731), shown on Figure 1. The area affected by the development is hereafter referred to as 'the site'.

2.1.3 There are a number of trees within the site and adjacent to the site boundary that may be affected by development. Detailed development plans are in the process of being drawn up and a planning application is to be submitted in 2021.

2.2 Site Description

2.2.1 The site, currently known as Diamond Jubilee Gardens, extends to approximately 1.23 ha and includes the whole of the riverside area between Water and Wharf Lanes, including the Embankment, which is currently dominated by parked cars. The River Thames and Eel Pie Island lie to the south and west of the site and there is typical urban development to the north and west consisting of residential properties, commercial space and other urban infrastructure.

2.3 Brief and Objectives

2.3.1 Arcadis LLP commissioned Thomson to complete an arboricultural survey and report of the site.

2.3.2 The objective of the survey and report was to assess the condition of the existing trees on site and any off site trees that might be affected by the development, providing sufficient information to enable decisions to be made on potential design layout and tree retention for the proposed development. The brief was to complete:

- An Arboricultural Survey of trees within or immediately adjacent to the site, in line with BS5837:2012.
- Review of the Local Planning Authority's website to determine whether trees on site are subject to a Tree Preservation Order or are covered by Conservation Area restrictions.
- - An Arboricultural Report detailing our survey methods, results and recommendations, including the Tree Schedule and Tree Constraints Plan, which should be used to inform feasibility studies and design options at an early stage.

2.3.3 This report details the methods and results of the tree survey and provides the Tree Schedule and TCP. The AIA and AMS will be completed once plans for the proposed development have been finalised.

2.4 Limitations

2.4.1 The information provided within this report and in the accompanying Tree Schedule covers only those trees that were inspected and their condition at the time of survey.

2.4.2 A full hazard assessment has not been made and therefore no guarantee is given as to the structural integrity of any of the trees on site.

2.4.3 Where trees were clad in ivy (*Hedera helix*), or where dense epicormic growth or dense underplanting obscured the main stem, this was recorded in the Tree Schedule. The inspection of such trees is impeded and as such a further inspection may be required following the removal of the obstruction. The retention categories of such trees should be considered as provisional only.

2.4.4 Measurements for off-site trees have been estimated and therefore may not fully represent the related constraints.

2.4.5 Whilst this report makes general observations on the long-term potential of the trees surveyed, trees are dynamic organisms and subject to continual change, thus this report should not be relied upon for the purposes of development for more than 12 months from the date of survey.

3. Methodology

3.1 Desk Study

3.1.1 Records of Tree Preservation Orders (TPOs) existing at the site and Conservation Areas within or adjacent to the site were sought from London Borough of Richmond Upon Thames.

3.2 Tree Survey

3.2.1 All significant trees at the site were assessed for their potential to be affected by the development proposals. Significant trees are defined as those with a trunk diameter of greater than 75mm at 1.5m above ground level according to the survey methodology outlined in BS5837:2012. Off-site or third party trees have been included where it is likely they would influence the development.

3.2.2 The trees surveyed were inspected from ground level only and no internal investigations were undertaken.

3.2.3 Trees were categorised as single trees or those that formed part of a distinct group such as a woodland or hedgerow. Groups can be defined as cohesive arboricultural features, either aerodynamically (for example, companion shelter), visually or culturally including for biodiversity (BS5837:2012). The information recorded for each tree can be seen in Table 1.

Table 1: Information recorded for each tree during survey

Attribute	Description
Tree No.	Numerical reference given in sequential order starting at number '1', corresponding with the numbers as set out in Figure 2; trees are given the prefix 'T', groups 'G', woodlands 'W' and hedgerows 'H'.
Species	The common names are based upon on site identification and expressed according to *Tree Guide* (Johnson & More, 2004).
Height	Measured approximately from ground level with the aid of a clinometer and shown in metres (m).
Stem Diameter	Diameter measured at approximately 1.5m above ground level. In the case of multi-stemmed trees, measurement is taken of each stem at 1.5m, where there are two to five stems; or a mean stem diameter at 1.5m, where there are more than five stems. Given in millimetres (mm).
Canopy Spread	Maximum branch spread measured in metres from the centre of the trunk in the direction of the four cardinal points of the compass (or an average can be given if branches demonstrate an even spread).
Crown Clearance	Height above ground level of the first significant branch and direction of growth, and the height above ground level of the overall canopy.

Attribute	Description
Age Class	• Young – less than one-third natural life span spent; • Middle-aged – between one-third and two-thirds natural life span spent; • Mature – greater than two-thirds life span completed; • Over-mature – mature, and in an overall state of decline; • Veteran – surviving beyond the typical age range for the species with a high value in terms of conservation and amenity.
Physiological Condition	Overall health, condition and function of the tree in comparison to a 'normal' example of the species of a similar age; e.g. 'good', 'fair', 'poor' or 'dead'. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.
Structural Condition	The overall structural condition of the tree including the roots, butt, trunk, limbs and their unions, and the presence of any structural defects, decay or pathological defects. • Good - no significant visible structural defects with a form typical for the species; • Fair - a specimen with only minor defects that are easily remedied or of no long term significance; • Poor - significant and irremediable physiological or structural defects that may lead to early or premature decline; • Hazardous - significant structural defects of such a degree that there is a risk of imminent collapse or failure. If deemed necessary, these gradings may be elaborated upon in the 'Comments' section.
Comments	Comments have been made, where appropriate, relating to location, health and condition, structure and form, estimated life expectancy, conservation value and amenity value within the local landscape.
Preliminary Management Recommendations	Tree work that should be undertaken for good arboricultural management, regardless of the requirements of the development.
Estimated Remaining Contribution	The estimated time, in years, that the tree will provide a safe contribution to the site (i.e. <10, 10-20, 20-40 and >40).

Quality Assessment

3.2.4 During the survey, the trees were assessed qualitatively, categorising the quality and value of the trees based on arboricultural, landscape and cultural (including conservation) features. Each tree was then placed into one of four categories. The four categories can be seen in Table 2. Definitions for these categories can be found in Appendix 2.

Table 1: Quality assessment categories

Category	Description
Category U	Trees 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.
Category A	Trees of high quality with an estimated life expectancy of at least 40 years.
Category B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
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 150mm.

3.2.5 Trees categorised as either A, B or C, were also allocated up to three subcategories. The subcategories chosen for each tree are dependent on the main reasons for selection of the particular category grading. The three subcategories are as follows:

1. Category grading based on mainly arboricultural qualities;
2. Category grading based on mainly landscape qualities; and
3. Category grading based on mainly cultural values, including conservation.

Root Protection Areas (RPAs)

3.2.6 Trees that are selected for retention on the site could be at risk of damage during construction, such as root damage during excavations for foundations or services, or any ground-working for landscaping. Further impacts on the trees may potentially result from vehicle movements and materials storage, including root severance, compaction of the soil and exclusion of air and water to the soil. The risk of tree damage is minimised if construction activities are planned to avoid the roots of trees.

3.2.7 The area of ground adjacent to each tree or group of trees that contains the majority of the roots can be calculated using the equation provided in the BS5837:2012. This Root Protection Area (RPA) is a radius around the tree of 12 times the stem diameter for a single stem. For multi-stemmed trees of two to five stems and greater than five stems, the cumulative stem diameters to be multiplied by 12, are calculated as per the equations in Table 3.

Table 3: Equations for the calculation of the RPA of multi-stemmed trees

Number of stems	Equation
Two to five	$\sqrt{((\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2)}$
More than five	$\sqrt{(\text{mean stem diameter})^2} \times \text{number of stems}$

3.2.8 The RPA for each tree in the Tree Schedule has been calculated and, where relevant, has been adjusted to take into account site conditions. For example, when a tree is growing in a confined root space adjacent to an existing building or other solid structure that would restrict root growth in that direction, the RPA has been adjusted accordingly (see Figure 2).

3.2.9 The RPA for tree groups is calculated using the stem diameter of the largest tree within the group. The RPA radius is calculated as per Section 3.2.7 and then used to define the RPA by following the outline of the group's extent.

3.2.10 Where the calculated RPA exceeds 707m^2, it has been capped at this figure, as per BS5837:2012. This is equivalent to a circle with a radius of 15m or a square with approximately 26m sides.

Date of Survey

3.2.11 The site was visited and the survey undertaken on 2nd July 2020 by Martin Grew, lead Arboriculturist surveyor.

Weather Conditions

3.2.12 The weather conditions at the time of survey were cloudy and overcast. Deciduous trees were in full leaf.

4. Results

4.1 Desk Study

4.1.1 It was confirmed using the London Borough of Richmond Upon Thames online mapping, on 26th July 2021 the site is located within the Twickenham Riverside Conservation Area. Whether trees are covered by TPOs is yet to be confirmed.

4.1.2 Under the Town and Country Planning (Tree Preservation) (England) Regulations 2012 it is prohibited to cut down, top, lop, uproot, wilfully damage or wilfully destroy; or cause or permit the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of any tree, or group of trees, subject to a TPO or that is located within a Conservation Area except with the consent of the local authority.

4.2 Tree Survey

4.2.1 A total of 65 significant individual trees and four groups of trees located within or immediately adjacent to the site boundary were recorded during the survey. A breakdown of categories can be found in Table 4. The locations of all trees, RPAs, retention categories and reference numbers are shown on Figure 2. A detailed description of each tree is given in the Tree Schedule in Appendix 1.

Table 2: Number of significant trees allocated to each retention category.

Tree Category	Number of Trees	Tree Numbers	Number of Groups	Group numbers	Total
A	7	T36, T37, T40, T41, T45, T46, T66	-	-	**7**
B	27	T2, T23, T29, T30, T31, T32, T33, T34, T35, T38, T42, T43, T44, T47, T48, T49, T50, T51, T52, T58, T59, T60, T61, T62, T63, T64, T65,	3	G2, G3, G4	**30**
C	26	T1, T3, T5, T6, T7, T10, T12, T13, T14, T15, T16, T17, T19, T20, T22, T24, T25, T26, T27, T39, T53, T54, T56, T57, T67, T68	1	G1	**27**
U	8	T4, T8, T9, T11, T18, T21, T28, T55	-	-	**8**
Total	**68**		**4**		**72**

Root Protection Areas (RPAs)

4.2.2 The RPAs for the trees and groups surveyed can be seen in Figure 2. The actual RPAs, in m^2, for the individual trees surveyed are shown in Appendix 1.

5. Recommendations

5.1 General Tree Retention Guidance

5.1.1 All trees on site should be considered for retention where possible, with the greatest consideration given to Category A trees and then B trees where these specimens occur, and finally Category C trees. However, the retention of Category C trees should not be at the expense of an efficient design. Category U trees are recommended for removal for sound arboricultural reasons. Where trees of any category are on adjacent land, and removal is required for the development, permission must be sought from the landowner before any works can be undertaken.

5.2 Site Specific Guidance

5.2.1 Seven Category A trees were identified during the survey, of which two, T36 and T37, lie within the site boundary. These trees should be retained if possible and incorporated into any future landscaping scheme as they offer high amenity value in the local landscape. Four trees, T40, T41, T45 and T46 are located outside the eastern boundary of the site and should not be impacted by any future proposals. The final tree, T66, is located on the high street at the northern end of Water Lane.

5.2.2 Close to trees T36 and T37, are five Category B trees, T32, T33, T34, T35 and T38, which collectively form an imposing arboricultural feature at the top of the Gardens. Loss of these trees would affect the local landscape and they should be retained if possible. T34 was planted by HRH Princess Alexandra for the Queen's Diamond Jubilee and therefore has cultural value and effort should be made to specifically retain this tree, either in its current location, or in a more suitable one if development pressures requires it.

5.2.3 Trees T58, T59, T60, T61, T62, T63 and T64 are located adjacent to existing car parking and form an attractive linear feature along The Embankment. They should be retained where possible.

5.2.4 In the southern corner of the site are three Category B Himalayan birch trees, a species known and planted for its attractive silver, almost white, bark. Whilst loss of these trees would be regrettable, they could be considered of less importance in the landscape overall due to their smaller size.

5.2.5 Tree groups G2, G3 and G4 have been formally pruned as pleached/tabletop trees and are located within hard standing. They should be kept as part of future landscaping proposals if possible although they may impinge of future development space. They will require ongoing pruning *ad infinitum* if they are to be retained in their current form.

5.2.6 There are nine Category B trees, T42, T43, T44, T47, T48, T49, T50, T51, T52, located outside the site boundaries which are also in good condition and are positioned in locations where they offer good amenity value. Loss of these trees would also adversely affect the local landscape. The four Category C trees T53, T54, T56, T57 are also located outside the site boundaries and development proposals should not affect them.

5.2.7 The eight Category U trees T4, T8, T9, T11, T18, T21, T28, T55 are in such a condition that they should be removed as part of routine arboricultural management.

5.2.8 The Category B trees T2, T23, T65 and Category C trees T1, T3, T5, T6, T7, T10, T12, T13, T14, T15, T16, T17, T19, T20, T22, T24, T25, T26, T27 and T39 form a group of trees on the east of the gardens and largely consist of low quality trees that appear to be largely unmanaged. Loss of these trees would reduce the tree cover in the local area, but they do not offer significant amenity value and their losses could be offset through new, higher quality tree planting.

5.2.9 Where appropriate, preliminary management recommendations have been made for each tree surveyed and are detailed in the Tree Schedule in Appendix 1.

5.3 Tree Protection

5.3.1 For those trees selected to be retained as part of the redevelopment, it will be necessary to maintain Construction Exclusion Zones (CEZs) during the construction phase. The purpose of CEZs is to prevent damage to the tree roots from severance, compaction of the soil, or exclusion of air and water to the soil.

5.3.2 The CEZ should cover the area around the RPAs of all trees at the site that are not directly affected by the works. The CEZ should be maintained by suitable stout fencing (see Appendix 3) and identified by marking with suitable notices (see Appendix 4) or adequate ground protection suitable to withstand any likely loading. The fencing should be fit for the purpose of excluding construction activity and remain rigid and complete throughout the duration of the works. If the ground protection is intended for pedestrian movements, a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile may be acceptable; however if intended for wheeled or tracked construction traffic, the ground protection should be designed by an engineer.

5.3.3 Where CEZs overlap with existing areas of tarmac, restricted working may be allowed and may not require protection by fencing. Such areas should, however, be clearly identified as restricted working areas within the CEZ by markings on the ground and notices. Within restricted working areas in CEZs, construction activities should be limited to surfacing works only. Strictly no digging should be allowed within these areas, except in cases where root-sensitive excavation techniques have been recommended in an Arboricultural Method Statement.

5.3.4 An adequate water and air supply to roots should be provided for all trees both during and after construction. This should include preventing impermeable surfacing from being allowed to cover more than 20% of the RPA.

5.4 General Recommendations

5.4.1 The following points are made as general recommendations:

- Building lines should be kept outside the RPA where possible. Limited use may be made for parking, drives or hard surfaces within the RPA, subject to advice from a qualified arboriculturist;
- Wherever possible, service runs should be routed outside the RPAs. If this is not possible, they should be kept together and trenchless techniques should be used. At all

times where services pass within an RPA, detailed plans showing the proposed routing should be drawn up in conjunction with an arboriculturist;

- On residential developments consideration must be given to future tree growth and orientation (BS5837:2012), i.e. adverse shading and blocked views from windows, which may lead to pressure to fell or remove trees in the future. Wherever possible, the windows of primary rooms should be orientated to avoid any potential conflict with tree canopies;
- A full ecological survey should be undertaken in order to determine the presence of any protected species; and
- An Arboricultural Impact Assessment and Arboricultural Method Statement should be produced once detailed plans for the development are available.

6. Bibliography

6.1.1 British Standards Institution (2012) BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*. BSI, London.

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6.1.10 Patch, D. & Holding, B. (2007) Arboricultural Practice Note 12: *Through the Trees to Development.* London: AAIS.

6.1.11 Robertson, J, Jackson, N & Smith, M (2006) *Tree Roots in the Built Environment.* The Stationery Office, London.

Appendix 1 - Tree Schedule

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T1	**Sycamore**; *Acer pseudoplatanus*	10	240, 140, 90	2	5	5	3	2.5SW	3	Middle-aged	10+	Fair	Fair	Variegated variety. Multistemmed from base with included unions. Ivy to 2/3 height. One sided canopy due to competition. Has been raised before.	Remove ivy and reduce/ remove smaller stems.	C2	38.6	3.6
T2	**Sycamore**; *Acer pseudoplatanus*	10	250	5	2	4.5	3.5	2W	1.5	Middle-aged	20+	Good	Good	Uneven canopy due to competition, thin growth to the north. Has been raised before, leaving dead pegs. Deadwood in lower canopy. In close proximity to top of retaining wall.	Remove deadwood and pegs.	B2	28.3	3
T3	**Sycamore**; *Acer pseudoplatanus*	11	260	2.5	2.5	4	5	2.5W	3.5	Middle-aged	10+	Fair	Good	Uneven canopy due to competition. Deadwood in canopy. Ivy to 1/3 height. Close to concrete swimming pool edge.	Remove ivy and deadwood	C2	30.6	3.2
T4	**Sycamore**; *Acer pseudoplatanus*	7	80	0	0	0	0	-	0	Young	<10	Dead	Poor	Dead tree	Fell to ground level	U	-	-
T5	**Sycamore**; *Acer pseudoplatanus*	8	80	4	2	2	4	0.5W	1	Young	10+	Fair	Fair	Very poor form. Suppressed tree. Close to concrete pool at base. Sparse canopy.	-	C2	6.6	1.5

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T6	**Sycamore**; *Acer pseudoplatanus*	10	150, 200, 200	5	2	4	4.5	1S	1	Middle-aged	10+	Fair	Fair	Very poor form. Suppressed tree. Close to concrete pool at base. Sparse canopy. Ivy to 1/4 height.	Remove ivy	C2	46.4	3.9
T7	**Hornbeam**; *Carpinus betulus*	5	90	2	0	0	0	1E	1	Young	20+	Good	Fair	Suppressed tree. Close to concrete pool at base. Sparse canopy. Ivy to 1/2 height.	Remove ivy	C2	3.7	1.1
T8	**Goat willow**; *Salix caprea*	7	160	0	0	0	0	1W	1	Over-mature	<10	Poor	Hazardous	Nearly dead, collapsed coppice. Close to concrete pool at base. One stem is alive still.	Fell to ground level	U	-	-
T9	**Sycamore**; *Acer pseudoplatanus*	9	90	3.5	0	0	3	4S	3	Young	<10	Poor	Poor	Suppressed tree. Close to concrete pool at base. Sparse canopy. Damaged at 1m by scrap metal leaning on stem. Wilted foliage.	-	U	-	-
T10	**Sycamore**; *Acer pseudoplatanus*	15	300	3	2	4	4	5NW	6	Mature	20+	Good	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Ivy to 2/3 height.	Remove ivy.	C2	40.7	3.6
T11	**Goat willow**; *Salix caprea*	8.5	150	0	0	0	0	-	0	Middle-aged	<10	Dead	Hazardous	Held with ivy to live tree.	Fell to ground level	U	-	-
T12	**Sycamore**; *Acer pseudoplatanus*	14	268	0	6	3.5	0	2NW	4.5	Middle-aged	10+	Good	Fair	Canopy competition. Close to concrete pool at base.	-	C2	32.5	3.3
T13	**Goat willow**; *Salix caprea*	10	290	1	6	3	1	4SE	4.5	Mature	10+	Poor	Fair	Deadwood in canopy. Close to concrete pool at base. Sparse canopy. Swept leaning stem se from ground level.	Remove deadwood	C2	38.0	3.5

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T14	**Sycamore**; *Acer pseudoplatanus*	15	250	1	4	1	5	4NW	3.5	Middle-aged	10+	Fair	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Twin stem from 1.7m included union. Deadwood in canopy.	Remove deadwood.	C2	28.3	3
T15	**Sycamore**; *Acer pseudoplatanus*	12	180	3	6	0	0	3NE	2	Middle-aged	10+	Fair	Fair	No lower canopy. Close to concrete pool at base. Sparse canopy. Suppressed leaning tree.	-	C2	14.7	2.2
T16	**Sycamore**; *Acer pseudoplatanus*	14	220	3	5	2	4	5N	2	Middle-aged	10+	Good	Fair	Close to concrete pool at base. Sparse canopy. Canopy competition.	-	C2	21.9	2.7
T17	**Sycamore**; *Acer pseudoplatanus*	13	220, 130	3	5	3	1	4NE	2.5	Middle-aged	10+	Good	Fair	Close to concrete pool at base. Canopy competition. Smaller stem is growing through railings. Almost no foliage on it.	Remove smaller stem	C2	29.5	3.1
T18	**Silver birch**; *Betula pendula*	11	160	1	4.5	1	1	6E	6	Middle-aged	<10	Poor	Fair	Close to concrete pool at base. Canopy competition. Very low vigour. Many dead branches. Leaning suppressed tree.	Fell to ground level	U	-	-
T19	**Sycamore**; *Acer pseudoplatanus*	15	270	3.5	5	3	4.5	2.5E	3	Middle-aged	10+	Good	Fair	Grown through paving. Canopy competition. Ivy filled.	Remove ivy.	C2	33.0	3.3
T20	**Sycamore**; *Acer pseudoplatanus*	9	100	1	0	0	0	2.5E	2.5	Young	10	Good	Fair	No lower canopy. Suppressed tree.	-	C2	4.5	1.2
T21	**Goat willow**; *Salix caprea*	8	280	0	0	2	5	1.7NE	3.5	Mature	<10	Poor	Poor	Mainly dead 1.7m pollard. Ivy filled.	Fell to ground level	U	35.5	3.4
T22	**Sycamore**; *Acer pseudoplatanus*	14	260	4.5	5.5	4	1	2NE	2.5	Mature	20+	Good	Good	Root girdling. Ivy to 1/3 height. Suppressed one sided tree.	Remove ivy.	C2	30.6	3.2

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T23	**Sycamore**; *Acer pseudoplatanus*	15	360	5	5	5	5	3.5N	3	Mature	20+	Good	Good	Ivy to 1/3 height. Close proximity to retaining wall. Fence is fixed to stem.	Remove ivy. Repair fence and remove nails from tree.	B2	58.6	4.4
T24	**Sycamore**; *Acer pseudoplatanus*	10	140	2	1	1	2	3W	3	Young	10	Good	Fair	Suppressed tree	Fell to remove competition from b2 tree	C2	8.9	1.7
T25	**Sycamore**; *Acer pseudoplatanus*	12	220	0	3	3	3	3W	3	Middle-aged	10+	Good	Fair	Suppressed tree. Ivy filled	Remove ivy	C2	21.9	2.7
T26	**Sycamore**; *Acer pseudoplatanus*	9.5	150	0	0	2.5	4	6W	4	Young	10	Good	Fair	Suppressed tree. Leaning west. Minimal canopy.	-	C2	10.2	1.9
T27	**Sycamore**; *Acer pseudoplatanus*	16	250	5	4	2	5	5N	4	Mature	10+	Good	Fair	One sided canopy.	-	C2	28.3	3
T28	**Sycamore**; *Acer pseudoplatanus*	9	290	0	0	0	0	-	4	Mature	< 10	Poor	Hazardous	Has failed at base and fallen into other trees.	Remove tree	U	38.0	3.5
T29	**Himalayan birch**; *Betula utilis*	7	120	2.5	2.5	2.5	2.5	1.5N	1	Young	20+	Good	Good	-	-	B1 2	6.5	1.5
T30	**Himalayan birch**; *Betula utilis*	7	140	2.5	2.5	2.5	2.5	1.5SE	1	Young	20+	Good	Good	-	-	B1 2	8.9	1.7
T31	**Himalayan birch**; *Betula utilis*	7	120	2	2	2	2	2NW	1	Young	20+	Good	Good	-	-	B2	6.5	1.5
T32	**Indian bean tree**; *Catalpa bignoniodes*	9	290	5	5	5	5	2SE	1	Mature	20+	Good	Good	Scattered small deadwood. Has been reduced before.	-	B1 2	38.0	3.5
T33	**Indian bean tree**; *Catalpa bignoniodes*	9	350	5	5	5	5	1.5W	1	Mature	20+	Good	Good	Scattered small deadwood. Has been reduced before. Low limbs on west side have been broken.	Remove torn pegs of low limbs.	B1 2	55.4	4.3

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T34	**Black poplar**; *Populus nigra*	13	260	3	3	3	3	2.5SE	1.5	Young	10+	Fair	Fair	Evidence of wet-rot decay at old pruning wound. Exudate down stem. ***Planted by HRH Princess Alexandra for Diamond Jubilee.***	-	B1 2 3	30.6	3.2
T35	**Hornbeam**; *Carpinus betulus*	15	550	4.5	5.5	4.5	3.5	3.5SE	2.5	Mature	10+	Fair	Fair	Bark necrosis on main stem. Dead stubs from old pruning operations in canopy. Deadwood in canopy. Thin low vigour growth over road.	-	B2	136.8	6.7
T36	**Hornbeam**; *Carpinus betulus*	15	510	5	5	5	5	0S	0	Mature	40+	Good	Good	Bark necrosis on main stem. Dead has been raised before. Small deadwood in canopy. Basal growth	Remove basal growth.	A1 2	117.7	6.2
T37	**Hornbeam**; *Carpinus betulus*	15	650	5.5	5.5	5.5	5.5	2.5S	2	Mature	40+	Good	Good	Ivy covered stem. Scattered deadwood in canopy. Has been raised before. Roots restricted by retaining wall to the north. Some damage to surface roots.	Remove ivy. Mulch to protect roots.	A1 2	191.1	7.8
T38	**Hornbeam**; *Carpinus betulus*	15	570	4.5	4.5	4.5	4.5	2.5W	2	Mature	10+	Poor	Poor	Large area of bark necrosis ground to 2m up stem. Low vigour patchy canopy. Scattered patchy deadwood in canopy. Has been raised before. Minimal rooting area.	Remove deadwood. Mulch.	B2	147.0	6.9
T39	**Sycamore**; *Acer pseudoplatanus*	11	280	3.5	3.5	3.5	3.5	-	4	Middle-aged	10+	Fair	Fair	No access measurements are estimated. Growing between gap in brick structures. Stem not visible below 4.5m.	-	C2	35.5	3.4
T40	**Italian alder**; *Alnus cordata*	16	530	4.5	4.5	4.5	4.5	3S	1.5	Mature	20+	Good	Good	-	-	A2	127.1	6.4

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T41	**Italian alder**; *Alnus cordata*	165	460	5	5	5	5	3.5S	1.5	Mature	40+	Good	Good	-	-	A1 2	95.7	5.6
T42	**Whitebeam**; *Sorbus aria*	9	280	3.5	4	2	0	2.5NE	1.5	Mature	10+	Fair	Good	Suppressed one side tree. Deadwood.	Remove deadwood.	B2	35.5	3.4
T43	**Sycamore**; *Acer pseudoplatanus*	9.5	300	3.5	3.5	3.5	3.5	-	1.5	Mature	10+	Fair	Fair	No access estimated measurements. Managed pollard.	-	B2	40.7	3.6
T44	**False acacia**; *Robinia pseudoacacia*	16	610	6	6	6	6	2SW	1.5	Mature	20+	Fair	Fair	Historical large tear out wound from 2m to ground. Scattered deadwood. Has been reduced before.	Raise over footpath. Remove deadwood.	B2	168.3	7.4
T45	**Weeping willow**; *Salix x sepulcralis 'Chrysocoma'*	15	700	7	5	2	6	5E	2	Mature	20+	Good	Fair	History of large snap outs. Has been heavily reduced.	-	A2	221.7	8.4
T46	**Weeping willow**; *Salix x sepulcralis 'Chrysocoma'*	15	790	4.5	6	6	6.5	2.5E	2.5	Mature	20+	Good	Fair	History of large snap outs. Has been heavily reduced.	Raise over road.	A2	282.3	9.5
T47	**Pin oak**; *Quercus palustris*	10	250	3.5	3.5	3.5	3.5	2.5E	1.5	Middle-aged	20+	Fair	Fair	Strong excurrent shape. Low vigour.	Raise over road and footpath	B1 2	28.3	3
T48	**Pin oak**; *Quercus palustris*	8.5	200	3.5	3.5	3.5	3.5	2.52	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Die back at top.	Raise over road and footpath. Remove deadwood.	B1 2	18.1	2.4
T49	**Sycamore**; *Acer pseudoplatanus*	14	400	5	5	5	5	-	1.5	Mature	10+	Good	Fair	No access estimated measurements. Pollard form	-	B2	72.4	4.9
T50	**Sycamore**; *Acer pseudoplatanus*	10	280	4	4	4	4	-	2	Middle-aged	10+	Good	Fair	No access estimated measurements.	-	B2	35.5	3.4
T51	**Sycamore**; *Acer pseudoplatanus*	15	350	3	3	7	4.5	-	0	Mature	20+	Fair	Fair	No access estimated measurements. One side canopy. Has been reduced before. Sparse canopy.	-	B2	55.4	4.3

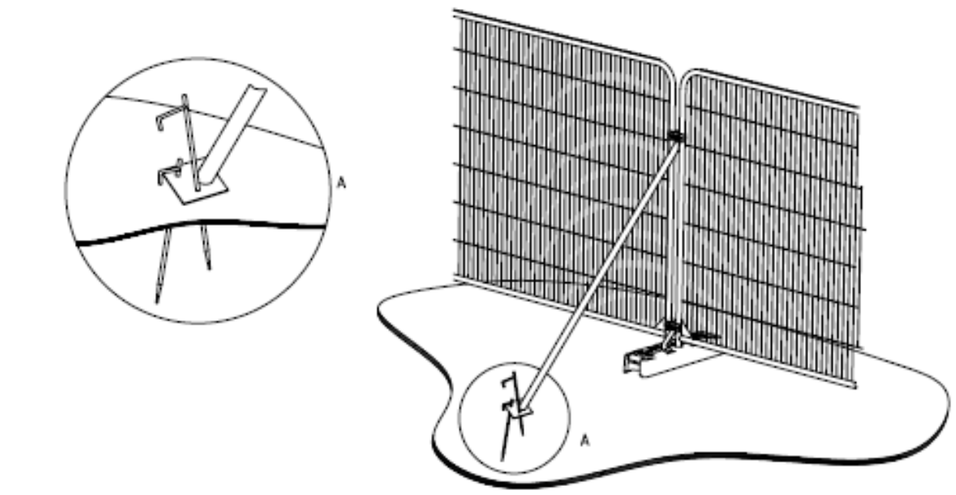
Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T52	**Ash**; *Fraxinus excelsior*	15.5	400	6	4.5	6	5	-	1.5	Mature	20+	Fair	Fair	No access estimated measurements.	Raise over footpath.	B2	72.4	4.9
T53	**Sycamore**; *Acer pseudoplatanus*	6.5	140	2.5	2.5	2.5	2.5	2.5SW	1.5	Young	10+	Good	Good	No access estimated measurements.	Raise over carpark	C2	8.9	1.7
T54	**False cypress species**; *Chamaecyparis sp.*	11	200	2	2	2	2	-	0	Middle-aged	10+	Poor	Fair	No access estimated measurements. Very sparse foliage. Very low vigour.	-	C2	18.1	2.4
T55	**Domestic apple**; *Malus domestica*	4	280	0	0	0	0	-	0	Mature	<10	Dead	Poor	No access estimated measurements.	Fell	U	35.5	3.4
T56	**Domestic apple**; *Malus domestica*	6.5	280	2	2	2	2	-	0	Mature	10+	Good	Fair	No access estimated measurements.	-	C2	35.5	3.4
T57	**Elder**; *Sambucus nigra*	6.5	200	2.5	2.5	2.5	2.5	-	0	Mature	10+	Fair	Fair	No access estimated measurements.	-	C2	18.1	2.4
T58	**Pin oak**; *Quercus palustris*	9	200	3.5	3.5	3.5	3.5	2SW	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour.	Raise over road and footpath.	B1 2	18.1	2.4
T59	**Pin oak**; *Quercus palustris*	9	210	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Dieback at top. Root girded.	Clear stem of regrowth.	B1 2	20.0	2.6
T60	**Pin oak**; *Quercus palustris*	8.5	220	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Strong excurrent shape. Low vigour. Dieback at top.	Clear stem of regrowth.	B1 2	21.9	2.7
T61	**Pin oak**; *Quercus palustris*	8	200	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Low vigour. Dieback at top.	-	B1 2	18.1	2.4
T62	**Pin oak**; *Quercus palustris*	9	200	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Low vigour dieback at top.	-	B1 2	18.1	2.4
T63	**Pin oak**; *Quercus palustris*	8	220	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Dieback at top.	-	B1 2	21.9	2.7
T64	**Pin oak**; *Quercus palustris*	8	240	3.5	3.5	3.5	3.5	2.5S	1.5	Middle-aged	10+	Fair	Fair	Excurrent shape. Dieback at top.	Remove deadwood	B1 2	26.1	2.9
T65	**Hornbeam**; *Carpinus betulus*	7	140	2	2	2	2	1.5S	1.5	Middle-aged	20+	Good	Good	-	-	B2	8.9	1.7

Tree/ Group No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m) N	E	S	W	Height of Lowest Limb and Direction (m)	Crown Clearance (m)	Age Class	Estimated Remaining Contribution (years)	Condition Physiology	Structure	Comments	Preliminary Management Recommendations	BS Category	RPA (m^2)	RPA Radius (m)
T66	**Pedunculate Oak**; *Quercus robur*	11	460	5	7	6	6	2NW	1.5	Middle-aged	40+	Good	Good	Locally prominent tree on high street.	-	A1	95.7	5.6
T67	**Callery pear**; *Pyrus calleryana*	5	110	1	1	1	1	1.5W	1.5	Young	10+	Fair	Fair	Established tree although sparse crown compared to adjacent tree.	-	C1	5.5	1.32
T68	**Callery pear**; *Pyrus calleryana*	5	90	1	1	1	1	1.5N	1.5	Young	10+	Good	Fair	Satisfactory condition	-	C1	3.7	1.1
G1	**Sycamore**; *Acer pseudoplatanus*	11	150	3	3	3	3	3	-	Middle-aged	10+	Fair	Fair	Group of low value ivy filled sycamore. Suppressed poor formed trees.	-	C2	-	-
G2	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	-	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-
G3	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	-	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-
G4	London plane; Platanus x hispanica	5.5	160	2	2	2	2	2	1.5	Middle-aged	20+	Good	Good	Group of pleached plane trees	Continue formal pruning programme. Remove basal growth.	B2	-	-

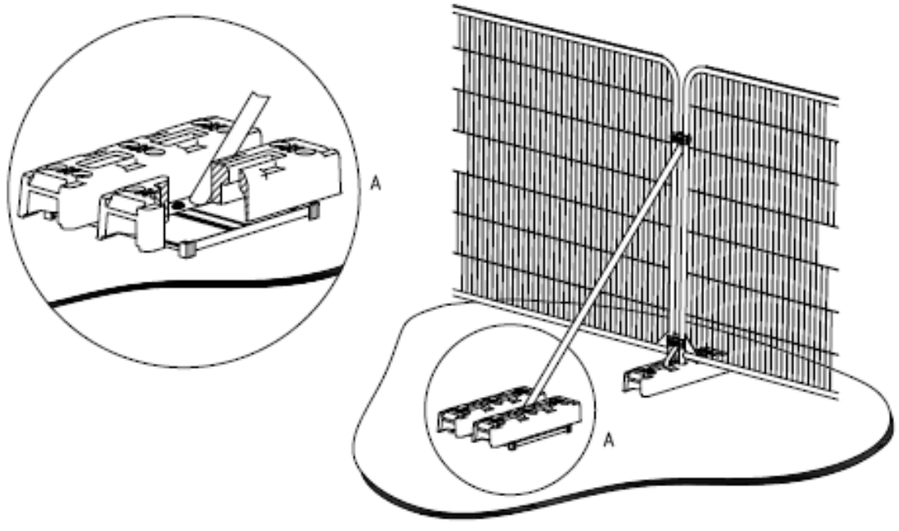
Appendix 2 – Table of Quality Assessment

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 be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have serious, irremediable, structural defects, 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 NOTE Category U trees can have existing or potential conservation value which might be desirable to preserve			DARK RED
	1 Mainly arboricultural values	**2 Mainly landscape values**	**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 of formal or semi-formal arboricultural features (e.g. the dominant and/or principle 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)	LIGHT GREEN
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	MID BLUE
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 150mm	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 landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

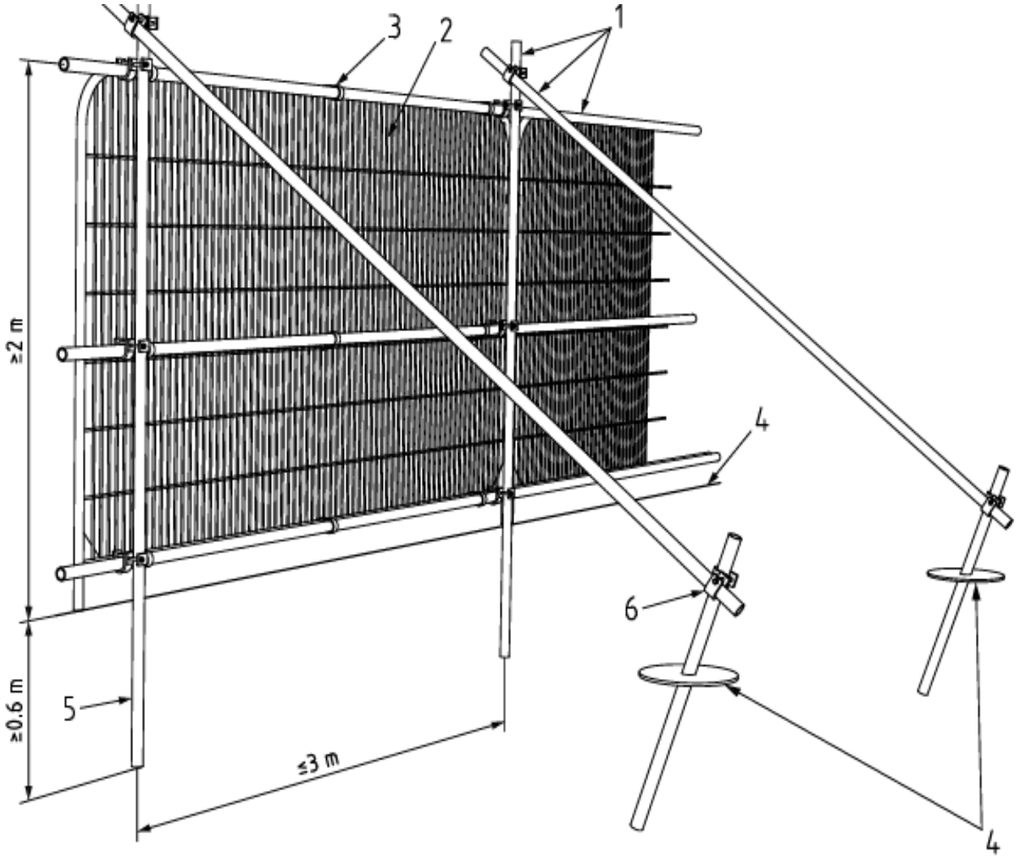
Appendix 3 - Example of Protective Fencing



a) Stabilizer strut with base plate secured with ground pins



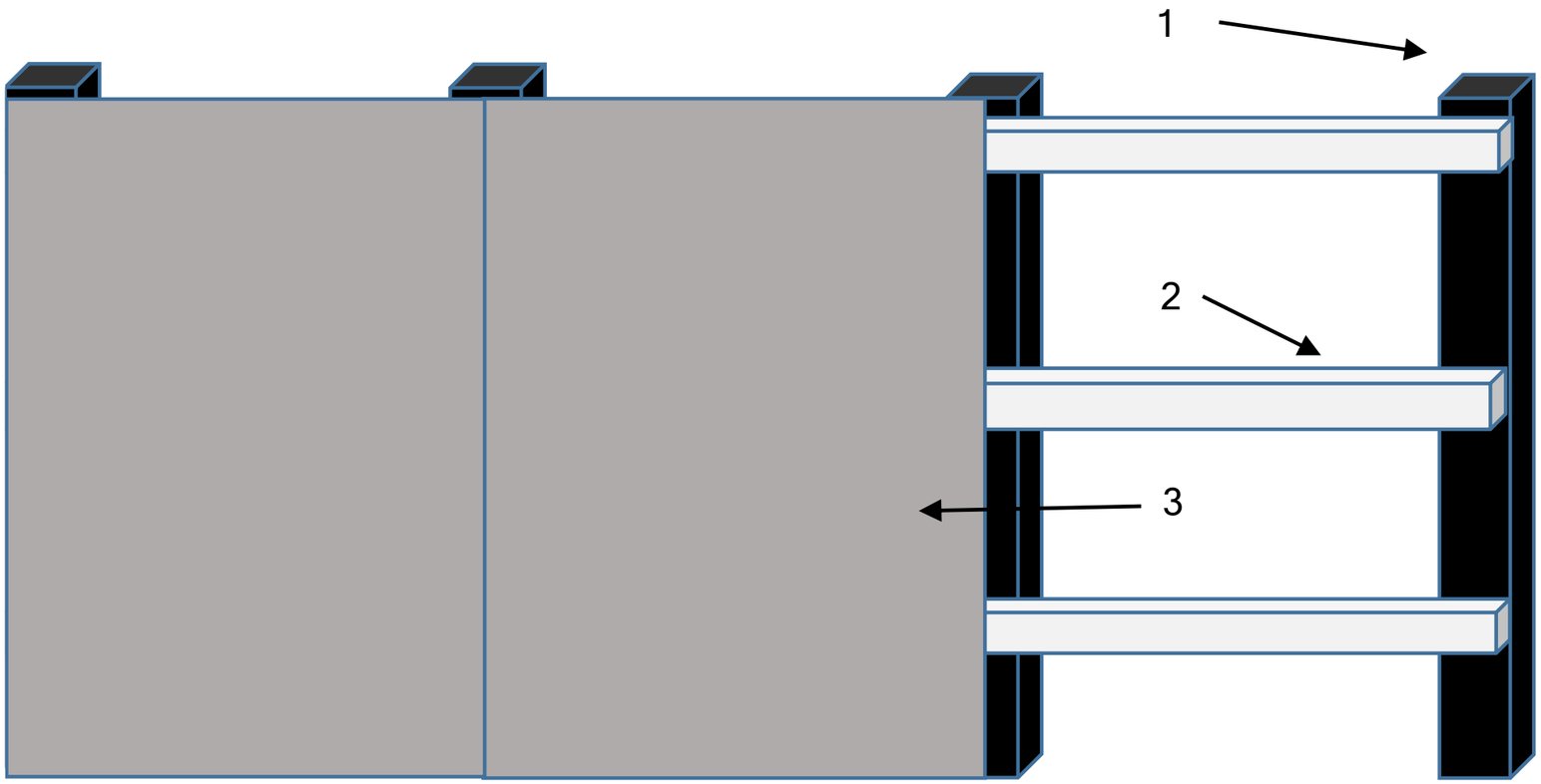
b) Stabilizer strut mounted on block tray



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

Appendix 4 - Example of Protective Fencing



1. 100mm x 100mm timber posts at 1.2m centres

2. Three 100mm x 50mm timber rails

3. 12mm WBP Virola hardwood through plywood framed panels

Appendix 5 - Tree Protection Fencing Notice