

Arboricultural Impact Assessment

St Pancras Gardens Ramp, Camley Street, London

Report Reference Number: 181031-1.0-StPG-AIA-MW

On behalf of

London Borough of Camden

31 October 2018

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Report Title: Arboricultural Impact Assessment

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Executive Summary

- This report provides an assessment of the impact upon trees and a proposal to install an access ramp off Camley Street to the East of the park. The report makes recommendations for mitigating any negative impacts. It is suitable for submission in support of a planning application.
- The design has been developed with careful consideration to minimise the impact on the most important trees across the site.
- 116 trees and 7 tree groups were surveyed to inform this report. The data for each is presented within the Tree Schedule at Appendix A.
- 2 of the trees (T99 & T100) and part of 1 group (G98) will need to be removed to facilitate the works. T101 is likely to need minor pruning works on the East aspect of the crown by 0.5m to facilitate the works.
- Sufficient space and adequate protection measures will be set out to ensure that the remaining retained trees are not damaged during the pre-construction and construction phase and to enable their successful development post-construction. Tree protection measures are discussed throughout this report and on the Tree Protection Plan at Appendix B.
- T96 will be subject to construction within the Root Protection Area (RPA), which will include surfaces and foundations. An Arboricultural Method Statement is recommended to ensure that this tree is not damaged, with supervision where appropriate.
- Camden London Borough Council has confirmed that none of the trees are covered by a TPO; however, they are considered to be of sufficient value. The site is within King's Cross St Pancras Conservation Area which affords the same protection.

1 Introduction

1.1 Brief and Context

- 1.1.1 Treework Environmental Practice was instructed by Graeme Shimmin of London Borough of Camden on 24 October 2018 to provide an Arboricultural Impact Assessment, in accordance with British Standard BS5837: 2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*, of the effect of the proposals on trees at the College Gardens site.
- 1.1.2 Trees are a material consideration for a Local Planning Authority when determining planning applications, whether or not they are afforded the statutory protection of a Tree Preservation Order or Conservation Area. British Standard BS 5837:2012 *Trees in Relation to Design, Demolition and Construction* sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and new developments. The Standard recommends a sequence of activities that starts in the initial feasibility and design phase (RIBA Stage 2 'Concept Design') with a survey to qualify and quantify the trees on site and establish the arboricultural constraints to development (above- and below-ground) to inform the design in an iterative process, and continues with an assessment of the arboricultural impacts of the final design and measures to mitigate such impacts should they be negative. Detailed technical specifications for mitigation and protection measures are devised in the design phase that follows (RIBA Stage 3-4 'Developed and Technical design'), and the sequence ends with the Implementation and Aftercare phase (RIBA Stages 5-7) with the implementation of those measures once planning permission is granted, guided by Arboricultural Method Statements (RIBA Stage 4-5, 'Technical Design and Construction) and professional guidance where appropriate.
- 1.1.3 This Arboricultural Impact Assessment (AIA) reports on the direct and indirect impacts of the proposed development on trees in terms of both the buildability of the proposals and the long-term impact of the finished scheme, and where necessary presents mitigation for these impacts.

1.2 Purpose of this Report

- 1.2.1 This AIA, and accompanying Tree Schedule and Tree Protection Plan, is provided to support a planning application for the proposed development. It sets out the arboricultural impacts of the proposals using the following considerations as a framework:
- Trees to be removed and trees to be retained.
 - Remedial tree work to retained trees to allow development and ensure retained trees will form a harmoniously integrated component of the proposed development.

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- Suitable measures to protect retained trees.
- Special construction or engineering measures required to enable trees to be harmoniously integrated into the proposed development.

1.3 The Development

- 1.3.1 The proposed development is to install an access ramp, and associated fixtures and fittings to the East of the park, off Camley Street.
- 1.3.2 The following documents have reviewed by Treework Environmental Practice to inform this report:

Document Title	Document/Drawing number	Originator
Topographical Survey	St Pancras Gardens	St Pancras Gardens
Ramp Plan V7.	SBB/ST PANCRAS GARDEN RAMP/101	Camden Engineering Service (Camden Council)
Tree Constraints Plan	181026-1.0-CGL-TCP-MM	Treework Environmental Practice

2 Existing Tree Population and Constraints

- 2.1.1 A survey covering trees on site and trees on adjacent land close enough to be affected by the development was undertaken on 26 and 29 of October 2018. The full survey results are presented in the Tree Schedule at Appendix A.
- 2.1.2 The survey was undertaken based on trees plotted using an outline base map as reference in Treework Environmental Practice's specialist tree management software – MyTrees. The basemap contained a topographical survey of the trees. Trees and hedges were plotted on the basemap using the topographical survey as reference.
- 2.1.3 The surveyed area within the red line boundary currently houses two dominant species, which are; 46 *Tilia sp.* and 35 *Platanus sp.* along with a mix of several other broad leaved species and a small proportion of evergreen species including *Laurocerasus sp.* groups. See Appendix A for full details.
- 2.1.4 BS 5837:2012 recommends classifying trees into four quality and value categories to determine their relative retentive worth. A summary of the relative retentive worth of the trees on site as recorded during the tree survey and expressed by their categories is given in Table 1. Appendix A explains the BS 5837:2012 tree categorisation process.

Table 1: Trees/Groups in each Retention Category

BS Category	No. of Trees (T)
A	34
B	49
C	33 trees/7 groups
U	None
Total	123

- 2.1.5 Trees present constraints to development both above and below ground. The above ground constraints comprise the physical extent of tree crowns. The below ground constraints comprise the roots, and are expressed in terms of the root protection area (RPA), which is the minimum rooting area that a tree needs to sustain itself in reasonable health. These constraints, as established by the tree-survey, inform this assessment of the impact of the development proposals.
- 2.1.6 The full results of the tree survey on which this report is based are given in the Tree Schedule at Appendix A, and the above- and below-ground constraints are illustrated on the Tree Protection Plan at Appendix B. Each tree (T) and Group (G) has been allocated an individual number to which it is referred in this report and all associated documents. The survey method and limitations are set out in Appendix E.
- 2.1.7 Nick Bell, Tree and Landscape Officer at London Borough of Camden has confirmed that no Tree Preservation Orders apply to the trees on site; however the site is within King's Cross St Pancras Conservation Area and are therefore all trees with a stem diameter of over 75mm measured at 1.5m above ground level are protected in the same way.

3 Arboricultural Impact of the Proposals

3.1 Proposed Tree Works

- 3.1.1 T99 and T100 will need to be removed to facilitate the ramp construction. G98, a group of 4 *Prunus avium* will need partial removal. This is either 2 or 3 trees from the group. T101 is likely to require facilitation pruning of up to 1.5m lateral reduction to the East aspect from 2-4m in height. No other pruning works are anticipated.

3.2 Tree Protection

3.2.1 *Root Protection Areas and Construction Exclusion Zones*

Retained trees will be protected during development by establishing a Construction Exclusion Zone (CEZ) around their Root Protection Areas (RPAs). RPAs are a layout design tool, indicating the minimum area around a tree deemed to contain sufficient roots and soil to maintain the tree's viability. RPAs should be treated as a precautionary area within which activities such as ground compaction, excavation, the storing of materials, ground level changes and other construction activity, likely to cause damage to trees should therefore be excluded or guided by an Arboricultural Method Statement and supervision where appropriate. A CEZ can be managed by the erection of barriers, which are shown on the Tree Protection Plan at Appendix B. Tree protection barriers must be installed before any enabling works or construction starts and, unless approved by the Local Planning Authority or by an arboriculturist approved by them, should remain in place until all construction activity has been completed.

3.2.2 This site is not considered suitable for barriers to be installed around the RPAs of all trees in the locality. Therefore tree protection methods are recommended to comprise of a detailed Arboricultural Method Statement with supervision where considered necessary and pre-commencement tool box talk, along with the tree protection illustrated on the Tree Protection Plan. Monitoring Forms should be completed, filed and supplied to Camden Council Tree Officer's following each visit.

3.2.3 The type of barriers should match the level of activity around the retained trees. Where a high level of construction activity is expected, fencing must be braced to be robust to vehicular impact and to prevent it from being easily repositioned; a specification similar to drawing 3 in BS 5837:2012 will be suitable (reproduced at Appendix D). In areas away from the main construction activity and vehicle movement, it may be appropriate to install a lower specification fencing, examples of which are given at Appendix D.

3.2.4 All protection fencing should carry identifying signs that state its purpose and proscribe its removal until all demolition and construction work is complete. An example sign is given at Appendix D.

3.3 Arboricultural Method Statement and Special Technical Measures

- 3.4.1 Conflicts between retained trees and aspects of the proposed development can be mitigated by the use of special technical measures. These are measures to minimise the impact on trees whilst working within the RPA. It is recommended that a detailed Arboricultural Method Statement is produced once full construction details are available before construction starts to guide sensitive works within the RPA of T96. The AMS should provide specific details on special technical measures required for the proposed works at this site along with sequencing of activities, ensuring any potential damage to trees above or below ground is minimised.

3.4 Additional Precautions

3.4.1 *Utilities and Services*

Information on the location of any associated service runs was not available at time of writing. In principle, traditional trench-installed utilities should be routed outside of the RPAs of retained trees to avoid root damage. Where routing utility runs within RPAs is unavoidable, all work should comply with The National Joint Utilities Volume 4 and advice should be sought from a professional Arboricultural Consultant.

3.4.2 *Soft Landscaping*

The Arboricultural Consultant should review any landscape operations that involve any work within the RPAs of retained trees and input additional site specific methodology where necessary. This work can be incorporated into the AMS.

Appendix A

Tree Schedule

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Tree Survey BS5837-2012



Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T1	1	Laurocerasus sp. Laurel	7.0	2	16	N 2.0	E 2.0	S 2.0	W 2.0	2.0	3.0	Semi Mature	Fair	Not on topographical survey.	13.0	2.0	10-20	C	2
T2	1	Laurocerasus sp. Laurel	2.0	1	25	N 2.0	E 2.0	S 2.0	W 2.0	2.0	3.0	Semi Mature	Fair	Not on topographical survey.	28.3	3.0	10-20	C	2
G3	12 2	Laurocerasus sp. Laurel Sambucus nigra Elder	8.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Semi Mature	Fair	Not on topographical survey.	4.5	1.2	10-20	C	2
T4	1	Alnus cordata Italian Alder	7.0	1	9	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Young	Fair	Not on topographical survey.	3.7	1.1	10-20	C	2
G5	4	Laurocerasus sp. Laurel	6.0	1	8	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Semi Mature	Fair	Not on topographical survey.	2.9	1.0	10-20	C	2
T6	1	Cerasus avium Wild Cherry	8.0	1	26	N 3.0	E 3.0	S 3.0	W 5.0	3.0	2.0	Early Mature	Good		30.6	3.1	20-40	C	2
T7	1	Chamaecyparis lawsoniana Lawson Cypress	20.0	1	46	N 3.0	E 4.0	S 3.0	W 3.0	3.0	2.0	Mature	Good		95.7	5.5	20-40	C	2
T8	1	Cordyline sp.	7.0	1	14	N 1.0	E 1.0	S 1.0	W 1.0	6.0		Early Mature	Fair	Not on topo. Not on topographical survey.	8.9	1.7	10-20	C	2
T9	1	Acer pseudoplatanus Sycamore	8.0	2	14	N 2.0	E 2.0	S 2.0	W 2.0	2.0	1.0	Semi Mature	Good	Not on topographical survey.	9.1	1.7	10-20	C	2
T10	1	Cordyline sp.	4.0	1	11	N 1.0	E 1.0	S 1.0	W 1.0	3.0		Early Mature	Fair	Not on topographical survey.	5.5	1.3	10-20	C	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T11	1	Cordyline sp.	4.0	1	10	N 1.0	E 1.0	S 1.0	W 1.0	3.0		Early Mature	Fair	Not on topographical survey.	4.5	1.2	10-20	C	2
T12	1	Cordyline sp.	6.0	1	22	N 1.0	E 1.0	S 1.0	W 1.0	4.0		Early Mature	Fair	Not on topographical survey.	21.9	2.6	10-20	C	2
G13	4	Laurocerasus sp. Laurel	5.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	4.5	1.2	10-20	C	2
T14	1	Laurocerasus sp. Laurel	7.0	5	37	N 4.0	E 3.0	S 4.0	W 4.0	2.0	1.0	Mature	Good	Not on topographical survey.	63.0	4.5	10-20	C	2
G15	3	Laurocerasus sp. Laurel	6.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	4.5	1.2	10-20	C	2
G16	4	Laurocerasus sp. Laurel	7.0	1	14	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	8.9	1.7	10-20	C	2
T17	1	Cordyline sp.	7.0	4	25	N 1.0	E 1.0	S 1.0	W 1.0	5.0		Early Mature	Fair	Not on topographical survey.	28.5	3.0	10-20	C	2
T18	1	Sambucus nigra Elder	5.0	3	17	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	13.7	2.1	10-20	C	2
T19	1	Cordyline sp.	8.0	2	27	N 1.0	E 1.0	S 1.0	W 1.0	5.0		Early Mature	Fair	Not on topographical survey.	33.5	3.3	10-20	C	2
T20	1	Sambucus nigra Elder	5.0	3	22	N 3.0	E 3.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	23.2	2.7	10-20	C	2
G21	9	Laurocerasus sp. Laurel	7.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair	Not on topographical survey.	4.5	1.2	10-20	C	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T22	1	Betula sp. Birch	6.0	1	15	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Semi Mature	Good		10.2	1.8	20-40	C	2
T23	1	Sorbus aucuparia Rowan/Mountain Ash	5.0	1	8	N 1.0	E 1.0	S 1.0	W 1.0	3.0		Semi Mature	Fair		2.9	1.0	10-20	C	2
T24	1	Cerasus avium Wild Cherry	15.0	1	47	N 4.0	E 5.0	S 3.0	W 3.0	6.0	7.0	Mature	Good	Decay / structural defect - Principal stems. Reaction wood / Adaptive growth - Stem / stems.	99.9	5.6	20-40	B	2
T25	1	Populus nigra 'Italica' Lomardy Poplar	27.0	1	106	N 5.0	E 5.0	S 2.0	W 2.0	5.0	7.0	Mature	Good		508.3	12.7	20-40	B	2
T26	1	Platanus x hispanica London Plane	27.0	1	136	N 10.0	E 9.0	S 7.0	W 11.0	6.0	6.0	Mature	Good	Decay / structural defect - Open cavity / cavities. Reaction wood / Adaptive growth - Stem / stems. Stems - Co-dominant.	706.9	15.0	40+	A	2
T27	1	Populus nigra 'Italica' Lomardy Poplar	25.0	1	89	N 4.0	E 6.0	S 2.0	W 2.0	5.0	5.0	Mature	Good	Leaning trunk - Minor.	358.3	10.7	20-40	B	2
T28	1	Tilia platyphyllos Large Leaved Lime	6.0	1	15	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Semi Mature	Good	Not on topographical survey.	10.2	1.8	20-40	C	2
T29	1	Tilia x vulgaris Common Lime	27.0	1	87	N 6.0	E 7.0	S 5.0	W 4.0	12.0	9.0	Mature	Good		342.4	10.4	40+	A	2
T30	1	Cerasus avium Wild Cherry	8.0	1	25	N 5.0	E 5.0	S 3.0	W 5.0	2.0	4.0	Early Mature	Good	Commemorative tree.	28.3	3.0	20-40	B	2
T31	1	Platanus x hispanica London Plane	30.0	1	79	N 7.0	E 3.0	S 7.0	W 10.0	6.0	8.0	Mature	Good		282.3	9.5	40+	A	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T32	1	Platanus x hispanica London Plane	30.0	1	104	N 11.0	E 6.0	S 6.0	W 12.0	6.0	7.0	Mature	Good		489.3	12.5	40+	A	2
T33	1	Platanus x hispanica London Plane	30.0	1	140	N 12.0	E 13.0	S 12.0	W 12.0	5.0	4.0	Mature	Good		706.9	15.0	40+	A	2
T34	1	Populus nigra 'Italica' Lomardy Poplar	4.0	1	5	N 1.0	E 1.0	S 1.0	W 1.0	1.0		Young	Fair	Not on topographical survey.	1.1	0.6	10-20	C	2
T35	1	Populus nigra 'Italica' Lomardy Poplar	29.0	1	93	N 4.0	E 5.0	S 2.0	W 2.0	5.0	7.0	Mature	Good	Leaning trunk - Minor.	391.3	11.2	20-40	B	2
T36	1	Acer pseudoplatanus Sycamore	25.0	1	58	N 4.0	E 7.0	S 7.0	W 4.0	5.0	8.0	Mature	Good	Stems - Co-dominant.	152.2	7.0	20-40	B	2
T37	1	Platanus x hispanica London Plane	30.0	1	93	N 12.0	E 15.0	S 7.0	W 4.0	8.0	6.0	Mature	Good		391.3	11.2	40+	A	2
T38	1	Platanus x hispanica London Plane	30.0	1	109	N 10.0	E 15.0	S 9.0	W 12.0	6.0	6.0	Mature	Good		537.5	13.1	40+	A	2
T39	1	Platanus x hispanica London Plane	27.0	1	109	N 5.0	E 3.0	S 7.0	W 9.0	6.0	11.0	Mature	Good		537.5	13.1	40+	B	2
T40	1	Platanus x hispanica London Plane	14.0	1	82	N 2.0	E 3.0	S 6.0	W 7.0	6.0	9.0	Mature	Good	Decay / structural defect - Localised.	304.2	9.8	40+	B	2
T41	1	Platanus x hispanica London Plane	30.0	1	83	N 5.0	E 5.0	S 7.0	W 9.0	14.0	13.0	Mature	Good	Stems - Co-dominant.	311.7	10.0	40+	A	2
T42	1	Platanus x hispanica London Plane	30.0	1	84	N 4.0	E 3.0	S 7.0	W 9.0	9.0	11.0	Mature	Good	Stems - Co-dominant.	319.2	10.1	40+	A	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T43	1	Crataegus monogyna Common Hawthorn/Quick/May	8.0	1	21	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Fair		20.0	2.5	10-20	C	2
T44	1	Cerasus avium Wild Cherry	4.0	1	12	N 2.0	E 1.0	S 4.0	W 4.0	1.0		Semi Mature	Fair	Leaning trunk - Major.	6.5	1.4	10-20	C	2
T45	1	Platanus x hispanica London Plane	30.0	1	92	N 3.0	E 7.0	S 8.0	W 7.0	15.0	9.0	Mature	Good		382.9	11.0	40+	A	2
T46	1	Platanus x hispanica London Plane	30.0	1	85	N 9.0	E 7.0	S 4.0	W 14.0	15.0	11.0	Mature	Good		326.9	10.2	40+	A	2
T47	1	Platanus x hispanica London Plane	27.0	1	63	N 3.0	E 4.0	S 5.0	W 3.0	15.0	12.0	Mature	Good		179.6	7.6	40+	B	2
T48	1	Platanus x hispanica London Plane	30.0	1	98	N 7.0	E 8.0	S 10.0	W 10.0	9.0	11.0	Mature	Good	Stems - Co-dominant.	434.5	11.8	40+	A	2
T49	1	Platanus x hispanica London Plane	30.0	1	122	N 12.0	E 11.0	S 10.0	W 5.0	5.0	11.0	Mature	Good	Stems - Co-dominant.	673.3	14.6	40+	A	2
T50	1	Platanus x hispanica London Plane	30.0	1	103	N 14.0	E 15.0	S 6.0	W 6.0	10.0	10.0	Mature	Good	Stems - Co-dominant.	479.9	12.4	40+	A	2
T51	1	Platanus x hispanica London Plane	32.0	1	84	N 10.0	E 7.0	S 10.0	W 7.0	17.0	14.0	Mature	Good	Not on topographical survey.	319.2	10.1	40+	A	2
T52	1	Platanus x hispanica London Plane	32.0	1	106	N 12.0	E 7.0	S 12.0	W 7.0	7.0	8.0	Mature	Good		508.3	12.7	40+	A	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T53	1	Platanus x hispanica London Plane	32.0	1	99	N 14.0	E 7.0	S 12.0	W 7.0	8.0	5.0	Mature	Good		443.4	11.9	40+	A	2
T54	1	Platanus x hispanica London Plane	32.0	1	99	N 13.0	E 7.0	S 11.0	W 7.0	10.0	5.0	Mature	Good		443.4	11.9	40+	A	2
T55	1	Platanus x hispanica London Plane	32.0	1	124	N 13.0	E 11.0	S 12.0	W 7.0	6.0	6.0	Mature	Good		695.6	14.9	40+	A	2
T56	1	Tilia x vulgaris Common Lime	21.0	1	49	N 4.0	E 4.0	S 4.0	W 4.0	5.0	5.0	Mature	Good		108.6	5.9	20-40	B	2
T57	1	Tilia x vulgaris Common Lime	21.0	1	48	N 4.0	E 4.0	S 4.0	W 5.0	5.0	6.0	Mature	Good		104.2	5.8	20-40	B	2
T58	1	Tilia x vulgaris Common Lime	22.0	1	38	N 3.0	E 4.0	S 3.0	W 4.0	5.0	6.0	Mature	Good	Not on topographical survey.	65.3	4.6	20-40	B	2
T59	1	Tilia x vulgaris Common Lime	22.0	1	43	N 3.0	E 4.0	S 3.0	W 5.0	5.0	6.0	Mature	Good		83.6	5.2	20-40	B	2
T60	1	Tilia x vulgaris Common Lime	22.0	1	47	N 3.0	E 4.0	S 3.0	W 4.0	5.0	6.0	Mature	Good		99.9	5.6	20-40	B	2
T61	1	Tilia x vulgaris Common Lime	22.0	1	47	N 4.0	E 3.0	S 4.0	W 4.0	5.0	5.0	Mature	Good		99.9	5.6	20-40	B	2
T62	1	Tilia x vulgaris Common Lime	22.0	1	47	N 4.0	E 2.0	S 5.0	W 2.0	5.0	4.0	Mature	Good		99.9	5.6	20-40	B	2
T63	1	Tilia x vulgaris Common Lime	22.0	1	45	N 4.0	E 2.0	S 3.0	W 4.0	6.0	7.0	Mature	Good		91.6	5.4	20-40	B	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T64	1	Tilia x vulgaris Common Lime	22.0	1	45	N 4.0	E 3.0	S 3.0	W 3.0	6.0	5.0	Mature	Good		91.6	5.4	20-40	B	2
T65	1	Tilia x vulgaris Common Lime	22.0	1	48	N 3.0	E 3.0	S 3.0	W 3.0	6.0	5.0	Mature	Good		104.2	5.8	20-40	B	2
T66	1	Tilia x vulgaris Common Lime	22.0	1	53	N 3.0	E 3.0	S 4.0	W 3.0	6.0	5.0	Mature	Good		127.1	6.4	20-40	B	2
T67	1	Tilia x vulgaris Common Lime	22.0	1	40	N 2.0	E 2.0	S 2.0	W 3.0	6.0	5.0	Mature	Good		72.4	4.8	20-40	B	2
T68	1	Tilia x vulgaris Common Lime	22.0	1	40	N 3.0	E 2.0	S 2.0	W 2.0	6.0	5.0	Mature	Good		72.4	4.8	20-40	B	2
T69	1	Tilia x vulgaris Common Lime	22.0	1	46	N 3.0	E 3.0	S 3.0	W 3.0	6.0	5.0	Mature	Good		95.7	5.5	20-40	B	2
T70	1	Tilia x vulgaris Common Lime	22.0	1	45	N 3.0	E 3.0	S 3.0	W 5.0	6.0	5.0	Mature	Good		91.6	5.4	20-40	B	2
T71	1	Tilia x vulgaris Common Lime	17.0	1	24	N 2.0	E 3.0	S 3.0	W 3.0	6.0	5.0	Mature	Fair	Suppressed crown - Major.	26.1	2.9	10-20	C	2
T72	1	Tilia x vulgaris Common Lime	22.0	1	49	N 3.0	E 3.0	S 4.0	W 4.0	6.0	7.0	Mature	Good		108.6	5.9	20-40	B	2
T73	1	Tilia x vulgaris Common Lime	22.0	1	45	N 2.0	E 3.0	S 4.0	W 3.0	6.0	5.0	Mature	Good		91.6	5.4	20-40	B	2
T74	1	Tilia x vulgaris Common Lime	22.0	1	47	N 3.0	E 2.0	S 3.0	W 4.0	6.0	5.0	Mature	Good		99.9	5.6	20-40	B	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T75	1	Malus sp. Apple sp.	4.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Mature	Good		4.5	1.2	10-20	C	2
T76	1	Tilia x vulgaris Common Lime	25.0	1	73	N 5.0	E 5.0	S 5.0	W 3.0	9.0	7.0	Mature	Good		241.1	8.8	20-40	B	2
T77	1	Tilia x vulgaris Common Lime	22.0	1	31	N 4.0	E 3.0	S 3.0	W 2.0	6.0	7.0	Early Mature	Good		43.5	3.7	20-40	B	2
T78	1	Tilia x vulgaris Common Lime	22.0	1	50	N 5.0	E 4.0	S 3.0	W 4.0	6.0	5.0	Mature	Good		113.1	6.0	20-40	B	2
T79	1	Liriodendron sp. Tulip Tree	10.0	1	16	N 3.0	E 3.0	S 3.0	W 3.0	3.0	3.0	Semi Mature	Good		11.6	1.9	20-40	C	2
T80	1	Tilia x vulgaris Common Lime	23.0	1	47	N 2.0	E 3.0	S 5.0	W 6.0	9.0	6.0	Mature	Good	Suppressed crown - Minor.	99.9	5.6	20-40	B	2
T81	1	Tilia x vulgaris Common Lime	25.0	1	61	N 4.0	E 3.0	S 5.0	W 5.0	9.0	6.0	Mature	Good		168.3	7.3	20-40	B	2
T82	1	Tilia x vulgaris Common Lime	25.0	1	61	N 3.0	E 3.0	S 5.0	W 5.0	9.0	7.0	Mature	Good		168.3	7.3	20-40	B	2
T83	1	Tilia x vulgaris Common Lime	25.0	1	57	N 3.0	E 3.0	S 5.0	W 5.0	9.0	7.0	Mature	Good		147.0	6.8	20-40	B	2
T84	1	Tilia x vulgaris Common Lime	25.0	1	64	N 3.0	E 3.0	S 5.0	W 6.0	12.0	4.0	Mature	Good		185.3	7.7	20-40	B	2
T85	1	Tilia x vulgaris Common Lime	25.0	1	64	N 5.0	E 5.0	S 4.0	W 4.0	8.0	4.0	Mature	Good		185.3	7.7	20-40	B	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T86	1	Tilia x vulgaris Common Lime	27.0	1	58	N 4.0	E 4.0	S 3.0	W 4.0	10.0	7.0	Mature	Good		152.2	7.0	20-40	B	2
T87	1	Tilia x vulgaris Common Lime	3.0	1	5	N 1.0	E 1.0	S 1.0	W 1.0	2.0		Young	Fair	Not on topographical survey.	1.1	0.6	10-20	C	2
T88	1	Platanus x hispanica London Plane	30.0	1	115	N 8.0	E 8.0	S 12.0	W 7.0	12.0	7.0	Mature	Good	Not on topographical survey.	598.3	13.8	40+	A	2
T89	1	Platanus x hispanica London Plane	30.0	1	114	N 14.0	E 14.0	S 6.0	W 5.0	8.0	3.0	Mature	Good	Not on topographical survey.	587.9	13.7	40+	A	2
T90	1	Laurocerasus sp. Laurel	12.0	2	35	N 4.0	E 4.0	S 4.0	W 4.0	2.0	4.0	Mature	Good		55.4	4.2	20-40	B	2
T91	1	Platanus x hispanica London Plane	30.0	1	100	N 8.0	E 5.0	S 8.0	W 8.0	8.0	6.0	Mature	Good		452.4	12.0	40+	A	2
T92	1	Platanus x hispanica London Plane	30.0	1	83	N 8.0	E 5.0	S 8.0	W 8.0	10.0	8.0	Mature	Good		311.7	10.0	40+	A	2
T93	1	Platanus x hispanica London Plane	30.0	1	82	N 10.0	E 6.0	S 8.0	W 7.0	5.0	8.0	Mature	Good		304.2	9.8	40+	A	2
T94	1	Platanus x hispanica London Plane	33.0	1	111	N 12.0	E 10.0	S 12.0	W 10.0	10.0	8.0	Mature	Good		557.4	13.3	40+	A	2
T95	1	Tilia x vulgaris Common Lime	25.0	1	74	N 5.0	E 9.0	S 5.0	W 4.0	9.0	6.0	Mature	Good	Suppressed crown - Minor.	247.7	8.9	20-40	B	2
T96	1	Platanus x hispanica London Plane	30.0	1	88	N 7.0	E 9.0	S 7.0	W 7.0	7.0	9.0	Mature	Good		350.3	10.6	40+	A	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T97	1	Prunus sp. Cherry sp.	8.0	1	22	N 3.0	E 3.0	S 3.0	W 3.0	2.0	2.0	Semi Mature	Fair		21.9	2.6	10-20	C	2
G98	4	Cerasus avium Wild Cherry	5.0	1	10	N 2.0	E 2.0	S 2.0	W 2.0	2.0		Semi Mature	Fair	Fell - Ground level. Remove upto 3 trees to facilitate works.	4.5	1.2	10-20	C	2
T99	1	Tilia x vulgaris Common Lime	8.0	1	29	N 4.0	E 4.0	S 4.0	W 4.0	2.0	2.0	Semi Mature	Good	Fell - Ground level. Remove tree to facilitate works.	38.0	3.5	20-40	B	2
T100	1	Tilia x vulgaris Common Lime	8.0	1	25	N 3.0	E 3.0	S 3.0	W 3.0	2.0	2.0	Semi Mature	Good	Fell - Ground level. Remove tree to facilitate works.	28.3	3.0	20-40	B	2
T101	1	Tilia x vulgaris Common Lime	8.0	1	28	N 4.0	E 4.0	S 4.0	W 4.0	2.0	2.0	Semi Mature	Good	Prune from adjacent structure. Reduce East aspect by up to 1.5m upto 4m in height to facilitate the ramp.	35.5	3.4	20-40	B	2
T102	1	Tilia x vulgaris Common Lime	8.0	1	30	N 4.0	E 4.0	S 4.0	W 4.0	2.0	2.0	Semi Mature	Good	Bark wound - Mammal.	40.7	3.6	20-40	C	2
T103	1	unrecognized Unrecognised	3.0	1	5	N 1.0	E 1.0	S 1.0	W 1.0	2.0		Young	Fair	Not on topographical survey. Unknown species.	1.1	0.6	10-20	C	2
T104	1	Tilia x vulgaris Common Lime	8.0	1	23	N 3.0	E 3.0	S 3.0	W 3.0	2.0	2.0	Semi Mature	Good		23.9	2.8	20-40	B	2
T105	1	Tilia x vulgaris Common Lime	8.0	1	23	N 4.0	E 4.0	S 4.0	W 4.0	2.0	2.0	Semi Mature	Good		23.9	2.8	20-40	B	2
T106	1	Tilia x vulgaris Common Lime	8.0	1	33	N 4.0	E 4.0	S 4.0	W 4.0	2.0	2.0	Semi Mature	Good		49.3	4.0	20-40	B	2

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Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T107	1	Tilia x vulgaris Common Lime	8.0	1	23	N 3.0	E 3.0	S 1.0	W 3.0	2.0	2.0	Semi Mature	Good	Suppressed crown - Minor.	23.9	2.8	20-40	C	2
T108	1	Tilia x vulgaris Common Lime	8.0	1	25	N 3.0	E 3.0	S 2.0	W 2.0	2.0	2.0	Semi Mature	Good	Suppressed crown - Minor.	28.3	3.0	20-40	C	2
T109	1	Platanus x hispanica London Plane	25.0	1	131	N 9.0	E 8.0	S 11.0	W 6.0	10.0	7.0	Mature	Good		706.9	15.0	40+	A	2
T110	1	Tilia x vulgaris Common Lime	25.0	1	81	N 6.0	E 4.0	S 4.0	W 5.0	9.0	8.0	Mature	Good		296.8	9.7	20-40	B	2
T111	1	Tilia x vulgaris Common Lime	25.0	1	81	N 6.0	E 6.0	S 4.0	W 6.0	9.0	8.0	Mature	Good		296.8	9.7	20-40	B	2
T112	1	Tilia x vulgaris Common Lime	23.0	1	75	N 6.0	E 6.0	S 6.0	W 6.0	8.0	10.0	Mature	Good		254.5	9.0	20-40	B	2
T113	1	Tilia x vulgaris Common Lime	25.0	1	59	N 6.0	E 6.0	S 5.0	W 3.0	8.0	10.0	Mature	Good		157.5	7.1	20-40	B	2
T114	1	Platanus x hispanica London Plane	28.0	1	190	N 14.0	E 14.0	S 12.0	W 14.0	5.0	4.0	Mature	Good		706.9	15.0	40+	A	2
S115	1	unrecognized Unrecognised	2.0	10	15	N 2.0	E 2.0	S 2.0	W 2.0	1.0		Mature	Fair	Fatsia japonica.	11.3	1.9	10-20	C	2
S116	1	unrecognized Unrecognised	2.0	10	15	N 2.0	E 2.0	S 2.0	W 2.0	1.0		Mature	Fair	Fatsia japonica.	11.3	1.9	10-20	C	2
T117	1	Ulmus glabra Wych Elm	3.0	1	24	N 2.0	E 2.0	S 2.0	W 2.0	2.0	2.0	Early Mature	Good	Bark wound - Major. Decay / structural defect - Base.	26.1	2.9	10-20	C	2

St Pancras Gardens, Camley Street, London
Tree Survey BS5837-2012



Tree/Group Reference	Tree Count	Species	Height (m)	Stem Count	Stem Diameter (cm)	Crown Radius (m)				Crown Clearance Height (m)	Lowest Branch Height (m)	Life Stage	Physiological Condition	Observations and Recommendations	RPA (m ²)	RPR (m)	Remaining Contribution (Years)	Retention Category	Retention Sub-category
T118	1	Platanus x hispanica London Plane	28.0	1	121	N 6.0	E 10.0	S 8.0	W 5.0	5.0	6.0	Mature	Good		662.3	14.5	40+	A	2
T119	1	Platanus x hispanica London Plane	30.0	1	122	N 9.0	E 8.0	S 10.0	W 5.0	7.0	8.0	Mature	Good		673.3	14.6	40+	A	2
T120	1	Platanus x hispanica London Plane	30.0	1	84	N 7.0	E 6.0	S 8.0	W 5.0	8.0	12.0	Mature	Good		319.2	10.1	40+	A	2
T121	1	Platanus x hispanica London Plane	30.0	1	88	N 12.0	E 8.0	S 4.0	W 5.0	7.0	10.0	Mature	Good		350.3	10.6	40+	A	2
T122	1	Platanus x hispanica London Plane	30.0	1	114	N 10.0	E 6.0	S 8.0	W 12.0	10.0	12.0	Mature	Good		587.9	13.7	40+	A	2
T123	1	Platanus x hispanica London Plane	30.0	1	87	N 5.0	E 8.0	S 8.0	W 6.0	10.0	12.0	Mature	Good		342.4	10.4	40+	A	2

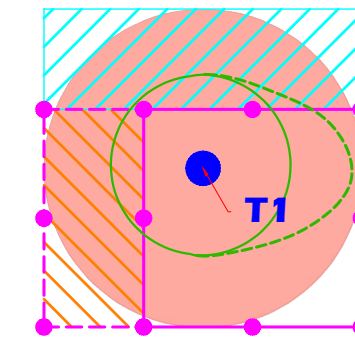
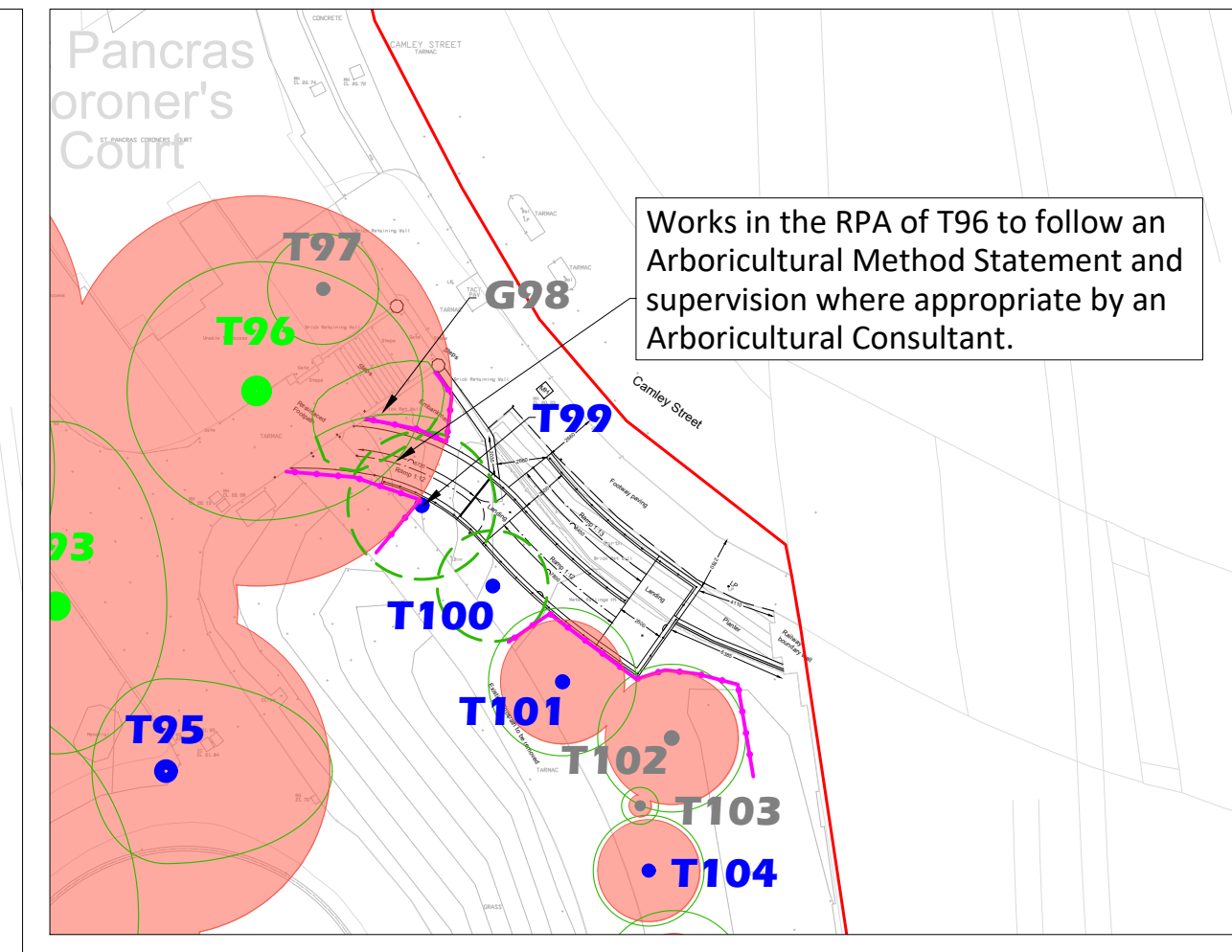
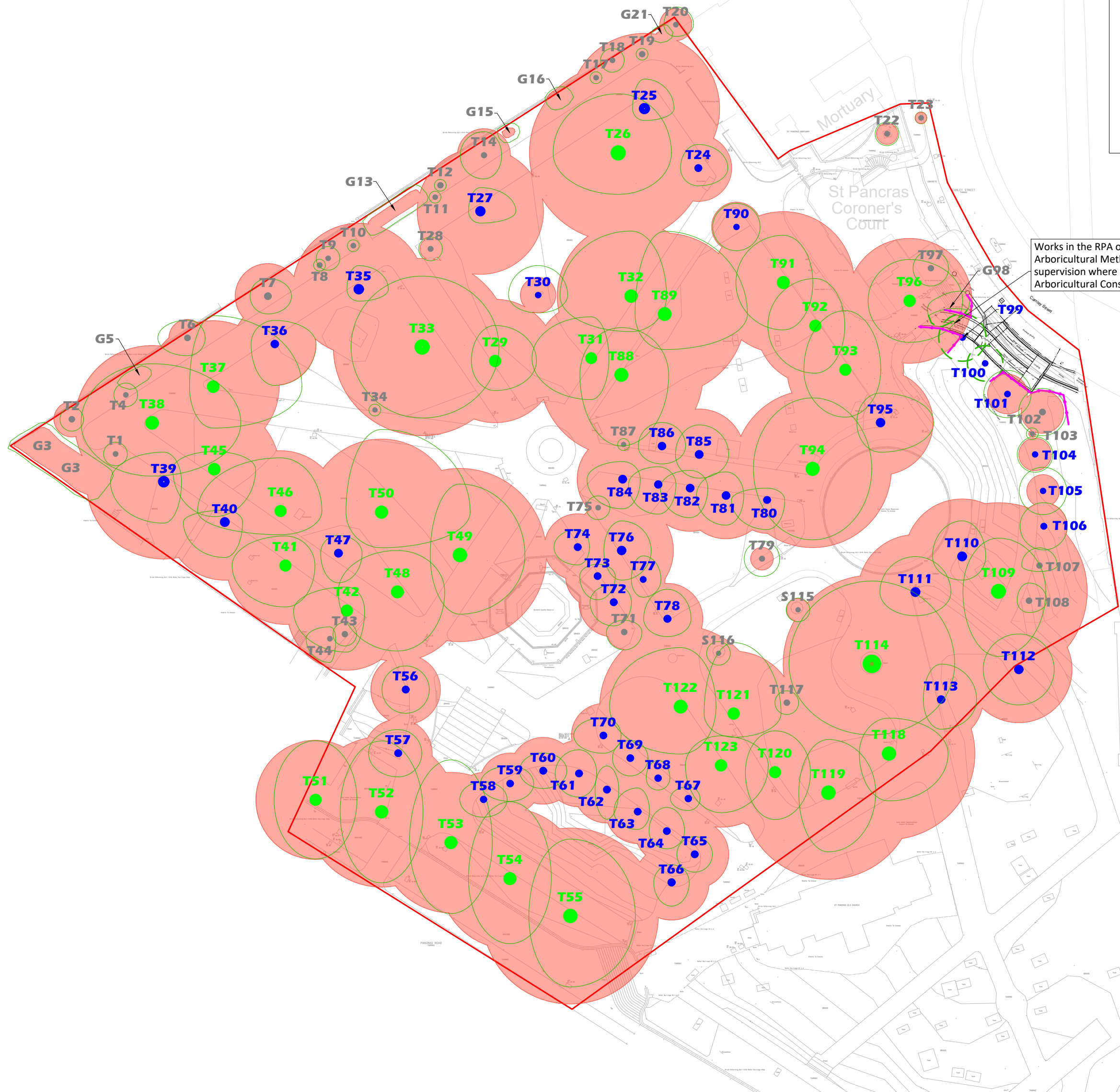
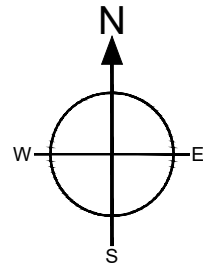
Tree Schedule Key



Tree/Group Reference	Reference number for individual trees or groups of trees, prefixed by T (Tree), G (Group), W (Woodland), H (Hedge) or S (Shrub) to indicate the type of feature.
Tree Count	Number of trees of a particular species recorded within a group feature, with the default value of 1 for single trees.
Species	Scientific name followed by common name (where available).
Height (m)	Tree height to the nearest metre, either measured with a device or estimated. Tree height for group records refers to the estimated average height of trees within the group (unrepresentative trees may be excluded from this estimate).
Stem Count	Number of stems. Stem count indicates whether the tree is single-stemmed or multi-stemmed and informs the RPA calculation.
Stem Diameter (cm)	Stem diameter, measured at 1.5m above ground level in accordance with Annex C of BS5837:2012. Diameters of multi-stemmed trees are presented as a combined stem diameter calculated in accordance with the formulae in Section 4.6.1 of BS5837:2012. Stem diameter for group records refers to the estimated average stem diameter of trees within the group (unrepresentative trees may be excluded from this estimate).
Crown Radius (m)	Distance from stem position to crown periphery in either the four cardinal or four ordinal directions, estimated to the nearest half metre. Crown spreads for group records refer to the estimated average spreads of trees within the group (unrepresentative trees may be excluded from this estimate).
Crown Clearance Height (m)	Distance between the ground and the lowest point of the crown periphery, estimated to the nearest half metre.
Lowest Branch Height (m)	Height of the lowest branch, the removal of which is considered likely to have a significant negative effect on the tree in terms of physiology or in terms of the size of wound created.
Life Stage	Young, Semi-mature, Early Mature, Mature, Late Mature, Ancient or Veteran.
Physiological Condition	Good, Fair, Poor, Dead.
Observations	General description of the tree or tree group, including basic features and morphology, structural and physiological condition, growing conditions and surroundings.
Recommendations	Management recommendations for tree works to address immediate unacceptable risks, or to facilitate development proposals.
RPA (m ²)	Minimum area around a tree deemed to contain sufficient roots and rooting soil volume to maintain the tree's viability, in which the protection of roots and soil structure is treated as a priority. Calculated from the stem diameter according to the formulae in BS5837:2012. RPA for group records is based on the estimated average stem diameter of trees within the group (unrepresentative trees may be excluded from this estimate).
RPR (m)	Radius of the RPA, in metres, when this is plotted as a circle around the tree stem.
Remaining Contribution (years)	Estimated number of years for which the tree will continue to make a positive contribution to the site, banded as < 10, 10-20, 20-40, 40 +.
Retention Category	Quality and value category (A , B , C or U) as defined in Table 1 of BS5837: 2012 (reproduced below), where A = high quality and value; B = moderate quality and value; C = low quality and value and U = tree identified for removal due to poor condition regardless of development proposals.
Retention Sub-category	One or more sub-categories (1-3) as defined in Table 1 of BS5837: 2012 (reproduced below), assigned for Categories A , B or C where 1 = arboricultural qualities, 2 = landscape qualities and 3 = conservation and cultural value.

Appendix B

Tree Protection Plan



- | | | | |
|----|------------------------------------|--|---|
| T1 | Tree or Group Reference Number | | Tree Protection Fencing |
| | Tree Stem Position A Category Tree | | Initial Tree Protection Fencing |
| | Tree Stem Position B Category Tree | | Ground Protection |
| | Tree Stem Position C Category Tree | | Special Engineering /Supervised Excavations |
| | Tree Stem Position U Category Tree | | Construction Exclusion Zone |
| | Tree Crown | | Pruning/Tree Removal |
| | Root Protection Area | | Site Boundary |

Date: October 2018

Scale: 1:600 @ A2

Project Name:
St Pancras Gardens, Camley Street, London

Drawing Title:
Tree Protection Plan

Drawing Number:
181031-1.0-StPG-TTP-NC



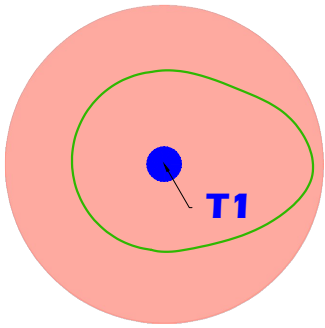
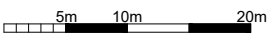
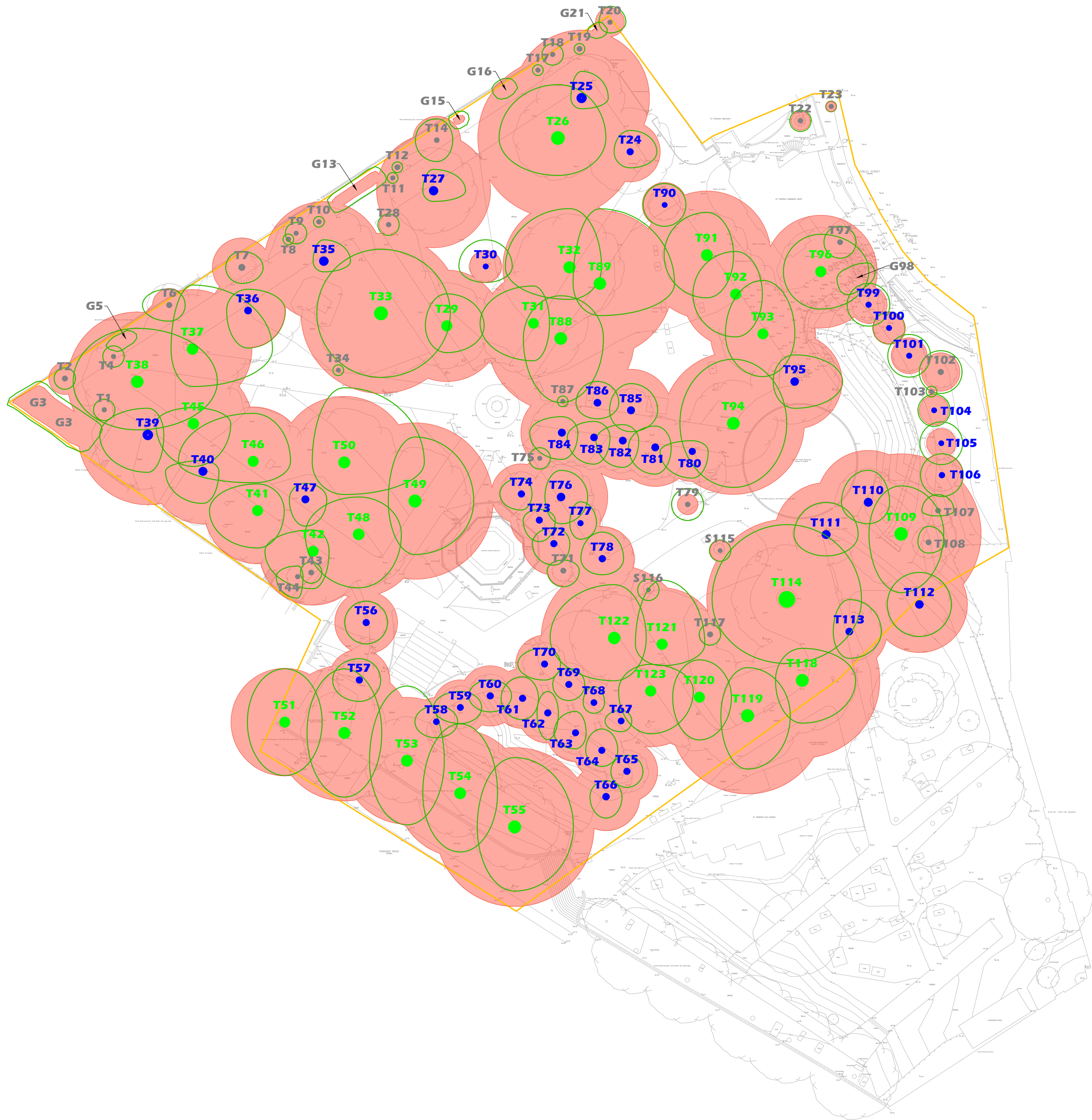
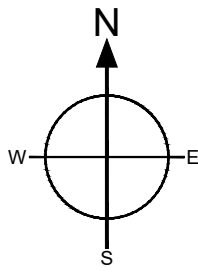
Treework Environmental Practice
Monarch House
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Bedminster
Bristol
BS3 2BX

Tel: 0117 244 0012
Web: www.treeworks.co.uk
Email: info@treeworks.co.uk



Appendix C

Tree Constraints Plan



- | | | | |
|----|--------------------------------|--|------------------------------------|
| T1 | Tree or Group Reference Number | | Tree Stem Position A Category Tree |
| | Tree Crown | | Tree Stem Position B Category Tree |
| | Root Protection Area | | Tree Stem Position C Category Tree |
| | Tree Survey Boundary | | Tree Stem Position U Category Tree |

Date: October 2018

Scale: 1:600 @ A2

Project Name:
St Pancras Gardens, Camley Street, London

Drawing Title:
Tree Constraints Plan

Drawing Number:
181030-1.0-StPG-TCP-NC



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Appendix D

Example Site Monitoring Form

Site Inspection Report

Completion of Arboricultural Operations – Monitoring Form

Site Name:		
Site Address:		
Client Name:	Instructed By:	
Site Manager:		
Arboricultural Operation Checked By:	Date:	Approved / Not Approved
Operation Completed / Additional Works Required:		
Number of Photographs Supplied:		
Completed By (Contractor Name):	Contractor / Subcontractor	
Copied to LPA	Yes / No	Contact Name:
Copied to Client	Yes / No	Contact Name:
Copied to Site Manager	Yes / No	Contact Name:

Operation Completed / Additional Works Required (Continued):

Appendix E

Tree Survey Method and Limitations

Tree Survey Method and Limitations

Tree Survey Method

1. The tree survey was conducted from ground level aided by the Visual Tree Assessment method (Mattheck and Breloer, 1994) and in accordance with BS5837: 2012.
2. All trees on the site with a stem diameter of over 75 mm (measured at 1.5 m above ground) were included in the survey.
3. Offsite trees within influencing distance of the site (typically those located within a distance of up to 12 times their stem diameter away from the site) were included in the survey.
4. Data collected included:
 - a designated tree number
 - type of feature (trees, group, woodland, hedge)
 - number of trees in group
 - tree species
 - height (metres)
 - number of stems
 - stem diameter (in centimetres, as measured at 1.5 m above ground)
 - crown clearance (height of periphery of crown spread above ground level in metres)
 - height of lowest branch (metres),
 - branch spread (to N, S, E and W)
 - age class
 - physiological condition
 - useful life expectancy
 - structural condition
 - BS5837 retention category (A, B, C or U)
 - site notes (where this has a bearing on the present or future health or structural condition of the tree)
 - preliminary management recommendations.
5. All measurements were made in metric using measuring devices where applicable. Estimated stem diameters (e.g., due to lack of access or dense undergrowth) were recorded as such and are shown in the Tree Schedule in bold (see the key at the end of the Tree Schedule table at Appendix A for an explanation of the measurements and codes presented therein).
6. While the appraisals of the surveyed trees are not tree risk assessments, they nonetheless take into account observed structural defects in drawing conclusions about the trees' retentive worth.

Survey Limitations

1. The survey was a preliminary assessment from ground level and observations were made solely from visual inspection for the purposes of an assessment relevant to planning and development. Only binoculars, trowel, mallet and fine manual metal probe were used to aid tree assessment, where necessary. No invasive or other detailed internal decay detection devices were used in assessing trunk condition.
2. The conclusions relate to conditions found at the time of survey. Any significant alteration to the site that may affect the trees that are present or have a bearing on the planning implications (including level changes, hydrological changes, extreme climatic events or other site works) will require a re-assessment of the trees and the site.
3. This survey is not a tree safety inspection. It is carried out in order to inform the planning process. Where clear and obvious hazards have been observed, these have been addressed in the recommendations (see Appendix A - Tree Schedule). A full assessment of the levels of risk posed by trees would need to consider site use together with tree hazards.