Part 1: BS: 5837 Tree Survey & Tree Constraints Plan Report

Site:

St Christopher's School
32 Belsize Lane
Hampstead
London
NW3 5AE.

Date of Site Visit:

Tuesday 4th August 2020

Prepared for:

St. Christopher's School

Prepared by:

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ISA Tree Risk Assessment Qualified

Bartlett Project Reference:

JPL/200255/R1/sh

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Submitted on19th August 2020

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1.0 EXECUTIVE SUMMARY:

1.0.1 The following report evaluates the trees within and adjacent to the above site, using the criteria and guidance set out in the British Standard 5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*.

1.0.2 The wider amenity and landscape values of the trees, as well as their useful life expectancies are determined, and as a result, a category grading to all trees for retention using the "Cascade Chart for Tree Quality Assessment" is assigned.

1.0.3 A Tree Constraints Plan has also been drawn and appended to the report. The Plan illustrates the tree locations, their above and below ground constraints and their spatial requirements with any proposed development

1.0.4 St Christopher's School is located along Belsize Lane, a residential suburb of Hampstead, and features a large historical four storey building located on approximately 0.75 acres of land.

1.0.5 The local landscape features a rich diversity of deciduous and evergreen shrubs and trees, both native and exotic varieties, primarily located within private residential curtilages.

1.1 Table 1: BS: 5837 Categories

BS: 5837 Category	Number
A	1
B	3
C	4
U	0
Total	8

2.0 SCOPE OF REPORT

2.1 Instruction

2.1.1 Bartlett Consulting has been instructed to undertake a tree survey in accordance with British Standard 5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*, for the trees and vegetation within the boundary of St Christopher's School, 32 Belsize Lane, Hampstead and Belsize Court, Wedderburn Road that have the potential to influence a proposed development, which therefore must be considered as a constraint within the project planning.

2.2 Documents & Supporting Information

2.2.1 Bartlett Consulting was provided with the following documentation and plans prior to the site visit & tree survey. They were sent via email in both PDF and DWG file format:

• 2026_GL_000 St_Chrstopher.dwg	• 2026_GA_012 St_Chrstopher.dwg
• 2026_GL_001 St_Chrstopher.dwg	• 2026_GE_001 St_Chrstopher.dwg
• 2026_GL_002 St_Chrstopher.dwg	• 2026_GE_002 St_Chrstopher.dwg
• 2026_GL_012 St_Chrstopher.dwg	• 2026_GE_011 St_Chrstopher.dwg
• 2026_GA_001 St_Chrstopher.dwg	• 2026_GE_012 St_Chrstopher.dwg
• 2026_GA_002 St_Chrstopher.dwg	• 2026_GS_001 St_Chrstopher.dwg
• 2026_GA_011 St_Chrstopher.dwg	• 2026_GS_011 St_Chrstopher.dwg

2.3 Aspects Included within Report

2.3.1 The tree survey included within this report is fully compliant with British Standard 5837: *Trees in Relation to Design, Demolition and Construction – Recommendations*. The tree survey schedule, included within Appendix 3 details; species name, various physical dimensions, notable observations and prescribes any preliminary tree works, whilst categorising the trees to their respective landscape/cultural value and perceived life expectancy and finally concluding with identifying those trees suitable for retention.

2.3.2 The tree survey has been conducted in accordance with the principals of the Visual Tree Assessment (VTA), a method developed by Mattheck & Breloer (1994); this is preliminary in nature and must not be misinterpreted as a detailed tree condition inspection.

2.3.3 The prescribed tree works only pertain to trees that pose an immediate and serious hazard to persons and property, or may be affected by a pathogen or pest of known contagion and pose a risk to other trees.

2.3.4 This report is accompanied with a Tree Constraints Plan (TCP), accurately detailing the positions of trees and vegetation, illustrating the physical dimensions of the crowns as per the cardinal points, as well as the calculated Root Protection Area (RPA) of each tree.

2.3.5 Modified RPA's will be illustrated if known below ground level obstructions exist, whilst tree shade patterns and future canopy spread for young trees will also be illustrated where necessary.

2.4 Aspects Excluded from Report

2.4.1 The prescribed tree works contained within this report do not take into consideration possible facilitation pruning. This report does not include an Arboricultural Implications Assessment (AIA), Arboricultural Method Statement (AMS), or a Tree Protection Plan (TPP).

2.4.2 The contents of this report do not include discussions regarding subsidence and/or heave as a result of retention or tree removal, nor does this report consider the water demands of trees present to determine foundation design and depth. If required, this can be provided on request.

3.0 TREE PRESERVATION ORDER & CONSERVATION AREA PROTECTION STATUS

3.1 Statutory Protection

3.1.1 The Town & Country Planning Act (Tree Preservation) (England) Regulations 2012 and the Town & Country Planning Act 1990 (as amended) provides legislative protection for trees within England.

3.1.2 A tree protection status check was conducted by Bartlett Consulting on 11th August 2020 via accessing the London Borough of Camden Council interactive mapping website (link below).

3.1.3 An email was also issued to the Planning department requesting further information regarding TPO's.

3.1.4 https://ssa.camden.gov.uk/connect/analyst/mobile/#/main?mapcfg=CamdenConservation&lang=en-gb

3.2 Tree Preservation Order (TPO) Status

3.2.1 TPO H23 – T50 – London Plane, confirmed 18.11.1957

3.3 Conservation Area (CA) Status

3.3.1 Fitzjohns Netherhall Conservation Area, designated 1985

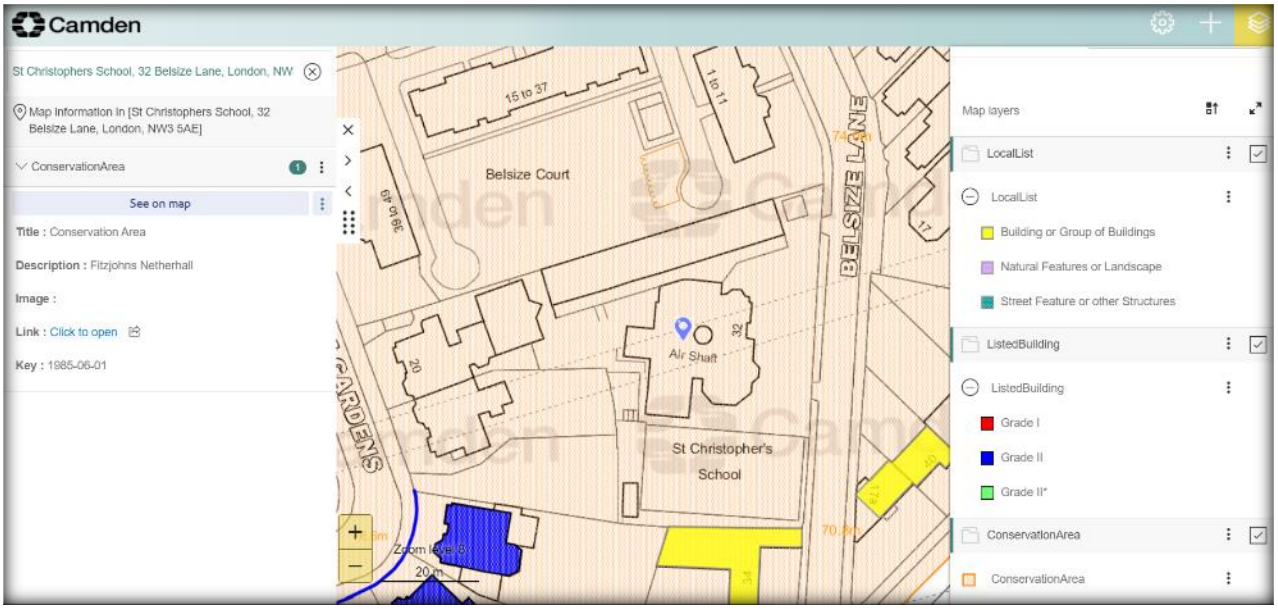

Figure 1: Showing the Screenshot Of St Christopher's School within Fitzjohns Netherhall Conservation Area, as Obtained from the London Borough Of Camden Council.

3.0 TREE PRESERVATION ORDER & CONSERVATION AREA PROTECTION STATUS (continued…)

3.4 Tree Management Implications

3.4.1 It has been established via email correspondence with the Local Planning Authority (LPA): Planning Assistant that the London Plane tree included within this report is currently subject to a Tree Preservation Order (TPO):

3.4.2 TPO Reference No. TPO H23

3.4.3 Under the Town and Country Planning (Tree Preservation) (England) Regulations 2012, you cannot carry out any works to a protected tree before obtaining formal written permission as issued by the appropriate Local Planning Authority. This obligation requires the submission of a Tree Preservation Order planning application (TPO1APP) but cannot be acted upon until full Local Planning Authority permission is granted

3.4.4 If consent is granted, all prescribed tree works contained within this report may be implemented, however if refused, implementation may be sought with the submission of a Tree Preservation Order planning application (TPO1APP) but cannot be acted upon until full Local Planning Authority permission is granted.

3.4.5 It has been established via the same email correspondence that the site also stands within a designated Conservation Area (CA), administered by the LPA; London Borough of Camden.

3.4.6 The CA is named: Fitzjohns Netherhall Conservation Area

3.4.7 Please note that the removal of dead trees and the pruning of dead wood from living trees are permitted and "excepted" works under the 2012 Regulation listed above. These works can be undertaken only after 5 working days' notice has been given to the local planning authority.

3.4.8 Furthermore, we haven't established whether any of the trees are subject to planning conditions.

3.4.9 We would be happy to submit the 1APP application on your behalf should you wish to proceed with any works arising from this consultation.

4.0 GENERAL SITE DETAILS

4.1 Description of the Site

4.1.1 St Christopher's School features a diversity of buildings, with a wide range of ages and architectural styles, and as a functioning school, the majority are utilised as teaching classrooms. There are many areas of hard landscaping surrounding the school buildings which are used as children's play areas, whilst there is a large multi-use games area (MUGA) is located to the south of the site.

Figure 2: Photograph Showing the Site as Viewed from the South.

4.2 Local Landscape and Amenity Evaluation

4.2.1 The landscape and tree cover of St Christopher's School features a diverse mixture of native and exotic deciduous and evergreen tree species.

4.2.2 The trees subject to the report are considered to have high public visibility and amenity value, as they can be seen from Belsize Lane and Wedderburn Road.

4.3 Previous Surveys & Site History

4.3.1 We are neither aware of any other surveys being conducted on site, other than the Topographical Site Survey. nor are we aware of any historical or cultural values relating to the trees.

5.0 GENERAL TREE DETAILS

5.1 Tree Identification & Location

5.1.1 The trees subject to this report are located within the curtilage of St Christopher's School and within adjacent land of Belsize Court.

5.1.2 The locations of the surveyed trees are illustrated on the Tree Constraints Plan (TCP) accompanying this report.

5.1.3 The accuracy of the tree locations are based entirely upon the provided Topographical Site Survey drawing. As access to the adjacent third party property was not possible at the time of the survey, some trees subject to this report have been surveyed and plotted by Bartlett Consulting using a laser distometer, a measuring tape and fixed points. Whilst this method does not guarantee accuracy provided by a land or topographical site survey, it is considered sufficient to allow the plotting of calculated Root Protection Areas.

5.1.4 Trees that have been plotted using this method include: T01, T02, T03 & T04.

5.1.5 Where deemed appropriate to do so, some trees have been considered as a group.

5.2 Trees Included within Survey

5.2.1 Only trees that are present and have a measured stem diameter equal to or greater than 75 millimetres are included within the tree survey.

5.2.2 Where possible and deemed appropriate to do so, trees present within adjacent lands which are located within influencing distance will be recorded. In such instances, all observations and measurements shall be obtained from the site, unless prior consent is granted by the landowner. In these instances, all measurement will be accompanied with a * suffix.

5.2.3 It must be noted that all trees are outside of the application site boundary, within Belsize Court and therefore the responsibility of the Estate Management. For the trees to be pruned properly, permission to access the land and prune the trees must first be granted by the landowner in accordance with British Standard 3998:2010 *Tree Work – Recommendations*.

5.3 Categorisation & Gathered Data

5.3.1 All gathered data contained within the Tree Survey Table is provided within Appendix 1 is compliant with the guidance set out within Section 4.4 of British Standard 5837: *Trees in Relation to Design, Demolition and Construction – Recommendations*.

5.3.2 Each tree is categorised as per the cascade chart given as Table 1 within the British Standard 5837, a copy of which is provided within Appendix 2 of this report.

6.0 TREE CONSTRAINTS PLAN

6.1 Below Ground Level Constraints

6.1.1 The below ground level constraint on any site will include the root system and rooting environment of trees being retained. The data gathered during the Tree Survey permits the creation of a Tree Constraints Plan (TCP). The TCP illustrates the trees location within and adjacent to the site, the physical dimensions of the main stem and crown above ground as well as the constraints below ground level caused by the calculated Root Protection Area (RPA) of each tree.

6.1.2 The calculated RPA is indicated by the orange broken circle on the TCP and shows the minimum area around each tree or groups of trees, subject to the Tree Survey, which is deemed to contain sufficient roots and rooting environment to maintain the current vitality of the tree. This area is as per the requirements of *British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations*.

6.1.3 In the first instance, the RPA should remain a construction exclusion zone and all proposed development should be planned and located outside the RPA for trees of such quality and value to be retained, essentially leaving the RPA sacrosanct.

6.2 Above Ground Level Constraints

6.2.1 The above ground level constraints on a development site can be numerous, resulting primarily from the current and/or ultimate crown height and spread of the retained tree, its species characteristics, such as evergreen or deciduous, the height of its crown above ground level and any "nuisance" that might be the result of a tree's proximity to living areas.

6.2.2 Proposed structures should be designed and/or located with due consideration of above ground constraints so as to prevent direct damage from occurring to the structure, as well as the need for unnecessary and possibly damaging tree management works due to shade and/or falling leaves affecting amenity space and living areas.

6.2.3 Whilst not affecting the total area of the calculated RPA, it may in some circumstances be modified. This consideration is made by the Arboriculturalist and included within the Arboricultural Implications Assessment (AIA), whilst taking into account the morphology and disposition of roots, the soil type and structure, topography and drainage, as well as any other known physical obstructions above and below ground level.

6.2.4 This report does not give consideration in this instance to the growth potential of trees or possible effects caused by of the obstruction of daylight to any existing building or proposed development.

6.2.5 Proposed structures should be designed and/or located with due consideration of this assessment and information, so as to prevent direct damage from occurring to the structure, as well as the need for unnecessary and possibly damaging tree management works.

7.0 CONCLUSIONS

7.1 Further Considerations

7.1.1 Once a scheme has been presented, an Arboricultural Implications Assessment (AIA) will take into account any issues relating to a proposed development design and layout of the site in regards to the retained trees.

7.1.2 This document will identify any trees that will require facilitation pruning, and/or removal, and those that will require replacement tree planting. Where the AIA has identified potential tree and development conflicts, we will provide recommendations for design modification and adjustment of the proposed footprint where necessary. The AIA will also provide methods of mitigation where required to ensure potential conflict does not cause damage to any retained trees.

7.1.2 An Arboricultural Method Statement (AMS) will be the final phase of the project, whereby specific construction methods and details pertaining to mitigation measures are provided.

7.1.3 The Tree Protection Plan (TPP) is typically composed at the same time when the AMS is written, following finalisation of a development design/ site layout. The TPP will identify trees to be retained, removed, and pruned for facilitation purposes, as well as the location and specification of tree protection barriers and non-compacting ground protection to be installed on site.

7.1.4 The AMS will consider construction activities where they are in close proximity to retained trees, dealing with issues such as site access, intensity of activity, the provision of a suitable working space, designated areas for delivery and storage of building materials, and if know at the time of writing the location of service runs and soakaways.

APPENDIX 1 TREE SURVEY KEY

Tree Reference Number	The tree number of physical tree tag (if applicable) provided to an individual tree or group of trees, as shown on the Tree Constraints Plan.
Species	Generally the common name given to the tree species. The Latin name is sometimes provided as clarification where deemed necessary.
Height	This figure is given in metres. Measurements are obtained using a digital clinometer. A black asterisk * will denote that the measurement is estimated.
Stem Diameter	This figure is given in millimetres. Measurement are obtained using a standard diameter tape, whilst measured from 1.5 metres above ground level, or otherwise indicated. A black asterisk * will denote that the measurement is estimated.
Crown Spread	This figure is given in metres. Measurements are obtained radially for all four cardinal points using a laser range finder. A black asterisk * will denote that the measurement is estimated.
Crown Clearance	This figure is given in metres. Measurements are obtained radially for all four cardinal points, between the crown and ground level, and obtained using a digital clinometer. A black asterisk * will denote that the measurement is estimated.
Height to first major branch	This is an approximate figure given in metres. Measurements are obtained by identifying the lowest lateral branch within the crown. Recorded information will also refer to a cardinal direction, and obtained using a digital clinometer. A black asterisk * will denote that the measurement is estimated.
Age	The following abbreviations are used to give the age of the tree; NP = Newly Planted, Y = Young, aged less than one quarter of its life expectancy, SM = Semi-Mature, trees of approx. one quarter of its life expectancy, EM = Early-Mature, between one quarter & half of its life expectancy, M = Mature, trees of over half of its life expectancy, OM = Over Mature, trees exceeding their life expectancy, V = Veteran, over mature trees which contain multiple wildlife habitat features & associations.
Physiological Condition	The following considerations are used to evaluate the physiological conditions of a tree (foliage & vitality): Dead, Poor, Fair & Good, with intermediate descriptions using same phrasing.
Structural Condition	Standard comments referring to the visible structural condition of tree: Hazardous, Poor, Fair, Good, with intermediate descriptions using same phrasing.
Observations	These are brief comments which relate to observations from ground level, unless otherwise stated. These observations are made to assist in categorising the tree. They do not provide or replace a comprehensive condition survey.
Preliminary Management Recommendations	These recommendations will only identify the need for more detailed assessment/inspection or tree management due to tree hazards of features which present an immediate risk to persons & property. The tree works do not consider general husbandry or required management of the trees, nor do they consider tree works that may be required prior to development or to facilitate access to the site.
Estimated Remaining Contribution	This is the number of estimated years that the tree will remain present and contribute to the local landscape. The following bands are used; <10 years, 10+ years, 20+ years & 40+ years.
Categorisation	This is the grading category applied following the tree survey. Trees are categorised in accordance with the cascade chart provided within Table 1 in BS: 5837 (2012). A copy of this chart is provided within Appendix 2 of this report. A red asterisk * will denote that the categorisation as given will be dependent upon information gained from further detailed inspection of the tree.
Root Protection Area & Root Protection Radius	The RPA is a figure given in metres squared, the minimal area which should be left undisturbed. The RPR is a figure given in metres, a measured radial distance away from the trees main stem.

APPENDIX 2 BRITISH STANDARD: 5837 (2012) TABLE 1: TREE CATEGORISATION

TREES UNSUITABLE FOR RETENTION				
CATEGORY & DEFINITION	**CRITERIA**			**IDENTIFICATION ON PLAN**
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	Trees that have 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**
TREES TO BE CONSIDERED FOR RETENTION				
CATEGORY & DEFINITION	**CRITERIA (subcategories)**			**IDENTIFICATION ON PLAN**
	1. Mainly arboricultural values	2. Mainly landscape values	3. Mainly cultural values, including conservation	
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years.	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation. Historical, commemorative or other value (e.g. veteran trees or wood-pasture)	**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 & 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	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 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significant greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	**GREY**
	NOTE: Whilst category C trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation.			

APPENDIX 3 BRITISH STANDARD: 5837 (2012) TREE SURVEY SCHEDULE

Tree Ref No.	Species	Ht. (m)	Stem Dia. (mm)	Crown Spread				Crown Clearance				Ht. to 1st limb (m)	Age	Phys. Cond.	Structural Condition			Observations	Preliminary Management Recommendations	Life Exp.	Cat.	RPA in m2 (Radius/ m)
				North	East	South	West	North	East	South	West				Basal	Stem	Crown					
T01	Sycamore *(Acer pseudoplatanus)*	18	500 500	7	5	6	6.5	4	6	3	3	3.0 W	EM	Good	F	F	F	• Third party tree; measurements estimated. • Twin-stemmed specimen, adequate union. • Previously crown reduced, adequate regrowth.	• No works presently required.	20+	B2	227.00 (8.50)
T02	Sycamore *(Acer pseudoplatanus)*	20	650	8	7	5	4	5	5	4	5	4.5 N	EM	Good	F	G	F	• Third party tree; measurements estimated. • Asymmetrical form, expressing crown bias towards north. • No observable defects.	• No works presently required.	20+	B2	191.13 (7.80)
T03	Sycamore *(Acer pseudoplatanus)*	7	130	3	3	3	3	3	3	3	3	3.0 E	Y	Good	F	G	G	• Third party tree; measurements estimated. • Self-sewn specimen. • No observable defects.	• No works presently required.	20+	C2	7.65 (1.56)
T04	Common Horse Chestnut *(Aesculus hippocastanum)*	20	900	6	8	7	7	7	6	4	5	3.0 E	M	Fair	F	F	F	• Third party tree; measurements estimated. • Asymmetrical form expressing crown bias towards east. • Previously pruned away from Belsize Court. • Significant infestation of Horse Chestnut Leaf Miner.	• No works presently required.	20+	B2	366.44 (10.80)
T05	Japanese spindle *(Euonymus japonicus)*	3.5	130	3	3	2	2	2	2	2	2	2.0 N	M	Good	F	G	F	• Developing from boundary planter. • Thinning crown.	• No works presently required.	10+	C2	7.65 (1.56)

Tree Ref No.	Species	Ht. (m)	Stem Dia. (mm)	Crown Spread				Crown Clearance				Ht. to 1st limb (m)	Age	Phys. Cond.	Structural Condition			Observations	Preliminary Management Recommendations	Life Exp.	Cat.	RPA in m2 (Radius/ m)
				North	East	South	West	North	East	South	West				Basal	Stem	Crown					
T06	London Plane *(Platanus x hispanica)*	25	1105	10	12	11	8.5	6	8	10	8	6.0 W	M	Good	F	G	G	• Dominant specimen with open grown form. • Bifurcation at 6.0m, adequate union. • Previously crown reduced, adequate regrowth. • No observable defects.	• No works presently required.	40+	A2	552.38 (13.26)
T07	Norway Maple *(Acer platanoides)*	13	545	3	4	5	4	6	6	6	6	3.5 W	EM	Fair	G	G	F	• Bifurcation 3.5m, western stem in decline. • Previously crown reduced, adequate regrowth, approx. 1.5m.	• Remove western stem.	20+	C2	134.37 (6.54)
TG08	Group consisting of: Viburnum Cotoneaster Mexican orange Forsythia	3	75	9	3	9	3	0.5	0.5	0.5	0.5	0.5 N	EM	Good	F	G	G	• Formal soft landscaped play area. • No observable defects.	• No works presently required.	10+	C2	2.54 (0.90)

APPENDIX 4 LIMITATIONS OF REPORT

Limitations of the Tree Survey & Scope of the Report

- This report is restricted to those trees & vegetation shown on the attached Tree Constraints Plan, described within the tree survey schedule, as identified within the instruction as per Section 1.1.
- All plans are illustrative of the discussions within the report and based entirely on the drawings provided to Bartlett Consulting. All scaled measurements must be checked against the original submission documents as well as confirmed on site.
- The survey was based on unaided, visual observations made from ground level only, using the principles of a Visual Tree Assessment (VTA).
- The trees were not climbed at the time of the survey.
- All observations were made from within the curtilage of the site or from a public open space unless otherwise stated.
- The tree survey is preliminary in its nature and must not be interpreted as a detailed tree condition inspection.
- This report does not consider the possible implications to any existing or proposed built structures. These matters will be dealt with in future reports as deemed necessary/ as and when instructed.

Timing of the Tree Survey & the Report

- The observations & finings of this report remain valid for one year, from the date of issuance.
- The observations & findings will be invalidated if any building works are undertaken, soil levels altered or tree works implemented.
- In the instance where building works have occurred, soil levels are altered or tree works completed, it is recommended that a new tree survey and report is completed.

Trees in Relation to Other Properties

- The tree survey and report consider only those trees in relation to the site as identified.
- It does not comment upon the possible effects of trees on neighbouring properties, including matters concerning subsidence or heave, or with regards to potential hazards presented by trees surveyed.
- Neighbouring land/tree owners that are identified as posing a potential risk to the site should seek their own independent advice.
- Damage to, or potential damage to any existing structures that are not referred to within this report is not considered, unless otherwise specified. This is inclusive of built structures within and neighbouring the site.

Trees in Relation to Subsidence, Heave and Direct Damage

- This report does not deal with matters concerning subsidence or heave to any existing built structure on or neighbouring the site. It may be prudent to consider the effects of heave on any built structure if trees are to be removed.
- Similarly, the issue of direct damage (physical damage caused by tree roots) is not dealt with in this report.

Trees Subject to Statutory Controls

- Whilst Bartlett Consulting has made attempts to ascertain if any of the trees subject to this report are 'protected', their status may be subject to change. Therefore the final responsibility for checking statutory protection for trees rests with the employed contractor and not with Bartlett Consulting
- Any prescribed tree works to a protected tree are provided due to perceived hazard and risk, and should be considered acceptable by the Local Planning Authority (LPA). However appropriate notification must still be provided to the LPA as they may take an alternative point of view.

Trees Subject to Environmental Factors

- The statements, findings and preliminary recommendations made within this report do not take into account any effects of extreme climate and weather incidences, vandalism, changes in the natural and built environment around the tree(s) after the date of this report, nor any damage whether physical, chemical or otherwise.

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APPENDIX 5 REPORT REFERENCES

As a progressive company, we keep abreast of research data relating to Arboriculture. All observations, recommendations and works are based on current industry standard reference material and a selection of pertinent items is shown below.

This survey and report has evolved from industry material including the following:

- O'Callaghan & Lawson (1995) *Trees and Development Conflicts: Importance of Advanced Planning & Site Control in Tree Preservation Plans*
- Matheny & Clark (1998) *Trees and Development a Technical Guide*
- BS 5837: (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations*
- BS 3998: (2010) *Tree Works - Recommendations*
- Town & Country Planning Act (Tree Preservation) (England) Regulations 2012
- Mattheck, C, Bethge K, Weber K. (2015) *The Body Language of Trees – Encyclopaedia of Visual Tree Assessment*
  Karlsruhe Institute of Technology Campus North.

Bartlett Consulting's arboricultural expertise has been used to interpret these references for practical application to the site and the trees which are the subject of this report, and to provide the most appropriate advice and guidance at this stage of project planning.

APPENDIX 6 GLOSSARY

Abiotic. Pertaining to non-living agents; e.g. environmental factors.
Absorptive roots. Non-woody, short-lived roots, generally having a diameter of less than one millimetre, the primary function of which is uptake of water and nutrients
Adaptive growth. In tree biomechanics, the process whereby the rate of wood formation in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium. This helps to maintain a uniform distribution of mechanical stress.
Adaptive roots. The adaptive growth of existing roots; or the production of new roots in response to damage, decay or altered mechanical loading.
Ancient tree. A specimen that has passed maturity, is very old in comparison to other trees of the same species and is in the final stage of its life. Ancient trees are important ecological assets in the landscape.
Architecture. In a tree, a term describing the pattern of branching of the crown or root system.
Bacteria. Microscopic single-celled organisms, many species of which break down dead organic matter, and some of which cause diseases in other organisms.
Bark. A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, hard and rigid with protective capabilities.
Bifurcation. The junction where single stems/branches divide into two at a union, sometimes implying that the two stems above the union are of similar size (see co-dominance).
Biotic. Pertaining to living agents; e.g. viruses, bacteria, fungi, plants & animals.
Bracing. The use of rods or cables to restrain the movement between parts of a tree.
Branch:

- **Scaffold.** A first order branch arising from a stem
- **Lateral.** A second order branch, subordinate to a scaffold branch or stem and bearing sub-lateral branches
- **Sub-lateral.** A third order branch, subordinate to a lateral or scaffold branch, or stem and usually bearing only twigs

Branch bark ridge. The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem.
Branch collar. A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base.
Brown-rot. A type of wood decay in which cellulose is degraded, while lignin is only modified.
Buckling. An irreversible deformation of a structure subjected to a bending load.
Canker. A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria
Co-dominance. In a woodland, a tree whose crown is at the general level of the canopy. Alternatively, within the crown of a tree, branches/stems of equal size above a union.
Compartmentalization. The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region.
Compression strength. The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees with special drilling devices.
Compression. A force which pushes and tends to compress. The material fails by being crushed or by buckling (following sideways deflection).
Condition. An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree
Conservation Area (CA). A geographical area recognized in the Town and Country Planning Act 1990 as being *'of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance'.*
Crown/Canopy. The main foliage bearing section of the tree
Crown Clean. The removal of dead, dying, damaged or diseased branches from the crown of a tree. Sometimes called 'dead wooding'.
Crown Lifting. The removal of limbs and/or small branches to achieve a specified vertical clearance above ground level or other surface.
Crown Reduction/shaping. An operation that results in an overall reduction in the height and/or spread of the crown of a tree by means of a general shortening of twigs and/or branches, whilst retaining the main framework of the crown and preserving, as far as possible, the natural tree shape.
Crown Thinning. The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure.
Defect. Any feature of a tree that is likely to make it less safe (in the case of a structural defect) or otherwise to reduce its health, longevity, landscape prominence or conservation value for any other reason.
Dieback. The death of parts of a woody plant, starting at shoot-tips or root-tips.
Disease. A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms.
Dominance. In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours.
Dysfunction. In woody tissues, the loss of physiological function, especially water conduction, in sapwood.
DBH (Diameter at Breast Height). Stem diameter measured at a height of 1.5m or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified.
Deadwood. Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard.
Epicormic shoot. A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot.
Felling licence. In the UK, a permit to fell trees in excess of a stipulated number of stems or volume of timber.
Formative pruning. Pruning of young trees to modify their form at maturity, either to avoid future structural defects (for instance by singling a twin-stem) or to create a desired cultivated tree form.
Flush-cut. A pruning cut which removes part of the branch bark ridge and or branch-collar.
Girdling root. A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue
Habit. The overall growth characteristics, shape of the tree and branch structure.
Harm. Personal injury or death, property damage, or disruption of activities.
Hazard. An element of tree risk: the tree part(s) with a capacity to cause damage or injury.
Hazard beam. A curved woody stem, where loading tends to bend it against the direction of curvature. They have a tendency to split longitudinally through the centre due to strongly opposing internal stresses.
Heartwood/false-heartwood/ripe wood. Sapwood that has become dysfunctional as part of the natural aging processes.

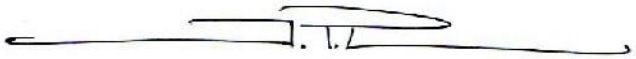
Included bark (ingrown bark). Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact.
Infection. The establishment of a parasitic micro-organism in the tissues of a tree or other organism.
Lever arm. A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch.
Lions tailing. A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading.
Loading. A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure.
Longitudinal. Along the length (of a stem, root or branch)
Lopping. A term often used to describe the removal of large branches from a tree, but also used to describe other forms of cutting.
Minor deadwood. Deadwood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree.
Mulch. Material laid down over the rooting area of a tree or other plant to help conserve moisture; a mulch may consist of organic matter or a sheet of plastic or other artificial material.
Natural bracing. A natural/grown structure formed above a union in the crown of a tree, which restricts the movement of the constituent union parts. Without mechanical stimulus, the centre of a union may not develop normally.
Occlusion. The process whereby a wound is progressively closed by the formation of new wood and bark around it.
Photosynthesis. The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products.
Pollarding. The removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.
Pruning. The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs.
Reactive Growth/Reaction Wood. Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth).
Risk. The combination of the likelihood of an event and the severity of the potential consequences.
Risk Assessment. The process of risk identification, analysis and evaluation.
Root zone. Area of soils surrounding a tree likely to contain absorptive and/or structural roots of the tree/s. The Primary root zone is that which we consider of primary importance to the physiological well-being of the tree.
Saprophyte: a fungi which uses non-living organic material and works beneficially for its host, recycling carbon, nitrogen, and other nutrients.
Sapwood. Living xylem tissues.
Selective delignification. A kind of wood decay (white-rot) in which lignin is degraded faster than cellulose.
Simultaneous white-rot. A kind of wood decay in which lignin and cellulose are degraded at about the same rate.
Soft-rot. A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole.
Shrub species. Woody perennial species forming the lowest level of woody plants in a woodland and not normally considered to be trees.
Stem/s. The main supporting structure/s, from ground level up to the first major division into branches.
Stress. In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature.
Stress. In mechanics, the application of a force to an object
Structural roots. Roots, generally having a diameter greater than ten millimetres, and contributing significantly to the structural support and stability of the tree.
Stub (snag). In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing-point or dormant bud; a snag usually tends to die back to the nearest growing point.
Taper. In stems and branches, the degree of change in girth along a given length.
Targets. In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it.
Tension. A force which pulls and tends to stretch. A material in tension may suffer ductile failure or brittle failure.
Topping. In arboriculture, the removal of the crown of a tree, or of a major proportion of it.
Tree Preservation Order (TPO). An order made by a local planning authority in England to protect specific trees, groups of trees or woodlands in the interests of amenity.
Understorey. A layer of vegetation beneath the main canopy of woodland or forest or plants.
Union. The area of physiological division of one primary tree stem/branch into two or more secondary members, commonly referred to as 'fork'.
Vascular wilt. A type of plant disease in which water-conducting cells become dysfunctional.
Veteran tree. A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned.
Vigour. The health and resilience of a tree (from the Latin 'to be strong'), reflected in the capacity of the whole tree to grow. The term is often used as a description of overall condition on a qualitative scale from 'high' to 'low'.
Vitality. A close synonym of vigour reserved for active processes in a tree that do not result in the capacity for growth, for instance a tree's response to injury, insect attack or disease.
VTA. Visual Tree Assessment. A structured and systematic evaluation of a tree considering biological and mechanical functions and systems, arriving at a failure criteria and tree management recommendations.
White-rot. A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded.
Wind exposure. The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity.
Wind pressure. The force exerted by a wind on a particular object.
Windthrow. The blowing over of a tree at its roots.
Woundwood. Wood with atypical anatomical features, developed in response to a wound, often resulting in a swelling (as round a pruning wound) which gradually occludes the wound.

We trust that the contents and recommendations contained within this report were informative, easy to understand and helpful to you, with regards to managing your tree. Should you have any further questions or concerns, please do not hesitate to contact us again.

REPORT CLASSIFICATION: Part 1: BS: 5837 Tree Survey & Constraints Plan

REPORT STATUS: Final

REPORT COMPLETED BY: Mr James Percy-Lancaster Cert Arb L4 (ABC) *TechArborA*
Senior Arboricultural Consultant



SIGNATURE:

DATE: Friday 19th August 2020

Part 2: BS: 5837 Arboricultural Implications Assessment & 'Draft' Tree Protection Plan Report

Site:

St. Christopher's School
32 Belsize Lane
Hampstead
London
NW3 5AE.

Date of Site Visit:

Tuesday 4th August 2020

Prepared for:

St. Christopher's School

Prepared by:

James Percy-Lancaster Cert Arb L4 (ABC) *TechArborA*
ISA Tree Risk Assessment Qualified

Bartlett Project Reference:

JPL/200255/R2/sh

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Submitted on 21st August 2020

TABLE OF CONTENTS

1.0 SCOPE OF REPORT

1.1 Instruction

1.1.0 Bartlett Consulting has previously been instructed to undertake a tree survey and compose a Tree Constraints Plan (TCP) in accordance with British Standard 5837: 2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*, gathering data on trees and vegetation within the boundary of St Christopher's School, 32 Belsize Lane, Hampstead, London as well as those on neighbouring properties considered to be within influencing distance. Data pertaining to four trees within the curtilage of Belsize Court, Wedderburn Road were obtained.

1.1.1 This report takes the previously gathered tree data and constraints, and overlays that information with the proposed site plan and proposed site layout, allowing for an evaluation of how the proposed single storey front extension and single storey side infill extension will co-exist with the tree population. Where there are tree which have the potential to influence, those trees must be considered as a constraint within the project planning.

1.2 Documents & Supporting Information

1.2.0 Bartlett Consulting was provided with the following documentation and plans prior to the site visit & tree survey. They were sent via email in DWG file format:

• 2026_GL_000 St_Chrstopher.dwg	• 2026_GA_012 St_Chrstopher.dwg
• 2026_GL_001 St_Chrstopher.dwg	• 2026_GE_001 St_Chrstopher.dwg
• 2026_GL_002 St_Chrstopher.dwg	• 2026_GE_002 St_Chrstopher.dwg
• 2026_GL_012 St_Chrstopher.dwg	• 2026_GE_011 St_Chrstopher.dwg
• 2026_GA_001 St_Chrstopher.dwg	• 2026_GE_012 St_Chrstopher.dwg
• 2026_GA_002 St_Chrstopher.dwg	• 2026_GS_001 St_Chrstopher.dwg
• 2026_GA_011 St_Chrstopher.dwg	• 2026_GS_011 St_Chrstopher.dwg

1.3 Aspects Included within Report

1.3.0 The information contained within this report is fully compliant with British Standard 5837 2012: *Trees in Relation to Design, Demolition and Construction – Recommendations*.

1.3.1 This Arboricultural Impact Assessment (AIA) is accompanied by a 'draft' Tree Protection Plan (dTPP). This plan illustrates trees to be retained and incorporated into the proposed development, identifies where above and below ground level constraints are caused and gives consideration to statutory controls, as well as the potential loss of trees on and adjacent to the site. Issues also considered identify any necessity to undertake facilitation pruning to retained trees, either arising from accommodation, excessive shading or due to an unacceptable amount of encroachment upon a retained trees rooting zone.

1.3.2 The dTPP also identifies recommended locations of physical tree protection barriers, non-compacting ground protection, and site specific working methodologies.

1.3.4 Mitigation measures are also provided within this report, identifying the need for physical tree protection barriers, non-compacting ground protection, as well as tree replacement planting.

1.3.5 Modified RPA's will be illustrated if known below ground level obstructions exist, or where considered appropriate to do so, whilst tree shade patterns and future canopy spread for young trees will also be illustrated where necessary.

1.0 SCOPE OF REPORT (Continued…)

1.4 Aspects Excluded from the Report

1.4.0 This report does not include an Arboricultural Method Statement (AMS), or a 'final' Tree Protection Plan (TPP).

1.4.1 The contents of this report do not include discussions regarding subsidence and/or heave as a result of retention or tree removal, nor does this report consider the water demands of trees present to determine foundation design and depth. If required, this can be provided on request.

1.4.2 Following the initial site visit and tree survey, we believe that there is a low potential for wildlife and ecological associations with the tree subject to this report. Ecological associations are considered to be limited to nesting birds within the crowns of trees.

1.4.3 The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats, insects and other species that inhabit trees, hedgerows, or other associated vegetation. Ecological considerations that involve EU Habitats Directive will over rule any arboricultural recommendations as given within this report.

1.4.4 It is the recommendation of Bartlett Consulting that professional, detailed, advice from an ecologist is sought (if not done-so already) to confirm the consideration of Bartlett Consulting and to check if any such constraints apply to this site and its development proposals.

1.4.5 All trees must be thoroughly and properly assessed for nesting birds prior to the commencement of any recommended tree works.

2.0 IMPLICATIONS OF PROPOSED DEVELOPMENT UPON EXISTING TREE POPULATION

2.1 Description of the Proposed Development

2.1.0 From the information provided to us and listed in Section 1.2 above, it is our understanding that the following aspects of proposed development which influence, or are influenced by the existing trees are:

1. Construction of front classroom extension.
2. Construction of the side infill extension.

2.2 Table 1: Implications of Proposed Development upon Existing Tree Population

Tree Ref.	Species	Category	Removal due to		Mitigation Required		Aspect of Development affecting retained tree
			Works	Condition	Crown	RPA	
T01	Sycamore *(Acer pseudoplatanus)*	B2	N/A	N/A	N/A	N/A	• No issues
T02	Sycamore *(Acer pseudoplatanus)*	B2	N/A	N/A	N/A	N/A	• No issues
T03	Sycamore *(Acer pseudoplatanus)*	C2	N/A	N/A	N/A	N/A	• No issues
T04	Common Horse Chestnut *(Aesculus hippocastanum)*	B2	N/A	N/A	N/A	N/A	• No issues
T05	Japanese spindle *(Euonymus japonicus)*	C2	N/A	N/A	✓	✓	• Adjacent to designated material storage area.
T06	London Plane *(Platanus x hispanica)*	A2	N/A	N/A	N/A	✓	• RPA adjacent to designated material storage area.
T07	Norway Maple *(Acer platanoides)*	C2	N/A	N/A	N/A	✓	• No issues
TG08	Group consisting of: Viburnum Cotoneaster Mexican orange Forsythia	C2	N/A	N/A	N/A	✓	• No issues

2.0 IMPLICATIONS OF PROPOSED DEVELOPMENT UPON EXISTING TREE POPULATION (continued…)

2.3 Table 2: Mitigation Measures Required for the Proposed Development & Existing Tree Conflicts

Tree Ref	Species	Category	Mitigation Required
T01	Sycamore *(Acer pseudoplatanus)*	B2	• None required.
T02	Sycamore *(Acer pseudoplatanus)*	B2	• None required.
T03	Sycamore *(Acer pseudoplatanus)*	C2	• None required.
T04	Common Horse Chestnut *(Aesculus hippocastanum)*	B2	• None required.
T05	Japanese spindle *(Euonymus japonicus)*	C2	• Erection of robust Tree Protection Barriers.
T06	London Plane *(Platanus x hispanica)*	A2	• Erection of robust Tree Protection Barriers.
T07	Norway Maple *(Acer platanoides)*	C2	• Erection of robust Tree Protection Barriers.
TG08	Group consisting of: Viburnum Cotoneaster Mexican orange Forsythia	C2	• Erection of robust Tree Protection Barriers.

2.0 IMPLICATIONS OF PROPOSED DEVELOPMENT UPON EXISTING TREE POPULATION (continued…)

2.4 Table 3: Tree Work

Tree Ref	Species	Category	Schedule of works prior to erection of tree protection barriers
T01	Sycamore *(Acer pseudoplatanus)*	B2	• No tree works presently required to facilitate proposed development works.
T02	Sycamore *(Acer pseudoplatanus)*	B2	• No tree works presently required to facilitate proposed development works.
T03	Sycamore *(Acer pseudoplatanus)*	C2	• No tree works presently required to facilitate proposed development works.
T04	Common Horse Chestnut *(Aesculus hippocastanum)*	B2	• No tree works presently required to facilitate proposed development works.
T05	Japanese spindle *(Euonymus japonicus)*	C2	• No tree works presently required to facilitate proposed development works.
T06	London Plane *(Platanus x hispanica)*	A2	• No tree works presently required to facilitate proposed development works.
T07	Norway Maple *(Acer platanoides)*	C2	• No tree works presently required to facilitate proposed development works.
TG08	Group consisting of: Viburnum Cotoneaster Mexican orange Forsythia	C2	• No tree works presently required to facilitate proposed development works.

3.0 SUMMARY OF IMPLICATIONS ASSESSMENT

3.1 Table 4: BS: 5837 Categories & Tree Loss

BS: 5837 Category	Number
A	0
B	0
C	0
U	0
Total	0

3.2 Tree Loss

3.2.0 The proposed front classroom extension and infill side extension does not necessitate the loss of any trees or hedgerows and as such there is not anticipated impact upon the local green landscape, or the wider landscape. There will be no visual impact upon the current public amenity that the site currently provides.

3.3 Discussion of Impacts

3.3.1 Direct Impacts:

3.3.2 The mathematical formula applied for calculated the trees Root Protection Area (RPA) as per BS: 5837 (2012) would normally provide a circle surrounding each tree within and adjacent to the application site. However, in this instance, the calculated RPAs of trees T01, T02, T03 and T04 have all been amended to reflect the physical constraint of the application site.

3.3.3 Each tree's calculated RPA has been off-set to the north, primarily due to the presence of the large retaining wall, backing on the southern boundary wall with Belsize Court. Given the difference in land levels between the two sites, we do not anticipate any tree roots to have developed below the approximately 3.0 metre high retaining wall to have trespassed into the application site of St Christopher's School.

3.3.4 As such we do not anticipate any detrimental impact to be expressed to trees T01, T02, T03 and T04.

3.3.5 The trees contained within the application site are essentially grouped together within a designated children's play area. The play area features existing railings, further assisting with creating an exclusion zone.

3.3.6 The calculated RPA for T06 – London Plane occupies a significant area, approximately 552 square metres, extending towards the front of the classroom buildings but falls short and is restricted to the area of existing hard standing on the east side.

3.3.7 Due to the constraints posed by the size, free space will be considered a premium, however it is critical that the RPA of T06 is provided a degree of exclusion during the construction process associated with the development works on site.

3.3.8 We are not aware that any changes are proposed to the areas of hard standing to the front of the classroom buildings or within the calculated RPA of T05.

3.3.9 We are not aware of the necessity to provide any additional underground services on site.

3.0 SUMMARY OF IMPLICATIONS ASSESSMENT (Continued…)

3.3 Discussion of Impacts (Continued…)

3.3.10 Indirect Impacts:

3.3.11 All site traffic shall enter the site via the primary and existing vehicular ingress/egress leading from Belsize Lane.

3.3.12 We do not anticipate any compaction to occur within the calculated RPAs of any retained trees within or adjacent to the site. The existing areas of hard standing will be occupied during the course of construction activities.

3.3.13 We have identified areas on site suitable for the designation of material storage areas, please refer to the 'draft' Tree Protection Plan for further information.

3.4 Infrastructure Requirements

3.4.0 Ground use planning should form part of the development project, with existing and/or proposed utility corridors identified on the proposed plans. It is strongly recommended that service ducts are shared across the service providers to limit further ground works and site disturbance.

3.4.1 Proposed service runs should be designed with full consideration to the guidance and recommendations of National Joint Utilities Guidelines No.10 – Volume 04: *Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* and avoid the notional RPA of retained trees in all circumstances, in the first instance.

3.4.2 If services are proposed through a notional RPA of any retained tree, professional arboricultural advice must be sought to ensure that any potential impact is kept to a minimum. Proposed trenches will be highlighted for excavation using an air spade or thrust boring techniques should be employed to install underground utility services beneath the trees rooting zone. These matters will be detailed in the Arboricultural Method Statement.

3.5 Erection of Tree Protection Barriers and Laying of Non-Compacting Ground Protection

3.5.0 In order to safeguard the retained trees on the site, it will be necessary to erect tree protective barriers prior to the commencement of works on site and to ensure that they remain in-situ for the duration of the project, unless otherwise directed.

3.5.1 The proposals presently do not necessitate the installation of non-compacting ground protection.

3.0 SUMMARY OF IMPLICATIONS ASSESSMENT (Continued…)

3.6 Shading of Retained Tree/s

3.6.0 We have identified from composing the Tree Constraints Plan, that T06 – London Plane shall cast a shadow upon the existing classroom and in turn to the proposed front extension. However this is an existing feature of the site and not regarded as a constraint, but rather a benefit to all.

3.6.1 Other 'common nuisance' issues such as leaf litter, flowers and sap can be addressed through careful and site specific design including: filtration for rainwater guttering of either mesh or "bristle" inserts; the incorporation of discreet ladder attachment points under the eaves; sufficient clearance between the edge of the roof and the guttering to facilitate ease of maintenance; fitting the downpipes with easily cleanable traps.

3.6.2 Further design features can be roof lighting, wider bay windows and doors, or reviewing the orientation of floor plans and living spaces where sunlight is more desirable to ensure natural and ambient light reaches these spaces.

3.7 Potential Growth and/or nuisance of retained trees

3.7.0 The designers should be minded that all trees located within the site will require continued management.

3.7.1 Leaf fall must be considered at this stage, as drains and guttering would potentially be affected by fallen leaves/needles, particularly during autumn months. As a result, the installation of gutter guards are considered to be pertinent to nuisance mitigation.

4.0 APPRAISAL OF TREE LOSS & RETENTION

4.1 Table 5: Summary of Trees

BS: 5837 Category	Remove	Retained		Total
		Tree work	No works	
A	0	0	1	1
B	0	0	3	3
C	0	0	4	4
U	0	0	0	0
Total	0	0	8	8

APPENDIX 1 LIMITATIONS OF REPORT

Limitations of the Arboricultural Implications Assessment

- This assessment is based upon information obtained from the BS: 5837 Tree Survey.
- All dimensions and measurement are based upon previously obtained data the BS: 5837 Tree Survey and from drawings provided to Bartlett Consulting.
- This assessment considers the possible implications to the proposed built structures. Suggestions from an arboricultural perspective may be provided outlining an alternative site layout. Such suggestions must be considered by the project Architect/Designer/or Engineer before implementing any suggestions.

Data on which the Assessment is based

- Validity, accuracy and findings of the report are directed by the accuracy of information provided to Bartlett Consulting at the time of conducting the tree survey and during report writing.
- Checking of independent data/information will not be undertaken, with particular reference given to scaled maps and drawings provided to Bartlett Consulting

Validation of the Assessment

- The assessment considerations/findings in this report remain valid for a period of one year, from the date of issuance.
- Such considerations/findings will become invalid if any building works are undertaken, soil levels altered, or any unsolicited tree works undertaken.
- If any alterations to the existing building structures, or soil levels, or if any unsolicited tree works have been completed, it is the recommendation of Bartlett Consulting that a new BS: 5837 Tree Survey/report is undertaken to reflect these changes.

Trees in Relation to other Properties

- This assessment only considers the trees in relation to the site and the proposed structures within it, as identified.
- The assessment does not comment upon trees in relation to structures beyond the boundaries of the site as identified (third party properties).
- Consideration of potential impact upon neighbouring built structures may be provided if pertinent, in the instances where boundary tree planting is proposed/required.
- Damage to, or potential damage to, any other built structures that is not referred to within this report are not considered, unless otherwise stated. This includes both neighbouring structures as well as any other structure on the site.

Trees in Relation to Subsidence, Heave and Direct Damage

- This report does not deal with matters concerning subsidence or heave to any existing built structure on or neighbouring the site. It may be prudent to consider the effects of heave on any built structure if trees are to be removed.
- Similarly, the issue of direct damage (physical damage caused by tree roots) is not dealt with in this report.

Trees Subject to Statutory Controls

- Whilst Bartlett Consulting has made attempts to ascertain if any of the trees subject to this report are 'protected', their status is always subject to change. Therefore the final responsibility for checking statutory protection for trees rests with the employed contractor and not with Bartlett Consulting
- Any prescribed tree works to a protected tree are provided due to perceived hazard and risk, and should be considered acceptable by the Local Planning Authority (LPA). However appropriate notification must still be provided to the LPA as they may take an alternative point of view.

Trees Subject to Environmental Factors

- The statements, findings and preliminary recommendations made within this report do not take into account any effects of extreme climate and weather incidences, vandalism, changes in the natural and built environment around the tree(s) after the date of this report, nor any damage whether physical, chemical or otherwise.

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APPENDIX 2 REPORT REFERENCES

As a progressive company, we keep abreast of research data relating to Arboriculture. All observations, recommendations and works are based on current industry standard reference material and a selection of pertinent items is shown below.

This survey and report has evolved from industry material including the following:

- BS 5837: (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations*
- BS 3998: (2010) *Tree Works - Recommendations*
- Town & Country Planning Act (Tree Preservation) (England) Regulations 2012
- Town & Country Planning Act (As amended) 1990
- Mattheck, C, Bethge K, Weber K. (2015) *The Body Language of Trees – Encyclopaedia of Visual Tree Assessment*
  Karlsruhe Institute of Technology Campus North.
- National Joint Utilities Group (2007) *Publication Volume 4: Issue 2 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.*
- National House Building Council Standard, Part 4.2 – *Building Near Trees*

Bartlett Consulting's arboricultural expertise has been used to interpret these references for practical application to the site and the trees which are the subject of this report, and to provide the most appropriate advice and guidance at this stage of project planning.

APPENDIX 3 TREE PROTECTION PLANNING

The draft Tree Protection Plan (dTPP) referenced JPL/200255/dTPP can be found as an appendix at the end of this report. The TPP has been prepared in accordance with Section 7.1 of British Standard 5837:2012.

Either tree protective fencing or ground protection will be required to safe-guard the trees against damage which may be sustained throughout redevelopment of the site, and this plan is indicative of the anticipated locations and/or zone of tree protection measures. The TPP has also been annotated to show indicative locations where, from an Arboricultural perspective, there is free space for the various demolition and construction requirements as well as site huts, outside of the zone of influence for tree protection & preservation.

The TPP has been drafted at this early stage to inform the client and landowners of these requirements, as well as illustrate how the tree protection measures and tree constraints may influence the free space around the site once development commences.

Vertical Barriers: physical protection measures for the retained trees, which will ensure that the designated RPA becomes an exclusion zone during any stage of development. Fencing will prevent machinery, men, materials, and other site activities from occurring within the RPA or damaging the tree crown.

Vertical barriers should be fit for the purpose of excluding construction activities, and appropriate to the degree and proximity of the site operations. A final specification will be provided once the layout has been finalised and agreed by all parties. An illustration has been included below for reference however.

The vertical barriers shall completely exclude access during all phases of site operations. The protected areas shall not be used for the storage of materials or spoil, nor for the mixing of substances or the disposal of any residues. Materials, equipment and arising debris will not be stacked against the vertical barrier, even temporarily. A4 sized Notice Signs must be laminated and attached to the vertical barrier at regular intervals so all visitors and operatives are aware of the tree protection requirements.

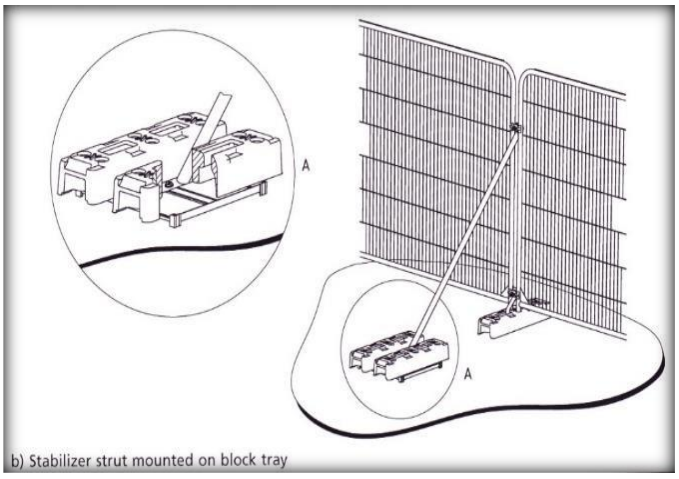


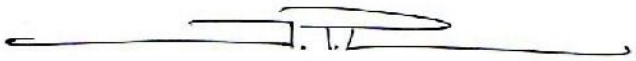
Figure 1: Illustration of Vertical Tree Protection Barrier

We trust that the contents and recommendations contained within this report were informative, easy to understand and helpful to you, with regards to managing your tree. Should you have any further questions or concerns, please do not hesitate to contact us again.

REPORT CLASSIFICATION: BS: 5837 Arboricultural Implications Assessment & Draft Tree Protection Plan

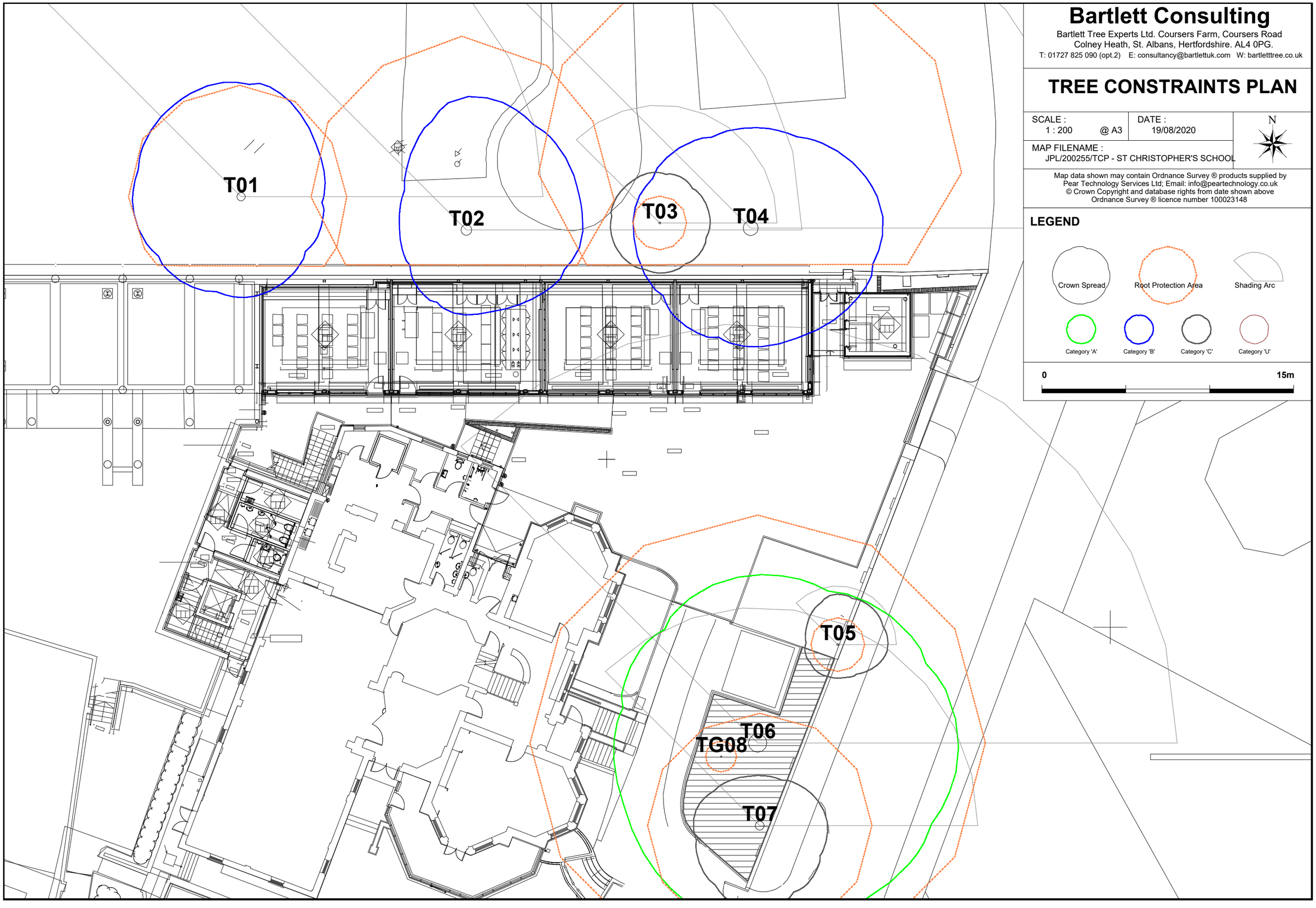
REPORT STATUS: Final

REPORT COMPLETED BY: Mr James Percy-Lancaster Cert Arb L4 (ABC) *TechArborA*
Senior Arboricultural Consultant



SIGNATURE:

DATE: Friday 20th August 2020



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TREE CONSTRAINTS PLAN

SCALE : 1 : 200 @ A3

DATE : 19/08/2020

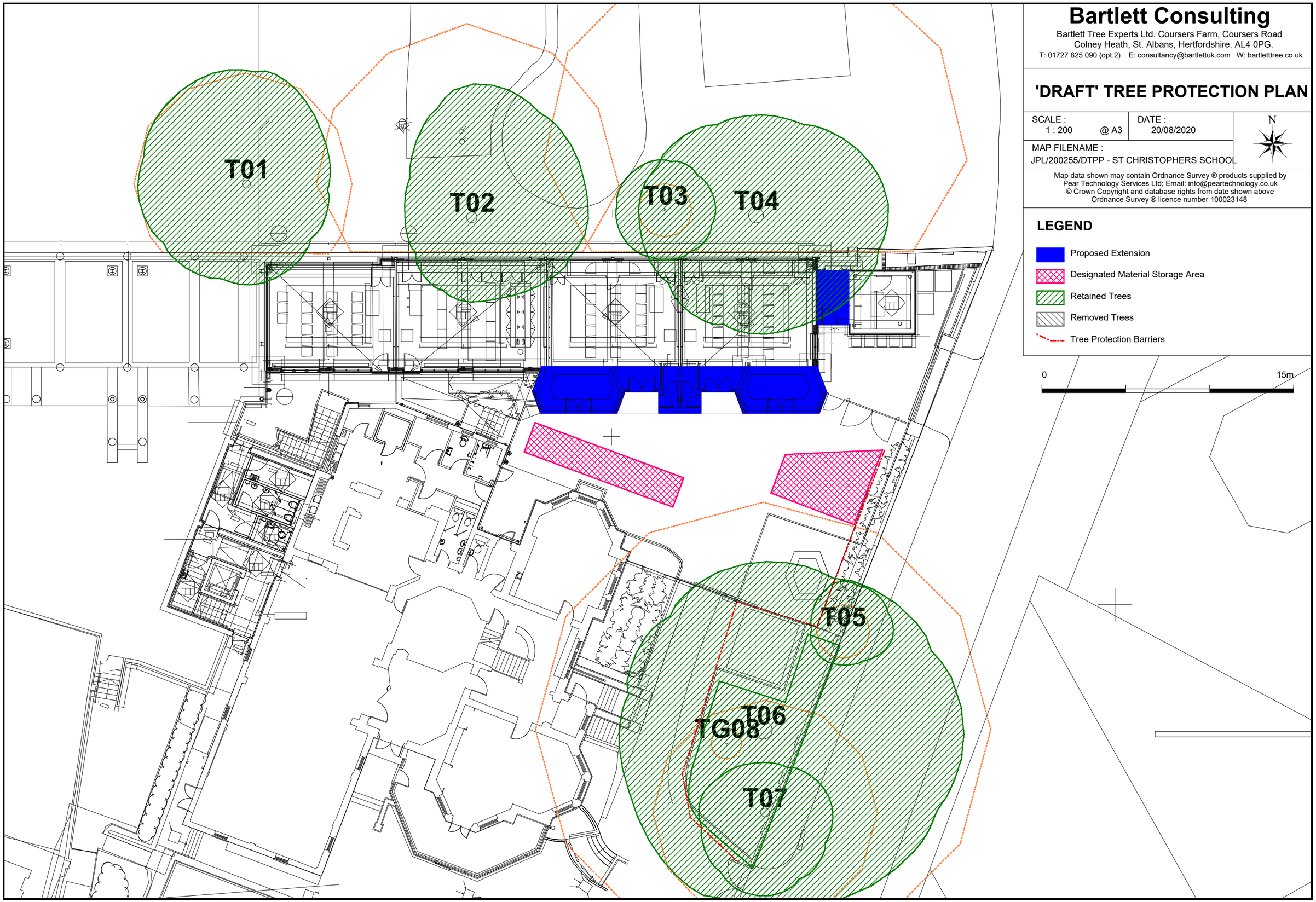
N

MAP FILENAME : JPL/200255/TCP - ST CHRISTOPHER'S SCHOOL

LEGEND

Crown Spread
Root Protection Area
Shading Arc
Category 'A'
Category 'B'
Category 'C'
Category 'U'

0 15m



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'DRAFT' TREE PROTECTION PLAN

SCALE : 1 : 200 @ A3

DATE : 20/08/2020

N

MAP FILENAME : JPL/200255/DTPP - ST CHRISTOPHERS SCHOOL

LEGEND

- Proposed Extension
- Designated Material Storage Area
- Retained Trees
- Removed Trees
- Tree Protection Barriers

0 15m