



ARBORICULTURAL IMPACT ASSESSMENT REPORT
SITE: 13 Lambolle Road, NW3 4HS, Camden
CLIENT: c/o Exedra Architects



**ENVIROARB
SOLUTIONS**

Paul Allen DipArb (RFS) MICFor MarborA

24th September 2024 EAS-205

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1.0 EXECUTIVE SUMMARY

- 1.1 The site is currently a private residential dwelling set within its own grounds. It is located on Lambolle Road in Camden, Greater London. The postcode is within the Belsize ward / electoral division, which is in the constituency of Hampstead and Highgate.
- 1.2 The trees on the site are primarily within and surround each boundary of the rear garden with early mature and mature trees of modest to high amenity value with younger trees located within shrub borders within the rear garden, most of which are of lower quality and landscape value.
- 1.3 The subject development proposal, relevant to the trees within and adjacent to the rear garden, is for the 'permitted' construction of a rear garden room / gym towards the southern boundary of the rear garden hidden amongst the surrounding trees.
- 1.4 The primary tree related issues are:
- 1.4.1 The full retention and protection of all the surveyed trees within and immediately adjacent to the development area. This is due to some of the subject trees being 3rd party owned and / or all the trees being located within Belsize Park Conservation Area, thereby affording them statutory protection.
- 1.4.2 The protection of any underlying tree roots, due to the proposed garden room being located within retained tree Root Protection Areas (RPA). This will be achieved by undertaking a TREE RADAR GPR survey of the site in order to seek to identify the location of major tree roots in order to design a specialised 'no-dig' foundation solution for the garden room using ground screw piles.
- 1.5 A summary of the affected trees is detailed in the table below:

Arboricultural Impact	Reason for Impact	A	B	C	U
Trees to be removed: - Development - Poor Condition	To facilitate the development or due to their condition (U cat)	None	None	None	None
Trees with RPA encroachment	To facilitate construction	None	T5, T9, T15	T6, T11-T14, T16-T25	None
Retained trees to be pruned	For Arboricultural maintenance	None	None	T10-T14, T16 & T17, T18-T25, H1	None

2.0 REPORT METHODOLOGY

2.1 EnviroArb Solutions Ltd (EAS) aim is to provide “fit for purpose” field survey, data capture and report based on the client brief. EAS approach broadly follows the guidance contained in “Trees in relation to demolition, design and construction – Recommendations” (BS5837:2012); however, the use of any terms or concepts contained within it does not imply EnviroArb Solutions Ltd acceptance of their validity or accuracy and the use of any section or concept contained within the standard is on the principle of its advisory status as guidance.

3.0 SCOPE

3.1 EnviroArb Solutions Ltd has surveyed the key trees on and adjacent to the site and has provided guidance within this report on the measures necessary to ensure successful tree retention during any development, with recommendations for tree removal and / or tree works as necessary. The scope was as follows:

3.2 To visit the site and complete a survey of trees, shrubs, hedgerows and other vegetation that may materially be of interest relative to development proposals.

3.3 To assess the likely impacts of the development on the trees and make ‘in principle’ recommendations relating to tree removals, tree retention and tree protection during development.

3.4 To carry out an arboricultural impact assessment on the effect of the new development at the site, identifying the Construction Exclusion Zones (CEZ) that are shown on the Tree Protection Plan (TPP). This plan will also show the locations for tree protective fencing and any temporary ground protection required, as well as identifying ‘No-Dig’ zones for any RPAs shown to be outside of CEZs.

3.5 To produce a Tree Constraints Plan (TCP), showing the locations of surveyed trees, their BS5837:2012 categorisation and the theoretical Root Protection Areas (RPAs).


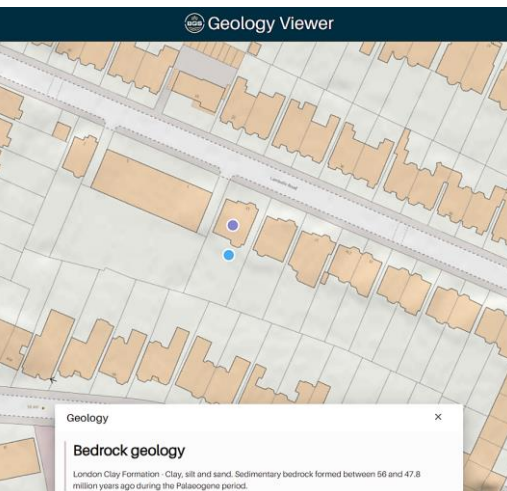
3.6 To make any other observations or recommendations required based on the survey.

4.0 PLANS AND REFERENCE DOCUMENTS

- 4.1 BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'
- 4.2 BS3998:2010 'Tree work – recommendations'
- 4.3 NJUG 4 – National Joint Utilities Group "Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Volume 4, issue 2. London: NJUG 2007"
- 4.4 Information from the London Borough of Camden Council local plan and website
- 4.5 BGS Open-Source Soil Data <http://www.bgs.ac.uk/nercsoilportal/maps.html>
- 4.6 We understand that the scheme is currently at the design stage.

5.0 DESCRIPTION OF SITE GEOLOGY

- 5.1 The site is a private residential dwelling set within its own grounds. It is located on Lambolle Road in Camden, Greater London. The postcode is within the Belsize ward / electoral division, which is in the constituency of Hampstead and Highgate.
- 5.2 The immediate and distant landscape character is urban residential. The topography is mostly level with steps up to a slightly raised rear garden / lawn area.

Site Location (OS)	Site Location (BGS Soil)
 An Ordnance Survey (OS) map showing a residential street named Lambolle Road. The map displays several buildings with yellow outlines and a blue dot indicating the site location. The road is labeled 'Lambolle Road'.	 A screenshot of the British Geology Survey (BGS) Geology Viewer. The map shows the same residential street as the OS map, with a blue dot indicating the site location. A pop-up window titled 'Bedrock geology' is visible, providing details about the London Clay Formation. The text in the pop-up reads: 'Bedrock geology', 'London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.'
British Geology Survey (Online) – Soils Summary: London Clay Formation - Clay, silt and sand.	

- 5.3 The underlying site soil has been identified as CLAY, and great care should therefore be taken to ensure no compaction of the soils occurs within the identified RPAs, as this soil type is less favourable to tree root growth / moisture movement and aeration.
- 5.4 All comments regarding soils should be verified with on-site geotechnical investigations and laboratory testing, with foundation depth and design determined by a structural engineer in accordance with the requirements of NHBC Chapter 4.2.

6.0 THE TREES

6.1 There were 25 individual trees, 2 shrub groups and 1 garden hedge surveyed on-site or immediately adjacent to the site boundary.

6.2 By BS5837:2012 Categorisation, the individual trees can be summarised as follows:

BS 5837 Cat	A	B	C	U
Specific Trees	0	5	20	0
Total Number	0	5	20	0

6.3 By group there were 2 'C' category shrub groups, and 1 'C' category garden hedge located along the western site rear garden boundary.

6.4 These trees' locations and a summary of their visual contributions can be summarised as follows:

BS 5837 Cat	A	B	C
Western Boundary - Contributing to private screening amenity	/	T1, T15	T7, T8, SG2 & H1
Eastern Boundary - Contributing to the private screening amenity	/	T2, T5	T3, T4, SG1
Southern Boundary - Contributing to private screening amenity	/	T9 & T15	T11-T25

6.5 The hedge identified on the site is not likely to be classified as 'important' within the Hedgerow Regulations 1997 as it is a managed garden Yew hedge.

6.6 Our online check with the Local Planning Authority has confirmed that the all the subject surveyed trees are subject to statutory protection due to the site’s location within Belsize Park Conservation Area.

6.7 The dominant tree on the site is the large multiple stemmed Beech tree, T1, located on the northwestern corner of the rear garden close to and proximal to the residential building. Although seemingly healthy it has been subject to multiple pruning and management operations over the years, mainly to crown lift, deadwood and cut back branches from the adjacent buildings. Beech are not known to tolerate this kind of heavy crown management but although misshapen with three remaining leading stems no evidence of pathogenic fungal disease was observed and the crown was healthy in spite of its previous management regime.

7.0 ARBORICULTURAL IMPACT ASSESSMENT

7.1 Tree Removals

7.1.1 No trees are required to be removed as a result of this development proposal.

7.1.2 Recommended tree pruning works are detailed within the Tree Works Schedule at Appendix 5.

Arboricultural Impact	Reason for Impact	A	B	C	U
Retained trees to be pruned	For Arboricultural maintenance	None	None	T10-T14, T16 & T17, T18-T25, H1	None

7.2 ROOT PROTECTION AREA (RPA) INCURSIONS

7.2.1 The following incursions into the RPAs of trees to be retained have been identified:

Arboricultural Impact	Reason for Impact	A	B	C	U
Trees with RPA encroachment	To facilitate construction	None	T5, T9, T15	T6, T11-T14, T16-T25	None

7.2.2 The most significant RPA incursions are for site access for construction activities of the garden room and the location and insertion of proposed specialised ground screws foundations for the building.

7.3 FOUNDATIONS

7.3.1 The minimal impact, 'no-dig' ground screw foundations proposed for the garden room, which, although within the RPAs of adjacent trees, will be located between pre-identified locations of tree roots where possible. Using a specialist contractor, they will scan the area of the garden room and identify the major tree root locations with a Tree Root Morphology Map (see figure 1 below). This will help inform the garden room construction team where they can place ground screw piles to avoid major tree roots as structurally possible.

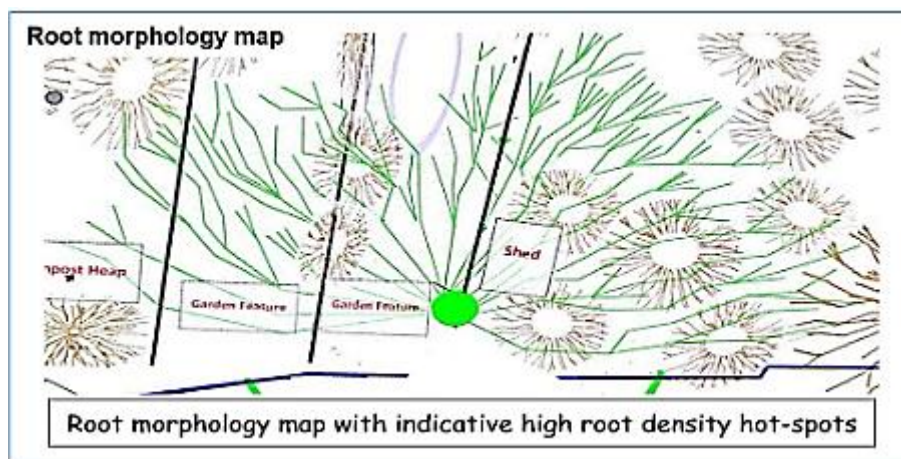


Figure 1 – Example Tree Root Morphology Map¹

7.3.2 In instances where soil conditions are known to be of a shrinkable clay the retained trees have the potential to constrain the foundation design for any adjacent new buildings within influencing distance. Final decisions as to the risks presented by retained / trees upon adjacent new buildings should be subject to detailed site geotechnical information being available, assessed by a structural engineer.

¹ <https://www.peterbartonassociates.uk/treeradar-root-finder>

7.4 HARD SURFACES

7.4.1 The development does not require the installation of new hard surfaces within the RPA of retained trees. Instead, it will utilise the pre-existing installed rear garden path along the western edge of the lawn.

7.4.2 To minimise the disruption on the retained trees during construction of the garden room, it is proposed that temporary ground protection is installed during the construction build process to minimise the soils compaction and potential tree root damage. These areas are indicated on the Tree Protection Plan as at Appendix 4.

7.4.3 Please refer to the relevant Arboricultural Protection Methods (APMs) No.2 & No.10, for full tree protection details on the proposed installation.

7.5 SERVICES

7.5.1 The route of any services needs to be carefully considered so as to avoid unnecessary encroachment into retained trees' RPAs. These should, where possible, not encroach within the RPAs of retained trees. Where excavations slightly encroach into adjacent trees' RPAs, the excavation should only be considered when supervised by the consultant arboriculturist from EnviroArb Solutions Ltd and may need to be undertaken using an 'Airspade' / hand tools.

7.6 GROUND LEVELS

7.6.1 No changes to existing ground levels are proposed within the RPAs of retained trees.

7.7 SHADING

7.7.1 Trees to the south and west of the proposal have the capacity to cast shade on the development area for the proposed garden room. However, as the garden room is not a 'live' living space and one which will be visited / utilised relatively infrequently, any shade cast will not provide for any additional 'Pressure to prune' beyond annual routine arboricultural trimming maintenance of the adjacent trees.

7.8 SITE SUPERVISION / MONITORING

7.8.1 Most damage to trees on development sites is caused inadvertently, and to ensure continued protection during development, a system of site monitoring is proposed.

7.8.2 Basic checks will ensure that protective fencing remains intact. Any unforeseen issues can also be identified and discussed before damage to the trees occurs.

7.8.3 The number of proposed visits is driven by the scale of the proposal. A more detailed explanation of what will be assessed during the proposed monitoring visits is contained in Appendix 6.

7.9 DEMOLITION

7.9.1 No Demolition of existing structures is required for this development proposal.

8.0 RECOMMENDATIONS

8.1 The preliminary tree works we have recommended are contained within the tree works schedule at Appendix 5.

8.2 Our additional recommendations are as follows:

8.2.1 That during the construction build phase, following current consultation with the arboriculturist from Enviroarb-Solutions Ltd, adequate provision is made for the protection of existing trees on site.

8.2.2 That by liaison with the council, formal agreement should be sought regarding the tree pruning required and tree protection methods employed to protect retained trees. These will be via the production of the detailed Arboricultural Protection Methods (APMs) included in this report, and will include:

- Tree protective fencing / trunk boxing as shown on the tree protection plan.
- No ground excavations within tree RPAs, unless approved by the Council.
- Any anti-compaction / temporary ground protection measures required to be taken.
- Specific APMs for construction of site access routes close to or within retained trees' RPAs.

8.2.3 That pre-commencement site meetings should be arranged to discuss the recommendations in this and subsequent reports and method statements, and that copies of all relevant arboricultural reports should be available on site.

8.2.4 That the Arboricultural Protection Methods (APMs) provided should be developed further with the contractor through the development process to include comments made by them, the client and the design team, as well as council officers. A copy of the tree report, including the APMs and tree protection plan, should always be kept on site.

8.2.5 That details of site inspection / supervision visits by the consultant arboriculturist are recorded and sent to the council, with copies retained by the site manager.

9.0 CONCLUSIONS

- 9.1 The site is located within an urban residential landscape setting. There are some trees of modest to high amenity value on site, most of which are 'B' and 'C' category standard trees. The dominant individual tree species on this site is Leyland Cypress with Birch, Beech and False Acacia as other standard trees present. All of these trees are statutorily protected due to the site's location within Belsize Park Conservation Area. Most of the trees are in need of annual crown pruning maintenance trimming works.
- 9.2 There are no trees identified to be felled as a result of this development proposal.
- 9.3 Retained trees will be fully protected by at least sturdy tree protection fencing / trunk boxing and temporary ground protection, as described at Appendix 8. Where encroachment into theoretical RPA is unavoidable temporary ground protection measures will be used which in this instance will likely be HDPE ground guards or similar due to the nature of the light / pedestrian construction tracking to and from the garden room site at the southern end of the rear garden. All tree protection measures are detailed according to construction drawings as part of the Arboricultural Protection Methods (APMs), which will include protection methods and supervision by a consultant arboriculturist from EnviroArb Solutions Ltd. Sufficient development room will be available after protection measures are instigated as described within this report.
- 9.4 Overall, it is concluded that, subject to appropriate controls, the development can be implemented without undue impact on retained trees. These should be detailed within the Arboricultural Protection Methods (APMs), that should be submitted to and agreed in writing by the Local Planning Authority prior to the commencement of the development.



Paul Allen MICFor Dip Arb (RFS) MarborA
Consultant Arboriculturist
24th September 2024

10.0 APPENDICES

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APPENDIX 1

KEY TO TREE TABLES

BS 5837 Cat	Description
A	Those of high quality and value: in such a condition as to be able to make a substantial contribution (> 40 years)
B	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (> 20 years)
C	Those trees of low quality and value: currently in adequate condition to remain until new planting could be established (> 10 years)
U	Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed regardless of development

Note: Sub categories are denoted in the tree survey data (A1, B1, C2 etc.). You are referred to the BS for further detail if required.

Tree No.	T (tree), G (group), H (hedge), W (woodland) + Ref No.
Species	Common Name
Ht (m)	Measured height in metres
DBH (m)	Diameter at 1.5m above ground level
Branch Spread	In m to cardinal points
Cr Ht Clearance (m)	Overall height of lowest branches from the ground level on side of proposed development
Life Stage	Young, Semi-Mature, Early-Mature, Mature, Over-Mature
General Observations	Observations on the condition of the tree(s)
Tree Work Specification	Proposed tree works in accordance with BS3998
BS Cat	See above
Life Exp	Estimated remaining contribution in years.
RPA Radius(m)	Radius of the trees Root Protection Area measured from the trunk to the edge of the RPA circle in metres
RPA (m2)	Overall Root Protection Area in m2
*	Indicates where tree data may have been estimated as tree was offsite / restricted access / dense vegetation hindering full inspection

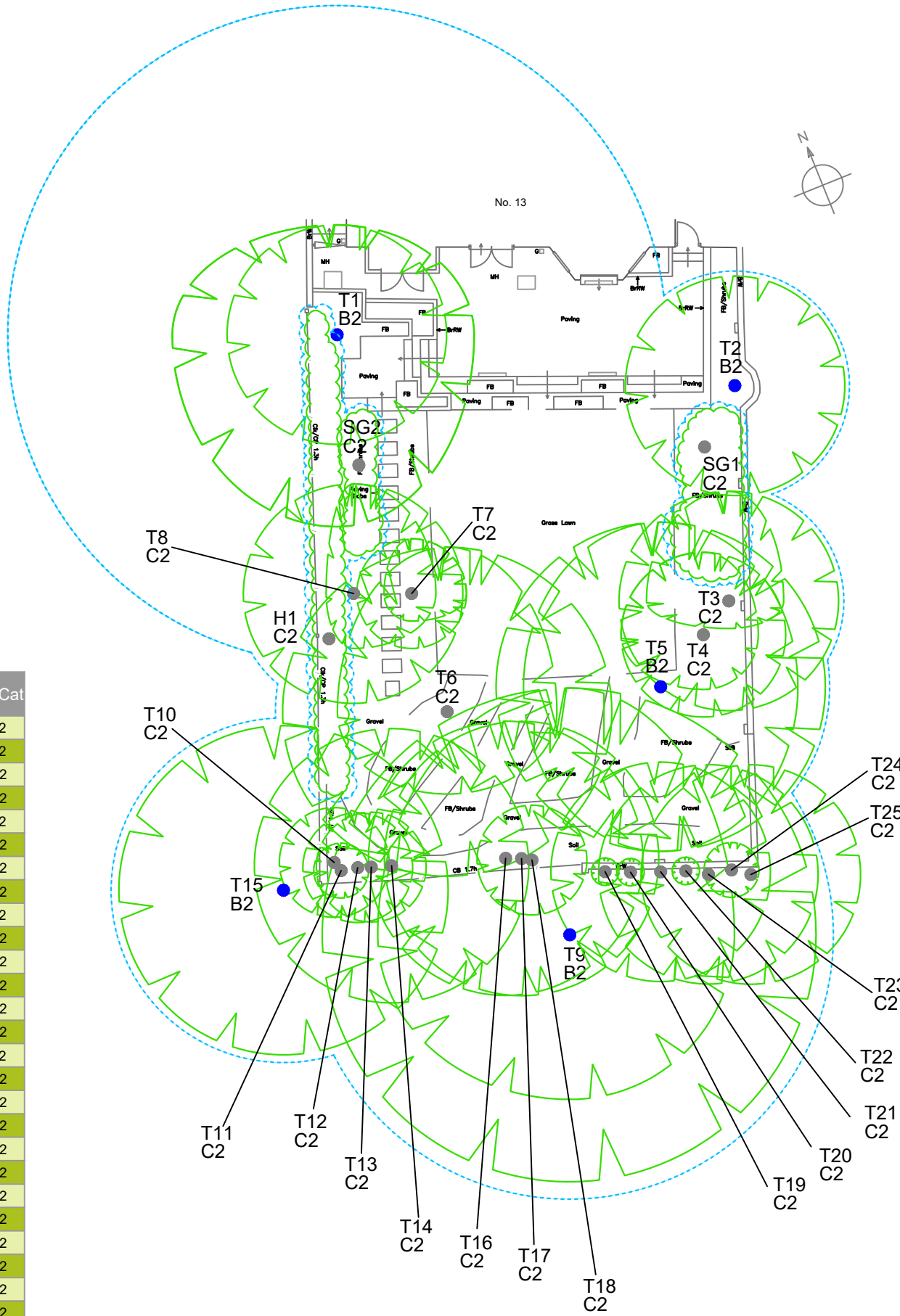
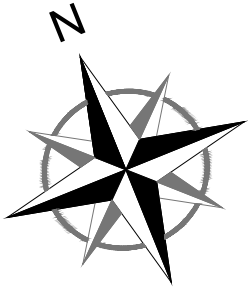
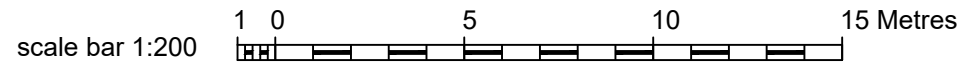
APPENDIX 2
TREE SURVEY TABLES

Tree Survey Tables - 13 Lambolle Road

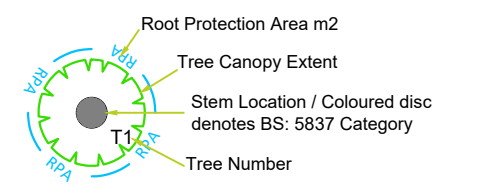
Tree No	Species	Ht (m)	CS N (m)	CS E (m)	CS S (m)	CS W (m)	DBH (mm)	No of Stems	RPA (m2)	RPR (m)	Can Cov (m2)	BS Cat	Age Class	Life Expect (Yrs)	Cr Ht (m)	Observations	Recommendations	Risk Zone	Priority Works	Plans
T1	Beech (Common)	20	4	5	7	6	1200	m/s	651	14	95	B2	Mature	20-39	5	Average form (asymmetric canopy), shape and condition. Subject to historic crown management; lifted, reduced and cut back from adjacent building. Dense asymmetric crown. Minor dead wood. Multiple-stemmed tree with x 3 leading stems. 4th stem previously removed.	No works.	High Risk Zone	No response required	1
T2	Birch (Silver)	11.5	4	4	4	4	240	1	26	3	50	B2	Early Mature	20-39	5	Average form, shape and condition. Dense crown. Minor dead wood.	No works.	High Risk Zone	No response required	1
T3	Pittosporum	7	4	2	1	3	230	2	24	3	20	C2	Early Mature	10-19	3	Average Twin stemmed suppressed form, shape and condition. Dense asymmetric crown. Minor dead wood. Infested with climber in crown.	No works.	High Risk Zone	No response required	1
T4	Japanses Maple	4	3	2	2	3	100	2	5	1	20	C2	Early Mature	10-19	2	Average Twin stemmed slightly suppressed form, shape and condition. Dense asymmetric crown. Minor dead wood.	No works.	High Risk Zone	No response required	1
T5	False Acacia	18	6	5	6	5	380	1	65	5	94	B2	Early Mature	20-39	5	Average form, shape and condition. Dense crown. Minor dead wood. Minor basal root crown suckers.	No works.	High Risk Zone	No response required	1
T6	Plum (Purple leafed)	12	6	4	3	4	420	2	80	5	57	C2	Early Mature	20-39	5	Average form, shape and condition. Dense crown. Minor dead wood. Co dominant tree with moderate included union. Trunk burr normal for species.	No works.	High Risk Zone	No response required	1
T7	Japanses Maple	3	2	2	1	1	100	1	5	1	7	C2	Early Mature	10-19	2	Poor slightly suppressed form, shape and condition. Dense asymmetric crown. Minor dead wood.	No works.	High Risk Zone	No response required	1
T8	Japanses Maple	4	4	3	2	1	100	2	5	1	19	C2	Early Mature	10-19	2	Poor slightly suppressed form, shape and condition. Dense asymmetric crown. Minor dead wood. Stem/Basal/Trunk wound at 0.5m on East side trunk with early decay.	No works.	High Risk Zone	No response required	1
T9	Sycamore	18	9	6	6	7	500	m/s	113	6	153	B2	Mature	20-39	6	3rd party tree to south in neighbours garden. Average form (asymmetric canopy), shape and condition. Subject to historic crown management; lifted. Dense asymmetric crown. Minor dead wood.	No works.	High Risk Zone	No response required	1
T10	Cypress (Leyland)	6	2	1	0	1	80	1	3	1	3	C2	Semi-Mature	10-19	1	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T11	Cypress (Leyland)	6	1	1	1	1	100	1	5	1	3	C2	Semi-Mature	10-19	1	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T12	Cypress (Leyland)	7	2	1	1	1	100	1	5	1	5	C2	Semi-Mature	10-19	1	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T13	Cypress (Leyland)	7	2	1	1	1	100	1	5	1	5	C2	Semi-Mature	10-19	1	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T14	Cypress (Leyland)	11	5	3	2	3	300	1	41	4	33	C2	Early Mature	10-19	1	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T15	Pissard Plum	12	6	5	5	5	350	1	55	4	86	B2	Early Mature	20-39	5	3rd party Average form, shape and condition. Dense crown. Minor dead wood. Co dominant tree with moderate included union.	No works.	High Risk Zone	No response required	1
T16	Cypress (Leyland)	11	5	3	2	3	360	1	59	4	33	C2	Early Mature	10-19	1	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Crown lift to 4m. Annual trimming maintenance	High risk zone	3 - within 12 months	1

Tree No	Species	Ht (m)	CS N (m)	CS E (m)	CS S (m)	CS W (m)	DBH (mm)	No of Stems	RPA (m2)	RPR (m)	Can Cov (m2)	BS Cat	Age Class	Life Expect (Yrs)	Cr Ht (m)	Observations	Recommendations	Risk Zone	Priority Works	Plans
T17	Cypress (Leyland)	11	5	3	2	2	260	1	31	3	27	C2	Early Mature	10-19	1	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Crown lift to 4m. Annual trimming maintenance	High risk zone	3 - within 12 months	1
T18	Cypress (Leyland)	7	2	3	2	1	150	1	10	2	13	C2	Semi-Mature	10-19	1	Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group. Dense upper crown, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T19	Cypress (Leyland)	6	0.5	1	1	1	100	1	5	1	2	C2	Semi-Mature	10-19	1	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T20	Cypress (Leyland)	4	0.5	1	1	1	100	1	5	1	2	C2	Semi-Mature	10-19	1	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T21	Cypress (Leyland)	10	4	2	2	3	200	1	18	2	24	C2	Early Mature	10-19	1	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T22	Cypress (Leyland)	4	0.5	1	1	1	100	1	5	1	2	C2	Semi-Mature	10-19	1	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T23	Cypress (Leyland)	8	4	2	2	2	200	1	18	2	19	C2	Early Mature	10-19	1	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T24	Cypress (Leyland)	5	1	1	1	1	100	1	5	1	3	C2	Semi-Mature	10-19	1	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
T25	Cypress (Leyland)	10	4	2	2	2	200	1	18	2	19	C2	Early Mature	10-19	1	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood. causing slight damage to boundary wall.	Annual trimming maintenance	High risk zone	3 - within 12 months	1
SG1	Mixed species shrubs: Purple Elder, Philadelphia, Viburnum, Hebe, Camelia	3	2	2	2	2	100	m/s	5	1	13	C2	Early Mature	10-19	0	Average form, shape and condition mixed shrub border. No significant recent crown management. Dense crowns, minor dead wood.	No works.	High risk zone	No response required	1
SG2	Mixed species shrubs: Abelia, Cotinis, Choisy, Box	2	2	2	2	2	100	m/s	5	1	13	C2	Early Mature	10-19	0	Average form, shape and condition mixed shrub border. No significant recent crown management. Dense crowns, minor dead wood.	No works.	High risk zone	No response required	1
H1	Yew (Common)	3	1	1	1	1	70	m/s	2	1	3	C2	Semi-Mature	10-19	1	Average form, shape and condition boundary hedge. Dense crowns, minor dead wood. Garden hedge, managed - trimmed.	Annual trimming maintenance	High risk zone	3 - within 12 months	1

APPENDIX 3
TREE CONSTRAINTS PLAN



Tree Survey Drawing Key



See EnviroArb Tree Survey for Individual Tree Details

- KEY**
Please refer to EnviroArb arboricultural report for details
- Category A - high quality and value
 - Category B - moderate quality and value
 - Category C - low quality and value
 - Category U - removal
- RPA - root protection area as defined by Table 2 BS 5837:2012
- Category U - removal

Tree No	Species	DBH (m)	No of Stems	Ht (m)	BS Cat
T1	Beech (Common)	1.2	m/s	20	B2
T2	Birch (Silver)	0.24	1	11.5	B2
T3	Pittosporum	0.23	2	7	C2
T4	Japanses Maple	0.1	2	4	C2
T5	False Acacia	0.38	1	18	B2
T6	Plum (Purple leafed)	0.42	2	12	C2
T7	Japanses Maple	0.1	1	3	C2
T8	Japanses Maple	0.1	2	4	C2
T9	Sycamore	0.5	m/s	18	B2
T10	Cypress (Leyland)	0.08	1	6	C2
T11	Cypress (Leyland)	0.1	1	6	C2
T12	Cypress (Leyland)	0.1	1	7	C2
T13	Cypress (Leyland)	0.1	1	7	C2
T14	Cypress (Leyland)	0.3	1	11	C2
T15	Pissard Plum	0.35	1	12	B2
T16	Cypress (Leyland)	0.36	1	11	C2
T17	Cypress (Leyland)	0.26	1	11	C2
T18	Cypress (Leyland)	0.15	1	7	C2
T19	Cypress (Leyland)	0.1	1	6	C2
T20	Cypress (Leyland)	0.1	1	4	C2
T21	Cypress (Leyland)	0.2	1	10	C2
T22	Cypress (Leyland)	0.1	1	4	C2
T23	Cypress (Leyland)	0.2	1	8	C2
T24	Cypress (Leyland)	0.1	1	5	C2
T25	Cypress (Leyland)	0.2	1	10	C2
H1	Yew (Common)	0.07	m/s	3	C2
SG1	Mixed species shrubs: Purple Elder, Philadelphia, Viburnum, Hebe, Camelia	0.1	m/s	3	C2
SG2	Mixed species shrubs: Abelia, Cotinis, Choisya, Box	0.1	m/s	2	C2

REVISIONS				
No	Description	By	Date	Chkd

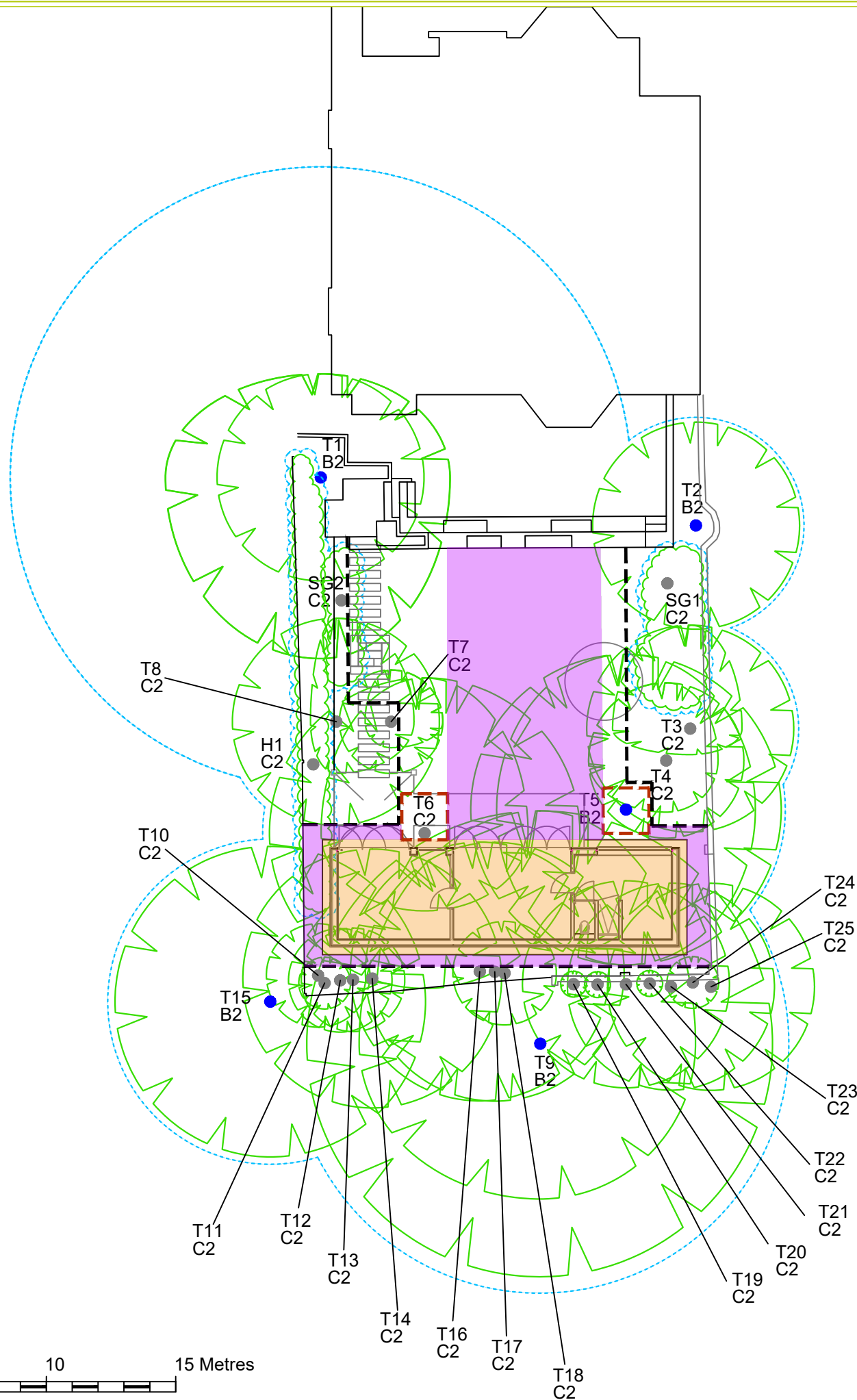
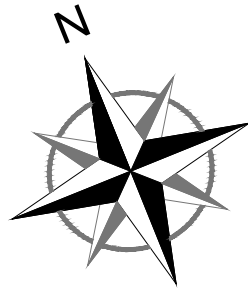


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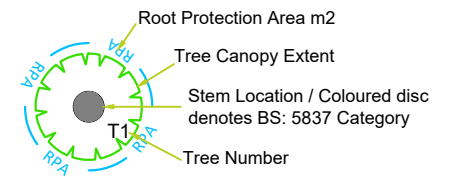
Drawing Title Tree Constraints Plan (TCP)		This drawing, its contents and associated properties are the property of EnviroArb-Solutions Ltd. No unauthorised reproduction is permitted without prior written consent by the management.
Client c/o Exedra Architects		
Site Address 13 Lambolle Road, London NW3 4HS		
Project No. EAS-205	Drwg No. EAS-205TCP	Sheet 1 of 1
Drawn S Blackwell	Approved P Allen	Date 21/09/24
		Scale 1:200

A3

APPENDIX 4
TREE PROTECTION PLAN

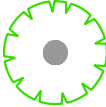


Tree Survey Drawing Key



See EnviroArb Tree Survey for Individual Tree Details

KEY

-  Tree to be retained
-  Tree to be Pruned
-  Tree to be removed
-  Tree protective fencing
-  Tree protective box hoarding
-  Supervised Excavations
-  Temporary Ground Protection

REVISIONS

No	Description	By	Date	Chkd



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Drawing Title Tree Protection Plan (TPP)		This drawing, its contents and associated properties are the property of EnviroArb-Solutions Ltd. No unauthorised reproduction is permitted without prior written consent by the management.
Client c/o Exedra Architects		
Site Address 13 Lambolle Road, London NW3 4HS		
Project No. EAS-205	Drwg No. EAS-205TPP	Sheet 1 of 1
Drawn S Blackwell	Approved P Allen	Date 21/09/24
Scale 1:200		A3

APPENDIX 5
TREE WORKS SCHEDULE

NOTE: All tree works to be undertaken in accordance with BS 3998:2010 'Tree work - Recommendations'. All pruning cuts to be made at suitable growing points, in line with the principles of natural target pruning.

Trees To Be Pruned

Tree No	Species	Ht (m)	DBH (mm)	No of Stems	BS Cat	Observations	Recommendations
T10	Cypress (Leyland)	6	80	1	C2	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance
T11	Cypress (Leyland)	6	100	1	C2	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance
T12	Cypress (Leyland)	7	100	1	C2	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance
T13	Cypress (Leyland)	7	100	1	C2	Suppressed form, shape and condition. Part of Southern boundary hedge group. Dense upper crowns, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance
T14	Cypress (Leyland)	11	300	1	C2	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance
T16	Cypress (Leyland)	11	360	1	C2	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Crown lift to 4m. Annual trimming maintenance
T17	Cypress (Leyland)	11	260	1	C2	Average managed form, shape and condition. Part of Southern boundary hedge group. Dense crowns, minor dead wood. Previously topped and lifted. Garden hedge group, managed - trimmed.	Crown lift to 4m. Annual trimming maintenance
T18	Cypress (Leyland)	7	150	1	C2	Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group. Dense upper crown, minor dead wood. Previously lifted. Garden hedge group, managed - trimmed.	Annual trimming maintenance

Tree No	Species	Ht (m)	DBH (mm)	No of Stems	BS Cat	Observations	Recommendations
T19	Cypress (Leyland)	6	100	1	C2	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T20	Cypress (Leyland)	4	100	1	C2	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T21	Cypress (Leyland)	10	200	1	C2	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T22	Cypress (Leyland)	4	100	1	C2	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T23	Cypress (Leyland)	8	200	1	C2	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T24	Cypress (Leyland)	5	100	1	C2	3rd party. Suppressed asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood.	Annual trimming maintenance
T25	Cypress (Leyland)	10	200	1	C2	3rd party asymmetric form, shape and condition. Part of Southern boundary hedge group behind 3rd party boundary wall. Dense upper crown, minor dead wood. causing slight damage to boundary wall.	Annual trimming maintenance
H1	Yew (Common)	3	70	m/s	C2	Average form, shape and condition boundary hedge. Dense crowns, minor dead wood. Garden hedge, managed - trimmed.	Annual trimming maintenance

APPENDIX 6

SITE INSPECTION & MONITORING SCHEDULE

General Tree Protection Methods

1. Site Inspections and Supervision of construction works close to, within of adjacent to retained tree RPAS will avoid potentially costly breach of tree protection conditions.
2. We recommend the arboricultural consultant from EnviroArb Solutions Ltd is retained to undertake inspections and supervision and work with the site manager to ensure compliance with tree protection conditions and advise where appropriate.
3. Both scheduled and unannounced site visits is often the most effective as these will serve to identify any damage to the Tree Protection Fencing, poor working practices, potential problems and points of conflict between the construction process and the health of the trees. The associated reports will include recommendations for remedial action.
4. During these instructed visits, any changes to the proposed works will be discussed, their impact assessed and recommendations for best practice will be outlined. After each of these visits, a copy of the report should be sent to the Site Agent, Local Planning Authority and Client. The remedial action undertaken will be recorded on the next visit.
5. It is essential to the successful implementation of the principles set out in this report that effective supervision and remedial actions are implemented from the outset, as detailed in the site supervision schedule below:

Constraints Item	Site Monitoring Required?	Visits No.	Timing of Site Visits	Actual Visit Date
Approved Tree works 'signed off' upon completion	Yes	Visit 1	Prior to construction	
Pre-commencement meeting with site manager to discuss CEZ, tree protection methods etc.	Yes	Visit 1	Prior to site clearance	
Establishment and protection of Root Protection Areas (RPAs) for retained trees, to 'sign off' installed tree protection fencing / boxing and temporary ground protection	Yes	Visit 1	Prior to site clearance	
Location of temporary access route through / adjacent to the retained trees and for access for construction and avoidance of compaction to the RPAs of retained trees	Yes	Visit 2	During construction phase	
Protection and prevention of damage to retained tree canopies during construction	Yes	Visit 2	During construction phase	
Post construction site assessment for any required remedial tree works operations recommendations	Yes	Visit 3	Post construction	

APPENDIX 7

BS5837: 2012 TREE CONSTRAINTS & ARBORICULTURAL PROTECTION METHODS

1 Pre-Construction / Tool-Box Talk Meeting

Prior to commencement of demolition / construction, an onsite meeting will be held with all relevant parties, including the site manager and appointed arboricultural consultant from EnviroArb Solutions Ltd. The purpose of this meeting is to ensure features on site match those in the approved Tree Protection Plan and CMS.

2 Installation of Tree Protection Measures

Usually in conjunction with 1. Above the tree protection fencing / boxing should be inspected to ensure it is installed at the correct locations prior to any demolition or ground-works commencing and remain in place throughout construction and be removed only after completion of construction works on the site. The construction process should not be commenced until the tree surgery works have been completed and the protective areas have been fenced off. Clear notices are to be fixed to the outside of the fencing with words such as 'TREE PROTECTION AREA – NO ACCESS OR WORKING WITHIN THIS AREA'.

3 Installation of Temporary Ground Protection

Within the fenced off area (or Construction Exclusion Zone – CEZ), no materials or chemicals should be stored at any time, no fires should be lit and no pedestrian or vehicle traffic should be allowed. Level changes within these areas should be kept to an absolute minimum. Every effort should be taken to protect a maximum possible area of the root system. No level changes or excavation within the RPAs should be undertaken without the consent of the Council. Where ingress is unavoidably required suitable temporary ground protection should be laid as approved in writing by the Council, as described at Appendix 9.

The site manager, all contractors and other relevant personnel are to be informed of the role of all the tree protection measures installed and their importance. A copy of the approved Tree Protection Plan will be displayed on site at all times during construction.

4 - Locations of Site Offices and Materials Storage Area

The site office, welfare facilities, storage for materials are not a constraint as these are contained within the property being renovated.

5 - Groundworks, Level Changes and Ground Screw Foundations

With regard to the approved drawings provided, the construction of foundations for the new build is ideally located beyond the Root Protection Areas (RPAs) of retained trees. Where close to or slightly within RPA's a specialised low impact foundation design should be used as recommended by a structural engineer and approved by the council tree officer, as in this instance. If the subsoil is found to be plastic, the foundations will be specified to take into account the potential influence of the vegetation on the moisture content and volume of the subsoil. A ground screw and frame foundation type is to be utilised with pile locations informed by a TREE RADAR GPR scan to be undertaken. Where possible the location of ground screw piles will seek to avoid major tree roots over 25mm in diameter as identified in the TRU tree root morphology mapping.

6 - Services

We recommend that all drainage and underground service routes are located beyond the RPAs of all the retained trees. If the service runs are to be located within an RPA, we recommend that this matter is dealt with by the approved Arboricultural Protection Methods (APMs). If services are located within an RPA, special implementation techniques such as vacuum excavation, moling, airspade, or hand digging may be required by the LPA. In the majority of cases, however, careful excavation with a low tonnage mechanical excavator, supervised by the consultant arboriculturist from EnviroArb Solutions Ltd, can adequately undertake services excavations. When tree roots are encountered the special implementation techniques and root protection can then be undertaken as and when they are observed.

7 - Dismantling Tree Protection Barriers & Post Construction Site 'Sign Off'

Dismantling the protection barriers around retained trees may be required to allow completion of final surface treatments and landscaping. Supervision of this exercise and control of the landscaping thereafter will be administered by the appointed arboricultural consultant from EnviroArb Solutions Ltd. The removal of the Tree Protection Fencing / trunk boxing is not an opportunity for machinery to access the previously fenced off area.

No further excavation will be carried out during this process and soils levels will not be raised above that existing by greater than 100mm and not within 4m of the trunk. Any removal of existing structures within the Root Protection Areas, including gardens type walls or paths, will be carried out by hand.



**Arboricultural Protection Method - APM 10
Construction within Root Protection Areas**



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APM 10 – Construction within Root Protection Areas (RPAs)

1.0 INTRODUCTION:

- 1.1 Wilful damage to protected trees is a criminal offence and could lead to enforcement action, a fine, a prison sentence or both.
- 1.2 Work on site should be undertaken under the normal site risk assessment procedures and comply with the wider site health & safety rules.
- 1.3 All site operatives entering root protection areas (RPAs) should be fully briefed as part of the toolbox talk by the supervising arboriculturist before work starts.
- 1.4 Specialist excavations within RPAs can be for continuous or broken trenches for strip foundations, foundation pads, pile locations and / or ground screws.

2.0 OTHER RELEVANT APMs:

- 2.1 APM 1 - Tree Protection – Fencing
- 2.2 APM 2 - Tree Protection – Ground Protection – to avoid compaction of RPAs when gaining access to the excavation site.
- 2.3 APM 3 - Site Monitoring - Site Inspections & Supervision – To monitor all works within RPAs by the supervising arboriculturist
- 2.4 APM 7 – Installing Permeable Hard Surfacing - Tree Root Protection within RPAs
- 2.5 APM 9 – Specialist Excavations for Services Installation within RPAs

3.0 REMINDERS:

- 3.1 Excavations for mini-piles or pads required to support structures located within retained tree RPAs should be preferably hand-dug down to a depth of 60cm and, if necessary, adjust location to avoid cutting roots greater than 25mm in diameter.
- 3.2 No excavation solutions are preferable and should only be made into existing soil levels except where authorised for supporting structures. This specifically applies to ground beams required between piles or pads which should ideally sit above ground level.
- 3.3 Provision needs to be made for ventilation and watering beneath substantial structures to prevent desiccation or anaerobic conditions for any underlying tree roots.
- 3.4 Where practicable, keep in-situ existing below ground structures where they can be reused to support new structures, e.g. new walls built on existing wall footings.
- 3.5 Where possible use ground screws located between major roots, first identified using Tree Radar scanning and root morphology maps.

4.0 SCOPE

- 4.1 APM 10 describes the practical requirements for installing new structures within RPAs, based on the recommendations in BS 5837:2012 (7.5 & 7.6).

5.0 TREE PROTECTION PLAN

- 5.1 The approved Tree Protection Plan (TPP) Indicates the location of the areas identified for supervised specialist excavations for supporting structures where within retained tree RPAs.

6.0 GENERAL PRINCIPLES

- 6.1 Conventional installation of new structures within retained tree RPAs using strip foundations is unacceptable in RPAs because the excavations can cause direct damage to tree roots and adversely disturb the soil. Additionally, the new structure to be installed will negatively impact upon the tree's rooting zone by displacing partially or completely precipitation and inhibit gaseous exchange. Adverse impact on trees will be reduced by minimising the extent of these changes in RPAs.
- 6.2 The installation of ground screws and mini-piles is preferable. Pad or post supports can often be used to support substantial structures especially with improvements with modern materials and design. Such foundations can support timber / steel framed flooring for garden rooms. Walls for garages and sometimes larger buildings. These should preferably be located above ground level, supported by standard small bore and sleeved piles, screw piles, pads, or posts with provision for water and gaseous input into the obstructed tree rooting zone. The risk of harm through soil compaction during the construction activity will be reduced using temporary ground protection as described in APM 2 – Tree Protection – Temporary Ground Protection. The risk of chemical contamination will be reduced by following the guidance within APM 4 - Contamination & Pollution Control within RPAs.
- 6.3 The risk of direct root damage from excavation will be reduced by following the guidance in APM 8 – Specialist Excavations within RPAs. If feasible, careful consideration should be given to retaining existing footings, especially relating to walls. This will allow the installation of new structures without the disturbance required to excavate and install new footings, as explained in APM 5 – Removal of structures & surfacing within RPAs.
- 6.4 Support locations will be hand or machine bored or hand-dug to at least a depth as advised by the structural engineer. To identify if any major roots over 25mm diameter are in conflict with the proposed structure foundations, initial scanning using TREE RADAR GPR can be undertaken to produce tree root morphology maps to inform specialist ground screw / pile locations. Sufficient flexibility will be built into the design to allow support locations to be moved to avoid major roots.

- 6.5 The diameter and the distribution of the loading supports should be minimised where possible to reduce the risks of tree rooting zone disturbance during the installation. The bases of such structures will allow for air and water input beneath through ventilation and irrigation provision.
- 6.6 The installation of 'no-dig' sub-base support can be used as an alternative foundation for lighter structures such as small sheds, carports, and bin stores. These can adequately support such structures on custom designed 'no-dig' surfacing, installed directly onto the soil surface, as described in APM 7 – Installing Permeable Hard Surfacing - Tree Root Protection within RPAs. Loading and product specification should only be made in conjunction with soil CBR testing, the product supplier and project structural engineer.

7.0 SPECIALIST CONSTRUCTION WITHIN TREE RPAs - EXAMPLES

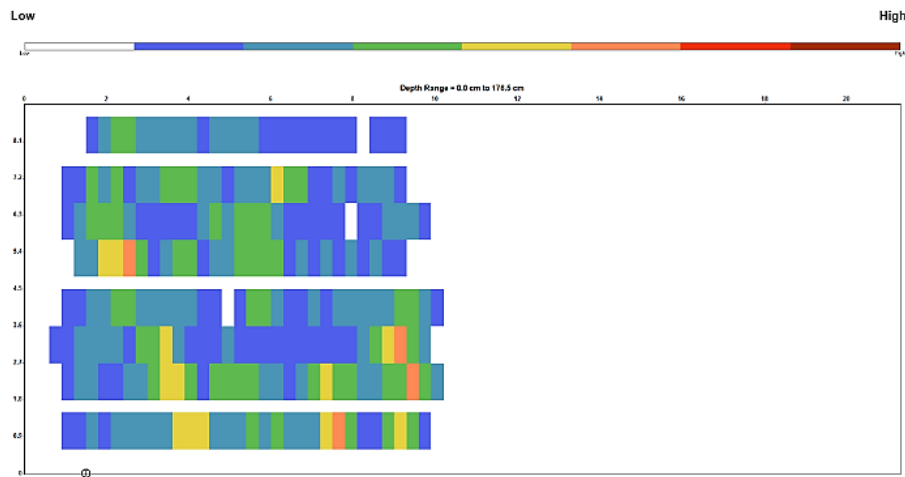


Vacuum excavation of services close to retained tree RPAs



Tree Radar GPR Scanner used to produce tree root morphology and root density maps to inform ground screw pile locations.

Root Density Map



TRU Root density map example



Tree Radar GPR Unit scanner

APPENDIX 8

TREE PROTECTION FENCING SPECIFICATION

on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

NOTE 1 Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

NOTE 2 It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

6.2.2.4 All-weather notices should be attached to the barrier with words such as: "CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 Default specification for protective barrier

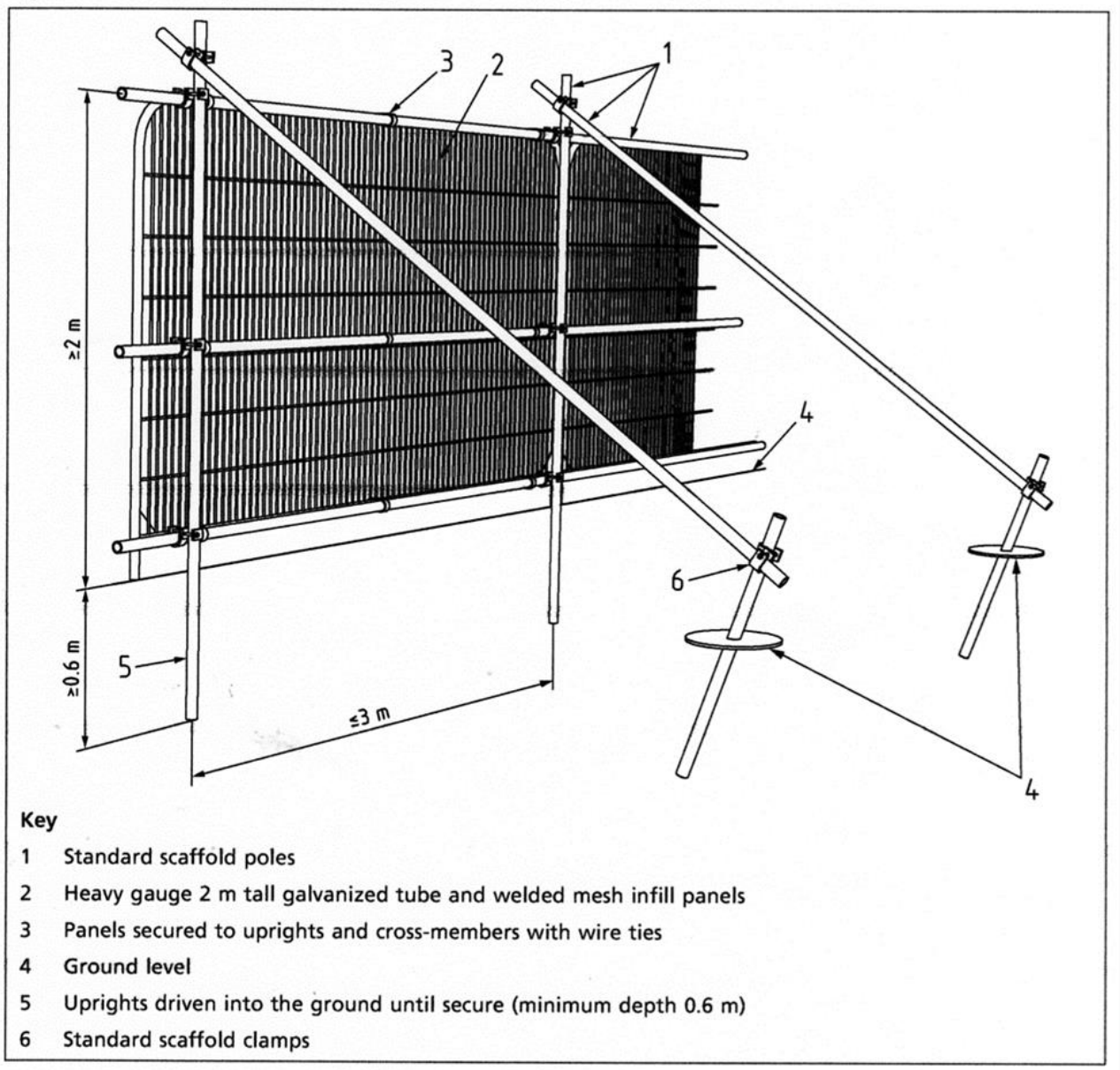
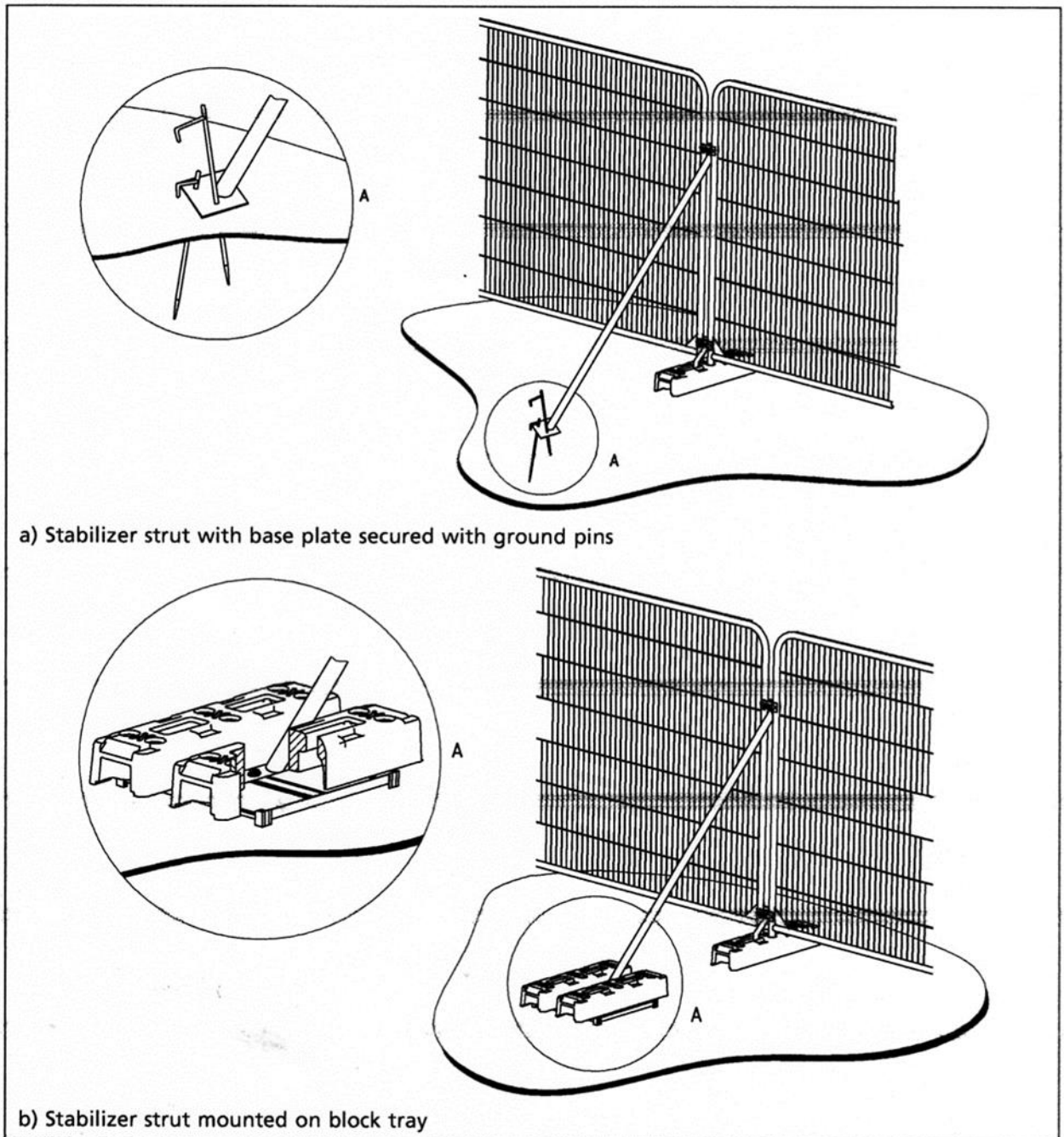


Figure 3 Examples of above-ground stabilizing systems



6.2.3 Ground protection during demolition and construction

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.

SUGGESTED TREE PROTECTION SIGN



TREE PROTECTION AREA

KEEP OUT

(TOWN & COUNTRY PLANNING ACT 1990)

**THE VEGETATION PROTECTED BY THIS FENCE IS
PROTECTED BY PLANNING CONDITIONS AND/OR IS
THE SUBJECT OF A TREE PRESERVATION ORDER.**

**IF YOU REQUIRE ACCESS INTO THIS AREA PLEASE
CONTACT THE SITE MANAGER AND CONSULTANT FROM**

ENVIROARB-SOLUTIONS LTD FOR ADVICE ON:

M: 07734 715337

APPENDIX 9

ARBORICULTURAL PROTECTION METHOD

APM NO. 2 – TEMPORARY GROUND PROTECTION



Arboricultural Protection Method 2 – Temporary Ground Protection



**ENVIROARB
SOLUTIONS**

APM 2 – TEMPORARY GROUND PROTECTION METHODS

1.0 INTRODUCTION:

- 1.1 Wilful damage to protected trees is a criminal offence and could lead to enforcement action, a fine, a prison sentence or both.
- 1.2 Work on site should be undertaken under the normal site risk assessment procedures and comply with the wider site health & safety rules.
- 1.3 All site operatives entering root protection areas (RPAs) should be fully briefed as part of the toolbox talk by the supervising arboriculturist before work starts.

2.0 OTHER RELEVANT APMs:

- 2.1 APM 1 - Tree Protection Barriers
- 2.2 APM 3 - Site Monitoring - Site Inspections & Supervision – To monitor all works within RPAs by the supervising arboriculturist

3.0 REMINDERS:

- 3.1 Temporary ground protection must be fit for purpose, i.e. prevent direct and indirect damage to the underlying soil and roots within RPAs.
- 3.2 Temporary ground protection will be installed at the locations shown on the tree protection plan.
- 3.3 The locations for temporary ground protection will not be altered without prior approval of the contract administrator, specifying engineers with advice from the supervising arboriculturist.
- 3.4 Where feasible, retain existing hard standing should act as temporary ground protection for as long as possible through the construction build phase.
- 3.5 Temporary ground protection must be specified by the project civil engineers with advice from the project consulting arboriculturist and 'signed off' by the arboricultural consultant at the start of the project and not be removed until the end of all construction and landscaping works.

4.0 SCOPE

- 4.1 APM 2 describes where the temporary ground protection will be installed, what form it can take and how long it should remain in-situ to effectively protect the RPAs of trees to be retained, based upon the recommendations in BS 5837:2012 (6.2 & 7.3) and the more recent APN 12 and as specified by the project civil engineers.

5.0 TREE PROTECTION PLAN

- 5.1 The approved Tree Protection Plan (TPP) Indicates the location of the temporary ground protection that defines the Construction Exclusion Zones (CEZ) around retained trees where it is not possible to install tree protection barriers.
- 5.2 The TPP indicates the areas of 'No / Reduced / Supervised - dig' permitted close to or within the retained tree RPAs.
- 5.3 The TPP locates the areas of temporary ground protection where required to be installed.
- 5.4 The TPP will show where Installed protective barriers can be re-enforced by temporary site buildings for offices and welfare units where practicable.

6.0 GENERAL PRINCIPLES

- 6.1 Well installed and robust temporary ground protection can be an effective means of preventing damage to the RPAs of retained trees during construction activity. In practice, a range of approaches can be used, including retaining existing hard surfacing or structures that already protects the soil, installing new materials, or a combination of both. Whatever the chosen option, the result will be that the underlying soil (rooting environment) remains undisturbed and retains the capacity to support existing and new root growth.
- 6.2 Temporary ground protection must be specified by the project civil engineers and installed and located as shown on the civil engineering plans and supporting documents. These should be developed with advice from the project arboricultural consultant, often supported by the specified product company technical specialists. The location for the temporary ground protection surfacing is then shown on the approved tree protection plan before any construction activity starts on site. It must remain in-situ until there is no risk of harm from construction activities including landscaping.
- 6.3 No temporary ground protection will have its location changed or be removed without advice from the consulting supervising arboriculturist. Furthermore, the condition of the ground protection will be regularly monitored throughout the construction phase to ensure it remains fit for purpose, i.e. sufficient to prevent damage to the RPAs of retained trees. Any variations to these restrictions must be agreed with advice from the project arboriculturist.

- 6.4 Cellular confinement systems can be used for temporary ground protection in areas where tree root damage would be caused by excavating into retained tree RPAs for the purposes of constructing temporary, new or replacement sub-base for hard surfacing. Compaction can occur when vehicles pass over unreinforced ground although even repeated foot traffic can also be detrimental to soil structure.
- 6.5 Where lighter construction access is required for a short period a re-enforced HDPE Polymer surface material such as 'Multi-Track' ground guards can be installed, in accordance with the manufacturer's instructions.

7.0 3D GROUND PROTECTION – APN 12 GUIDANCE



THE USE OF CELLULAR CONFINEMENT SYSTEMS NEAR TREES: A GUIDE TO GOOD PRACTICE

GUIDANCE NOTE 12



Author:
Ben Rose

The Arboricultural Association
The Home of Arboriculture

www.trees.org.uk



INSTALLATION GUIDE

■ **simplified**



GEOWEB® Tree Root Protection



Ground-Guards

Bulletin

TREE ROOT PROTECTION DURING CONSTRUCTION PROJECTS

The Department for Communities and Local Government's guide "Tree Roots in the Built Environment" states that "ground protection should be installed before any materials or machinery is brought onto the site"(Section 9.3.3.2)

It has been shown that "the major contribution to soil compaction from vehicle movements comes from the first passes of vehicles over the ground" (Section 4.2.3)

Thus it is essential that ground protection is specified and installed from day one of construction projects.

Failure to protect the ground from compaction will lead to reduced water and oxygen infiltration to the tree roots, and can ultimately lead to the decline of the tree.

The use of GROUND-GUARDS for tree root protection

The **Ground-Guards** temporary roadway system is frequently used on construction sites to protect the ground from erosion and damage by construction vehicles. **Ground-Guards** are usually installed as a roadway consisting of a parallel track of 2.4m x 1.2m panels with a 1.2m space in between. Where a temporary roadway must pass near to trees, the following extra precautions must be taken in order to provide cushioning for the ground under the tree canopy:

1. Edge rails of 200 x 50mm sawn timber should be installed where the trackway will pass under the tree canopy. These should be staked on either side of the trackway using 50 x 50x 500mm timber stakes at 1.5m spacings.
2. A layer of geotextile membrane should be laid to cover at least the area under the tree canopy, and preferably under the whole of the trackway.
3. A pad of Ground Guards, three boards wide should be laid on top of the geotextile membrane, between the timber rails.
4. A 150mm deep layer of wood chippings should be laid.
5. The twin trackway can then be laid so that it rises over the wood chippings as it passes under the tree canopy. Extra Ground-Guard boards should be installed in the gap between the twin trackway at this point to retain the wood chips in place.

Ground-Guards

Tel: 0113 267 6000

Fax: 0113 267 2222

Email: info@greentek.org.uk



Ground protection is essential to maintain the health of tree roots on construction sites.



Ground-Guard trackways should have additional cushioning installed where they pass near to trees.

- 200X50 timber rails
- 50X50X500 timber stakes
- Geotextile Membrane
- Base layer of Ground-Guards
- Wood Chippings
- Ground-Guard Trackway



Crown Copyright Acknowledged for quotations from "Tree Roots in the Built Environment"

MultiTrack



Overall Size: 2435 x 1215 x 13mm (plus treads)

Surface Area: 2.95m²

Weight: 39kg

Tread Options: Roadway, Walkway and Smooth, or a combination

Connectors: 10 joining points. A choice of standard clip joiners, low profile joiners or bolted joiners, plus anchor pins

Packed in: Stillage of 25 mats

Stillage Pack: **Weight:** 1105kg
Dimensions: 2550 x 1260 x 900mm

Slip Testing: BS7976 part 2

Deflection: Tested on varying CBR ground conditions using a 300mm diameter steel platen with 6 tonnes load to simulate the pressure of an HGV wheel

Ground CBR 11.35%: Deflection 17.68mm

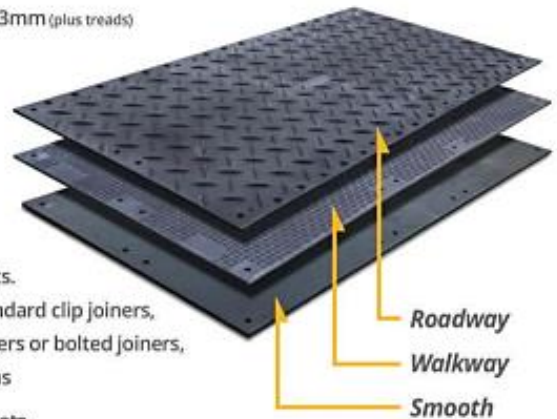
Ground CBR 8.58%: Deflection 20.41mm

Ground CBR 4%: Deflection 22.00mm

Guarantee:

It is the user's responsibility to assess the load-bearing capacity of the ground, and to only operate vehicles within the weight that the ground is capable of safely supporting. Ground-Guards Ltd accepts no liability whatsoever for any damage, loss or injury arising from the ground conditions on which these products are used.

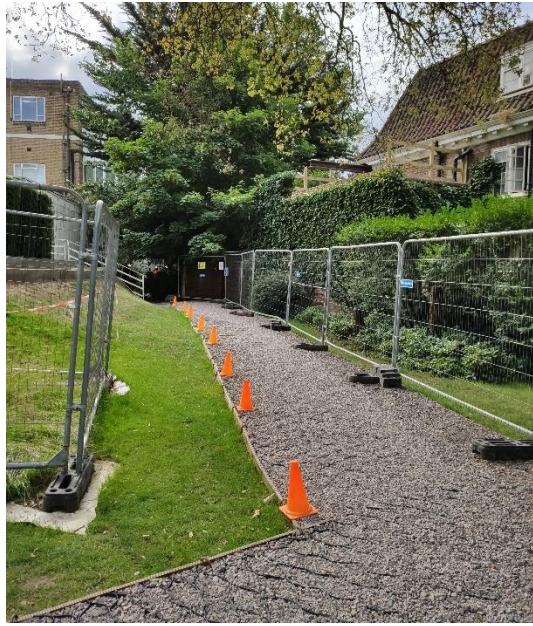
MultiTrack mats are not suitable to use for bridging purposes. Damage caused by mechanical equipment (e.g. cuts by digger buckets) or sharp protrusions beneath the mats is not covered by this guarantee.



GroundGuards®

+44 (0)113 267 6000
info@ground-guards.co.uk
www.ground-guards.co.uk

10.0 TEMPORARY GROUND PROTECTION - EXAMPLES



Overfill 100mm 3D cellular confinement webbing laid as a temporary surface for pedestrian access only.



Robust 200mm 3D cellular confinement webbing laid with armored HDPE Polymer plastic plating secured for additional surface use as temporary site access and contractors site compound.



Robust heavy duty HDPE Ground Guards pinned into place over existing tarmac access to provide additional temporary ground protection during site clearance & construction phase.

APPENDIX 10
PHOTOGRAPHS



T1 – Common Beech



T2 – Silver Birch



T5 - False Acacia



T6 - Plum (Purple leafed)



T7 - Japanese Maple



H1 - Yew (Common)



SG1 - Mixed species shrubs Purple Elder, Philadelphia, Viburnum, Hebe, Camelia



SG2 - Mixed species shrubs Abelia, Cotinus, Choisya, Box



T25 - Cypress (Leyland)



T16 - Cypress (Leyland)



Location for proposed gym / garden room within the RPAs of adjacent Leyland Cypress

APPENDIX 11 - PLANNING REPORT CAVEATS

General - Trees

Unless otherwise stated tree observations have been undertaken from ground level and using non-invasive techniques only with tree locations plotted according to the client provided site topographical survey information (where a topographical survey cannot be provided the accuracy of tree locations based upon an OS plan base cannot be relied upon). Comments contained within the report on the condition and risk associated with any tree relate to the condition of the tree at the date and time of survey. Please note that the condition of trees is subject to change. This change may occur but is not limited to biological and non-biological factors as well as mechanical / physical changes to conditions in the proximity of the tree. Trees should be inspected at intervals relative to identified site risks and in accordance with relevant HSE and Central Government guidance. EnviroArb Solutions Ltd can provide further information on this matter if required.

Unless otherwise specified, no checks have been carried out in respect of statutory controls that may apply, e.g. Tree Preservation Orders, Conservation Areas or planning conditions².

Where tree surgery works have been identified these works are based on the assumption that full and detailed planning is approved, no tree works should be undertaken prior to determination of this application without up-to-date confirmation of the Tree Preservation Order / Conservation Area Status of the vegetation. All tree works should be undertaken in accordance with the appropriate Duty of Care. This should include, for example, site specific risk assessments and due diligence inspections for the presence of wildlife and protected species and habitats..

Where Tree Felling is required prior to planning approval - Any woodland operations made where the volume of timber felled is over 5m³ within any calendar quarter and is not subject to stated exceptions, will require a Felling License as described within the Forestry Act 1967 as amended and / or as part of the Environment Act 2021 Part 6 s.114 & 115³. Possible exceptions apply to felling trees that, when measured at a height of 1.3 metres from the ground have a diameter over bark of 8cm or less or if thinning (i.e. felling carried out in order to improve the growth of the remaining trees), have a diameter over bark of 10cm or less; or if underwood or existing coppice (i.e. previously managed by cutting to promote multi-stemmed growth arising at or near ground level), individual stems have a diameter over bark of 15cm or less⁴.

Any comment relating to 3rd party trees has been made without full access to the tree(s). Should these trees have any impact on the proposed development we would advise you to instruct us to contact the 3rd party and undertake further inspection work.

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Not a Design Statement or Method Statement

This report has been prepared in respect of development impacts on trees. The report provides details and makes in principle recommendations relating to tree protection, which may have implications for design, construction, materials and methods to be employed in the development. Any such recommendations should be approved by the relevant designer / competent person.

² The Town and Country Planning (Tree Preservation) (England) Regulations 2012 & Town and Country Planning Act 1990 – Part V111_ch1 – Trees SS-210

³ Refer to the Forestry Act 1967-6 & Environment Act 2021-6s.114 & 115 & The Forestry (Exceptions from Restriction of Felling) Regulations 1979-7 for the complete list of exceptions contained in those pieces of legislation.

⁴ Forestry Act 1967 Part 2-9 - Requirement of licence for felling



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