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S1349-J3-R1

REPORT

regarding the impact on trees of proposals for development at
13 Daleham Gardens, London, NW3 5BY

View of rear boundary

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Contents

1 Instructions

I am instructed by Charley Lacey of Marek Wojciechowski Architects Ltd on behalf of clients to make an assessment of tree amenity value and condition of trees at 13 Daleham Gardens, London, NW3 5BY and of the impact of a proposal for development on such trees, and to supply an arboricultural methods statement and tree protection plan for use in supporting an application for local planning authority (LPA below) consent. The design and access statement / design summary submitted by Marek Wojciechowski Architects Ltd describes the scheme.

2 Executive summary

The impact on public amenity connected to how trees will be affected by the scheme is found to be slight. The scheme will require three trees/small groups in the rear garden to be removed. All retained trees will be easily protected from harm during the project.

3 Introduction

3.1 The environmental role of Local Planning Authorities

LPAs play an important part in the almost continual balancing act that is part and parcel of contemporary local government. They regulate development in the interests of the community. Increasingly, the environment plays a role in our lives, and strongly affects our health, both mental and physical. This is typically recognised in planning policy determined by LPAs, and the formal planning guidance published by them. LPAs process planning applications in line with this policy and guidance.

3.2 British Standards

These continue to play a significant role in the quality of our lives in the UK, by defining minimum standards for many products, and making recommendations where precise, exhaustive specifications are not absolutely possible, for example with services.

3.3 British Standard 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'

BS 5837:2012 (the Standard, below) is the fourth version in a series, the first being in 1980. This Standard provides a framework for the valuation, in ornamental terms, of trees, and gives recommendations for their protection on building sites.

3.4 How the Standard is used by an arboriculturist

It is used as a tool by an arboriculturist, who for the purposes of this type of professional activity, is someone who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction. This is the profession which is concerned, in a wider sense, with the care and cultivation of trees for amenity (all the benefits). An arboriculturist, then, uses the Standard:

a) to assess the value, in terms of amenity, of the trees on and adjoining a particular site, whether such trees are formally protected or not, for example by reason of being in a Conservation Area or because they are scheduled within a Tree Preservation Order. (Both of these provisions are part of the Town and Country Planning Act 1990, part VIII.);
b) secondly, to help assess the impact upon the trees of the proposal for development;

c) lastly, to give ways of protecting retained trees during construction, should the proposal receive planning consent.

3.5 How the arboriculturist prepares tree protection methods

In practice, as advances in materials and techniques are rapid, the arboriculturist does not necessarily specify a precise commercial product, but defines the essential components of methods of demolition and construction which often make use of specialized materials. These may be termed 'tree-friendly' methods, meaning that they have as their focus the well-being of the tree. These appear on the tree protection plan(s) appended, typically titled: 'Tree Retention and Tree Protection Measures', and within the text below.

3.6 Classification of trees

The Standard recommends a way of classifying trees when assessing their potential value in relation to proposed development. Value means (mainly) *visual* value to the general public. It also allows for other values to be considered such as historic or conservation value. Some surveys may not find any trees of one or more categories.

Table 1 describes, as: 'U', a low-value tree; denoted by a dark red outline on plans, the shape of the edge of the tree's crown typically more or less concentric to the trunk position.

It also shows 'A', 'B' and 'C', in descending merit:

- 'A' category, green crown outline, are trees of high vitality or good form, or of particular visual importance.
- 'B' category, blue crown outline, are good trees but may be of slightly poorer form or be not sited as importantly as 'A' category trees.
- 'C' category, grey crown outline are trees of no particular merit, but in adequate condition for retention.

A minimum expected safe useful life is also assessed. Please note that a low value tree may have a very long life expectancy. The two factors are only linked in that, for example, a very high value tree cannot also have a very low life expectancy.

3.7 Root protection area

'RPA' below. The RPA is a zone around the trunk of the tree, in which protective measures must be used in order to prevent significant damage to trees.

3.8 Use of appended plans

The appended plans have different applications:

- Plan reference no. S1349-J3-P1, shows the spread of the crowns (the upper, leaf-bearing part of trees), and is intended to indicate the relationship of any neighbouring trees to each other. This plan gives a quick reference assessment of value as per section 4, table 1, page 9 of the Standard.

- S1349-J3-P2 is the 'tree protection plan' (TPP) referred to in the Standard (section 3.11). It is colour-coded to indicate where tree-friendly methods are proposed during the overall construction process, which may involve demolition, main construction and landscaping phases.

4 Observations

4.1 Site visit

I visited the property on 22nd May 2024 in order to carry out an inspection. Weather conditions were wet and dull; they permitted adequate inspection. Photo quality in terms of light level and contrast is rather poor.

4.2 Survey method

I used a tree mallet, spade, diameter tape, laser rangefinder, pocket retractable tape, binoculars, scaling pole, tree data recording software, pen, pencil and paper. No trees were climbed: inspection was from ground level.

4.3 Appraisal identification

My appraisals of observations, discussions and other data are italicised below, in each relevant section and paragraph. This emphasises the clear separation between data and opinion to assist the end-users: client, architect and LPA case and tree officers.

4.4 Amenity / Screening by trees and shrubs

Some trees listed (6, G7, 8) are visible from Daleham Gardens, and other adjoining public viewpoints. Much of the flank boundary verdure on both sides of the rear garden is shrubbery.

4.5 Statutory constraints

The site is in the London Borough of Camden administrative area.

Trees on or adjacent to the site enjoy the benefit of a Tree Preservation Order (TPO).

The site stands within the Fitzjohns Netherhall Conservation Area.

4.6 Soil assessment

The British Geological Survey (BGS) information for the area indicates that the underlying sub-soil is the London Clay Formation - clay, silt and sand.

Topsoil within the site appears to derive from the underlying subsoil. I saw no evidence of soil-stripping, trenching, or level-alteration in the recent past, nor did I observe any apparent compaction or drainage problems.

4.7 Measurements on site

Tree heights estimated by scaling pole.

Tree diameters measured as per the Standard, Annex C.

Tree spreads on the plans below are approximately to scale, determined on site, typically by laser rangefinder, direct measurement, pacing, sighting in relation to site features and architect-supplied plan data.

4.8 Tree data table

This is the core of the report in terms of site observations. In all cases, in the absence of negative comment below on health/vitality and structure of trees, normal physiological condition (health) and structural condition applies. Unless stated otherwise, 'tap tests' on the trunk-bases, etc., for the sonority typically associated with decay in trees were found to be normal. Unless stated otherwise, no signs of protected species were noted; for example, potential bat roost features (PRFs below). Where no height to lowest branch figure is given, the information appears completely irrelevant to planning determination. The matter of clearance above ground level is discussed under the individual tree entries if this is relevant to planning determination. (For information on other data in the columns, see section 3 above.)

Tree number	Tree type	Height (m)	Stem diameters (mm)	Radius of RPA if circle (mm)	RPA (m^2)	Comments	Life expectancy (years)	Assessed BS5837 value
1	English yew	7	250, 100	3231	32.8	Outside the site.	40+	C1
2	common holly	7	275	3300	34.2	Apparently just within the site. Ivy-infested. Cover photo is of shrub mass in corner of garden (the trees 1 and 2 are invisible).	20+	C1
G3	Lawson cypress	9	Trunk diameters and RPAs as per plan			Minor contribution to screen but of poor form	40+	C2
4	weeping birch	4.5	270	3240	33.0	Minimal landscape contribution.	20+	C1
G5	limes	16	<600	7200	162.9	High landscape importance and function, forming a dense screen in summer between the rear elevations of houses on Fitzjohns Avenue and Daleham Gardens. No access and no direct line of sight to trunks.	40+	B2
6	common holly	9	350, 280, 150, 100	5797	105.6	Outside site, suffering from Phytophthora illicis. Prominent but of very short life expectancy. For this reason cannot reasonably be considered a constraint on development, e.g. if roots are cut.	<10	U

Tree number	Tree type	Height (m)	Stem diameters (mm)	Radius of RPA if circle (mm)	RPA (m^2)	Comments	Life expectancy (years)	Assessed BS5837 value
G7	purple plums	6.5	Trunk diameters and RPAs as per plan			Of some minor screening value; of very poor form. Regularly maintained as pollards, last apparently around 2020.	20+	C2
8	contorted willow	10	500	6000	113.1	Poor form. Once pollarded to a height of about 3m above ground level.	20+	C1
9	tree coton -easter	8	<300	3600	40.7	Poor form. Contributes slightly to screen between the sites.	20+	C1

4.9 Photos

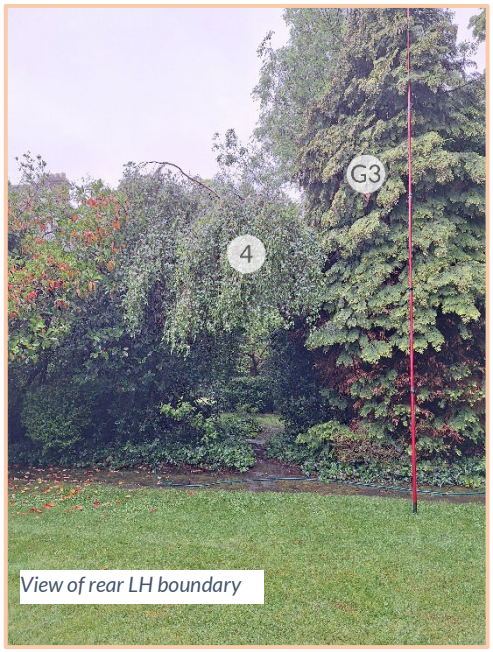
Note on photo labelling- the colour of the numeral identifying trees matches that used for the four BS 5837:2012 tree value categories (see 3.6 above)

View of front RH side of site

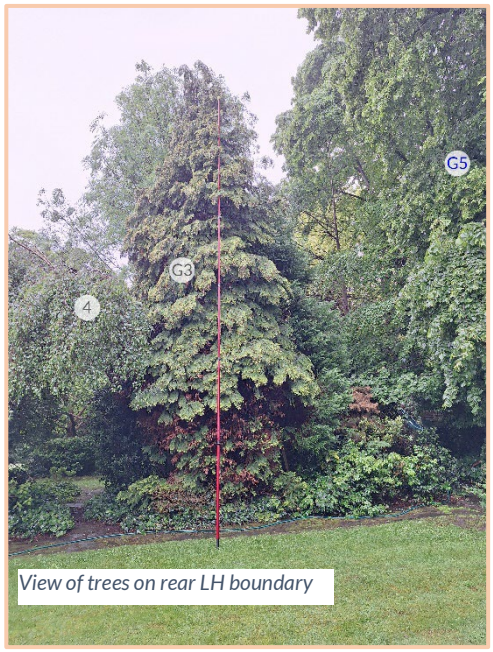
View of rear RH boundary


View of rear RH boundary


View of rear elevation and part of back garden of site



View of rear LH boundary



View of trees on rear LH boundary

View of front LH boundary of site

View of front boundary of site


View of rear elevation


View of rear LH boundary of site

5 Arboricultural impact assessment (AIA)

5.1 RPAs – modifications to shape

I carried out an assessment as per the Standard (section 4.6.2) in connection with the plotting of the RPAs of all trees. This section requires that site conditions such as the locations of various structures, the internal support mechanisms of various trees, etc., are taken into account in determining the likely position of roots. Adjoining structures and features have been noted in this respect. Where applicable, the modified-shape RPA, of equivalent area, has been plotted on the plans appended (shown as shapes bounded by an orange line). The subsoil is likely to be clay, typically a shrinkable medium.

The shapes of the root systems of trees have probably not been unusually affected by subsoil type.

Adjoining structures have likely affected the RPAs, as indicated on plans.

The factors above have no significance in connection with the impact assessment and TPP provided.

5.2 Roots and the design

It is usual for discussions between the arboriculturist and architect to take place at an early stage following the arboriculturist's site survey. A full tree constraints and tree value assessment was commissioned and supplied in May 2024.

No need arose in this case to discuss the design, as I found no significant conflicts with trees worthy of retention, q.v. below.

5.3 The static root plate (SRP) compared with RPA

SRP is an abbreviation for static root plate, (Mattheck, 1991, etc.) and means the structurally significant roots nearest the trunk: the principal roots that hold the tree upright. This is derived from a radial dimension based on trunk diameter near ground level. The RPA is a guide to where physiologically significant roots, those necessary for, primarily, water uptake, are likely to be located.

5.4 Assessment of SRP/RPA encroachment by dwelling/structure footprint

Some encroachment on the RPA of a retained tree is entailed, as analysed in the table below:

Tree no.	*Tree*	*RPA area (m^2)*	*Area affected (m^2)*	*% affected*	*Notes*
1	*English yew*	*32.80*	*1.94*	*5.91%*	*lower ground floor*

In view of the above, as the changes do not involve significant root cutting, and in view of tree-friendly methods as proposed below, I see no basis to conclude that any tree will suffer harm, if these methods are followed carefully.

5.5 Perception of trees by building users

The proposed (extended and basemented) dwelling is in an almost identical position in relation to the trees as is the existing structure. It is typical for internal layouts to be designed to minimise shading inconvenience. Gardens that are part-shaded by trees provide typically welcome flexibility in terms of use.

The existing structure's position in relation to the existing trees has not generated any obvious or reported requirement to prune trees inappropriately. In view of the above I conclude that shading by

and perception of trees have been considered (as the Standard (sections 5.3.4 and 5.6.2.6) recommends) and appear not to be negative factors.

5.6 Superstructure and tree appraisal – tree pruning

In accordance with the Standard, section 4.4.2.5 (f), I note from the drawings supplied that no encroachment by the superstructure on the crowns of retained trees will occur.

Pruning proposed to tree group G5 to benefit the garden and promote the thrift of proposed planting is well within the bounds of good arboricultural practice.

(See British Standard 3998:2010 'Tree work – Recommendations'.) A schedule for the use of a contractor appears within the AMS below.

5.7 Access clearance

I note from my site visit and the plans received that no retained tree conflicts with pedestrians, construction traffic, nor end-user vehicles.

5.8 Tree removal considerations in the Standard

In conserving trees on development sites, expected best practice is as in the Standard (section 5.1.1):

> "Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification: attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal."

Thus, implicit in the process are decisions about tree removal. This is often perfectly reasonable and provides space for new trees.

The above advice appears to have been considered in formulating proposals for development in this case.

5.9 Replacement planting – mitigation for proposed tree loss

Please see tree data table above for comments on the individual trees proposed for removal. See plan S1349-J2-P2 for the locations of proposed planting:

A= variegated holly (Ilex aquifolium 'Handsworth New Silver' 1.2m 35L pot (5 no.)

It is typical for a full landscaping scheme to detail tree, shrub and herbaceous planting etc. The LPA may wish to stipulate that precise species and cultivars are adopted in any such scheme.

The soil type indicated by BGS data and soil condition as appraised places no significant constraint on species selection for tree and other planting. Overall, appropriate replacement tree planting will play a generally minor role in providing for future public and local amenity.

5.10 Policy compliance

The LPA website was searched for relevant policy documents and supplementary planning documents (SPDs). I am aware of:

- Camden Planning Guidance (Trees)
- Camden Local Plan
- Camden Planning Guidance (Design)

It is of course ultimately for planners to determine compliance with planning policy.

I submit that the proposals in this report, encompassing tree protection methods in accordance with the principles of British Standard 5837:2012, will, if implemented, facilitate fair compliance with relevant policies relating to trees.

6 Conclusion

6.1 Summary

I conclude that the impact by the scheme proposed on the amenity provided by trees, subject to implementation of the arboricultural method statement's contents, will, overall be negligible.

6.2 Note to LPA

I invite the LPA to consider, if it is minded to grant consent, the incorporation of the specific *order of implementation* of the **Arboricultural method statement** below into any Conditions applied. Such measures are likely to maximise tree protection. Finalised details of tree-handling on site during construction is typically a matter requiring the input of a main contractor within CDM regulations, and these matters in practice almost always follow planning consent, as it is typical for no contractor to have been appointed prior. The writer is willing to prepare a Construction Issue version of the AMS in due course.

7 Sources and relevant documents used

- Ground-level inspection
- Supplied plans:
    - Marek Wojciechowski Architects drg. no.: 24003 P1999
    - Marek Wojciechowski Architects drg. no.: 24003 P2003

8 Copyright

9 Arboricultural method statement (AMS)

9.1 Overview

The methods required involve not only physical arrangements on site but effective administration prior to implementation. Trees that have been the recipients of careful handling during construction add considerably to the appeal and value of the finished development. If conflicts between any part of a tree and the building(s) arise in the course of building works these can often be resolved quickly and at little cost if an arboriculturist is consulted promptly. Lack of such care is often apparent quickly and decline and death of such trees can wreck design aims. It can of course also affect saleability, and reflects poorly on the construction and design personnel involved.

I propose that arboricultural administration takes place as outlined below. Needless to state the MC must fully comply with these proposals for them to be effective. This involves proper initial contact with the retained arboricultural consultant, followed by persisting contact, throughout the contract, until at least late landscaping stage.

9.2 Administration

A. Identification of key personnel in order of responsibility for tree protection on site

Role	Name	Company	E-mail	Mobile	Landline
site manager	TBC	TBC	TBC	TBC	TBC
main contractor	TBC	TBC	TBC	TBC	TBC
architect	Charley Lacey	Marek Wojciechowski Architects Ltd	charley@mw-a.co.uk	07951 919 524	020 7580 0019
arboriculturist	John Cromar	John Cromar's Arboricultural Co. Ltd.	johncromar@treescan.co.uk	07860 453072	01582 808020

B. Induction and personnel awareness of arboricultural matters

Prior to commencement a meeting will be held on site between the arboriculturist and the site manager (who will be required to sign the awareness document 9.4 below) and during which meeting all the tree protection methods, materials, order and integration with the build programme will be considered. This document, confirming awareness on the part of personnel of the various items, will be retained for the LPA.

C. Inspection of and supervision schedule for tree protection measures, frequency and methods of site visiting and record keeping

At site possession, the tree protection measures applicable to the works, as detailed in this report will be inspected by the arboriculturist and signed off if compliant. An initial inspection will take place; a monthly inspection will take place routinely; unannounced site inspections may also be carried out. Additionally, the arboriculturist shall attend site as required by architect, or site agent, or the LPA. *All reports on site visits to be copied to the LPA within 5 days of site visit.* These reports to be compiled, and an end of project summary produced, together with any recommendations for future action.

D. Procedures for dealing with variations and incidents

As C above. Additionally, the architect shall inform the arboriculturist of any design variations or variation intention of tree protection; also, the site manager shall inform the arboriculturist if he intends to vary or deviate from the agreed tree protection methods or timing. Action in response to incidents will be commensurate with and appropriate to the nature of any such incident.

E. The order of work on the site, including demolition, clearance and building

As per tree protection methods below.

F. How problems will be reported and solved

Any breaches of tree protection measures shall constitute a Tree-Related Incident ('TRI'), a report on which will be copied to architect, client and LPA. A remedial action notice will be served by the arboriculturist and copied to all parties. Timescales for remediation completion shall be monitored. *All reports on site visits will be copied to the LPA within 5 days of site visit.* Action in response to incidents will be commensurate with and appropriate to the nature of any such incident. Any breach of the stipulated timescale for remediation will trigger a further TRI report.

G. How accidents and emergencies involving trees will be dealt with

Dependent on nature of incident; as above; an e-mail with photographic inclusion will be sent by the site agent. The arboriculturist or staff will attend site to appraise the situation and determine remedial action. A TRI report will be issued, as above.

9.3 Implementation on site

It is proposed that the methods specified below are followed in their entirety. Please note that the methods are referenced by various colours, lines and hatches on the tree protection plans appended. The scale of the plans is dependent on the paper size on which any hardcopy is produced.

It is highly important to tree health and vitality that construction activities are carried out strictly in accordance with the tree-friendly construction methods below. It is widely not understood outside the arboricultural profession, for example, that a single traverse of a root protection area by a mechanical excavator can cause significant and permanent damage to trees, even if this is not visible immediately afterward.

N.b. The methods below are intended to be read not only by the instructing client, but also by all others concerned with processing and determining of the application. Following planning approval, the methods are finally intended for full implementation on site by the main contractor or in some cases by a DIY builder. A degree of familiarity with the language of basic building techniques is assumed. I will of course explain any unfamiliar arboricultural term – see contact details on cover page, and at the end of the report.

9.4 Tree-friendly construction methods and awareness document

Section 9.4 including all the methods below should be printed out; the plans to full scale, and kept readily to hand on site. (To be read and duly completed:) I the undersigned builder / site agent / main contractor have been given a copy of the tree protection measures reproduced below and the plans S1349-J3-P1 v1 and S1349-J3-P2 v1 with which they are to be read. I have studied these tree protection measures on site with the arboriculturist. I have asked questions if I have been unsure about the practicability or safety of any measure. Any queries arising have been resolved. I see no reason why the tree protection should not be implemented as outlined below and undertake to take all reasonable steps within my remit to promote their installation and retention for the duration required, as outlined below.

There are 19no. methods in this set, to be implemented in the order given unless stated otherwise. Any breaches shall constitute a TRI, in accordance with 9.2 F, G above.

PREPARATION / DEMOLITION

Please read with tree protection plan, S1349-J3 P2, appended.

Method 1: ***SCHEDULE OF TREE WORK (Aim of method: to ensure only appropriate tree work is carried out)*** Tree work shall be in accordance with the schedule below, and to BS 3998:2010 'Tree Work - Recommendations', and in accord with spread line marked on plan. Heights are in metres; diameters are in millimetres.

Tree number	Tree type	Height (m)	Stem diameters (mm)	Comments
2	common holly	7	275	Remove; grind stumps to 250mm below ground level.
G3	Lawson cypress	9	<200	
4	weeping birch	4.5	270	
G5	limes	16	<600	Prune lower branches (below 8m above ground level) to a radial spread on east side only, of 3m. Crown clean in sector overhanging site.

NOTES:

- In Conservation Areas, in accordance with TCP Act 1990 Section 211, a formal notification to the LPA is required of intention to prune or remove any trees, where these actions are not strictly required for the construction proposed to take place. 42 days after formal notification should be allowed before proceeding with the notified work, during which time (and after) the LPA may place a Tree Preservation Order (TPO) on the tree, thus requiring a formal application for any works to living wood.

- If a tree is the subject of a TPO a formal application must be made to the LPA for consent for any work to the living wood of trees, if that work is not strictly required for the construction proposed to take place.
- All tree work should be carried out to BS 3998:2010 'Tree Work - Recommendations'.
- The Wildlife and Countryside Act 1981 protects with certain exceptions all birds and their nests. It is an offence to destroy such nests or take or injure such birds in the course of tree works operations.
- If a tree is a bat-roost, a licence to work on the tree must first be obtained from the relevant Statutory Nature Conservation Organization (in England: Natural England 0845 601 4523.) Acting without a licence is likely to be justifiable only in acute emergencies threatening human life and where all other legally available option such as footpath diversion, fencing and warning signs cannot be applied.
- 'Crown cleaning' – an umbrella term now covered by several separate sections in BS3998:2010 – should be understood to mean: removal of foreign objects (section 7.13); removal of ivy to the extent needed to facilitate inspection (section 7.12), typically trimming back (e.g. with a hedge cutter or secateurs) to near the line of the trunk or branches; and/or removing selected stems so that the structure of the tree can be seen sufficiently. Dead wood can be an important ecological feature. Treatment of dead wood under 'crown cleaning' shall mean (section 7.3.2) shorten and retain if safe to do so, thus retaining some resource for invertebrates, etc.

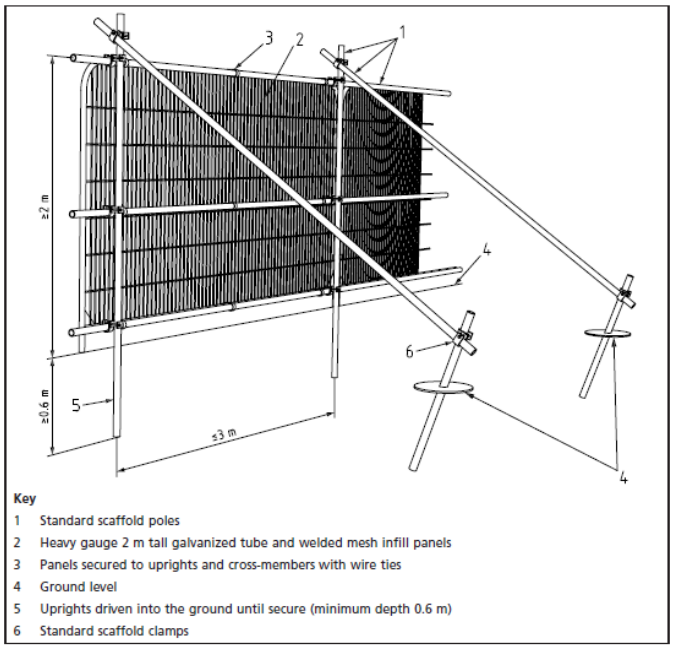
Arisings shall be chipped and removed from site, or stockpiled outside RPAs for possible later use as mulch at landscape phase. No vehicles shall stand or operate in any of the RPAs of retained trees. Any traversing of RPAs shall be preceded by laying of temporary trackway, such as TuffTrak® Euromat ground guards or similar appropriate temporary trackway sections. The temporary trackways shall be fixed together with manufacturers' approved fixings. This protective layer shall stay in place throughout arboricultural site preparation phase. Alternatively, tree operations shall be carried out via foot access only.

Method 2: ***WELFARE FACILITY (Aim of method: to facilitate compliance with HSE regulations whilst providing protection for trees during demolition operations and construction)***
The placement in terms of whereabouts on site of the structure is flexible: no pruning of tree branches to accommodate the superstructure shall take place. No reduction whatever in existing ground levels shall take place in RPAs (orange shape/circles on plans). Timber bearers such as modern or re-purposed railway sleepers shall be laid directly on the ground surface. Alternatively the floor and superstructure supporting frame shall be supported by micro-piles such as StopDigging or Great British Ground Screw Company Ltd. proprietary or similar micro-piles inserted with hand tools only. Trial pits to determine micro-pile locations shall be dug with hand tools only. N.B. The precise location of piles is flexible. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. No roots over 20mm diameter shall be cut. No connection to services of any kind shall be made below ground level in RPAs (orange shape/circles on plans): all services in and out shall be above ground level.

Method 3: ***TREE PROTECTION FENCING (Aim of method: to provide protection for trunks, branches and roots during demolition operations and construction)***

This method shall apply where indicated by pink lines. Tree protection fencing shall be erected, in accordance with the heavy-duty specification - BS5837:2012 section 6.2.2., Figure 2.

Figure 2 **Default specification for protective barrier**



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

No ground levels reduction or excavation shall take place within (=the tree side of) the fence lines.

No construction machinery on tracks or wheels shall enter the fenced-off zone(s). Incursions shall constitute a TRI, in accordance with 9.2 F, G above.

No fires shall be made on any part of the site, or within 20m of any tree to be retained. No storage of materials shall be made within (the tree side of) the protective fences.

Method 4: ***GROUND SURFACE HANDLING and PROTECTION (Aim of method: to provide protection for roots during demolition operations and construction)***

This method shall apply in the zones hatched blue on plan. NO levels reduction shall take place. This includes no 'scraping up' with a mechanical excavator or otherwise. Any existing hard surfacing, any existing surface debris, light vegetation, etc., that lies within the zone shall be removed using hand tools only.

NO levels reduction shall take place. This includes no 'scraping up' with a mechanical excavator or otherwise. Continuously abutted scaffold boards or manufactured boards shall be laid so as to completely cover this area. This area shall be used for light-duty access such as foot traffic only and light, modular type of construction, e.g. garden studio construction only.

OR

A 2D geotextile membrane, such as 'Ekotex' shall be laid; 100mm of green-source woodchip; continuously abutted scaffold boards or manufactured boards so as to completely cover this area. This area shall be used for medium-duty access pedestrian access only.

OR

To handle loads imposed by pedestrian-operated plant up to 1 tonne gross weight, a 2D geotextile membrane, such as 'Ekotex' shall be laid, and in sequence; 100mm of green-source woodchip; continuously abutted scaffold boards and a layer of manufactured board at least 25mm thick screwed to the underlying scaffold boards.

OR

To handle loads exceeding 2 tonnes the ground surface shall be covered with TuffTrak® Euromat ground guards or similar appropriate temporary trackway sections. The temporary

trackways shall be fixed together with manufacturers' approved fixings. On completion of build phase the ground guards shall be lifted by hand or by plant standing outside the zone.

Any scaffold erection shall take its bearing directly off the ground surface via spreader plates/scaffold boards.

Method 5: ***TEMPORARY ACCESS – INTENSIVE SITE (Aim of method: to provide heavy-duty protection for roots during demolition operations and construction)***
This method shall apply in zone gridded green on plan. No reduction of levels shall take place. No wheeled or tracked machinery shall be used, except if standing on completed formation as outlined below. An HDPE impermeable membrane shall be laid over the surface; 100mm depth sharp sand shall be laid over membrane; edge restraint shall be of timber formwork around the entire perimeter of the zone; such edge restraint shall stand 50mm above finished concrete-pour level to prevent concrete leaching into the soil; concrete shall be poured to a depth of 100mm over sharp sand layer. On completion of construction phase or when all need for vehicular access to the zone has ceased, slab / sand / membrane shall be removed using only hand-held tools or hand-held power tools. Any subsequent works in this zone shall be carried out as per Method 10.

Method 6: ***DEMOLITION (Aim of method: to prevent asphyxiation and contamination of roots during demolition operations)***
This method shall apply generally / in the zones outlined orange on plan. Demolition, which shall be by 'top down, sides in' method, shall be carried out with hand tools or hand-held power tools only. Arisings shall be removed for disposal off site. None shall be spread in root protection areas (orange shapes/circles).

CONSTRUCTION

Method 7: ***SERVICE TRENCHES (Aim of method: to limit and control root damage during services installation close to tree roots)***
N.b. This applies to ALL services: Electricity, gas, water, etc. Existing services shall be utilised wherever possible.

These methods shall apply generally within any RPA (orange shapes/circles).

1) The trench shall be opened with an air-spade to required depth. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of trench is dug. Services shall be worked under/over/around/between roots so as not to cut or damage any larger than 20mm diameter.
   OR
2) The trench shall be dug with hand tools only. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. No roots over 20mm diameter shall be cut. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of trench is dug. Services shall be worked under/over/around/between roots so as not to cut or damage any larger than 20mm diameter.

Method 8: ***CONCRETE and MORTAR MIXING***
This method shall apply generally within any RPA (orange shapes/circles). No concrete or mortar mixing shall take place unless within a fully bunded area with no outflow to any part of an RPA. Any slurry arising shall be pumped to an IBC or similar container and removed from site for disposal.

Method 9: ***ROOT PROTECTION and PRUNING (Aim of method: to limit and control root cutting during below-ground installation/construction)***
This method shall apply within only the RPA (orange shape/circle) of tree 1. Excavation shall be made with hand tools only. Any roots encountered shall be trimmed to the edge of excavation using a sharp edge tool such as handsaw or secateurs; the cuts shall be made at right angles to the long axis of the root, and in accordance with BS3998:2010, 8.6. An HDPE membrane shall be placed between any root-bearing soil (i.e., within the RPAs) and any wet concrete to be poured. Impermeable sheeting (to exclude wet concrete) shall be laid and secured locally by temporary weighting / taping as required. Concrete casting shall take place without disturbing this protective layer.

Method 10: ***TRANSITION FROM TEMPORARY ACCESS TO PERMANENT POROUS DRIVEWAY / CAR PARKING (Aim of method: to provide continuous protection for roots through to handover)***
This method shall apply in zone gridded green on plan. On completion of construction phase or when all need for construction-related access to the zone has ceased, the formwork shall be removed and any new edge restraint required shall be formed of permanent tanalised timber such as modern railway sleepers pegged or pinned through, e.g. with re-bar, to the substrate. The re-bar shall be driven below the upper face of the timber and the hole sealed with a hardwood peg and glued and trimmed flush. If edge restraints are required to be flush with adjacent ground levels, topsoil shall be loose-tipped and graded by hand to slope to existing levels.

On completion of construction phase or when all need for construction-related access to the zone has ceased, the temporary slab / sand /membrane shall be removed using only hand-held tools or hand-held power tools. The underlying sub-base shall be left undisturbed if it is competent to support the domestic-use loads envisaged. If it is, A is proposed. If it is not, B is proposed.

A. No excavation below the underside of the existing sub-base shall take place. A geogrid such as Tensar 'TriAx' shall be laid directly on the ground surface within the edge restraints. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid. This shall be 'no fines', granite or other hard stone, such as 'track ballast'. Slabs shall be laid open-jointed and the joints rammed with granite chippings. Paving blocks shall be open-jointed type.

B. The underlying sub-base shall be removed using only hand-held tools or hand-held power tools. A geogrid such as Tensar 'TriAx' laid shall be laid directly on the ground surface within the edge restraints. The grid size shall be sufficiently small to retain the stone layer 'no fines', granite or other hard stone, such as 'track ballast' to be laid in the geotextile layer above. This shall be a 3D pocket geotextile type 100 or 150mm deep, depending on envisaged loads, backfilled with 40-60mm clean stone – no fines, granite or other hard stone, such as 'track ballast', and may also be augmented where required to function as a SUDS feature. A further fine-mesh geogrid such as Tensar 'TriAx' shall be laid. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid. This shall be 'no fines', granite or other hard stone, such as 'track

ballast'. Slabs shall be laid open-jointed and the joints rammed with granite chippings. Paving blocks shall be open-jointed type. For a resin-bound open-pore gravel finish a further fine-mesh geogrid or needle-punched 2D geotextile may be required (to manufacturer's specification) over the level-correction layer.

Method 11: *WALL REBUILD / CONSTRUCTION*

This method shall apply in zones of cyan fill on plan. The wall shall be rebuilt on existing footings where competent to bear the calculated load. Where not, footings shall be confined to isolated pads, dug initially to trial positions. The trial pits to determine pad or pile locations shall be dug with hand tools only, or opened with an air-spade to required depth. N.B. The precise location of pads or piles is flexible within a dimension to be determined by retained engineer/architect. If hand digging is adopted, probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. THE WORK SHALL PROCEED CAUTIOUSLY. No roots over 20mm diameter shall be cut. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of hole is dug. It shall be borne in mind that the presence of large numbers of roots >20mm in diameter may effectively prevent completion of trial pit, as this would be sufficient reason to terminate the operation and consider its purpose complete or would entail the moving of the trial pit to a different location. If a root > 20mm diameter is inadvertently damaged, it shall be retained in situ for appraisal by the arboriculturist. Where roots more than 20mm diameter are unearthed in the pad locations and a pad cannot be re-located, the roots shall be wrapped in bubble wrap. The wrap shall not be wound very tightly against the root. All edges shall be sealed with insulating or gutter tape (not packing tape). (This sleeving both protects the root and forms a compressible layer when wet concrete is poured.) The sleeving shall be chased into the sides of the pit (where the root enters the soil face) for a distance of about 50mm and the entry point ring-sealed with expanding foam. It is important to ensure that a 25mm minimum thickness of wrap is fixed around the roots to be preserved. This protection shall be carried out progressively as the pad pit is dug, so as to protect roots from casual damage during excavation. An impermeable membrane shall line the trial pit and all edges sealed to prevent concrete leachate coming into contact with root-bearing soil. The pads shall be cast, and pre-cast lintels or architectural steelwork placed so as to leave a clearance of at least 50mm from retained roots. The wall shall be constructed. Brick slips may be bonded to any exposed pre-cast lintels or architectural steelwork if desired.

Method 12: *FOOTPATHS (various finishes possible)*

This method shall apply in zones of red crosses on plan. No 'scraping up' with a mechanical excavator shall take place. No wheeled or tracked machinery shall be used: construction shall be by means of hand tools/hand-held power tools. No reduction of levels shall take place, except to remove any wearing surface where a competent sub-base is to be retained and utilized. Edge restraint shall be formed from tanalised timber pinned to substrate with tanalised timber pegs or similar.

'NIDAGRAVEL' (allows a gravel finish where a firm walkover experience is required)

Levels can be corrected by use of granite chippings NO FINES. A 3D pocket geotextile system, such as the 'Nidagravel' tray system 40mm deep backfilled with 40mm+, clean stone or gravel – NO FINES can be laid directly over the level correction layer. This system provides a wheelchair-friendly finish.

OR SLABS

A fine-mesh geogrid such as Tensar 'TriAx' shall be laid. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid: granite chippings, NO FINES. Paving shall be laid open-jointed and the joints rammed with granite chippings.

Method 13: ***AIR-SOURCE HEAT PUMP UNIT***
This method shall apply in the zone of yellow fill on plan. No general reduction of existing ground levels shall take place. This means that no roots of any tree shall be cut. Galvanized welded 20-25mm steel mesh shall be cut to size to form edge restraints, and cut to suit the existing ground profile, secured at the corners with wire, supported if necessary with 10mm diameter rebar pins. The open-topped gabion cage thus formed shall be backfilled with 40-60mm clean stone. Formwork to contain the concrete while setting shall be installed, pegged or supported by timber. An impermeable membrane shall be laid within the formwork over the clean stone to prevent any leachate reaching the RPA below. The slab shall be cast, with one or more mesh reinforcement layers if required, using mix with minimal water content; 'low-slump'. After setting, the formwork shall be removed, the impermeable membrane trimmed, and the edges of the slab covered, if desired, with decorative wood bonded to the gabion steel mesh, e.g. via battens to further facilitate gaseous exchange. Any and all unit services shall be clipped to the garden wall, not placed in a trench.

Method 14: ***PLANTER (EDGE) CONSTRUCTION***
(Aim of method: to minimise root cutting)
This method shall apply in zone of brown fill on plan. The planter walls shall be formed from modern railway sleepers (1200mm x 200mm x 100mm or similar) laid flat, to required height, drilled at approx. 1.5m intervals and pinned to substrate with 25mm dia. re-bar or similar. Levelling shall be via minimal excavation (max. 60mm below existing levels), cutting no root greater in diameter than 20mm OR by chocking on hardwood slips / packers, and/or cutting base layer to fit step-wise into any slope. The re-bar shall be driven below the upper face of the topmost sleeper and the hole sealed with timber dowel or other hardwood peg and glued and trimmed flush.

Method 15: ***PERMANENT END-USER FENCING (Aim of method: to prevent potentially significant root cutting during an operation often assumed to be of low tree-impact)***
Where such fencing is proposed within root protection areas (orange circles), post holes shall be dug with hand tools only. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of hole is dug. It should be borne in mind that the presence of large numbers of roots >20mm in diameter may effectively prevent completion of post hole, and this would be sufficient reason to terminate the operation and move post hole to a different location. If a root >20mm is inadvertently damaged, it shall be retained *in situ* for appraisal by the arboriculturist.

Method 16: ***TREE PLANTING AREAS (Aim of method: to ensure thrift of new planting)***
This method shall apply after completion of main build only. Ground preparation for tree planting areas shall entail removal of hard surfacing using hand tools or hand-held power tools only, the removal of degraded or compacted or contaminated soil to a depth of at least 0.45m below finished surrounding ground level. The base and sides of the pit shall be forked over to at least one hand fork's spit in depth. Screened topsoil (to BS3882: 2015 topsoil) with biochar (such as https://www.soilfixer.co.uk/biochar-article) - 5% of the topsoil volume shall be used as planting medium. This equates to about 20 kgs of product per cubic metre of topsoil (to

BS3882: 2015 topsoil) to a maximum depth of 0.45m within 1.3m of the trunk location of each tree to be planted. Soil handling of any kind shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. Tree planting shall be in accordance with British Standard 8545:2014 'Trees: from nursery to independence in the landscape - Recommendations'. - Recommendations' ('the Standard' below). This enshrines good arboricultural practice: the tree shall be planted so that the root collar lies at finished ground level, shall be short-staked and tied with proprietary tree tie or otherwise stabilised in accordance with the Standard, section 10.5. The ground surface shall be mulched within 0.75m of the trunk location in accordance with the Standard, section 11.5.7, with composted organic material.

Any whips shall similarly be planted so that the root collar lies at finished ground level, and shall be protected with proprietary growing tube (staked). The ground surface shall be mulched within 0.75m of the trunk location in accordance with the Standard, section 11.5.7, with composted organic material.

Method 17: ***LANDSCAPING PREPARATION IN ROOT PROTECTION AREAS (Aim of method: to ensure thrift of topsoil)***
This method shall apply after completion of main build only. Operations shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. Ground preparation within root protection areas shall entail use of hand tools only. The ground surface shall be thoroughly hand-forked over in vertical mode only to one spit's depth (250mm). Care shall be taken not to damage tree roots greater than 20mm diameter. Weed treatment if required shall be via BASIS qualified operatives. Surface debris shall be removed by hand to barrow and disposed of off-site. No wheeled or tracked plant shall be used: hand-held power tools may be used. (Outside root protection areas, mechanical cultivation shall be permitted.) The finishing soil horizon where additional planting medium is required shall be composed of biochar (see: https://www.soilfixer.co.uk/biochar-article) mixed with topsoil (to BS3882:2015 topsoil) - 5% by volume (equating to 20 kgs of product per cubic metre of topsoil), which shall be laid by hand-barrow: no mechanical plant shall over-run the loose-tipped material. All handling of soils/soil-mix shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. The mix shall be laid to finish to required levels and allowed to settle via mist irrigation / watering-in / natural rainfall. The ground surface shall be worked to a fine tilth with hand tools prior to planting. No mechanical compaction whatever shall be used. Levelling and minimal consolidation shall be by hand tools / foot and board only, or naturally. Earthworm Inoculation Units (see: https://www.wormsdirectuk.co.uk/product/worm-colonies-lawn-areas/) shall be placed with their tops 150mm below ground level at 5m intervals in all soil build-up areas. The units, which are typically cardboard, shall be earthed in and irrigated.

Method 18: ***MAINTENANCE (Aim of method: to prevent expensive losses soon after planting)***
Maintenance shall consist of the regular moderate watering of any plant the subject of the planting proposal during the first season (April 15 to October 15) after planting and thereafter in the following four years if drought conditions occur. Mulch shall be kept topped up to a maximum depth of 100mm.

Method 19: ***REPLACEMENT (Aim of method: to maintain treescape as planned and consented)***
If within five years of issue of certificate of completion any plant the subject of the planting proposal dies or in the opinion of the LPA becomes seriously damaged or diseased, the same shall be replaced according to the above methods.

(All design subject to engineering approval, but used on other sites and known to be practicable and reliable).

Name [print]:

For construction company:

Date:

Signature……

S1349-J3-R-1

End of section 9.4 document

End of main body of report – plans appended.

Dated: 16th December 2024

Signature (for John Cromar's Arboricultural Co. Ltd.)

John Cromar

Dip. Arb. (RFS), FArborA

JOHN CROMAR'S
ARBORICULTURAL
COMPANY LTD

www.treescan.co.uk
admin@treescan.co.uk

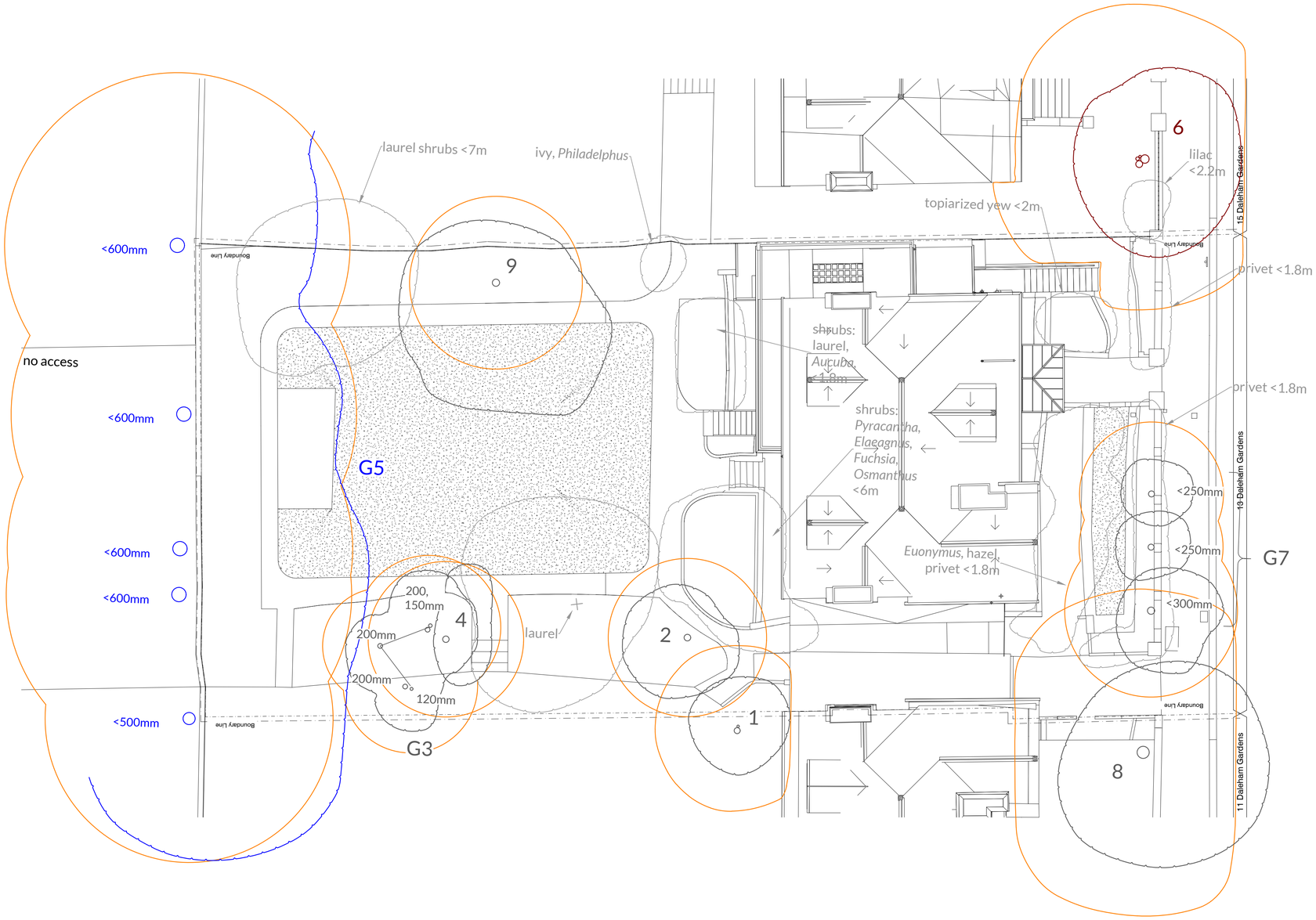
01582 808020
07860453072

10 Plans

N.b. The scale of the plans is dependent on the paper size on which any hard copy is produced.

S1349-J3-P1 v1

S1349-J3-P2 v1



JOHN CROMAR'S ARBORICULTURAL COMPANY LIMITED

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KEY TO COLOURS / LINETYPES USED IN RELATION TO TREES

GREEN - High Value (A)
BLUE - Moderate Value (B)
BLACK - Low Value (C)
RED - Very short life expectancy (U)
ORANGE SHAPES: Root Protection Areas

Spread and trunk colours correspond directly to those used in British Standard 5837:2012, Table 2.

TOOTHED LINE: Tree spread line

DRG. NAME

TREE VALUE ASSESSMENT (AS PER BS 5837:2012) & ROOT PROTECTION AREAS

NOTES

Do not use for setting out purposes.
All dimensions to be checked on site.

Any scale referenced below applies **ONLY** when plan **printed at ISO A1 size.**

The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

TEXT
FOR FULL DETAILS OF TREE VALUE PLEASE SEE REPORT

BASED ON
MAREK WOJCIECHOWSKI ARCHITECTS DRG. NO.: 24003 P1999 and P2000 SUPPLIED

SITE ADDRESS
13 Daleham Gardens, London, NW3 5BY

DRG. REF.	REV. NO.
S1349-J3-P1	v1
SCALE & SIZE	DATE
1:100 @ A1	16-Dec-24

0 5

The methods below typically each have a unique colour code and hatch or other reference to the plan, for example, pink lines indicate where fences to protect trees should be positioned.

PREPARATION / DEMOLITION

Method 1: ***SCHEDULE OF TREE WORK***
Tree work shall be in accordance with the schedule within report and to BS 3998:2010 'Tree Work - Recommendations', and in accord with spread line(s) marked on plan.

Method 2: ***WELFARE FACILITY (Aim of method: to facilitate compliance with HSE regulations whilst providing protection for trees during demolition operations and construction)***

The placement in terms of whereabouts on site of the structure is flexible: no pruning of tree branches to accommodate the superstructure shall take place. No reduction whatever in existing ground levels shall take place in RPAs (orange shape/circles on plans). Timber bearers such as modern or re-purposed railway sleepers shall be laid directly on the ground surface. Alternatively the floor and superstructure supporting frame shall be supported by micro-piles such as StopDigging or Great British Ground Screw Company Ltd. proprietary or similar micro-piles inserted with hand tools only. Trial pits to determine micro-pile locations shall be dug with hand tools only. N.B. The precise location of piles is flexible. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. No roots over 20mm diameter shall be cut. No connection to services of any kind shall be made below ground level in RPAs (orange shape/circles on plans): all services in and out shall be above ground level.

Method 3: ***TREE PROTECTION FENCING (Aim of method: to provide protection for trunks, branches and roots during demolition operations and construction)***

This method shall apply where indicated by pink lines. Tree protection fencing shall be erected, in accordance with the heavy-duty specification - BS5837:2012 section 6.2.2., Figure 2.

No ground levels reduction or excavation shall take place within (=the tree side of) the fence lines.

No construction machinery on tracks or wheels shall enter the fenced-off zone(s). Incursions shall constitute a TRI, in accordance with 9.2 F, G above.

No fires shall be made on any part of the site, or within 20m of any tree to be retained. No storage of materials shall be made within (the tree side of) the protective fences.

Method 4: ***GROUND SURFACE HANDLING and PROTECTION (Aim of method: to provide protection for roots during demolition operations and construction)***

This method shall apply in the zones hatched blue on plan. NO levels reduction shall take place. This includes no 'scraping up' with a mechanical excavator or otherwise. Any existing hard surfacing, any existing surface debris, light vegetation, etc., that lies within the zone shall be removed using hand tools only.

NO levels reduction shall take place. This includes no 'scraping up' with a mechanical excavator or otherwise. Continuously abutted scaffold boards or manufactured boards shall be laid so as to completely cover this area. This area shall be used for light-duty access such as foot traffic only and light, modular type of construction, e.g. garden studio construction only.

OR

A 2D geotextile membrane, such as 'Ekotex' shall be laid; 100mm of green-source woodchip; continuously abutted scaffold boards or manufactured boards so as to completely cover this area. This area shall be used for medium-duty access pedestrian access only.

OR

To handle loads imposed by pedestrian-operated plant up to 1 tonne gross weight, a 2D geotextile membrane, such as 'Ekotex' shall be laid, and in sequence; 100mm of green-source woodchip; continuously abutted scaffold boards and a layer of manufactured board at least 25mm thick screwed to the underlying scaffold boards.

OR

To handle loads exceeding 2 tonnes the ground surface shall be covered with TuffTrak® Euromat ground guards or similar appropriate temporary trackway sections. The temporary trackways shall be fixed together with manufacturers' approved fixings. On completion of build phase the ground guards shall be lifted by hand or by plant standing outside the zone.

Any scaffold erection shall take its bearing directly off the ground surface via spreader plates/scaffold boards.

Method 5: ***TEMPORARY ACCESS - INTENSIVE SITE (Aim of method: to provide heavy-duty protection for roots during demolition operations and construction)***

This method shall apply in zone gridded green on plan. No reduction of levels shall take place. No wheeled or tracked machinery shall be used, except if standing on completed formation as outlined below. An HDPE impermeable membrane shall be laid over the surface; 100mm depth sharp sand shall be laid over membrane; edge restraint shall be of timber formwork around the entire perimeter of the zone; such edge restraint shall stand 50mm above finished concrete-pour level to prevent concrete leaching into the soil; concrete shall be poured to a depth of 100mm over sharp sand layer. On completion of construction phase or when all need for vehicular access to the zone has ceased, slab / sand / membrane shall be removed using only hand-held tools or hand-held power tools. Any subsequent works in this zone shall be carried out as per Method 10.

Method 6: ***DEMOLITION (Aim of method: to prevent asphyxiation and contamination of roots during demolition operations)***

This method shall apply generally / in the zones outlined orange on plan. Demolition, which shall be by 'top down, sides in' method, shall be carried out with hand tools or hand-held power tools only. Arisings shall be removed for disposal off site. None shall be spread in root protection areas (orange shapes/circles).

CONSTRUCTION

Method 7: ***SERVICE TRENCHES (Aim of method: to limit and control root damage during services installation close to tree roots)***

N.b. This applies to ALL services; Electricity, gas, water, etc. Existing services shall be utilised wherever possible.

These methods shall apply generally within any RPA (orange shapes/circles).

1) The trench shall be opened with an air-spade to required depth. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of trench is dug. Services shall be worked under/over/around/between roots so as not to cut or damage any larger than 20mm diameter.

   OR

2) The trench shall be dug with hand tools only. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. No roots over 20mm diameter shall be cut. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of trench is dug. Services shall be worked under/over/around/between roots so as not to cut or damage any larger than 20mm diameter.

Method 8: ***CONCRETE and MORTAR MIXING***

This method shall apply generally within any RPA (orange shapes/circles). No concrete or mortar mixing shall take place unless within a fully bunded area with no outflow to any part of an RPA. Any slurry arising shall be pumped to an IBC or similar container and removed from site for disposal.

Method 9: ***ROOT PROTECTION and PRUNING (Aim of method: to limit and control root cutting during below-ground installation/construction)***

This method shall apply within only the RPA (orange shape/circle) of tree 1. Excavation shall be made with hand tools only. Any roots encountered shall be trimmed to the edge of excavation using a sharp edge tool such as handsaw or secateurs; the cuts shall be made at right angles to the long axis of the root, and in accordance with BS3998:2010, 8.6. An HDPE membrane shall be placed between any root-bearing soil (i.e., within the RPAs) and any wet concrete to be poured. Impermeable sheeting (to exclude wet concrete) shall be laid and secured locally by temporary weighting / taping as required. Concrete casting shall take place without disturbing this protective layer.

Method 10: ***TRANSITION FROM TEMPORARY ACCESS TO PERMANENT POROUS DRIVEWAY / CAR PARKING (Aim of method: to provide continuous protection for roots through to handover)***

This method shall apply in zone gridded green on plan. On completion of construction phase or when all need for construction-related access to the zone has ceased, the formwork shall be removed and any new edge restraint required shall be formed of permanent tanalised timber such as modern railway sleepers pegged or pinned through, e.g. with re-bar, to the substrate. The re-bar shall be driven below the upper face of the timber and the hole sealed with a hardwood peg and glued and trimmed flush. If edge restraints are required to be flush with adjacent ground levels, topsoil shall be loose-tipped and graded by hand to slope to existing levels.

On completion of construction phase or when all need for construction-related access to the zone has ceased, the temporary slab / sand /membrane shall be removed using only hand-held tools or hand-held power tools. The underlying sub-base shall be left undisturbed if it is competent to support the domestic-use loads envisaged. If it is, A is proposed. If it is not, B is proposed.

A. No excavation below the underside of the existing sub-base shall take place. A geogrid such as Tensar 'TriAx' shall be laid directly on the ground surface within the edge restraints. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid. This shall be 'no fines', granite or other hard stone, such as 'track ballast'. Slabs shall be laid open-jointed and the joints rammed with granite chippings. Paving blocks shall be open-jointed type.

B. The underlying sub-base shall be removed using only hand-held tools or hand-held power tools. A geogrid such as Tensar 'TriAx' laid shall be laid directly on the ground surface within the edge restraints. The grid size shall be sufficiently small to retain the stone layer 'no fines', granite or other hard stone, such as 'track ballast' to be laid in the geotextile layer above. This shall be a 3D pocket geotextile type 100 or 150mm deep, depending on envisaged loads, backfilled with 40-60mm clean stone - no fines, granite or other hard stone, such as 'track ballast', and may also be augmented where required to function as a SUDS feature. A further fine-mesh geogrid such as Tensar 'TriAx' shall be laid. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid. This shall be 'no fines', granite or other hard stone, such as 'track ballast'. Slabs shall be laid open-jointed and the joints rammed with granite chippings. Paving blocks shall be open-jointed type. For a resin-bound open-pore gravel finish a further fine-mesh geogrid or needle-punched 2D geotextile may be required (to manufacturer's specification) over the level-correction layer.

Method 11: ***WALL REBUILD / CONSTRUCTION***

This method shall apply in zones of cyan fill on plan. The wall shall be rebuilt on existing footings where competent to bear the calculated load. Where not, footings shall be confined to isolated pads, dug initially to trial positions. The trial pits to determine pad or pile locations shall be dug with hand tools only, or opened with an air-spade to required depth. N.B. The precise location of pads or piles is flexible within a dimension to be determined by retained engineer/architect. If hand digging is adopted, probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. THE WORK SHALL PROCEED CAUTIOUSLY. No roots over 20mm diameter shall be cut. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of hole is dug. It shall be borne in mind that the presence of large numbers of roots >20mm in diameter may effectively prevent completion of trial pit, as this would be sufficient reason to terminate the operation and consider its purpose complete or would entail the moving of the trial pit to a different location. If a root > 20mm diameter is inadvertently damaged, it shall be retained in situ for appraisal by the arboriculturist. Where roots more than 20mm diameter are unearthed in the pad locations and a pad cannot be re-located, the roots shall be wrapped in bubble wrap. The wrap shall not be wound very tightly against the root. All edges shall be sealed with insulating or gutter tape (not packing tape). (This sleeving both protects the root and forms a compressible layer when wet concrete is poured.) The sleeving shall be chased into the sides of the pit (where the root enters the soil face) for a distance of about 50mm and the entry point ring-sealed with expanding foam. It is important to ensure that a 25mm minimum thickness of wrap is fixed around the roots to be preserved. This protection shall be carried out progressively as the pad pit is dug, so as to protect roots from casual damage during excavation. An impermeable membrane shall line the trial pit and all edges sealed to prevent concrete leachate coming into contact with root-bearing soil. The pads shall be cast, and pre-cast lintels or architectural steelwork placed so as to leave a clearance of at least 50mm from retained roots. The wall shall be constructed. Brick slips may be bonded to any exposed pre-cast lintels or architectural steelwork if desired.

Method 12: ***FOOTPATHS (various finishes possible)***

This method shall apply in zones of red crosses on plan. No 'scraping up' with a mechanical excavator shall take place. No wheeled or tracked machinery shall be used: construction shall be by means of hand tools/hand-held power tools. No reduction of levels shall take place, except to remove any wearing surface where a competent sub-base is to be retained and utilized. Edge restraint shall be formed from tanalised timber pinned to substrate with tanalised timber pegs or similar. 'NIDAGRAVEL' (allows a gravel finish where a firm walkover experience is required)

Levels can be corrected by use of granite chippings NO FINES. A 3D pocket geotextile system, such as the 'Nidagravel' tray system 40mm deep backfilled with 40mm+, clean stone or gravel - NO FINES can be laid directly over the level correction layer. This system provides a wheelchair-friendly finish.

OR SLABS

A fine-mesh geogrid such as Tensar 'TriAx' shall be laid. The grid size shall be sufficiently small to retain the level correction/bedding layer stone to be laid: granite chippings, NO FINES. Paving shall be laid open-jointed and the joints rammed with granite chippings.

Method 13: ***AIR-SOURCE HEAT PUMP UNIT***

This method shall apply in the zone of yellow fill on plan. No general reduction of existing ground levels shall take place. This means that no roots of any tree shall be cut. Galvanized welded 20-25mm steel mesh shall be cut to size to form edge restraints, and cut to suit the existing ground profile, secured at the corners with wire, supported if necessary with 10mm diameter rebar pins. The open-topped gabion cage thus formed shall be backfilled with 40-60mm clean stone. Formwork to contain the concrete while setting shall be installed, pegged or supported by timber. An impermeable membrane shall be laid within the formwork over the clean stone to prevent any leachate reaching the RPA below. The slab shall be cast, with one or more mesh reinforcement layers if required, using mix with minimal water content; 'low-slump'. After setting, the formwork shall be removed, the impermeable membrane trimmed, and the edges of the slab covered, if desired, with decorative wood bonded to the gabion steel mesh, e.g. via battens to further facilitate gaseous exchange. Any and all unit services shall be clipped to the garden wall, not placed in a trench.

Method 14: ***PLANTER (EDGE) CONSTRUCTION***
(Aim of method: to minimise root cutting)

This method shall apply in zone of brown fill on plan. The planter walls shall be formed from modern railway sleepers (1200mm x 200mm x 100mm or similar) laid flat, to required height, drilled at approx. 1.5m intervals and pinned to substrate with 25mm dia. re-bar or similar. Levelling shall be via minimal excavation (max. 60mm below existing levels), cutting no root greater in diameter than 20mm OR by chocking on hardwood slips / packers, and/or cutting base layer to fit step-wise into any slope. The re-bar shall be driven below the upper face of the topmost sleeper and the hole sealed with timber dowel or other hardwood peg and glued and trimmed flush.

Method 15: ***PERMANENT END-USER FENCING (Aim of method: to prevent potentially significant root cutting during an operation often assumed to be of low tree-impact)***

Where such fencing is proposed within root protection areas (orange circles), post holes shall be dug with hand tools only. Probes such as screwdrivers or steel rod <10mm diameter to determine root presence ahead of digging shall be used. The work shall proceed cautiously. Roots 20mm or more in diameter unearthed shall be temporarily protected with bubble-wrap and insulating or gaffer tape while rest of hole is dug. It should be borne in mind that the presence of large numbers of roots >20mm in diameter may effectively prevent completion of post hole, and this would be sufficient reason to terminate the operation and move post hole to a different location. If a root >20mm is inadvertently damaged, it shall be retained *in situ* for appraisal by the arboriculturist.

Method 16: ***TREE PLANTING AREAS (Aim of method: to ensure thrift of new planting)***

This method shall apply after completion of main build only. Ground preparation for tree planting areas shall entail removal of hard surfacing using hand tools or hand-held power tools only, the removal of degraded or compacted or contaminated soil to a depth of at least 0.45m below finished surrounding ground level. The base and sides of the pit shall be forked over to at least one hand fork's spit in depth. Screened topsoil (to BS3882: 2015 topsoil) with biochar (such as https://www.soilfixer.co.uk/biochar-article) - 5% of the topsoil volume shall be used as planting medium. This equates to about 20 kgs of product per cubic metre of topsoil (to BS3882: 2015 topsoil) to a maximum depth of 0.45m within 1.3m of the trunk location of each tree to be planted. Soil handling of any kind shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. Tree planting shall be in accordance with British Standard 8545:2014 'Trees: from nursery to independence in the landscape - Recommendations'. - Recommendations' ('the Standard' below). This ensbrines good arboricultural practice: the tree shall be planted so that the root collar lies at finished ground level, shall be short-staked and tied with proprietary tree tie or otherwise stabilised in accordance with the Standard, section 10.5. The ground surface shall be mulched within 0.75m of the trunk location in accordance with the Standard, section 11.5.7, with composted organic material.

Any whips shall similarly be planted so that the root collar lies at finished ground level, and shall be protected with proprietary growing tube (staked). The ground surface shall be mulched within 0.75m of the trunk location in accordance with the Standard, section 11.5.7, with composted organic material.

Method 17: ***LANDSCAPING PREPARATION IN ROOT PROTECTION AREAS (Aim of method: to ensure thrift of topsoil)***

This method shall apply after completion of main build only. Operations shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. Ground preparation within root protection areas shall entail use of hand tools only. The ground surface shall be thoroughly hand-forked over in vertical mode only to one spit's depth (250mm). Care shall be taken not to damage tree roots greater than 20mm diameter. Weed treatment if required shall be via BASIS qualified operatives. Surface debris shall be removed by hand to barrow and disposed of off-site. No wheeled or tracked plant shall be used: hand-held power tools may be used. (Outside root protection areas, mechanical cultivation shall be permitted.) The finishing soil horizon where additional planting medium is required shall be composed of biochar (see: https://www.soilfixer.co.uk/biochar-article) mixed with topsoil (to BS3882:2015 topsoil) - 5% by volume (equating to 20 kgs of product per cubic metre of topsoil), which shall be laid by hand-barrow: no mechanical plant shall over-run the loose-tipped material. All handling of soils/soil-mix shall take place only after a minimum of 3 days after heavy rain, and shall where possible be carried out 7 days or more after such rainfall. The mix shall be laid to finish to required levels and allowed to settle via mist irrigation / watering-in / natural rainfall. The ground surface shall be worked to a fine tilth with hand tools prior to planting. No mechanical compaction whatever shall be used. Levelling and minimal consolidation shall be by hand tools / foot and board only, or naturally. Earthworm Inoculation Units (see: https://www.wormsdirectuk.co.uk/product/worm-colonies-lawn-areas/) shall be placed with their tops 150mm below ground level at 5m intervals in all soil build-up areas. The units, which are typically cardboard, shall be earthed in and irrigated.

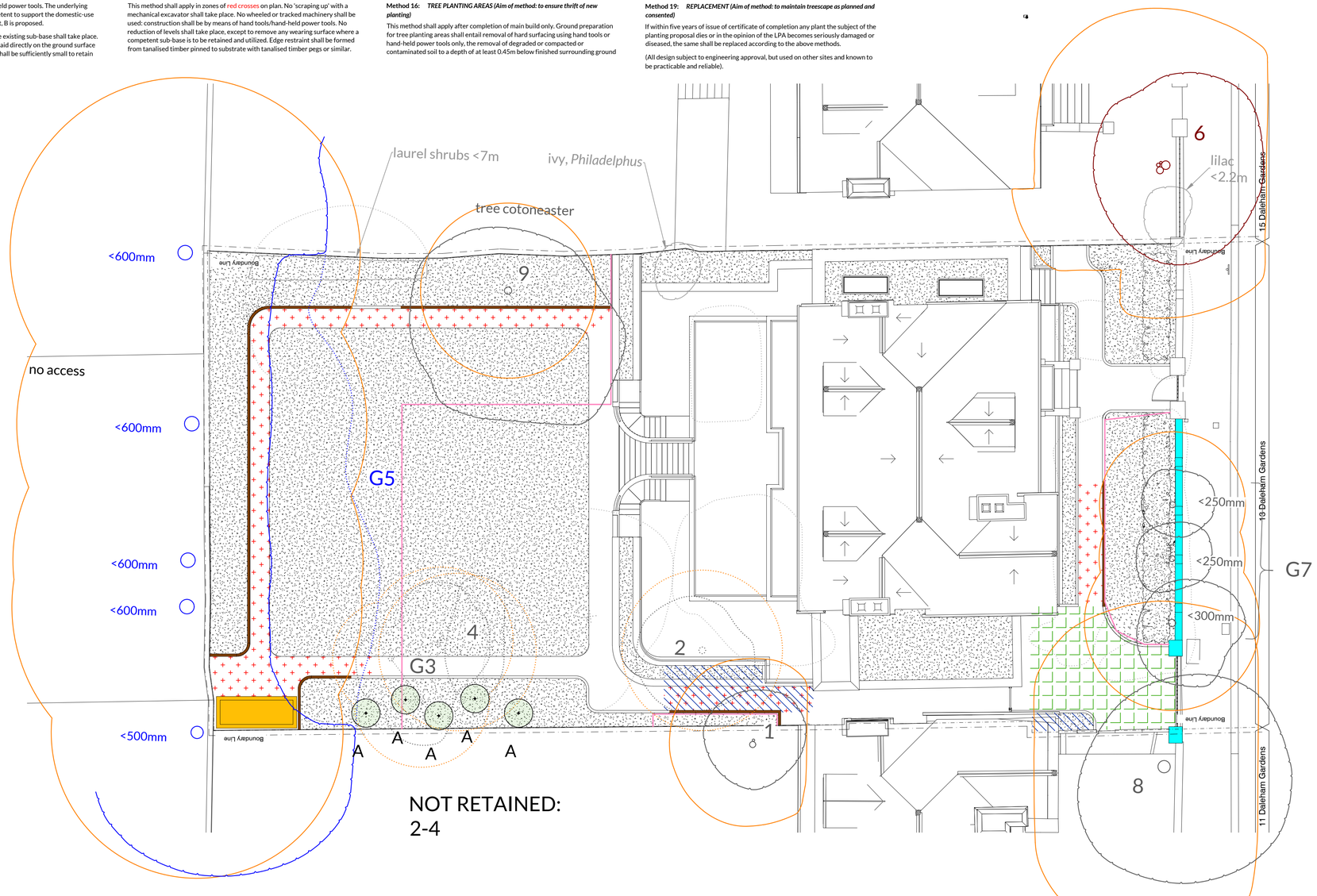
Method 18: ***MAINTENANCE (Aim of method: to prevent expensive losses soon after planting)***

Maintenance shall consist of the regular moderate watering of any plant the subject of the planting proposal during the first season (April 15 to October 15) after planting and thereafter in the following four years if drought conditions occur. Mulch shall be kept topped up to a maximum depth of 100mm.

Method 19: ***REPLACEMENT (Aim of method: to maintain treescape as planned and consented)***

If within five years of issue of certificate of completion any plant the subject of the planting proposal dies or in the opinion of the LPA becomes seriously damaged or diseased, the same shall be replaced according to the above methods.

(All design subject to engineering approval, but used on other sites and known to be practicable and reliable).



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KEY TO COLOURS / LINETYPES USED IN RELATION TO TREES

GREEN - High Value (A)
BLUE - Moderate Value (B)
BLACK - Low Value (C)
RED - Very short life expectancy (U)
ORANGE SHAPES: Root Protection Areas

Spread and trunk colours correspond directly to those used in British Standard 5837:2012, Table 2.

PROPOSED NEW PLANTING:
Where applicable, this is indicated by green stipple within roundels (trees) or other shapes, e.g., for hedges. For key to the letters designating locations, please see report.

DRG. NAME
TREE PROTECTION PLAN

NOTES
Do not use for setting out purposes.
All dimensions to be checked on site.

Any scale referenced below applies **ONLY** when plan **printed at ISO A1 size.**

The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

TEXT
PLEASE READ WITH SECTION 9 OF REPORT FOR FULL METHOD DETAILS

BASED ON
MAREK WOJCIECHOWSKI ARCHITECTS DRG. NO.: 24003 P1999 and P2000 SUPPLIED

SITE ADDRESS
13 Daleham Gardens, London, NW3 5BY

DRG. REF.	REV. NO.
S1349-J3-P2	v1
SCALE & SIZE	DATE
1:100 @ A1	16-Dec-24

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