1-38-4325/3

R E P O R T

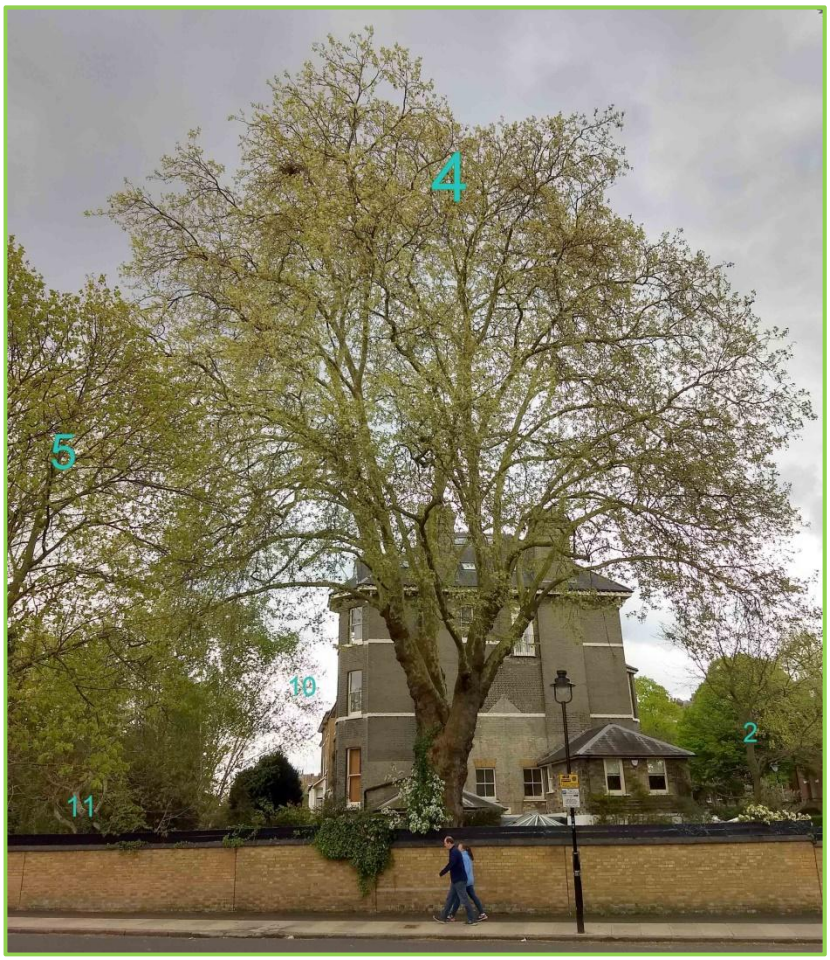
on the impact on trees

of proposals for development

at

42 Elsworthy Road, London, NW3 3DL

(13th August 2019)



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01
Introduction and Instructions

I am instructed by Marek Wojciechowski Architects Ltd. on behalf of clients to make an assessment of tree amenity value and condition of trees at 42 Elsworthy Road, London, NW3 3DL and of the impact of a proposal for development (an extension and basement) on such trees. Accordingly, I visited the property on 1st May, 2019 in order to carry out an inspection. Site exploratory works near tree 4 were carried out following correspondence and discussion with Camden Council Tree Officer Nick Bell, and an amended scheme in the particular of the extent of the patio and basement is here considered.

02
Copyright

02.01

03
Notes

03.01
PLANS

1-38-4325/P1 gives an approximate representation (in plan) of actual crown form, and is intended to indicate the relationship of neighbouring trees to each other, and should be read with the comments on crown shape and tree value in TREE DETAILS appended. The plan gives a quick reference assessment of value as per section 4, table 1, of BS 5837:2012 'Trees in relation to design, demolition and construction - Recommendations'. Assessment of value in the TREE DETAILS table appended is, in accordance with this British Standard related mainly but not exclusively to the criterion of *visual value to the general public*. The Standard recommends a way of classifying trees when assessing their potential value in relation to proposed development. Some surveys may not include any trees of one or more categories. Table 1 suggests categories 'U', 'C', 'B' and 'A' , in ascending merit. 'U' (RED crown outline on plan) category trees are dangerous \ low value trees that could require removal for safety or arboricultural reasons. 'C' (GREY or black/uncoloured crown outline on plan) category trees are of no particular merit, but in adequate condition for retention. 'A' category trees (GREEN crown outline on plan) are trees of high vitality or good form, or of particular visual importance: 'B' (BLUE crown outline on plan) category are good trees but may be of slightly poorer form or be not sited as importantly as 'A' category trees. See TREE DETAILS appended. Category Assessment appears in column 10. This standard also provides a way of determining an area (see TREE DETAILS column 7) – the RPA – root protection area - around the trunk of the tree in which protective measures should be used in order to prevent significant damage to trees. There are

various ways of achieving this. A simple way is to use exclusion fencing, but other methods have been shown by established use to be very effective.

03.02
1-38-4325/P2 and 1-38-4325/P3 are colour-coded to indicate where arboricentric methods are proposed during the demolition and construction processes.

04
Sources and Documents

Ground level inspection.
Supplied plans :
MAREK WOJCIECHOWSKI ARCHS.
DRG. NO.: 16092 E_02 Existing Lower Ground Floor Plan
DRG. NO.: 16092 P_01 rev. B Proposed Lower Ground Floor Plan
DRG. NO.: 16092 P_02 rev. B Proposed Lower Ground Floor Plan
DRG. NO.: 16092 P_03 rev. A Proposed Lower Ground Floor Plan

05
Appraisal

05.01
EXECUTIVE SUMMARY
The trees on and adjacent to the site are part of the arboricultural grain of this suburb of London and contribute considerably to the amenity of the locality. The great majority of these are retained within the proposals. Those that are proposed removed are typically of short safe useful life expectancy, or are dangerous. The loss of the few others are insignificant to public amenity and can be addressed by proposed planting. The proposed basement by reason of degree (minimal) will not have a deleterious effect on retained trees.

05.02
AMENITY / SCREENING BY TREES AND SHRUBS
Certain trees, including the large London plane (4), are of significant general public amenity value, as they are visible from public viewpoints. Several of the same trees and others are also of considerable strictly local amenity value to owners / users of the site, and to those of adjoining properties.

05.03
TREES AND LAYOUT - POTENTIAL FOR CONFLICT WITH ROOTS
(Details appear in the tree detail table appended.) The figures in columns 5 and 6 in the Tree data table appended indicate the root protection area ('RPA' below), and typically the basic exclusion fence position. New materials and methods have been developed and continue to be developed that assist in promoting the successful retention of trees in association with constructed features. It should be noted that BS 5837:2012 (section 7.4.2) supports 'up and over' methods of construction where appropriate. The design principle of this method is outlined within Arboricultural Practice Note 12 (Through the Trees to Development, - a revision of APN 1, 1996, published originally by AAIS / Tree

Advice Trust). This method has been used for many years on the recommendation of John Cromar's Arboricultural Co. Ltd. and has successfully allowed the retention of mature trees very close to construction activities.

05.04
An assessment as per BS5837:2012 section 4.6.2 has been carried out in connection with all trees to be retained. (This section requires that site conditions such as location of structures, tree mechanics, etc., are taken into account in determining the likely position of roots.) This is of particular relevance in connection with this site where several trees to be retained are sited close to substantial boundary walls. In such situations, some trees' root systems are substantially deflected and develop along moisture, penetrability and atmospheric gradients. This tendency is quite strongly genera-related. Accordingly, several RPAs (root protection areas) have been amended to more realistically represent likely root extent. Tree 4's roots have almost certainly not been entirely contained by the boundary wall, whereas other trees' roots almost certainly have been. Tree 5 is badly decayed: no emendation of the RPA has, accordingly been carried out as this tree is, reasonably, not a constraint on development.

05.05
ROOTS and DESIGN
SRP is an acronym for *static root plate*, (after *Mattheck*, 1991, etc.) a radial dimension derived from trunk diameter based on studies of wind-thrown trees and thus a guide to where structurally significant roots are likely to be located. RPA is an acronym used in BS5837:2012 and signifying the *root protection area*. The RPA is a guide to where systemically significant roots are likely to be located. No encroachment on the SRP of any retained tree is entailed.

Minor encroachment on the RPA of certain retained trees is entailed, as analysed in the table below (previous and current compared) :

Tree no.	Tree	RPA area (m^2)	Area affected (m^2)	% affected	Notes
1	English yew	146.98	0.11	0.07	Proposed LGF
4	London plane	706.86	10.82	1.53	Proposed basement + PFT
4	London plane	706.86	18.29	2.59	Proposed LGF
10	Himalayan birch	28.73	1.03	3.59	Proposed basement + PFT
4	London plane	706.86	29.17	4.13	Previous basement + PFT
4	London plane	706.86	55.42	7.84	Previous LGF
10	Himalayan birch	28.73	1.03	3.59	Previous basement + PFT

In the writer's now extensive experience gained over more than a third of a century in arboriculture, controlled, limited-extent, vertical root cutting of this kind is of little or no significance to tree health. Trial pitting in advance of application has been carried out, and the amended proposals based on the findings of roots. The actually damaging operations are those that degrade or compact the ground surface within the RPA, for example by uncontrolled access

by mechanical excavators, dumpers, etc. It should be noted that the limited root cutting entailed in this proposal is, by an order of magnitude, far less than that entailed in the commercial moving of maturing and even mature trees, which has been practised successfully for centuries.

In view of the above I conclude that no special footings are needed from the arboricultural perspective. In this case all trees to be retained can be adequately protected by exclusion fencing and arboricentric methods as proposed below to reduce impacts on root systems of retained trees.

05.06
PERCEPTION OF TREES
The majority of the significantly-sized retained trees are located mainly to the north west and west of the proposed extended dwelling.

The proposed (extended) dwelling is in an almost identical position in relation to the trees as is the existing structure : the existing structure's position in relation to the existing trees has not generated any obvious or reported requirement to prune trees inappropriately. Minor historic reductions of the crown spread of London plane 4 on its south-east side were noted, and repeat pruning on an appropriate cycle can thus reasonably be expected to be consented indefinitely. The proposed extension is multiple-lit (from three elevations). The proposed basement will be partly artificially lit. Light-wells to the front (south-east) are proposed.

In my view the internal layout of the proposed dwelling has been designed so as to generate minimum shading inconvenience. In view of the above I conclude that shading by and perception of trees has been considered (as sections 5.3.4 and 5.6.2.6 of BS 5837:2012 recommend) and appear not to be negative factors.

05.07
SUPERSTRUCTURE AND TREE APPRAISAL - TREE PRUNING
I note from the elevation drawings supplied that no encroachment on the crowns of retained trees will occur. Tree surgery (removals) is proposed to be to British Standard 3998:2010 'Tree work – Recommendations'. A schedule for the use of a contractor appears below.

05.08
TREE REMOVAL APPRAISAL and REPLACEMENT PLANTING
Please see section 08 for comments on the individual trees proposed for removal. Overall, appropriate replacement tree planting will play a minor role in providing for future public and local amenity. The British Geological Survey information for the area indicates that the underlying sub-soil is London clay. This places no significant constraint on species selection for tree and other planting. See plan for locations:

A= cypress oak (*Quercus robur* 'Koster') 14-16cm girth 85 L pot

B= dawn redwood (*Metasequoia glyptostroboides*) 16-18cm girth 85L pot

05.09
SUPERVISION
Supervision by and regular communication with an arboriculturist is a nigh-essential element of site management where trees are present and to be retained. I propose that this takes place at key points in the construction process, and additionally whenever required by the architect or LPA. These key stages are as per section 06.01 below.

05. 10
PUBLISHED GUIDANCE IN RELATION TO TREES AND DEVELOPMENT
In conserving trees on development sites, expected best practice is as in B.S. 5837 : 2012. Section 5.1.1 notes:

"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."

05.11
The above advice appears to have been considered in formulating proposals for development.

05.12
CONCLUSION
I conclude that the construction proposed, subject to precautionary measures as outlined above and as per the recommendations outlined below, will not be injurious to trees to be retained, nor will require unreasonable numbers of trees of significant public amenity value to be removed. Any tree losses will be satisfactorily addressed by proposed planting.

05.13
SUPERVISION
Supervision by and regular communication with an arboriculturist is typically an essential element of site management where trees are present and to be retained. I propose that this takes place at key points in the construction process, and additionally whenever required by the architect or LPA. These key stages are as per OVERVIEW below.

05.14
Note to LPA : if the Authority is minded to grant consent, it is invited to consider:

a) the incorporation of the specific *order of implementation* of the arboricentric methods below into any Conditions applied.

b) to specify in a Condition that any Construction Management Plan incorporates all the arboricentric methods herein.

Such measures are likely to maximise tree protection.

06
TREE PROTECTION - ARBORICENTRIC METHODS

06.01

OVERVIEW

It is highly important to tree health and vitality that construction activities are carried out strictly in accordance with the tree protection methods specified below. It is widely not understood that a single traverse of a root protection area by a mechanical excavator can cause SIGNIFICANT and PERMANENT (albeit temporarily invisible) damage to trees.

Any such machinery, including, for example, tracked piling rigs, shall be kept at ALL times outside the root protection areas (RPAs) as indicated in the Tree data table appended, and/or shall be subject to ARBORICENTRIC METHODS below.

Fences to protect trees shall be respected as TOTAL EXCLUSION fences. Hence, before any site activity, including demolition, the fence lines shall be complete.

Protective fencing and any temporary protection of ground surfaces will have to be removed in due course to allow finishing of landscaping, paving, etc., but this shall not take place until all need for vehicular access to the site has passed, and shall be agreed with arboriculturist / planners on site during progress of works.

Supervision by an arboriculturist appointed directly by the client (not the main contractor) should take place at key points in the construction process, and additionally whenever required by the architect, client, main contractor or LPA. These key stages are:

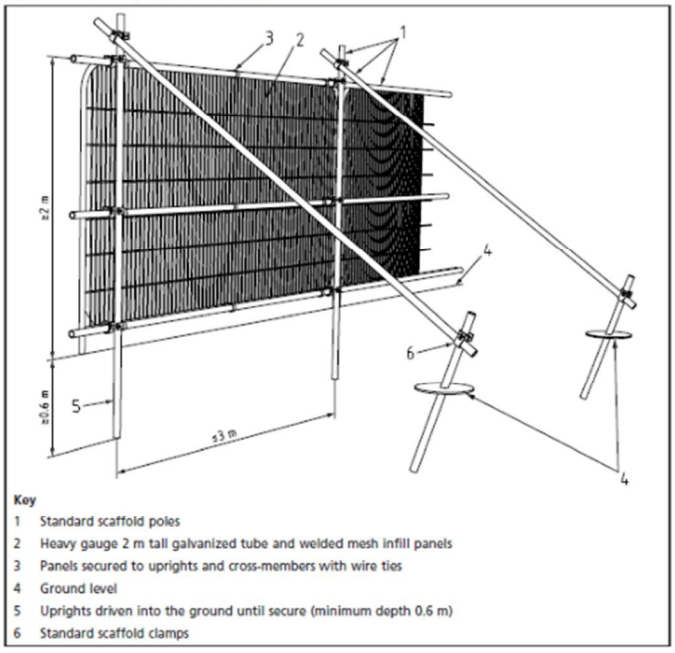
1) **At site possession by contractor, outline all tree protection measures with site agent and resolve any issues arising.**
2) **Ensure tree work is carried out to specification and sign off. Ensure protective fencing is erected and completed as proposed. Ensure any site cabins, mixing sites for mortars, disposal-to-skip sites, etc., are located appropriately, and sign off.**
3) **Supervise lifting of hard surfacing near trees.**
4) **Supervise laying of temporary or permanent geotextile combination ground protection and sign off.**
5) **Attend as required to supervise digging for and the laying of lighting cable ducts or services.**
6) **Approve any removal or adjustment of protective fencing and sign off.**

PREPARATION / DEMOLITION

PLEASE READ WITH PLAN REFERENCE 1-38-4325/P2, APPENDED.
The Methods shall be implemented in the order given unless it is stated to the contrary.

Method 1 : TREE WORK
Tree work shall be in accordance with the provided specification and good arboricultural practice, and to BS 3998:2010 'Tree Work - Recommendations'. The stumps of certain trees (see SCHEDULE appended) shall be removed by mechanical stump grinder, not by mechanical excavator. Arisings shall be chipped and removed from site, or stockpiled outside RPAs for 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 Zigma Ground Solutions Euromat Ground Guards. The temporary trackways shall be fixed together with manufacturers' approved fixings. This protective layer shall stay in place throughout arboricultural site preparation phase.

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

Method 2 : TREE PROTECTION FENCING
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 6.2.2.2., Figure 2 : No ground levels reduction or excavation shall take place within (=the tree side of) the fence lines.

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 protective fences.

Method 3 : SITE ACCOMMODATION
These methods shall apply in the red crosses zone. Timber baulks such as railway sleepers shall be laid to support temporary modular structures. Any craneage shall be from outside RPAs. No below-ground service connections shall be made, e.g. to toilets : all such piping / ducting / cables shall lie above ground. Rainwater collected from the roof shall be piped back to the ground surface below the structure.

Alternatively, or in combination the following may be installed :

SUSPENDED TEMPORARY DECKING FOR MATERIALS STORAGE
Timber pegs or timber baulks shall be installed supporting suspended decking. The area shall be covered by heavy-duty impermeable membrane, with falls ensuring water is drained to areas outside any RPA, and covered by a further non-slip covering, or consisting of an impermeable non-slip covering.

Below any such area install sprinkle irrigation or by hand, for approx. 2 hrs. per day, during the hours of darkness, between April and September irrigate using proprietary garden irrigation system on a timing device, or manually.

Method 4 : GROUND SURFACE HANDLING and PROTECTION
This method shall apply in the zone 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. 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 pedestrian access only.

OR

If loads exceed that of pedestrians, a 2D geotextile membrane, such as 'Ekotex' shall be laid; 150mm of green-source woodchip; continuously abutted scaffold boards and a layer of manufactured board at least 25mm thick screwed to the underlying scaffold board so as to completely cover this area This area may be used for pedestrian-operated plant up to 2 tonnes in weight.

OR

To handle loads exceeding 2 tonnes the ground surface shall be covered (in sequence) by a 2D geotextile membrane, such as 'Ekotex' ; 100mm of green-source woodchip ; 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 : DEMOLITION
This method shall apply generally. 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.

Any contaminated soil shall be removed with hand tools only and removed from site.

This method shall apply generally and shall be by 'top down, sides in' method. Arisings shall be removed for disposal off site. Any contaminated soil shall be removed with hand tools only and removed from site. None shall be spread in the RPAs.

CONSTRUCTION

PLEASE READ WITH PLAN REFERENCE 1-38-4325/P3, APPENDED.
The Methods shall be implemented in the order given unless it is stated to the contrary.

Method 6 : TREE PROTECTION FENCING
Tree protection fencing shall be maintained/adjusted, as per Method above.

Method 7 : GROUND SURFACE HANDLING and PROTECTION
This method shall apply in the zone(s) hatched blue on plan. Ground protection as per Method above shall be maintained/adjusted. Local temporary lifting shall be carried out to facilitate Method 11, whereafter the protection shall immediately be restored.

Method 8 : SERVICE TRENCHES
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).

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.
OR
3) Services shall be thrust-bored using trenchless techniques (compressed air-driven 'mole') at a depth of 700mm or more below ground level, entailing no surface excavation. Starter pits for rams shall be outside any RPA, or reception/starter pits shall be opened according to 1) or 2) above.

Method 9 : ROOT PRUNING - CONTIGUOUS PILE WALL – FACILITATION TRENCH

This method shall apply in the zone of cyan fill on plan. An access trench shall be opened with hand tools only (in the position indicated on plan), to a depth of 600mm below ground level. Roots shall be trimmed to the side of the trench closest to the tree with a sharp edge tool or sharp hand saw. Chainsaws shall not be used. The roots shall be trimmed at right angles to the long axis of the root. No paint or other treatment shall be applied to the cut ends. An HDPE membrane shall be applied vertically to the exposed soil face closest to the tree, retained in position by vertically placed manufactured board extending the full depth and width of the vertical face of the trench. The boards shall be 22mm thickness and shall be retained in position during the piling operations by timber pegs or held with wing nuts on tie rods passed diagonally through the sheeting into the soil face.

Method 10 : ROOT PRUNING

This method shall apply within the magenta honeycomb zone. The excavation shall be made with hand tools only. Any roots encountered shall be trimmed without splintering to the edge of excavation using sharp edge tools 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 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 11 : REMEDIAL ROOT TREATMENT

This method shall apply in the zone of green roundels on plan. Holes in the ground shall made on a 1m x 1m spacing with a pinch bar to a depth of 20 cm and width of 40mm. 75g (exactly) of sucrose (sugar) shall be dissolved in 1.5 litre of water and poured into each hole. Treatments should be applied as soon as possible after root cutting but only once in one growing season (March to October). The solution shall be applied gradually to prevent overflow.

LANDSCAPING PHASE

Method 12 : FOOTPATHS (various finishes possible)
This method shall apply in all RPAs (zones of orange shapes/circles on plan). No reduction of levels shall take place. No wheeled or tracked machinery shall be used : construction shall be by means of hand tools. NO reduction in existing ground levels shall take place – no 'scraping up' with or without a mechanical excavator.

'NIDAGRAVEL'
Edge restraint shall be formed from tanalised timber pinned to substrate with tanalised timber pegs or similar. 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 2D geotextile such as 'Ekotex' shall be laid directly on the ground surface. Levels can be corrected by use of granite chippings NO FINES. Paving shall be laid open jointed and the joints rammed with granite chippings.

OR

FLEXIBLE FORMATION
(This method shall be used where new footpaths are to be laid over large surface or close-to surface roots in excess of 20mm diameter.)

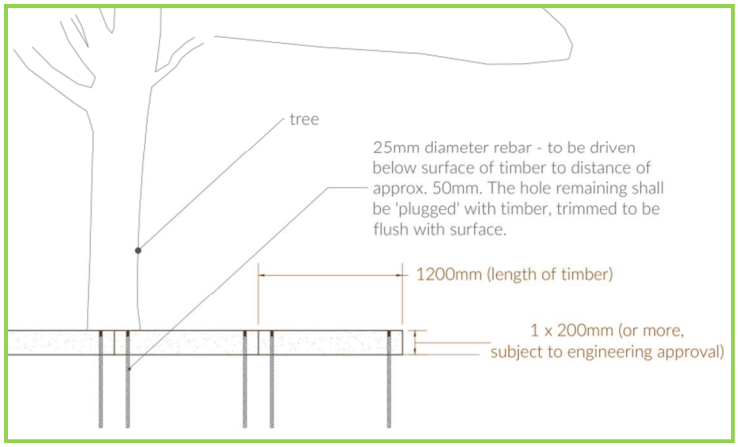
The surface shall be probed cautiously by hand-tools. Any smaller roots than 20mm diameter shall be trimmed using a sharp edge tool such as handsaw or secateurs; the cuts shall be made at right angles to the long axis of the root, and in accordance with BS3998:2010, 8.6. The path sub-base formation shall be built up in layers from the prepared ground surface as follows: a double layer of all-natural fibre hessian (jute) shall be laid to entirely cover the base area, draped over or arranged around any roots preserved as above, then clean crushed hard stone / angular ballast (typically sold as 'track ballast' - not limestone) 20mm-40mm NO FINES, to 40mm over the hessian layer, and compacted with whacker plate or similar, then a light dressing of dry clay loam (20% maximum of the volume of stone) screed over the surface. A further layer (40mm) of this combination shall be used to create the required profile. Over this, a separating layer of non-woven geotextile such as 'Ekotex' shall be laid, followed by the wearing course of KBI Flexi-Pave HD (porous finish) nominal thickness 25mm-50mm which shall be applied by specialist contractor over the prepared substrate. Any edge restraint shall be formed of tanalised timber pegged or pinned 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.

Method 13 : EXISTING HARD SURFACES TO BE SUPERCEDED BY REPLACEMENT HARD SURFACING

This method shall apply in the purple crosses zone on plan. No 'scraping up' with a mechanical excavator shall be carried out. The existing hard surface shall be lifted by hand tools or hand-held power tools only. The underlying sub-base shall be left undisturbed if levels allow and if the sub-base is competent to support the loads envisaged. Otherwise no excavation below the underside of the existing sub-base shall take place. Any such excavation in the existing sub-base shall be by hand tools or hand-held power tools only. The sub-base shall remain intact during demolition phase.

Method 14 : PLANTER CONSTRUCTION



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 : GROUND PREPARATION FOR TREE PLANTING AREAS

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. 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'. 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. 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 to a depth of 100mm with composted organic material or proprietary mulch mat.

Method 16 : REPLACEMENT
If within five years 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).

07
General

If conflicts between any part of a tree and the building(s) arise in the course of development these can often be resolved quickly and at little cost if a qualified arboriculturist is consulted promptly. Lack of such care is often apparent quickly and decline and death of such trees can spoil design aims and can of course affect saleability, and reflect poorly on the construction and design personnel involved. Trees that have been the recipients of careful handling during construction add considerably to the appeal and value of the finished development.

Dated: 13th August 2019
Signed:

John C. M. Cromar, **Dip.Arb.(RFS) F.Arbor A.** **01582 808020 / 07860 453072**

APPENDICES

08
Tree Data

Tree number	Tree type	Approx. height (m)	Stem diameters	Radius of RPA if circle (mm)	RPA (m^2)	Comments	Life expectancy	Assessed BS5837 value category
1	English yew	9	570	6840	147.0	Ivy infested. Branches pruned back on N side	40+	B1
2	*Gleditsia triacanthos*	10	245	2940	27.2	Reduced circa 2013 to about 7m in height. Some public view	40+	B1
3	common lime	10	403	4836	73.5	Outside site ; tree under local authority control. Some screening value	40+	B1
4	London plane	19	1370	15000	706.9	Large tree noted to have been cut back on the building side.	40+	A2
5	false acacia	11–15	1000	12000	452.4	Badly decayed base. Repeatedly reduced and well below natural crown size. Likely dangerous. Remove; replace with suitable tree (see 05.07)	<10	U
6	snakebark maple	8	190	2280	16.3	Attractive locally; some screening function.	20+	C1
7	red beech (*Nothofagus fusca*)	6	140	1680	8.9	Small and unimportant	20+	C1
8	Himalayan birch	11	200	2400	18.1	One of group of three; locally attractive.	20+	B2
9	Himalayan birch	11	220	2640	21.9	One of group of three; locally attractive.	20+	B2
10	Himalayan birch	11	252	3024	28.7	One of group of three; locally attractive.	20+	B2
11	*Magnolia* spp.	5.5	200, 170	3149	31.2	Locally ornamental; shrub form	20+	C1

Tree number	Tree type	Approx. height (m)	Stem diameters	Radius of RPA if circle (mm)	RPA (m^2)	Comments	Life expectancy	Assessed BS5837 value category
12	winter flowering cherry	4	90	1080	3.7	Strong lean	10+	C1
13	Scots pine	2.5	55	660	1.4	Tiny distorted tree	10+	C1
14	English yew	3	120	1440	6.5	Clipped as shrub	40+	C1
15	sycamore	12	300	3600	40.7	Outside site heavily reduced; a little screening value	10+	C1
16	sycamore	10	435	5220	85.6	Outside site ; tree under local authority control. Rather heavily reduced; a little screening value	20+	C1
17	variegated holly	2	25	300	0.3	Very close to front boundary wall and unsuitably sited for growth to maturity. Tiny survivor of understorey of false acacia removed by reason of consent 2017/2568/T.	40+	C1

In all cases, in the absence of negative comment on vitality and structure, normal systemic and physiological condition should be considered to apply.

Dependent on time of year of survey, deciduous trees may not have been in leaf at the time of inspection. This may have limited precise identification.

09
Schedule

Trees at 42 Elsworthy Road, London, NW3 3DL

Please read in conjunction with plan 1-38-4325/P2.

Tree number	Tree type	Approx. height (m)	Stem diameters	Comments
2	*Gleditsia triacanthos*	10	245	Remove: grind stumps to below ground level.
5	false acacia	11–15	1000	
12	winter flowering cherry	4	90	
13	Scots pine	2.5	55	
14	English yew	3	120	

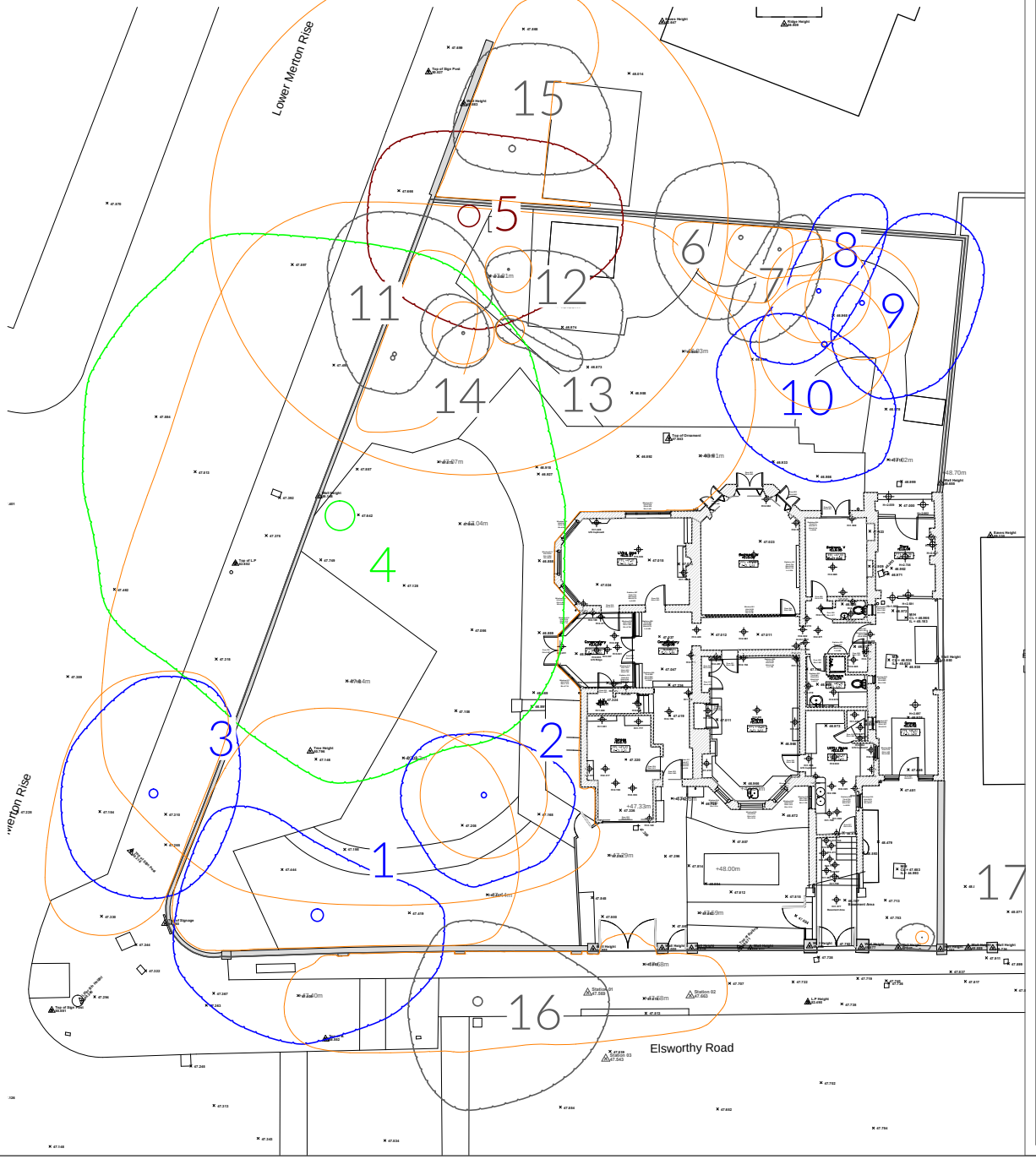
NOTES:
This schedule notifies the LPA, where such notification is required, of intention to prune or remove trees in accordance with TCP Act 1990 Section 211. 42 days after notification should be allowed before proceeding with the work, during which time (and after) the LPA may place a Tree Preservation Order on the tree(s), thus requiring a formal application for any works to living wood.

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.

Ivy and dead wood can be important ecological features. Ivy where specified in the work schedule should be treated as per BS3998 section 7.12. In summary this means 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 inspected. In practice this may need to be done outside the bird-nesting season. Treatment of dead wood shall be as per section 7.3.2 – essentially shorten if possible, thus retaining some resource for invertebrates, etc.

10
Plans

1-38-4325/P1 v7
1-38-4325/P2 v3
1-38-4325/P3 v5



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KEY TO COLOURS/LINETYPES USED IN RELATION TO TREES

GREEN - High Value
BLUE - Moderate Value
BLACK - Low Value
RED - Remove/Very short life expectancy
ORANGE SHAPE'S: Root Protection Areas

TOOTHED LINE: Tree spread line

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

DRG. NAME
TREE VALUE ASSESSMENT AS PER BS 5837:2012 & ROOT PROTECTION AREAS

TEXT
FOR FULL DETAILS OF TREE VALUE PLEASE SEE REPORT

BASED ON
MAREK WOJCIECHOWSKI ARCHS. DRG. NO.: 16092 E_02 Existing Lower Ground Floor Plan SUPPLIED

SITE ADDRESS
42 Elsworthy Road, London, NW3 3DL

DRG. REF.	REV. NO.
1-38-4325/P1	v7
SCALE & SIZE	**DATE**
1:100 @ A1	13-Aug-19

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PREPARATION / DEMOLITION

Method 1 : TREE WORK
Tree work shall be in accordance with the provided specification and good arboricultural practice, and to BS 3998:2010 'Tree Work - Recommendations'. The stumps of certain trees (see SCHEDULE appended) shall be removed by mechanical stump grinder, not by mechanical excavator. Arisings shall be chipped and removed from site, or stockpiled outside RPAs for 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 Zigma Ground Solutions Euromat Ground Guards. The temporary trackways shall be fixed together with manufacturers' approved fixings. This protective layer shall stay in place throughout arboricultural site preparation phase.

Method 2 : TREE PROTECTION FENCING
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 6.2.2.2., Figure 2, see below. No ground levels reduction or excavation shall take place within (=the tree side of) the fence lines.

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 protective fences.

Method 3 : SITE ACCOMMODATION
These methods shall apply in the **red crosses** zone. Timber baulks such as railway sleepers shall be laid to support temporary modular structures. Any craneage shall be from outside RPAs. No below-ground service connections shall be made, e.g. to toilets : all such piping / ducting / cables shall lie above ground. Rainwater collected from the roof shall be piped back to the ground surface below the structure.

Alternatively, or in combination the following may be installed :

SUSPENDED TEMPORARY DECKING FOR MATERIALS STORAGE
Timber pegs or timber baulks shall be installed supporting suspended decking. The area shall be covered by heavy-duty impermeable membrane, with falls ensuring water is drained to areas outside any RPA, and covered by a further non-slip covering, or consisting of an impermeable non-slip covering.

Below any such area install sprinkle irrigation or by hand, for approx. 2 hrs. per day, during the hours of darkness, between April and September irrigate using proprietary garden irrigation system on a timing device, or manually.

Method 4 : GROUND SURFACE HANDLING and PROTECTION
This method shall apply in the zone 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. 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 pedestrian access only.

OR

If loads exceed that of pedestrians, a 2D geotextile membrane, such as 'Ekotex' shall be laid; 150mm of green-source woodchip; continuously abutted scaffold boards and a layer of manufactured board at least 25mm thick screwed to the underlying scaffold board so as to completely cover this area This area may be used for pedestrian-operated plant up to 2 tonnes in weight.

OR

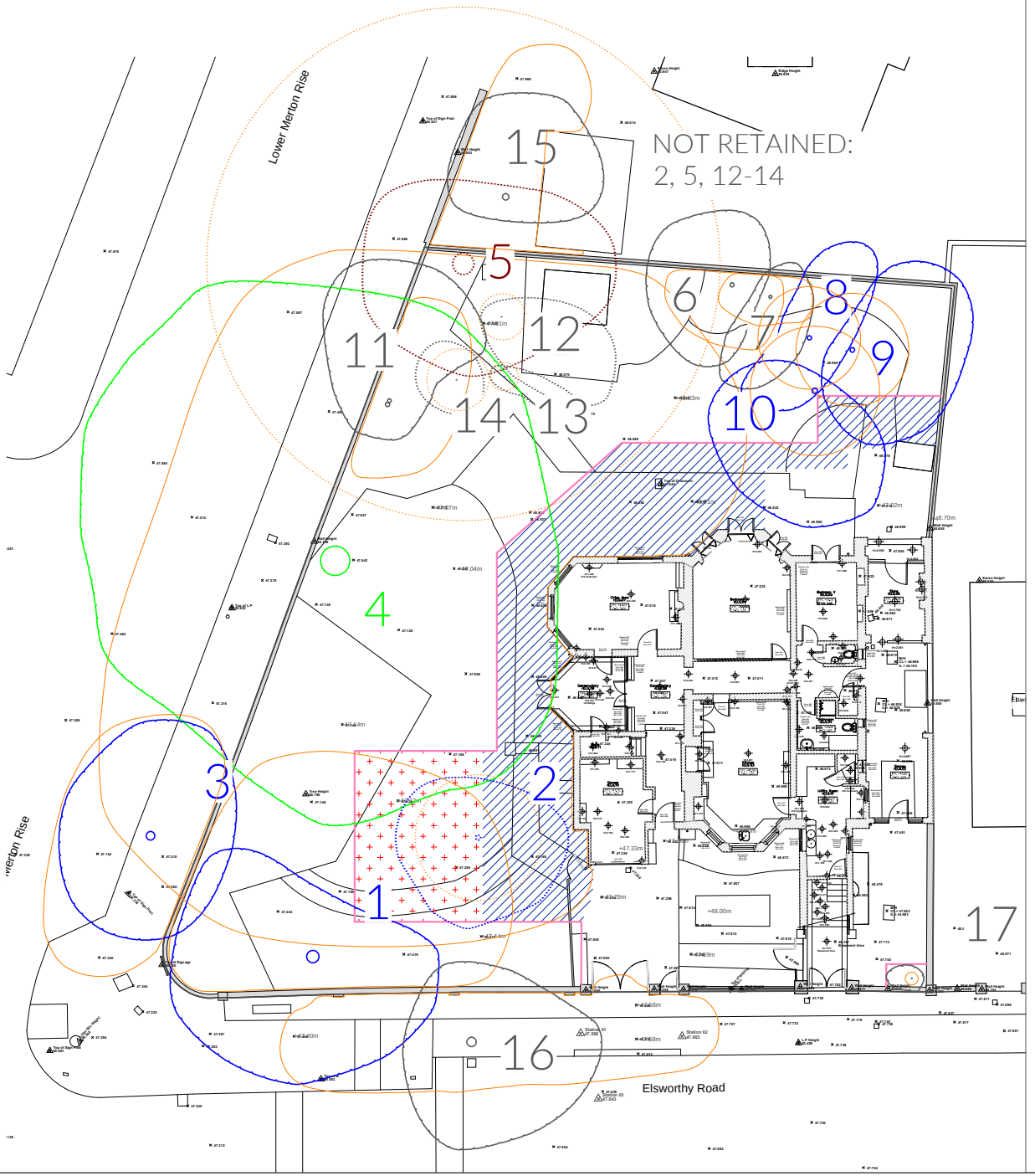
To handle loads exceeding 2 tonnes the ground surface shall be covered (in sequence) by a 2D geotextile membrane, such as 'Ekotex' ; 100mm of green-source woodchip ; TuffTrakR Euromat ground guards or similar appropriate temporary trackway sections. The temporary trackways shall be fixed together with 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 : DEMOLITION
This method shall apply generally. 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.

Any contaminated soil shall be removed with hand tools only and removed from site.

This method shall apply generally and shall be by 'top down, sides in' method. Arisings shall be removed for disposal off site. Any contaminated soil shall be removed with hand tools only and removed from site. None shall be spread in the RPAs.



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NOTES
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All dimensions to be checked on site.

DRG. NAME
TREE RETENTION & TREE PROTECTION MEASURES (Site Preparation Phase)

TEXT
FOR FULL METHOD DETAILS PLEASE SEE REPORT

BASED ON
MAREK WOJCIECHOWSKI ARCHS. DRG. NO.: 16092 E_02 Existing Lower Ground Floor Plan SUPPLIED

SITE ADDRESS
42 Elsworthy Road, London, NW3 3DL

DRG. REF.	REV. NO.
1-38-4325/P2	v3
SCALE & SIZE	**DATE**
1:100 @ A1	13-Aug-19

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CONSTRUCTION

Method 6 : TREE PROTECTION FENCING
Tree protection fencing shall be maintained/adjusted, as per Method above.

Method 7 : GROUND SURFACE HANDLING and PROTECTION
This method shall apply in the zone(s) hatched **blue** on plan. Ground protection as per Method above shall be maintained/adjusted. Local temporary lifting shall be carried out to facilitate Method 11, whereafter the protection shall immediately be restored.

Method 8 : SERVICE TRENCHES
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).

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.
OR
3) Services shall be thrust-bored using trenchless techniques (compressed air-driven 'mole') at a depth of 700mm or more below ground level, entailing no surface excavation. Starter pits for rams shall be outside any RPA, or reception/starter pits shall be opened according to 1) or 2) above.

Method 9 : ROOT PRUNING - CONTIGUOUS PILE WALL - FACILITATION TRENCH
This method shall apply in the zone of **cyan fill** on plan. An excess trench shall be opened with hand tools only (in the position indicated on plan), to a depth of 600mm below ground level. Roots shall be trimmed to the side of the trench closest to the tree with a sharp edge tool or sharp hand saw. Chainsaws shall not be used. The roots shall be trimmed at right angles to the long axis of the root. No paint or other treatment shall be applied to the cut ends. An HDPE membrane shall be applied vertically to the exposed soil face closest to the tree, retained in position by vertically placed manufactured board extending the full depth and width of the vertical face of the trench. The boards shall be 22mm thickness and shall be retained in position during the piling operations by timber pegs or held with wing nuts on tie rods passed diagonally through the sheeting into the soil face.

Method 10 : ROOT PRUNING
This method shall apply within the **magenta honeycomb** zone. The excavation shall be made with hand tools only. Any roots encountered shall be trimmed without splintering to the edge of excavation using sharp edge tools 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 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 11 : REMEDIAL ROOT TREATMENT
This method shall apply in the zone of **green roundels** on plan. Holes in the ground shall made on a 1m x 1m spacing with a pinch bar to a depth of 20 cm and width of 40mm. 75g (exactly) of sucrose (sugar) shall be dissolved in 1.5 litre of water and poured into each hole. Treatments should be applied as soon as possible after root cutting but only once in one growing season (March to October). The solution shall be applied gradually to prevent overflow.

LANDSCAPING PHASE

Method 12 : FOOTPATHS (various finishes possible)
This method shall apply in all RPAs (zones of **orange** shapes/circles on plan). No reduction of levels shall take place. No wheeled or tracked machinery shall be used : construction shall be by means of hand tools. NO reduction in existing ground levels shall take place - no 'scraping up' with or without a mechanical excavator.

'NIDAGRAVEL'
Edge restraint shall be formed from tanalised timber pinned to substrate with tanalised timber pegs or similar. 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 2D geotextile such as 'Ekotex' shall be laid directly on the ground surface. Levels can be corrected by use of granite chippings NO FINES. Paving shall be laid open jointed and the joints rammed with granite chippings.

OR

FLEXIBLE FORMATION
(This method shall be used where new footpaths are to be laid over large surface or close-to surface roots in excess of 20mm diameter.)

The surface shall be probed cautiously by hand-tools. Any smaller roots than 20mm diameter shall be trimmed 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. The path sub-base formation shall be built up in layers from the prepared ground surface as follows: a double layer of all-natural fibre hessian (jute) shall be laid to entirely cover the base area, draped over or arranged around any roots preserved as above, then clean crushed hard stone / angular ballast (typically sold as 'track ballast' - not limestone) 20mm-40mm NO FINES, to 40mm over the hessian layer, and compacted with whacker plate or similar, then a light dressing of dry clay loam (20% maximum of the volume of stone) screed over the surface. A further layer (40mm) of this combination shall be used to create the required profile. Over this, a separating layer of non-woven geotextile such as 'Ekotex' shall be laid, followed by the wearing course of KBI Flexi-Pave HD (porous finish) nominal thickness 25mm-50mm which shall be applied by specialist contractor over the prepared substrate. Any edge restraint shall be formed of tanalised timber pegged or pinned 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.

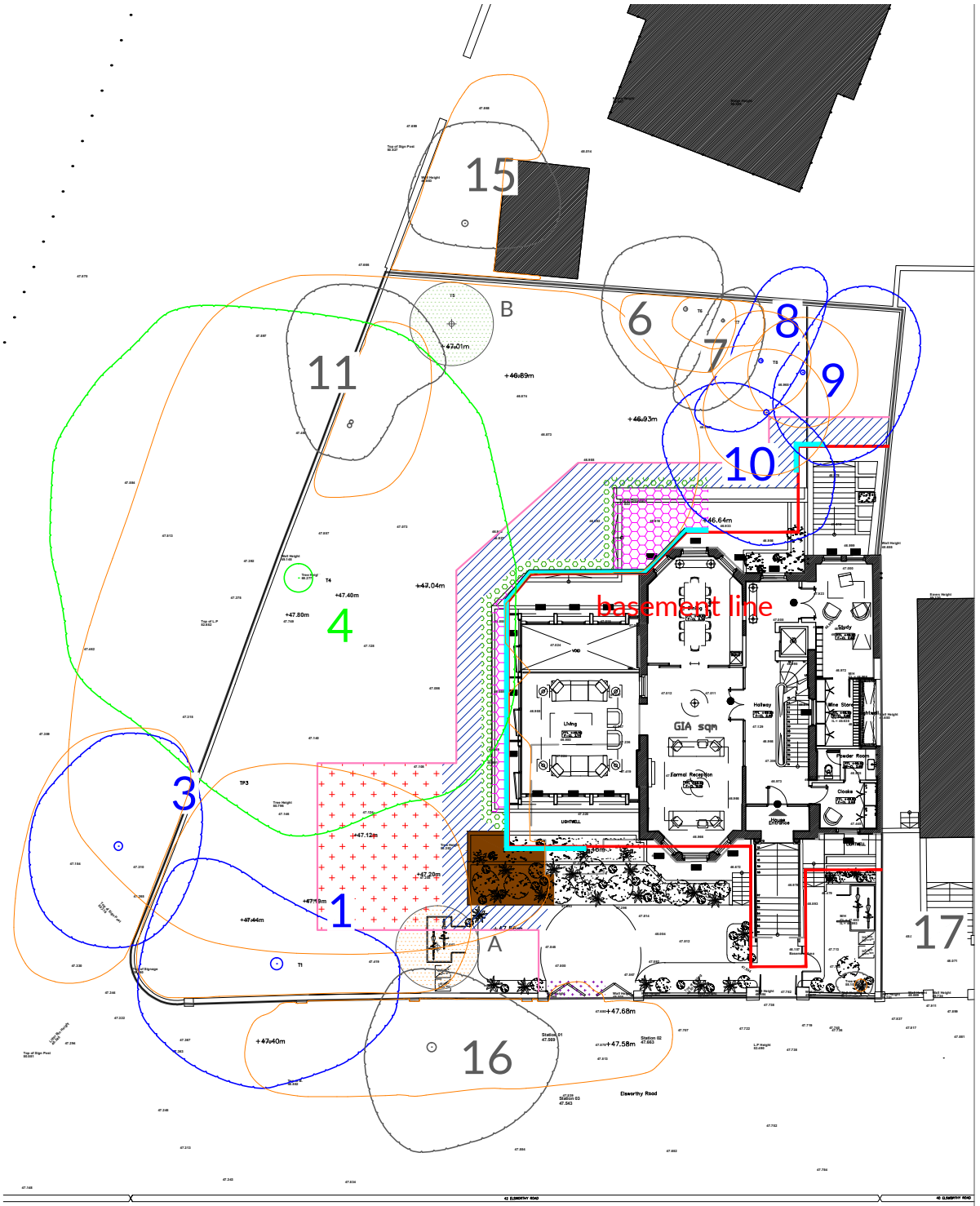
Method 13 : EXISTING HARD SURFACES TO BE SUPERCEDED BY REPLACEMENT HARD SURFACING
This method shall apply in the **purple crosses** zone on plan. No 'scraping up' with a mechanical excavator shall be carried out. The existing hard surface shall be lifted by hand tools or hand-held power tools only. The underlying sub-base shall be left undisturbed if levels allow and if the sub-base is competent to support the loads envisaged. Otherwise no excavation below the underside of the existing sub-base shall take place. Any such excavation in the existing sub-base shall be by hand tools or hand-held power tools only. The sub-base shall remain intact during demolition phase.

Method 14 : PLANTER CONSTRUCTION
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 : GROUND PREPARATION FOR TREE PLANTING AREAS
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. 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'. 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. 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 to a depth of 100mm with composted organic material or proprietary mulch mat.

Method 16 : REPLACEMENT
If within five years 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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All dimensions to be checked on site.

DRG. NAME
TREE RETENTION & TREE PROTECTION MEASURES
(Construction Phase)

TEXT
FOR FULL METHOD DETAILS PLEASE SEE REPORT

BASED ON
MAREK WOJCIECHOWSKI ARCHS. DRG. NO.: 16092 P_01 rev. B Proposed Ground Floor Plan SUPPLIED

SITE ADDRESS
42 Elsworthy Road, London, NW3 3DL

DRG. REF.	REV. NO.
1-38-4325/P3	v5
SCALE & SIZE	DATE
1:200 @ A1	13-Aug-19

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