Pre-development Arboricultural Survey and Report

Land at Frontage of 46 Well Walk, Hampstead, London NW3 1BT

A report to: Lynne Marcus on behalf of Mr. B. Kernahan

Date: 5th September 2016

Report No: WAS 49 /2016

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Report Verification

This study has been undertaken in accordance with British Standard 5837:2012 “Trees in relation to design, demolition and construction - Recommendations”.

Disclaimer

The contents of this report are the responsibility of Wassells Arboricultural Services Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Wassells Arboricultural Services Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

Validity of Data

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified and experienced arboriculturist to assess any changes to the trees and groups on site and to inform a review of the conclusions and recommendations made.

It should be noted that trees are dynamic living organisms that are subject to natural changes as they age or are influenced by changes in their environment. As such following any significant meteorological event or changes in the growing environment of the trees they should be re-assessed by a suitably qualified and experienced arboriculturist.

Introduction and Scope of Report

This document has been produced to provide a detailed survey of trees that could be affected by the proposed development and that are within, surrounding and nearby to this reports site demise.

The scope of this report follows the recommendations and guidance described within ***BS 5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations*** which sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures.

The report will assess the quality, amenity and landscape value of all surveyed trees as described by the tree category system within BS 5837 (see section below).

The protection of all trees to be retained and where they are likely to be affected by the proposed development construction activities are described as provisional tree protection measures for information purposes only and shall require a site specific AMS once final plan are agreed.

The report will also indicate, where necessary, the likely impact the proposals may have on those trees in the future.

The report will also recommend any required tree works to enable access and also to mitigate potential damage from construction activity and for the future well being of the trees concerned.

This is intended to support the planning application for development of this site.

The tree survey for the site can be found in Addendum 3 below

Abbreviations:

RPA = root protection area

CEZ = construction exclusion zone

CWA = construction working area (including materials storage)

AMS = arboricultural method statement

Arboricultural Impact Assessment

Proximity of Proposed Development to existing Trees

Ref: Addendum 1 -Table 1, Addendum 3

All trees in or near the above site have been surveyed and that information is shown in addendum 3 below.

The proposed development is to replace an existing concrete surfaced front parking area with a new resin bonded finish. The existing parking area is beneath a large protected Lombardy Poplar T2 and there is a need to carefully replace the existing surface to prevent unnecessary damage to the root area of this tree.

The existing concrete surface is in a poor and dangerous condition and is also on a relatively steep slope to the side entrance of the property. The proposed replacement surface will be more suitable for this location as it is flexible and semi-permeable and thus likely to improve the environmental condition over the root system of the tree.

The proposed specification for the replacement surfacing is designed to protect any root system beneath the concrete cap that may be encountered.

A trial hole was dug to check the depth of the existing concrete and this was found to be 200mm deep with no indication of roots at that depth – ***see drawing 48WW/2 and picture gallery***

The remaining trees T1, T3 – T5 within the survey will not be impacted by the proposal.

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Tree Protection Measures (Provisional)

Ref: Addendum 1 & 2

**** These measures shall be seen as provisional for planning purposes and subject to a detailed follow up AMS submission as part of a construction plan once proposals are agreed and to conform to any specific planning conditions made ****

Excavation within RPA of Retained Trees

Ref: Addendum 1

* **Please see addendum 1 section on Excavation within RPA of retained trees.**

- See specification below in addendum 4
- The existing concrete surface is to be broken up by hand machinery
- The broken out concrete is to be lifted by hand for removal to skip
- Excavation below the old concrete surface to achieve base level of the sub-base is to be by hand only
- Any surface roots encountered above 25mm in diameter are to be retained
- Sub-base to be laid as quickly as possible around any exposed roots
- AS to be sought as below if large areas of rooting are found

Tree Protection Barriers & Construction Exclusion Zone

***Please see specification for tree protection barriers shown below**

- Protect stem of tree T2 from any potential machinery damage by hoarding off around the stem

Ground Protection of Existing Surfaces within Root Protection Area (RPA) of Retained Trees

Ref: Addendum 1

* **Please see addendum 1 section on Ground Protection System**

- None required as whole site is RPA of tree T2

Access Facilitation Pruning & Tree Works

Ref: Addendum 2

Recommended tree works are shown in the end column of addendum 3 below

Site Storage and Accommodation

Not within the RPA of retained trees.

Installation of Services

None required

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Arboricultural Supervision (AS)

AS shall be required during work within and adjacent to the RPA of retained trees. It must be undertaken at regular intervals with a written record of the meetings maintained with suitable photographic record in support.

The AS must include a pre-construction commencement site visit, to be arranged by the Site Manager under instruction from Architects, and thereafter at specific events that affect the retained trees on site to enable sign-off by the AS. These are typically as follows:

1. Erection of tree protection fencing
2. Installation of ground protection to retained trees whose RPA are affected by the CWA
3. Start of Excavation/piling of foundations within the RPA of retained trees
4. Tree pruning requirements to prevent crown damage from construction activity
5. Start of Excavation/installation of paths, roads and car parking within RPA of retained trees
6. Installation of underground services within the RPA of retained trees
7. Tree condition survey on completion of construction work

Conclusion

Provided the recommendations shown above and the methodology for protection of any retained trees are followed, there will not be an effect on the current or future condition of those trees that are retained as part of the proposed scheme.

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Tree Grading Categories

Ref: Grading Category as per BS 5837:2012 Section 4.5 Table 1 & Table 2 – Tree quality assessment chart. Tree Survey Schedule in Addendum3 below for description of trees categorized

The grading categories are based on the following criteria:

A= those trees of high quality and value suitable for retention for longer than 10years and worthy of being a material constraint to development

B= those trees of moderate quality and value suitable for retention for longer than 10years and worthy of being a material constraint to development

C= those trees of low quality and not worthy of being a material constraint to development

U=trees of such a condition that they cannot realistically be retained as living trees in the context of the current land use

NG = not graded. Those trees not considered to be in any of the above categories

Categories A, B and C have further sub-categories (not qualified in BS) with regards to the reasons for tree retention as follows:

1: Mainly arboricultural qualities.
2: Mainly landscape qualities.
3: Mainly cultural values, including conservation.

Trees categorized within this report:

1 Category A trees = T1 & T2

2 Category B trees = none

3 Category C trees = T4 & T5

4 Category U trees = none

5 NG = T3

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Age Categories and Distribution

Those trees assessed as being young (Y) in age can generally be considered to have significant growth potential. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over- mature trees as a result of declining physiological or structural condition.

Semi mature trees (SM) will generally make a significant contribution to the landscape character and appearance of the site and their retention will provide more immediate succession. These trees will also have significant growth potential.

Mature trees (M) are not considered to have significant future growth potential and have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape contribution of the site however a tree stock over dominated by mature trees will require careful management to ensure that continuation of canopy cover can be achieved.

Over-mature trees (OM) do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

Veteran trees (V) are those that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

References

1. BS 5837:2012 Trees in Relation to Design, Demolition and Construction - Recommendations
2. BS3998:2010 Tree Work – Recommendations
3. NJUG Volume 4 Issue2 2007 – Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.
4. NHBC Standards – Section 4.2 Building Near Trees
5. British Geological Survey – London & the Thames Valley
6. Principles of Tree Hazard Assessment – Lonsdale 2001
7. Diagnosis of Ill Health in Trees – Stouts & Winter 2004
8. Tree Survey Plan – at end of report
9. Existing and proposed plans – Lynne Marcus Design

Declaration

This Tree Survey, Impact Assessment and provisional tree protection measures have been written and checked by Richard Wassell of Wassells Arboricultural Services Ltd. and are provided without prejudice as an objective and professional assessment of the trees described.

Signed: R.J.Wassell Date: 05. 09. MMXVI

Richard Wassell. Director

MCIHort MArborA NDArb (RFS) Kew Diploma NEBOSHlevel3

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Addendum 1 – Tree Protection

Ref: BS 5837:2012 in Tables C.1 & D.1of annex C & D

Table 1 -Tree protection measurements

Tree Number As per tree survey plan & schedule	Stem Diameter @ 1.5 metres agl. Millimetres	Root Protection Area (RPA) - Radius *measured from centre of stem* Metres	Tree/Root Protection Area (RPA) Sq. Metres	Affect of building proposal on the total RPA
T1	1200	14.4	652	Not affected by the proposed re-surfacing of the front car parking area. Maximum depth of proposed new surface is 300mm and to be a semi-permeable finish as specified.
T2	800	9.6	290	Not affected by the proposed re-surfacing of the front car parking area. Maximum depth of proposed new surface is 300mm and to be a semi-permeable finish as specified.
T3	100	1.5	7	Not affected by the proposed re-surfacing of the front car parking area. Maximum depth of proposed new surface is 300mm and to be a semi-permeable finish as specified.
T4	100	1.5	7	Not affected
T5	2 x 75 1 x 100	1.5	7	Not affected

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Protecting Root Zone of Trees (BS 5837:2012 section 6.2 Figs. 2 & 3):

The Root Protection Area (RPA)

This is the area surrounding a tree that is deemed to contain sufficient roots and rooting volume to maintain the trees viability in the future. The root system is typically concentrated in the uppermost 600 – 1200mm of the soil and is not necessarily symmetrical around the tree, being dependant on a number of factors such as water, nutrients, oxygen, soil penetrability and physical obstructions such as existing foundations or changes in level (terracing).

The RPA is a design layout tool that is deemed to be a minimum area around a tree where the protection of roots and soil structure are treated as a priority. This area is envisaged as and portrayed with a circle around each tree but where there appears to be restrictions to root growth the circle is reshaped to reflect more accurately the likely distribution of the rooting area of the tree concerned.

Key Points

1. AVOID building works within the RPA if at all possible but if not then carefully consider the following: where the RPA is likely to be severely affected because of site design constraints then felling and planting replacement(s) trees in a more suitable location on the site will need to be considered.
2. Where possible do not use strip foundations within the RPA, if absolutely necessary consider using a trenching saw or excavate by hand to avoid 'shatter damage' to the root system.
3. Consider using piling techniques for foundations @ maximum 350 mm diameter with ground beams on or above the surface of the root zone.
4. Unless unavoidable, do not exceed entering the root zone by more than one fifth of RPA radius.
5. Do not trench tangentially across the root zone for footings and services unless it cannot be avoided.
6. Consider 'no dig' techniques for services installation, with radial service lines being preferable to tangential across the root zone. Where this is undertaken then boring must be carried out below 600mm deep.
7. Any hard surfacing, paths and roads need to have the same considerations for the RPA and as in the above points. Where possible paths and hard surfacing (patios etc) need to be surface constructed (cellular) and semi-porous to allow water penetration and gaseous exchange into the root system of trees.

Excavation within Root Protection Area of trees

Where trees are to be retained then any proposed foundation, underground services work and hard surfacing such as roads/paths falling within the RPA of trees that are to be retained shall be kept as far away from tree stems as possible(SEE NOTE 1 ABOVE). Where any such works are necessary within the RPA there will be a requirement to dig carefully by hand and ensure any roots encountered of maximum 25mm in diameter shall be exposed and correctly pruned back by a competent Arborist. Where larger roots are encountered of above 25mm in diameter then advice from the Arboricultural Supervisor (AS) for the site must be sought prior to any work being undertaken.

Any roots exposed/ pruned back as part of the above operation shall NOT be left exposed to drying out. All roots exposed/pruned shall be either covered with damp Hessian sacking prior to backfill or backfilled/covered immediately with a suitable open and free draining compost/loam.

Site Hoarding

Site hoarding shall be no closer than 1.5 metres away from the stem of retained trees and consist of 20mm plywood sheets supported by minimum 100mm square posts and 100 x 50mm rails with posts at 2.5 metre centres.

Post holes for site hoarding that are required within the RPA of nearby trees shall be dug by hand and are to be a maximum of 300 x 300mm and 450mm deep

Ground Protection System Specification:

- Level area of RPA concerned by blinding with sharp sand at maximum depth of 50mm
- Lay geo-textile membrane such as 'Terram' to cover area concerned
- Cover geo-textile with maximum of 100mm MOT Type 1 sub-base
- Retain MOT type 1 with edge restraint such as 30 x 100mm edging board pegged every 2 metres to prevent migration of the sub-base

Addendum 2 – Tree Works

Ref: Addendum 3

Schedule of Tree Works

1. All proposed tree removal and tree pruning works are described in the management recommendations of the tree survey in addendum 3

2. Tree work to be carried out to the following standards and guidelines:

   - BS 3998:2010 Recommendations for Tree Work

   - Tree pruning cuts will be carried out using the 'Natural Target Pruning' technique as defined by: *BS 3998:2010 section 7.2.5 and Fig. 2 The Pruning of Trees, Shrubs and Conifers: George E. Brown & Tony Kirkham – 2nd edition revised & enlarged 2004 and Section 3.1.27 of The Arboricultural Association Specification for Tree Works June 2008.*

   - Crown clean involves removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, and removal of Ivy and all epicormic growth within crown including stem & basal epicormic growth.

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Addendum 3 - Schedule of Tree Survey Information – BS5837:2012 section 4.4

SITE: 46 Well Walk, Hampstead London NW3 1BT DATE: 5th August 2016

Tree Number	Species	Diameter Class mm	RPA radius metres	Height metres	Crown Spread metres	Crown height	Age Class	Grading Category	Estimated Life Expectancy	Structure	Physiology, Condition & other factors	Management recommendation
T1	Lombardy Poplar	1200	14.4	29	N=3 S=4 E=1 W=3	H	M	A2	20-40	G	AA Some deadwood within crown. No visible signs of past branch breakout within crown. No visible signs of stem decay or decay organisms	Light reduction and thin of crown, removal of deadwood and selective canopy raising proposed as separate application to Camden **Carried out early 2016**
T2	Lombardy Poplar	800	9.6	29	N=3 S=3 E=4 W=1	H	M	A2	20-40	G	AA Some deadwood within crown. No visible signs of past branch breakout within crown. No visible signs of stem decay or decay organisms Ivy to 5 metres on stem with wooden boundary fencing either side of stem	Light reduction and thin of crown, removal of deadwood and selective canopy raising proposed as separate application to Camden **Carried out early 2016**
T3	Snowy Mespil	100	1.5	4	N=1.5 S=1.5 E=1.5 W=1.5	M	SM	NG	20-30	M	A Growing in slight raised bed next to concrete parking area	N
T4	Autumn Flowering Cherry	100	1.5	6	N=1.5 S=1.5 E=1.5 W=1.5	L	SM	C2	20-30	G	AA Growing in front garden	N
T5	Himalayan Birch	2 x 75 1 x 100	1.5	5	N=1.5 S=1.5 E=1.5 W=1.5	L	SM	C2	20-30	M	AA Growing in raised planter (400mm high) next to house lobby	N

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TREE SURVEY KEY:

Tree Number and Species = number of tree on plan and Common Name as per reference book: A Field Guide to the Trees of Britain and Northern Europe by Alan Mitchell 1974 ISBN: 0 00 219213 6

Height = estimated height of tree from surrounding ground level +/- 3 metres

Diameter Class = diameter of main stem @ 1.5 metres above ground level

Crown Spread = maximum extent of branches measured radially from the base of the tree, trees with asymmetrical crowns are shown with distances in relation to compass points. N = north etc.

Crown Height = height of canopy and/or first major branch above ground level. Low (L) = below 3 metres | Medium (M) = 3 to 6 metres | High (H) = above 6 metres

Age Class = Young(Y): age less than 1/3rd life expectancy | Semi-mature(SM): 1/3rd to 2/3rd life expectancy | Mature (M): Over 2/3rd life expectancy | Over mature (OM): mature and in state of decline | Veteran (V): Surviving beyond typical age range for species

Grading Category: As per BS 5837:2012 Table 1 – Tree quality assessment, which refers to tree quality and landscape/amenity value; A=high, B=moderate, C=low, U = not suitable for retention, NG= not graded

Estimated Life Expectancy = estimated useful and remaining contribution to the site in years

Structure = structural condition of the tree based on roots, trunk, and major stems/branches along with the presence of any structural defects and decay organisms. Categories are: Very Good (VG); Good (G); Moderate (M); Poor (P); Hazardous (H)

Physiology/Condition = Overall health, condition and function of the tree in comparison to a 'normal' specimen of its species and age. Categories are: Above average (AA); Average (A); Declining (D)

Other factors = any other physical/environmental factors that could influence the tree now/in the future

Management Recommendations: N = no work required**. CC** = removal of dead, diseased & dying wood from tree crown, thinning of overcrowded crown, removal of Ivy from crown & stem and removal of all epicormic growth within crown including stem & basal epicormic growth on Lime trees.**LC** = lift crown. **TC** = thin crown. **RC** = reduce crown. **P** = pollard. **SP** = scaffold pollard. **RE** = remove epicormic and basal growth. **FP** = Formative prune **F** = fell to ground level. **FG** = fell and grind out stump. **R** = carry out replacement planting. **AI** = 3 yearly Arboricultural inspection

RPA radius = radius of typical root protection area, described as a circle and measured around centre of the tree

N/K = not known

 # = estimated data

NDG = Next door garden

g.l. = ground level

Alan Mitchell System = Estimate of tree age based on open grown tree with full crown. Age in years = Girth (circumference) in centimetres measured at 1.5 metres above ground level and divided by 2.5 i.e. Tree of girth 250 cm = 100years old

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Addendum 4 – Plans and Picture Gallery

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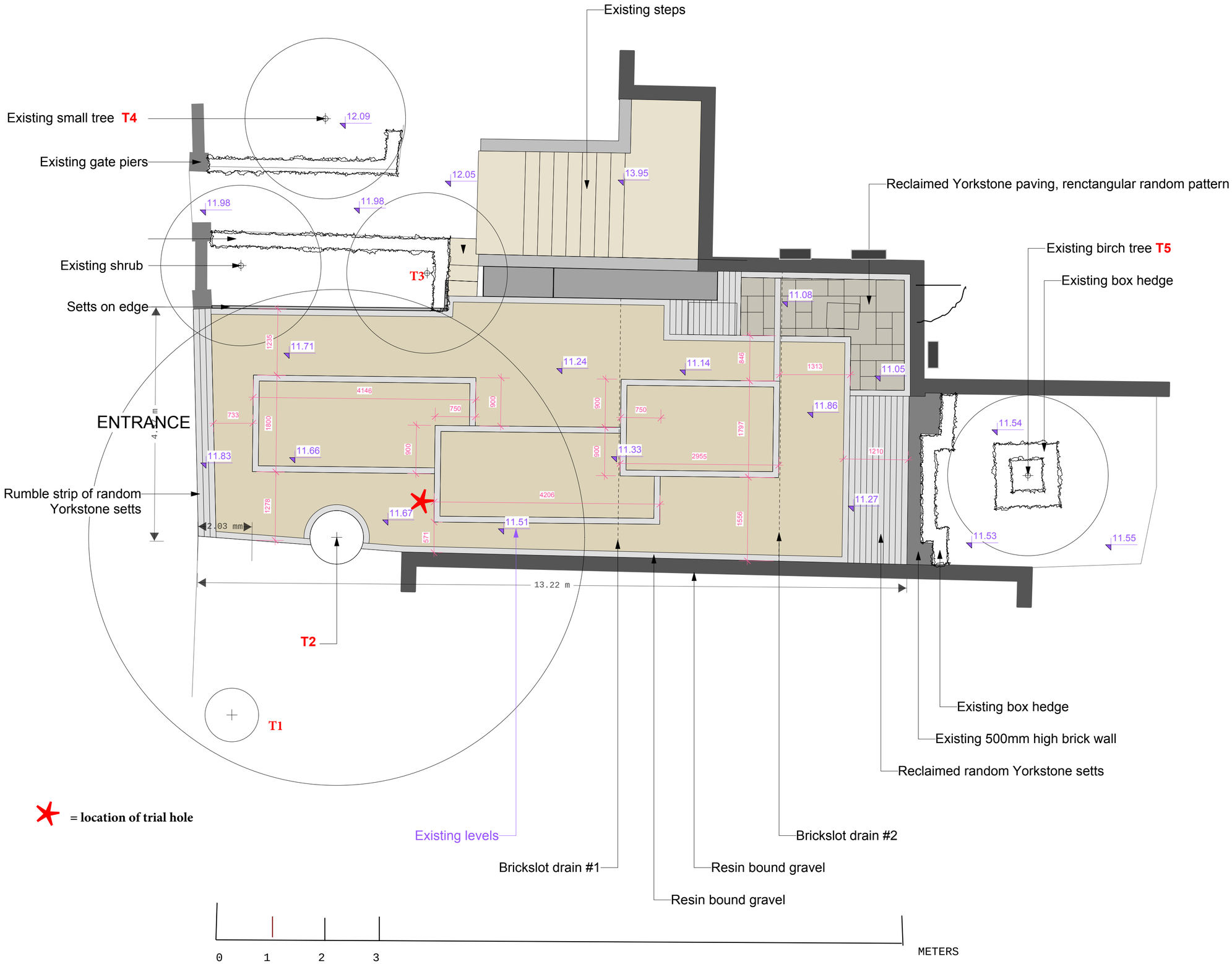

LYNNE MARCUS GARDEN DESIGN

GARDEN DESIGN PROPOSAL

DWG: Concept Plan #2

DWG No: 48WW/2

Client:

Site Address:
48 Well Walk
Hampstead
London
NW3 1BT

**** All mesurements and levels to be checked on site***

Date: 02-06-2016 | Scale: 1:50 @ A2

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LYNNE MARCUS
GARDEN DESIGN

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Project:46 Well Walk, NW3.
Client: Mr B Kernahan
Date: 28/8/16

Specification

To be read in conjunction with design drawing 48WW/2

Finished Materials:

- Reclaimed random sized York Stone paving
- Reclaimed random York stone setts
- Reclaimed cubed York stone setts (100mm x 100m x 100mm and 100mm x 100mm x 50mm)
- Resin bound gravel in 'Scandanavian Pearl' supplied by Addagrip.

1. **Clearance and Preparation.**

Excavate carefully by hand to maximum 300mm below existing finished surface level of concrete except around the protected Poplar tree, which will be excavated to no more than 150mm for a minimum of one meter around the outside edge of the tree stem. Any surface roots encountered shall be retained and back-filled around with the MOT sub-base.

Remove all waste to skips.

2. **Build up**

Geotextile membrane
Infill of approx

- 200mm free draining, compacted MOT under resin bound aggregate surface

- 150mm free draining compacted MOT under edging/rectangle detail random setts and infill setts
- 50mm free draining, compacted MOT for 1m around tree

3. **Random York stone SettEdging and rectangle design detail**

   Laid on 50mm mortar

   1. Row rumble strip.

   2. Single row to perimeter and rectangular detail. INC RAISED SETS BY LHS BORDER.

   3. 2no multi row bands adjacent to reclaimed paved area.

   Random York-stone setts

   Each will have an 8-10mm pointed gap and will finish flush with the main in-fill material.

4. **Infill**

   - **York stone random paving and setts**

   As drawn, lay reclaimed random x random Yorkstone paving and setts to agreed falls and inverts as shown on plan.

   Paving is laid onto a geo-textile membrane then 100mm compacted MOT sub-base and then 50mm of mortar. Jointing to match the setts.

   - **Porous resin bound aggregate**

   Once the setts are laid and cured, a specialist contractor to undertake laying (on-top of 200mm of compacted MOT by us), 80mm of porous grade of tarmac, then 20mm of the approved porous resin bound surface.

   The resin will finish flush with the setts.

5. **Drainage.**

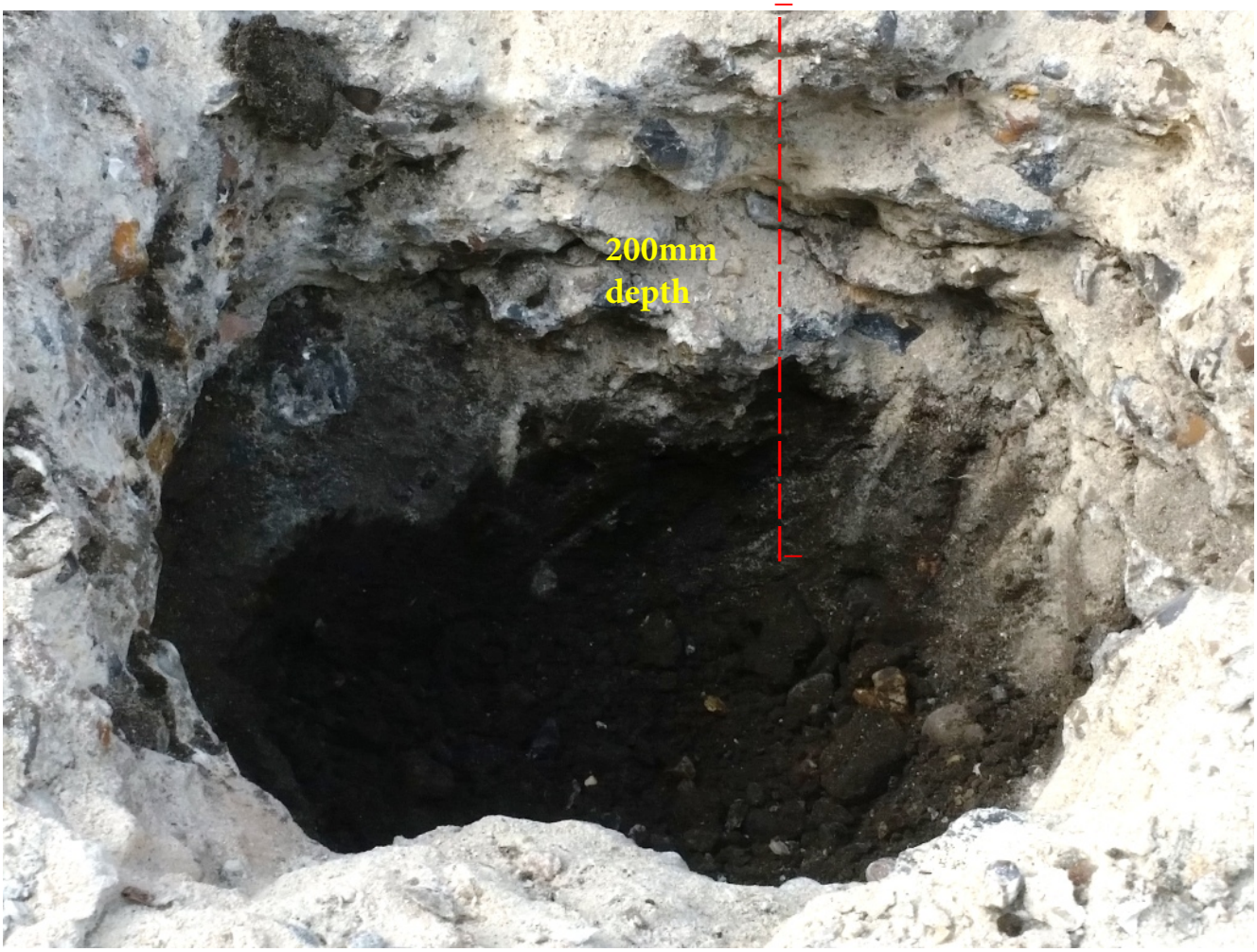
   Two separate brick slot lines across the width of the driveway;

   One is at the start of the multi row setts at the bottom of the drive, the other is a bit further up on the next sett edge detail.

   Both are designed to catch excess run off and collect and discharge into the existing mains provision via new underground pipework we will install.

As both surfaces are porous, the run off should be minimal, but I think it prudent to include these two runs, (they will be indicated on plan).

Also we will replace 2no manholes in this area for recessed ones to better disguise their positions.



Trial hole in existing concrete surface