Arborweald Environmental Planning Consultancy

LANDSCAPE, ARBORICULTURE & ECOLOGY
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Details Pursuant to British Standard 5837:2012,
Trees in relation to design, demolition & construction
Land @ 95 Canfield Gardens, London NW6 3DY

BS5837:2012 Survey and Report

November 2018

Surveyors: D K-Spall; P Collins, Cert.Ed., NCH (Arb.); & A Livingstone, DTLLS Level 6 (Arb. & Countryside), ND Level 4 Arb.

Report Author: D K-Spall BSc (Hons) Ecol., FDSc Arb., MArborA.

DKS/664

Contents

1.0. Introduction

Arborweald Environmental Planning Consultancy (AEPC) has been commissioned by the owners of 95 Canfield Gardens; Ms A Vidiney and Mr A Dunster, to provide details pursuant to the British Standard 5837: Trees in relation to design, demolition and construction – Recommendations (BS5837:2012). This report has taken into account Hampstead Garden Design (HSG) documents (section 1.2.) and discussions with Sarah Oxby (HSG) and the property owners, ensuring that appropriate consideration of trees has been integral to the construction design.

AEPC is a multidisciplinary environmental planning consultancy qualified to provide a professional service in the fields of arboriculture, ecology and the natural landscape. It is led by its founder; David Kavanagh-Spall who is a trained Arboriculturist and Ecologist, and a professional member of the Arboricultural Association. David has over 20 years' industry experience. Assessment is based upon professional qualifications and knowledge, and published professional guidance/recommendations and legislation. The BS5837:2012 tree surveys were carried out on 02/10/2018 and 08/11/2018, when weather conditions facilitated good visibility and therefore did not act as an impediment to the survey.

Trees were assessed by way of visual tree assessment (VTA) from ground level with the aid of binoculars, high powered torch, probe, acoustic hammer, true metre wheel, laser range finder, compass, drag tape, diameter tape and clinometer.

1.1. Legal Considerations/Risk Assessment

Although the potential risk to someone passing beneath a tree when the tree or part of it fails is relatively remote, the risk is present. This increases significantly in areas of consistent and regular usage on a year-round basis, such as pedestrian and vehicular highways, car parks and amenity areas. Where static structures exist, the risks become constant and an assessment is made as to whether complete or partial failure of a tree could cause damage to such structures. Utilities in the proximity of tree roots should be carefully planned to avoid damaging tree structural integrity (installation and maintenance of utilities) and to avoid structural root pressure on utilities. Garden use in the proximity of trees should also be carefully considered as, e.g. bonfires, barbeques, intensive flower bed cultivation etc. can be significantly damaging to trees. Within the scope of any tree survey it is a fact that not all risks of root, stem or crown failure can be covered, particularly in relation to freak occurrences of weather when even trees of a sound condition can be the subject of structural failure. Trees also have the rare propensity to drop limbs that appear to be in an acceptable condition. These rare occasions have been known to occur in spring and summer on calm days. Although rare, trees shedding limbs should be acknowledged as a risk that cannot be entirely mitigated. The law requires that properties are retained safely for residents, visitors and neighbours (Occupiers Liability Act, 1957/84, Defective Premises Act, 1972 and as Common Law Duty of Care) this includes the reasonable care of trees.

1.2. Relevant Documents

Hampstead Garden Design Plans, *Site Survey Plan,* Dated *23/07/18* and *Layout Plan,* Dated *02/10/18.*

2.0. Rationale

Provide sustainable solutions for trees and the development which takes appropriate account of the area's character.

3.0. General Site Character Assessment

Assessment of the character of the site and surrounding area consisted of a walkover assessment of both. Also assessment of the general character of the area through viewing maps and assessing views into the site from all cardinal points.

The property is located in a London area with relatively large front and rear amenity space. Local rear gardens are well stocked with mixed-age-class tree cover. Front gardens are more limited for space with occasional tree planting mostly, consisting of trees <10m in height and rarely trees of greater height with moderate to small managed crown spreads. Front amenity areas are bordered by brick walls with iron railings and abundant boundary vegetation including; shrubs, hedges and occasionally trees. Street tree planting is rarely present. The overall local setting is verdant with, the site contributing through frontage shrubs and a partial view of one mature rear garden tree (silver birch *T8, Tables 1 and 2*).

The site is located within a local Conservation Area (CA) and trees T6 and T8 are the subject of Tree Preservation Orders [TPO] (Tables 1 and 2). Works to trees within CAs cannot usually be conducted unless a 6-week Notification is first provided to the Local Planning Authority (LPA) without a responding TPO being made by the LPA in the 6-week timeframe. Trees the subject of TPOs require the LPAs consent before work can be conducted. Tree works reasonably required to implement a planning approval and carried out in accordance with the planning approval, require no consents from the LPA regarding CA and TPO trees. The proposed development does not impact on trees and shrubs and would therefore, not be to the detriment of the area's character.

4.0. Tree Survey

Trees were assessed individually or as groups, in relation to the surrounding landscape setting and development proposal. Trees were assessed for general condition, amenity, age and size. Table 1 lists the trees and tree measurements and table 2 sets out life stage, condition, categorization and estimated remaining contribution. In accordance with BS5837:2012 trees were assessed as individuals or groups based on their amenity contribution and functional properties. Tree work

recommendations made (table 2) are provided as recommendations for sustainable trees to property relationships. Appendix 1 provides scientific species name identification and 2 and 3 provide tree location and tree protection plans. Trees surveyed are those within the influence of the proposed development and vice versa.

Table 1: Trees and Tree Measurements

First significant branch (cardinal direction) = FB(N, E, S, W); Crown starts= CS; Above ground level= AGL; Ground level= GL; Diameter at breast height= DBH; Estimated = #; Root protection area= RPA; millimetres= (mm); metres = (m); Hedgerow = H; Codominant= Codom; Multi= >3 stems.

Tree no.	Species	Height (m)	DBH (mm)	FB & CS Height (m) AGL	Crown spread @ cardinal points; N,E,S & W (m)	RPA (m^2)
T1	Common lime	16	530	FB & CS @ <2	5, 4, <4 & <4	127
T2	Chanticleer pear	7	110	FB & CS @ <2	1, <1, <1 & <2	5
T3	Chanticleer pear	9	113	FB & CS @ <2	1, 2, 1 & <2	8
T4	Chanticleer pear	7	110	FB & CS @ <2	<2, <2, 1 & 2	5
T5	Wild cherry	11	210	FB & CS @ <2	4, 4, 4 & 2	20
T6	Common lime	11	540	FB & CS @ 6	3, 3, 3 & 3	132
T7	Wild cherry	10	220	FB & CS @ 4	3, 4, 4 & 4	22
T8	Silver birch	17	440	FB & CS @ <5	4, 4, 3 & 4	88

Table 2: Tree Condition and Amenity Contribution

Structural condition = Sc; Physiological condition = Pc; Estimated minimum life expectancy = Eml; Local Planning Authority = LPA; Category A = High amenity, B = Moderate amenity, C = Low amenity & U = Hazard to targets

Tree no.	Life stage	Sc	Pc	Eml	BS5837 Category	Comments
T1	Mature	Average NB: Ivy obscured sufficient VTA	Poor NB: Ivy obscured sufficient VTA	10	C1	Moderate sized tree of poor condition. Containing deadwood of <40% of crown volume. Root function is likely limited by a combination of normal garden use (including foot traffic-compaction) and, the adjacent wall and hardstanding to its SW. Historically wooden batons have been nailed to the tree's stem to provide a step ladder up the tree; with likely decay developing from this action. Dense ivy coverage of the whole tree prevented a sufficient VTA. Recommend felling to ground level but if retained; >70% ivy would need to be removed, deadwood pruned to make safe and full tree inspection should be conducted with according management recommendations implemented. **Effective protection can be provided with the tree potentially sustainably retained.**

Tree no.	Life stage	Sc	Pc	Eml	BS5837 Category	Comments
T2	Semi - mature	Average	Average	10+	**C1**	Small tree of ltd garden amenity. Where the tree is not regularly managed at/near current size; quinqennial monitoring is recommended. **Effective protection can be provided with sustainable tree retention.**
T3	Semi - mature	Average	Average	10+	**C1**	Small tree of ltd garden amenity. Where the tree is not regularly managed at/near current size; quinqennial monitoring is recommended. **Effective protection can be provided with sustainable tree retention.**
T4	Semi - mature	Average	Average	10+	**C1**	Small tree of ltd garden amenity. Where the tree is not regularly managed at/near current size; quinqennial monitoring is recommended. **Effective protection can be provided with sustainable tree retention.**
T5	Semi - mature	Average	Average - good	10+	**C1**	Relatively small tree with amenity ltd to private rear amenity areas. Foliage density was less than optimal as is common with usual garden usage including ground disturbance & compaction. Tree's close proximity to dwellings should inform tree management to retain at current size. However, were the tree to be removed due to concerns over sustainable retention, there would be no impact on the area's arboricultural character. Where the tree is not regularly managed or removed it should be the subject of triennial monitoring. A small amount of patio construction facilitation pruning may be required; ltd to pruning back branches up to a maximum diameter of 50mm and to no higher than 2.5m. The edge of the E side of the tree's RPA is slightly impinged upon by the new patio however, this is tolerable with special protection measures (SPM) implemented (S.7.1.). Where retained ground amelioration measures (S.7.2.) would significantly improve root function and crown density. **Effective protection can be provided with sustainable tree retention.**

Tree no.	Life stage	Sc	Pc	Eml	BS5837 Category	Comments
T6	Semi - mature	Good	Good	10+	C1	Relatively small off-site, neighbouring property tree with amenity ltd to private rear amenity areas. Root morphology was assessed as asymmetric (Appendix 2 plan, shows root morphology) due to relatively deep boundary garden wall foundation (probed to >500mm depth), located adjacent & to the tree's E: Damage to the wall was evident from structural root pressure potentially providing a minute & significantly ltd area for root ingress into the site. Wall repair sensitive to the tree's roots would be prudent. Tree's close proximity to dwellings should inform tree management to retain at current size, through continued pollarding. Where the tree is not regularly pollarded it should be the subject of triennial monitoring. **Effective protection can be provided with sustainable tree retention.**
T7	Semi - mature	Average	Average	10+	C1	Small tree of ltd garden amenity. Where the tree is not regularly managed at/near current size; quinqennial monitoring is recommended. **Effective protection can be provided with sustainable tree retention.**

Tree no.	Life stage	Sc	Pc	Eml	BS5837 Category	Comments
T8	Mature	Average - good	Average - good	20+	**B1**	Tree with ltd public amenity through, provision of partial visibility from Canfield Gardens highway. The tree is well managed but has some structural vulnerabilities & physiological stresses: Historically steps & a platform have been constructed around the tree; @ >3m AGL the platform is in contact with the tree under where the tree's 2 main crown supporting limbs have developed; woundwood is present but with no noticeable decay or pathogens evident. Also, small pockets of decay are developing from historical pruning wounds particularly, mid-limb @ approx. 4.5m AGL; relatively large diameter branch has been removed with resulting large wound but at present only ltd decay & sufficient holding/residual wood. Rhizosphere is ltd much like a street tree due to the following; wall foundations to E & S >500mm depth & set in concrete hardstanding, garden steps to the S/SW set in hardstanding which was also probed to >500mm depth below ground level & the dwelling including cellar level. The root morphology as assessed is provided in plan form (Appendix 2). Foliage density & condition is generally good but a little sparse at the apical central point. There is some epicormic growth on the main limbs potentially from lever arm pressure but also possibly due to retrenchment from poor rhizosphere area. Tree should be monitored triennially & pruned every 5 – 7 years to retain at a smaller than current size; as currently is becoming dominant close to dwellings. Steps & platform should be sensitively removed. Development would result in an increased rhizosphere area. **Effective protection can be provided with sustainable tree retention where, regular & appropriate tree management is implemented.**

***All tree monitoring and work is the responsibility of the tree owners and is in the interests of safe tree retention. All trees should be assessed post storm weather conditions.**

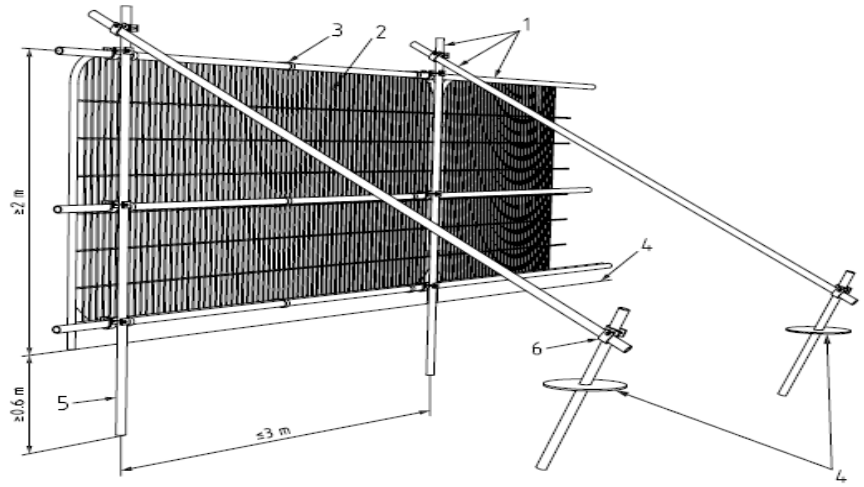
5.0. Arboricultural Impact Assessment

The proposed development including decking and the western edge of the stone patio would be located within the BS5837 theoretical optimal radial root protection zone (TORPZ) for trees' T5 and T8. However, the impingement upon T5 would be <5% of its TORPZ, perfectly tolerable for a young tree particularly, with SPM (S.7.1.) implemented. With regard to T8, both the current decking would be removed and the new decking constructed by hand. With the new decking floating on a framework attached to carefully located vertical struts. Decking removal and construction shall also be the subject of SPM (S.7.1.). The new decking will also require a small garden wall to be removed increasing the potential rhizosphere into an existing soil bedding area for T8. A small amount of construction facilitation pruning may be required to T5 on its eastern side but limited to branches of <50mm diameter and only to a maximum height of 2.5m above ground level. Facilitation pruning where required shall be conducted in accordance with the British Standard for Tree Works (B3998, 2010). With protection measures in place the impact upon the trees would be de minimus and with a long-term rhizosphere benefit for T8. No trees are required to be removed to facilitate development.

In conclusion the development proposal from an arboricultural perspective has no negative impact on assessed trees or the arboricultural character of the area and is therefore acceptable from an arboricultural perspective.

6.0. Arboricultural Protection

In accordance with BS5837 (2012) effective tree protection would be achieved through the provision of construction exclusion zones (CEZs) protected by the erection of appropriate barriers (Fig 1) and limiting construction activities to specified construction operations areas (COAs). The CEZ is a sacrosanct area that usually should not be the subject of any disturbance, including the stacking of materials. The site foreman or arboriculturist should ensure that the barrier is not breached and that the CEZ remains a sacrosanct tree protection area.



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

***5 Where space & ground limitation prevent driving uprights into the ground, pinned feet are acceptable.**

Fig 1: BS5837 Barrier Specification

6.1. Construction Operations Area (COA)

The COA is an area or areas where all construction activities are carried out including logistics/material storage, construction worker facilities, mixing of construction materials and fuels etc. without detrimentally impacting on retained trees adjacent to the site. It should be the responsibility of the site foreman to plan COAs for each phase of development appropriately taking trees into account and to ensure that all construction associated activities remains within COAs and building footprints.

7.0. Arboricultural Method Statement

Arboricultural method statements for particular non-standard tree protection measures are required where standard tree protection measures cannot be met. The location of decking and the west side of the stone patio requires special protection measures (SPM).

7.1. Special Protection Measures

In order to ensure the tree roots of T8 are not damaged, implementation of the current decking demolition and new decking construction must be phased first. Therefore, as development commences the new decking area will in-part provide ground protection for T8's roots. With regard to T5 and the new stone patio, measures need to be implemented in relation to the slight impingement into the tree's TORPZ to prevent potential far reaching root damage.

7.1.1. Decking Works (T8)

Removal of decking to be primarily by hand. Removal of old wooden struts to be conducted with spades and hand-held machinery. Small diggers may only be utilised to dig out old struts if hand held machinery is not sufficient and then only under supervisory arboricultural supervision. Digger main body would only be operated from the south of the retaining wall which is located to the south of T8 and outside of tree protection areas. New decking to be constructed by hand. Where pile rammer machinery is to be utlised: It shall be brought in via the concrete hard standing access and only be operated from the area south of the retaining wall, which is located south of T8 or from above ground newly built or retained decking; therefore, outside of tree protection areas.

7.1.2. Patio Works (T5)

Any required excavation along the eastern edge of T5's TORPZ shall require SPM to be implemented to appropriately mitigate any potential damage to absorptive roots that might be encountered. In order to minimise the impact on any roots present the following methodology would be applied:

Excavation: Any necessary excavating required should be carried out by hand where possible, with a Supervisory Arboricultural Watching Brief (Appendix 4). In the event that roots are encountered, the appointed competent arboriculturist would cleanly cut back roots and cover them with site excavated topsoil to prevent desiccation. Where excavation is carried out by a mini digger, the digger body shall be located outside of the CEZ and shall be to the following methodology: *Ground excavated with toothed bucket and removed by dragging/lifting small depths (15 – 30cm) in stages facilitating clean cutting back of roots where encountered. Cut roots would be covered with on-site excavated topsoil.*

7.2. Ground Amelioration

Ground amelioration advice is provided independent of the planning application and is therefore, at the owners' discretion to implement. Both trees T5 and T8 would benefit from ground amelioration where it is possible to implement it. Ground amelioration should be conducted in accordance with the following methodology:

7.2.1. Turf Removal

Removing turf from around trees to provide as large an undisturbed optimal rooting area as possible perhaps, laid to topsoil and decorative mulch and/or with some defensive planting in place can improve the trees' rhizosphere environment:

Remove turf by spade, only where avoidance of impact damage to any visible roots is possible. Insert spade up to a maximum depth of 50mm, then lay horizontally and loosen turf then remove. Ground should then be hand de-compacted.

7.2.2. Ground De-compaction

Hand de-compaction will significantly improve root function and therefore, the trees' overall physiological condition:

Insert a garden fork into the ground every 2 metres width and length wise for the treated area and lever it back and forth to loosen the soil (no digging/turning soil over should take place). No fork insertion should take place within 1.25m of the centre of each tree trunk; this is to avoid damaging large structural roots. Outlying large roots should also be avoided when inserting the fork away from the tree trunk. Ground should then be treated with a shallow 50mm each of good quality topsoil and composted bark mulch; decorative bark mulch can also be utilised to make a garden feature.

7.3. Implementation Timetable

In order to ensure effective protection of trees and woody plants, protection measures must be integrated into the development timetable (table 3).

Table 3: Tree and Woody Plant Protection Phased Timetable

Phase	Activity
1	Carry out tree work operations necessary to make trees safe and to facilitate development.
2	Implementation of protection barriers.
3	Set out construction operations areas.
4	Commencement of development with further arboricultural input if required; phasing the decking demolition and construction (by hand) as the initial development phase.
5	Completion of development.
8	Dismantling of protection measures.

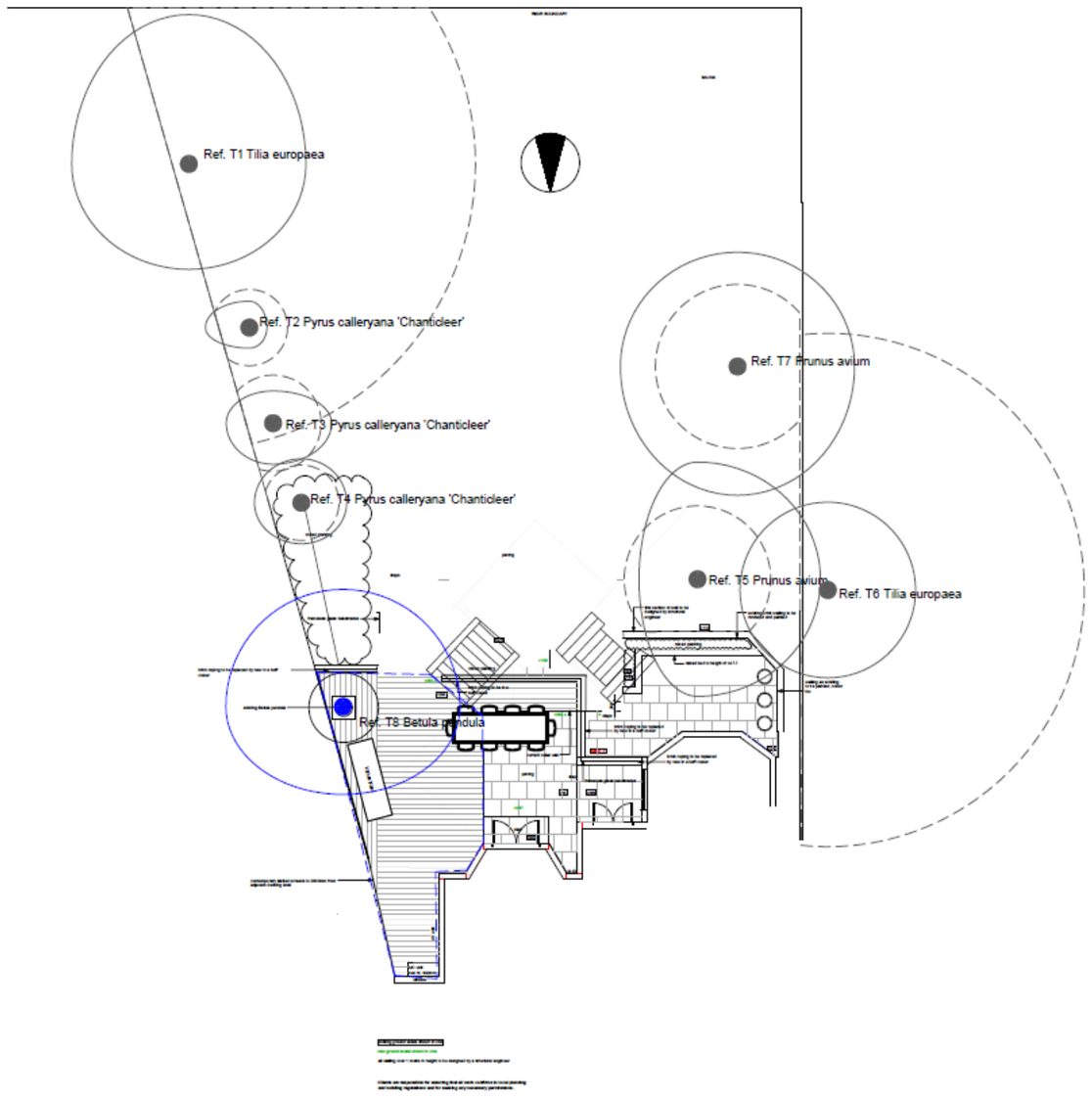
8.0. Conclusion

This report provides information which would help ensure the effective protection of retained trees and the pertinent management of trees all appropriate to the local area's character.

Appendix 1 Binomial Common and Scientific Names

Common and Scientific Binomial Tree Species Names	
Trees	
Chanticleer pear	*Pyrus calleryana* 'Chanticleer'
Common lime	*Tulia* x *europaeus*
Silver birch	*Betula pendula*
Wild cherry	*Prunus avium*

Appendix 2: Tree Plan Existing



Notes
This drawing is based on an original C.A.D plan provided by Sarah Oxby of Hampstead Garden Design.

Key
Identification of tree categories BS 5837

U DARK RED
Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

CATEGORY A LIGHT GREEN
Trees of high quality with an estimated remaining life expectancy of at least 40 years.

CATEGORY B MID BLUE
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

CATEGORY C GREY
Trees of low quality with and estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm.

Root protection area RPA's

Cat. U
Cat. A
Cat. B
Cat. C

Note: Assessed root morpology.

RPAs shown are reflective of assessed actual root morphology. Plan PDF @ accurate scale size provided separate from this report. DWG available upon request.

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Project
Patio Improvement Scheme
95 Canfield Gardens

Drawing Title
BS5837 Existing tree constraints

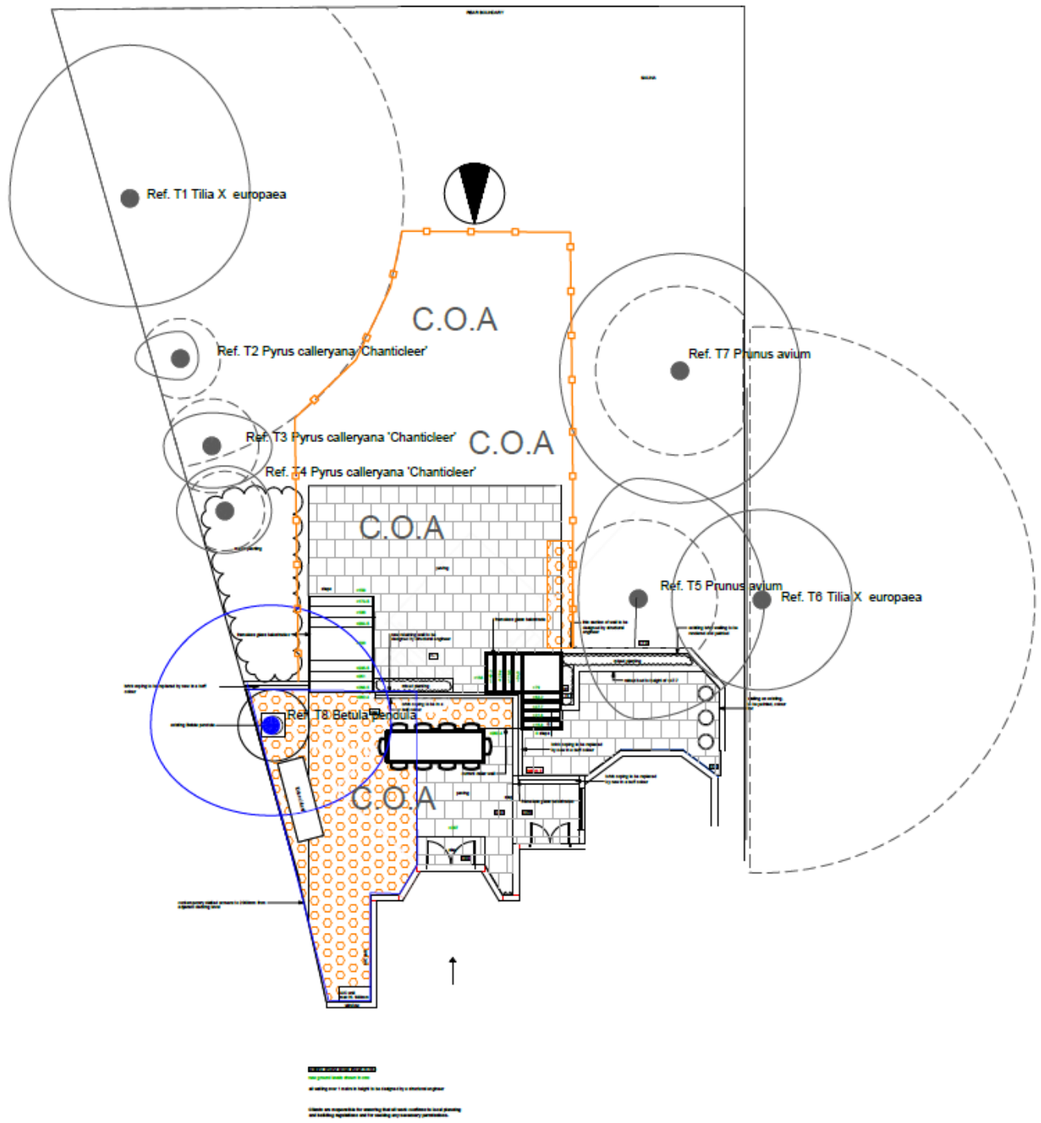
Drawing number DKS/664 TC001
Revision

Date 09/11/18
Scale 1:200 @ A3

Drawn by: PC
Checked by DKS

Client
Sarah Oxby of Hampstead Garden Design, acting for A. Dunster & A. Vidiney of:
95 Canfield Gardens
London
NW6 3DY

Appendix 3: Tree Protection



Notes

The construction operations area consists of the hatched area for special protection measures and the area contained within the barrier fencing and south of the existing building

The footprint of the existing building can also be considered to be part of the construction operations area.

All construction operations must take place entirely within this area to protect the root zones of existing trees on site.

Key

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U DARK RED

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CATEGORY C GREY

Trees of low quality with and estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter of below 150mm.

Barrier fencing

Root protection area RPA

Notes

RPAs shown provide the fullest possible BS5837 calculated area & reflect findings of actual root morphology. Plan PDF @ accurate scale size provided separate from this report. DWG available upon request.

Construction operations area C.O.A

Construction exclusion zone Any area not included in the C.O.A

Special Protection Measures

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Project

Patio Improvement Scheme
95 Canfield Gardens

Drawing Title
Tree Protection Plan

Drawing number DKS/664- TP002

Revision

Date 12/11/2018

Scale 1:200 @ A3

Drawn by: PC

Checked by DKS

Client

Sarah Oxby of Hampstead Garden Design
On behalf of:
A Dunster & A Vidiney
95 Canfield Gardens
NW 6 3DY

Appendix 4: Arboricultural Supervision and Audit Form

Company: Inspector:

Site:

Reference Number: Inspection Date:

Scrub, Tree, Group, Woodland Edge Number:

Development Status

Pre-development ☐ Development phase ☐ Development paused ☐

Status of Protection Measures

Where required previous remedial measures implemented ☐

All protection measures in place in full compliance with the Arboricultural Protection Method Statement (APMS) ☐

All protection measures not in full compliance with the APMS ☐

Remedial measures required due to the following within the Construction Exclusion Zone:

Ground contamination ☐ Changed soil levels ☐ Excavations ☐ Vehicle movements ☐

Cement washings ☐ Material storage ☐ Water run off ☐ Ground compaction ☐

Unauthorised tree works ☐

Remedial measures required due to the following barrier condition:

Barrier erection does not accord with the APMS ☐ Barrier not in place ☐

Barrier not intact ☐ Ground protection not in place ☐

Any other faults/breaches ☐

Details

Where remedial measures required:

Details

Where alternate tree protection measures are proposed:

General Comments

Date of next inspection:

Copied to client ☐ Copied to Site Manager ☐ Copied to Local Planning Authority ☐