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Arboricultural Report

Client: Mr Ariel Klien

Site: Mount Cottage

47d Netherhall Gardens, London NW3 5RJ

*Survey undertaken: Trees in relation to design, demolition and construction –
Recommendations.*

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*RFS certificate in Arboriculture
AA Technicians certificate in Arboriculture
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1. Background:

This report is in conjunction to the tree survey attached, which has been undertaken to identify any trees within or affected by the proposed development at the site address that should be removed or retained and therefore protected during the proposed development. This report will outline tree categorization methodology with reference to BS 5837:2012.

The proposed site is within a conservation area. The local authority is the Royal Borough of Camden.

2. Clients Brief:

- To undertake a tree survey within the rear gardens of affected properties. Plan supplied by William Tozer associates.
- To provide an Arboricultural report identifying the trees to be retained, removed or worked on within the proposed development and outline and evaluate the constraints posed by the trees retained on site via:
- Root Protection Area (RPA) – Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of a tree, shown in plan form.
- Construction Exclusion Zone – Area based on the RPA, identified by an arboriculturalist, to be protected during development, including demolition and construction work, by the use of barriers and or ground protection, fit for purpose to ensure the successful long term retention of a tree.
- Tree Protection Plan (TPP) – Scale drawing prepared by an arboriculturalist showing the finalized layout proposals, tree retention and tree landscape protection measures detailed within the arboricultural method statement (AMS), shown in plan form.
- Arboricultural Implications Assessment – Study undertaken by an arboriculturalist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.
- Arboricultural method statement (AMS) – Methodology for the implementation of any aspect of development that has the potential to result in loss or damage to a tree. N.B. The AMS is likely to include details of an on site tree protection monitoring regime, construction traffic management plan in relation to trees and a tree pruning schedule.

3. Scope:

The survey has been conducted in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

4. Site Observations:

Mount Cottage is a residential property set back from Netherhall Gardens with a relatively large front garden and no rear garden. The property consists of a ground floor and first floor with a south facing front garden and a small planting bed consigned to the west of the property. Sole access is via a front garden gate southeast corner of front garden. Mount cottage is located in a conservation area and two mature Common Lime trees grow on the front boundary line overhanging the footpath, both of these trees hold tree protection orders as they are prominent from the road and contribute to the character and landscape of the road. Low-level shrubs and creepers encase the front garden creating a cottage garden effect. The ground surface is entirely paved with brick patio, raised borders surround the trees and planting beds. A pyrocantha tree grows on the west boundary, which has been shaped into a sphere. Regular tree maintenance is apparent and the Lime tree canopies have been reduced approximately 3-4 years ago. Netherhall Gardens is on a significant gradient as much of Hampstead is situated on a hill and the road slopes down from east to west outside the front of property. The soil profile is London clay. The weather at the time of survey was clear with no wind.

5. The Proposed Development:

A complete refurbishment of the existing property to incorporate a lower ground floor living area underneath the existing footprint of the property and extending into the front garden by 3930mm (50% of depth of original house). Please refer to architects plans and drawing numbers A/02/101 for a more detailed illustration of the proposed development. The client wishes to retain the two lime trees in conjunction with the development as well as all camellia shrubs and wants to enhance the front garden post development with new vegetation and planting in newly constructed planting beds.

6. (i) Tree Survey

*Attached as a separate pdf documents: Reference - **FP/TS/241***

(ii) Survey Map - *attached as a separate pdf document identifying tree numbers and BS Tree Categories: Reference – **TMS 47d Netherhall Gardens***

Below: Table 1 – Cascade chart for tree quality assessment

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
Trees unsuitable for retention (see Note)		
Category U	<ul style="list-style-type: none"> Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unusable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby or very low quality trees suppressing adjacent trees of better quality 	See Table 2
<p>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</p> <p><i>NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>		
<p>1 Mainly arboricultural qualities 2 Mainly landscape qualities 3 Mainly cultural values, including conservation</p>		
Trees to be considered for retention		
Category A	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features
	Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality
	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees with material conservation or other cultural value
Category C	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits
	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Trees with no material conservation or other cultural value
		See Table 2

(iii) Tree Constraints Plan:

Attached as a separate pdf drawing: Reference TCP 47d Netherhall Gardens

(iv) Tree Protection Plan:

Attached as a separate pdf drawing: Reference TPP 47d Netherhall Gardens

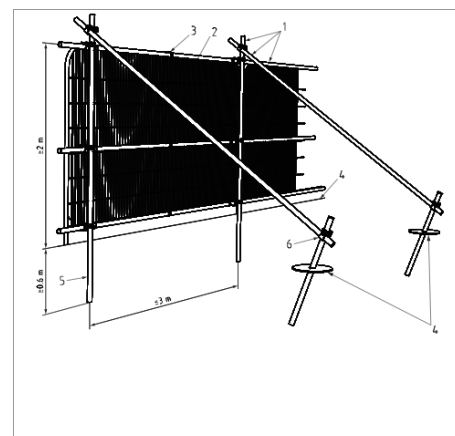
7. (i) Construction Exclusion zones (CEZ's):

Barriers and/or ground protection should protect trees that are being retained on site before any materials or light machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Erection and retention of a 2m high sturdy secure temporary fence, typically heras style, on a scaffold framework should be positioned along the CEZ calculated along side the RPA's of retained trees.

Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree. Barriers should be maintained to ensure that they remain rigid and complete. Pins should be driven in to the ground to ensure rigidity and demarcation of barriers with spray will indicate whether or not the barriers have been moved. The mixing and storage of materials is prohibited within the construction exclusion zones, contractors and machinery are also prohibited within CEZ's to mitigate soil compaction. This should be communicated via the project manger at commencement of each stage of the development.

Fig.1 BS 5837:2012:

Example of typical tree protection fencing used to demarcate the calculated construction exclusion zone.



(ii) Recommendations to mitigate or eliminate damage to tree roots within RPA's

To mitigate root desiccation during excavation and the installation of a new retaining wall within the RPA's of T1 & T2 specialist methods should be used:

Extraction of existing soil within the RPA should be followed by the installation of root barrier or plastic membrane pinned to the soil profile exposed to ensure the exposed roots are protected from drying out and or exposure to concrete or other materials. Subterranean activities should consider the rooting area of protected trees throughout the project and majority proportions of RPA's must be kept free of excavation and construction activity.

Designs for foundations that would minimize adverse impact on trees should include particular attention to existing levels, proposed finished levels and cross-sectional details. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from the project architect, developer and an engineer.

(iii) Appropriate measures to eliminate or mitigate severance of roots for construction of a utility service:

Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care should be taken in the routing and methods of installation of all underground apparatus. Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routing should be drawn up in conjunction with the project arboriculturalist. Trenchless insertion methods should be used with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected, excavation using hand-held tools might be acceptable for shallow service runs where applicable.

8. Arboricultural Implications Assessment:

The proposed development impacts the mature Lime trees T1 & T2 due the subterranean activity to take place outside the existing footprint of Mount cottage. The lower ground floor is to extend 3.95m from front of house towards front garden boundary leaving a distance of 4.8m of undisturbed ground to tree stems. The majority of this area is to be incorporated in a construction exclusion zone with a supported conveyor belt to extract soil through the centre of the front garden boundary in between canopies of T1 and T2. The RPA of T1 extends into the proposed development by 2m at its extremity, T2 has a slightly narrower stem and therefore smaller protection radius, which is compromised by 1m (see *TCP 47d Netherhall Gardens*). It is important to consider that the trees have been heavily reduced in the past and do not have a proportionate height to their stem diameters. Water availability has been increased as the canopy drip line decreases and rooting activity of these trees is much more likely to be contained in a lesser radial area than that of the calculated RPA. Nevertheless I have worked on the basis of the BS calculations and overestimating the rooting area should ensure the health and vitality of T1 and T2 during the proposed development.

T3 must be removed to allow for the proposed excavation and the loss of the pyrocantha will not adversely impact the amenity value of the local area due to its positioning on the west boundary of site. The re landscaping of the garden post development will further enhance this garden with new ornamental trees planted on the east boundary and camellias along the south boundary. To summarise due to the prominence of the retained Lime trees on the front boundary, the locality will notice very little change in vegetation throughout the course of the proposed development. There are no street trees in the vicinity or neighbouring trees, which would be affected by the project.

9. Site Observations



Photo 1: T1 on the right of picture adjacent to pedestrian entrance (site access) and T2 on the left of photo. Both trees were reduced to approximately 6m in height 3 years ago and now have re formed canopies via epicormic growth. Front elevation of Mount cottage can be seen through the canopies.

Photo 2: Taken from Netherhall Gardens facing east up the hill with T2 and T1 on the left of picture. The trees are now beginning to encroach into the highway and are due to be reduced as part of cyclical tree pruning management. The street has an abundance of privately owned trees in front gardens of property, which contributes to the high amenity value of the area.



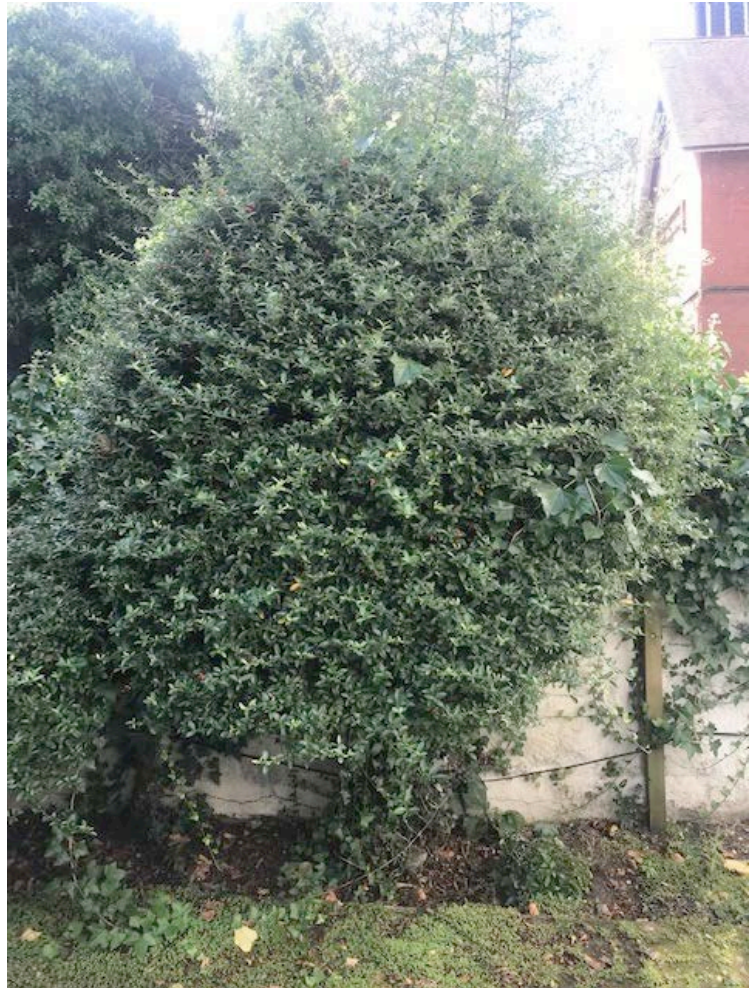


Photo 3 & 4: Site entrance adjacent to the stem of T1. Brick planter boundary surrounds both tree stems and planting beds around the garden. There is a small step down onto rear garden surface and step up to front door level. There is no plan to develop or alter the front gateway or front boundary walls therefore demolition and construction would be confined to the house only.

Photo 5: View of T1 and T2 from inside the front garden of Mount cottage with access on the left. Camellias grow underneath the canopies, which will be retained (stem diameters under 75mm at 1.5m from ground level). There is a clear gap in between the tree canopies T1 & T2 for a soil and rubble extracting conveyor belt.



Photo 6: T3 - *Pyrocantha* to be removed as part of the proposed development. Half of the shaped canopy is visible from neighbouring driveway, apart from that this tree is not visible from the road and in my opinion would not cause irreparable loss of landscape.



10. Arboricultural Method Statement:

To ensure the health and existing vitality of the trees that grow in and around the proposed site, the AMS should be used in conjunction with the tree protection plan attached to this report. (*TPP 47d Netherhall Gardens*) See below trees that require protection, pruning or removal prior to demolition and construction.

T1 – Common Lime: RPA impacted by footfall access into site as well as excavation for proposed basement. 10% of calculated RPA in a northern direction to be removed due to subterranean activity. Existing brick patio to be retained throughout project – no stripping of soil within CEZ’s – root membrane to be installed on north face of dig to mitigate root desiccation during concreting and basement construction.

T2 – Common Lime: RPA impacted by excavation for proposed basement. 5% of calculated RPA in a northern direction to be removed for subterranean activity. Existing brick patio to be retained throughout project – no stripping of soil within CEZ’s – root membrane to be installed on north face

of dig to mitigate root desiccation during concreting and basement construction.

T3 – Pyrocantha: Fell to ground level and remove stump to provide uninhibited access along west boundary (service runs etc.).

Pruning:

Canopy reductions of T1 & T2 are recommended prior to work commencing to ensure no mechanical damage to the canopies occur when installing the proposed basement soil extracting conveyor belt. The trees are due to be reduced regardless as part of a cyclical pruning management plan. The dormant season of 2019/2020 would be an ideal time in terms of tree health, to carry out the tree surgery.

Installation of services and utility runs:

At this stage it is not clear where the service runs and inspection chambers will be installed. From proposed plans, running along the east boundary wall towards the front gate is the most suitable. All services running through RPA's must be installed by hand dig only with arboricultural supervision.

Construction exclusion zones:

2m high 'Heras' fencing with pins driven into the brick patio to ensure rigidity will barrier off construction activity within RPA's as per the tree protection plan. Site monitoring should take place fortnightly by the project arboriculturalist.

Site access:

The site access denotes the scale of machinery permitted onto site, currently it is pedestrian only and due to the close proximity of T1 & T2 I would recommend this being a hand dig project with no unreasonably heavy machinery permitted in the front garden.

11. CTMP – construction traffic management plan with regards to soil and rubble extraction adjacent to TPO trees.

A disabled bay allocated for the current resident of Mount Cottage is directly outside the front of property. Once the house is vacant and this bay is no longer required it would be advisable to change the use of this bay and suspend it for skip and construction activities. The tree canopies of T1 & T2 will have been reduced by this stage and will be clear of the highway for loading and unloading.

12. Conclusion

The proposed development of Mount Cottage to increase the living space of this residential property is feasible despite constraints from the trees and access. Normally ground compaction around tree roots is a major factor in being able to retain trees in good health. The risk of compaction in this instance is reduced by the presence of the 60x100mm brick patio, which will offer ample load bearing capabilities for the size of machinery permitted on to site.

It is reasonable to assume that the calculated RPA's are no longer accurate due to the past history of pruning. The tree canopies are now much smaller and demand for water, nutrients and structural

stability are reduced because their roots now feed, support and nourish smaller structures. 90% of the RPA's will be unaffected by subterranean activity according to the BS5837 guidelines. Storage and mixing of building materials has been allocated within the existing property away from drains to prevent leaching of chemicals into the soil profile. The soil extraction conveyor belt offers a practical and labour saving solution to extract material from site bypassing the tree canopies and front access gate.

All tree pruning should be carried out in accordance with British Standards 3998:2010. The Tree Protection Plan annotates measures to protect trees during the proposed development as per BS 5837:2012. Should the client wish, I would oversee the tree protection prior to works commencing, during and after the proposed development for continuity.

*This report is to be submitted in conjunction with **Tree Survey – FP_TS_241 Site Plans – TMS 47d Netherhall Gardens, TCP 47d Netherhall Gardens, and TPP 47d Netherhall Gardens.***

13. References:

- BS 5837:2012 – Trees in relation to design, demolition and construction – Recommendations
- Original scale site survey supplied by William Tozer associates.