Wood Consulting

Caring for your environment & property **Environmental Limited**

Horticultural, Arboricultural, Landscape Consultant & Contractors

Arboricultural and Planning Impact Integration Assessment Report: Dannatt House, 5a Templewood Avenue, Hampstead, London, NW3 7UY

Report Date: 13th November 2019

Ref: WCEL/PEW/AIA/1113:19

This report has been prepared as an assessment of the scheme that has been specifically prepared in consultation with WCEL, Structural Design Studio and Coppin Dockray Architecture & Design, which has been engineered for the site based on some possible constraints identified during site investigation exploratory work and should be read in conjunction with the information of the trial pit/foundation investigation information provided by Coppin Dockray Architecture & Design on the 24th October 2019 and 8th November 2019.

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Arboricultural Report

Location: Dannatt House, 5a Templewood Avenue, London, NW3 7UY
Ref: WCEL/PEW/AIA/1113:19 Client: Mr & Mrs Furman
Report Date: 13th November 2019 Inspection Date: 15th October 19
Site Investigation Info: 24th October 2019 and 8th November 2019
Prepared by: Philip Wood BSc(Hons)LAM.

Please note that abbreviations introduced in [Square brackets] *may be used throughout the report.*

Instructions

Issued by – Bev Dockray of Coppin Dockray Architecture & Design on behalf of Client

TERMS OF REFERENCE – Wood Consulting Environmental Limited [WCEL] were initially instructed to survey the subject trees within the garden area of the property and the adjoining land close to the house, in order to assess their general condition and to provide a planning impact and integration statement for the remodelling of the house (including first floor & roof changes) and minor ground floor extension and associated re-landscaping. The majority of the remodelling work and alterations of the first floor and roof will be carried out close to or within the building envelope while the small single storey flank extension of the bedroom will be constructed using an engineered shallow profile reinforced slab.

Further to the initial site visit and inspection by WCEL, trial pit/foundation investigations were commissioned to determine the depth of existing foundations of any features and structures to enable parameters for a low impact engineered foundation design to be prepared. This could be used to inform a specialist structural engineering company to provide a bespoke foundation design that could be used to enable the small extension to be constructed, while minimising the impact to retained trees within the garden of the neighbouring property. WCEL surveyed the trees to provide a planning impact and integration statement for the scheme which has been assessed in conjunction with the site investigation work carried out on the 24th October 2019 and 8th November 2019 and the specialist foundation design since prepared by Structural Design Studio who have produced a foundation design based on the restrictions and parameters provided by WCEL to enable a credible engineered solution to demonstrate that a solution can be achieved subject to appropriate safeguards.

The Local Authority give guidance related to development near trees and where there may be some tree related impact, the proposed development should be assessed by an arboricultural consultant to consider the impact of the proposed scheme and try to safeguard the long-term health and well-being of the trees on or adjacent to the site for the future sustainability of the local area. Also, if or where, trees are affected or require removal by a proposed scheme the impact should be assessed in accordance with the current standard. In this scheme some trees within the neighbour's garden are proposed for removal and existing trees on site shall be retained and protected. The Local Planning Authority require information to demonstrate that the scheme, or any revisions, would not have an excessive or overly detrimental impact on the neighbouring trees, which is accessed in this report.

Executive Summary

The proposal for the site is to reconfigure and remodel the house (including first floor & roof changes) with a small addition of minor ground floor extension and then for the gardens to be enhanced with associated re-landscaping. The majority of the remodelling work and alterations of the first floor and roof will be carried out close to or within the building envelope while the small single storey flank extension of the bedroom will be constructed using an engineered shallow profile reinforced slab. The small light weight extension would be constructed on a specially designed reinforced slab carried between the existing foundations of the building and the replaced foundation of the current boundary wall. This solution requires very minimal excavation below the soil ground level and has been proposed to include a small turn down of the front edge of the reinforced slab for frost protection adjacent to the existing threshold of the building to keep any excavation to an absolute minimum. Services and drainage location remain as existing and any new connections for the relocated bathrooms will remain within the building envelope and joining to the existing services adjacent to the house. The proposed foundation and reinforced floor slab can be seen in the engineers' detail within the supporting information. The position and location of the turn down edge of the reinforced concrete slab is sited predominantly within the location of the site investigation pits already formed from the site investigation work and therefore will require very minimal additional excavation beyond that undertaken for the foundation investigation work. From the information viewed by WCEL there has been no information provided of any arterial root or structural roots were identified during the site investigations from the Oak (T15). The impact to the Oak (T15) and other trees on and adjacent to the site for the remodelling and small extension of the property have been considered as part of this arboricultural report as well as consulting with a structural engineer to demonstrate that the specialist foundation design is achievable and compliant with building regulations to demonstrate that the proposed scheme is implementable, subject to other planning related restrictions. Given the existing finished floor level above ground and the levels/presence of existing structures and their foundations, the impact of the scheme on the retained established trees is to a negligible level without significant impact to the established roots, subject to appropriate conditioned safeguards. In addition, the site investigation information, the structural engineers design solution and the architects scheme enables a clearer assessment to be made by the local authority of an approvable scheme and foundation design which can be approved at the initial planning stage rather than leave uncertainty of the foundation solution to conditional approval.

The scheme has been designed with no tree loss required, though WCEL have noted a standing dead Silver Birch Trunk (T1) which the top half of the tree had collapsed and is currently hanging in the tree requires urgent action by the owner. There is also a sparse Wild Plum (Prunus spp) (T3) adjacent to boundary which has a fungal bracket from a decay fungus located at its base and is also recommended for removal and replacement (both located in the neighbour's garden 5 Templewood Avenue). These trees do not require removal for the construction of the extension, or remodelling of the house but action should be taken to address the impaired condition of these trees.

It is considered that it would be possible to achieve the scheme without excessive root loss or damage to the established trees on and adjoining the site, by carefully implementing the reinforced engineered foundation floor slab. It has been assessed that it would be possible to position and cast the foundation and slab and this would not require excavation below

300mm thus avoiding significant impact or loss of roots. The new light weight construction design of the low-rise extension will require minimal disturbance to the established vegetation and roots if implemented under appropriate Arboricultural Supervision. It is accepted that there will be a small incursion into the theoretical RPA of the Oak (T15) but this has been accessed as negligible (less than 1%) especially considering the extensive open ground relatively unrestricted soil media still being retained on site. Ground protection measures would be required when working over the soil in the Root Protection Areas of the retained trees, but given the constrained access and manually formed foundation solution proposed this can be achieved using ground protection load spreading boards which would make it possible to achieve this without significant impact to the trees, with soil loading below the surfaces, kept to an absolute minimum. The proposed position of the replacement wall foundation, reinforced concrete slab, drainage, services and building construction make-up above would have very little broader amenity impact to the local area as there is no need to remove any trees. The removal of 1 dead and 1 poor quality tree from the neighbour's garden is recommended as part of the regular maintenance and good arboricultural management of the vegetation.

Therefore, if implemented sensitively, as is proposed, the impact of the scheme should be minimal within the broader context of the area. The Ash (T14) & Oaks (T13 & T15) are closest to the proposed works and are recognised as valuable amenity assets to the Conservation Area, they can be retained and could be adequately protected. Lesser visually important trees in the rear garden and those adjoining the site, will also be retained and protected as shown in the report. It is the intention of the scheme to work around these trees and the smaller trees retaining as much of the vegetation as possible and as such the proposal, if implemented in accordance with the recommendations of this report, should not be of sufficient detriment to warrant refusal of the scheme on detrimental tree impact grounds. There are notable large pieces of decay and deadwood in the Oak (T15) which overhang the site, these will require trimming back to reduce conflict and for safety purposes. This pruning is not dissimilar to the pruning work previously carried out at the property. This would be required regardless of the proposal and is only considered to be very minor works which is unlikely to be objected to by the LPA.

It is considered that if consent is granted enabling the building of the small extension, remodelling and alterations to the first floor and roof, no trees require removal to implement these elements of the scheme. All efforts have been made to recommend suitable/realistic adjustments to enable the scheme to be implemented without significant detrimental impact to the long-term health and amenity of the trees on and adjoining the site. The trees in third party ownership, which are located on the adjoining land relatively near to the boundary should not be detrimentally impacted upon if the development is implemented sensitively taking reasonable precautions to avoid damage to tree roots and the surrounding soil. All the remaining trees on and adjacent to the site would be able to be retained and protected with the exception of those on poor health identified within the report.

An initial assessment had been made of the likely Arboricultural Impact and it has been considered to be acceptable. Further site investigations were carried out to determine depths of existing foundations and potential root activity, this also determined that the scheme would be acceptable subject to a specialist foundation design solution which is now part of the new application documents), using specialist shallow style construction specification is considered acceptable.

It would be possible to work carefully within the theoretical radial root protection areas for the trees without causing any significant detrimental impact if carried out with an appropriately worded method statement to which the scheme has been designed around. Some enabling works for the demolition, foundation excavation and construction work are proposed within part of the RPAs of four of the retained trees as such the scheme has been revised to reduce the impact to the retained trees to a minimal and acceptable level, if carried out with caution and sensitivity, and under the appropriate arboricultural supervision (where required) it would be possible to construct the proposed scheme without excessive or significant long term detrimental impact to all the retained trees. Some form of tree protection fencing and/or ground protection would be required to protect the soil areas around the trees during the development works which would need to be discussed and agreed with the contractor prior to any work starting on site and detailed to the LPA by way of condition if required.

Therefore, the trees identified for retention on site would require protection in accordance with industry best practice and BS 5837: 2012 – Trees in relation to design, demolition and construction – recommendations, in order to ensure their longevity. In the majority, there are no major level changes proposed in the RPAs, just the removal of a shallow profile of soil below the existing paving for the small bedroom extension, to enable the reinforced concrete slab to be formed and the soil below the existing boundary wall location at a depth below where no root activity was observed. The retained trees in the existing garden area can be adequately protected and should be unaffected as long as the tree protection measures are followed unless the proposed scheme changes and this would need to be re-assessed. Pictures of the trial pit investigations have been appended to this report. This identifies that there were roots present within the soil profile, but many were noted as remnant of the recently removed mature Laurels and root activity of small ephemeral feeding roots was much lower than initially envisaged and there were no substantial arterial roots. In addition, the reinforced concrete foundation slab is to be kept very shallow leaving many roots undisturbed. These works are recommended to be carried out with significant care and under arboricultural supervision.

Having discussed the details with the architect and structural engineer, the plans having been amended taking account of the site investigation findings and report recommendations it is considered that it would be possible to reduce the impact to the remaining soil and roots where present. This should keep the soil disturbance and impact to a minimum, thus avoiding unnecessary or excessive damage to the Oak tree (T15), which is considered to be acceptable if carried out with appropriate care.

Given that: If the scheme is to take on board the recommendations in this report and conditioned to be implemented in accordance with the structural engineers design and calculations, the retained trees on and adjoining the site should not be significantly adversely affected by the proposed scheme with minimal soil and minor root loss; the trees on and adjacent to the site can be retained and protected with the use of tree protection fencing and ground protection measures; the mature trees can be retained and worked around with no additional pruning necessary to obtain access for the construction of the extension, there should be no tree related reasons for refusing the proposed scheme, subject to an appropriately worded condition being attached to any planning approval.

Documents Supplied

Sandra Coppin of Coppin Dockray Architecture & Design supplied the following documents:

Supplied prior to site visit:

1.	Existing Site Plan	Date: 26/04/2019	Dwg No: 1803-EX-01	Rev -
2.	Existing Ground Floor Plan	Date: xx.xx.xxxx	Dwg No: 1803-EX-10	Rev -
3.	Existing First Floor Plan	Date: xx.xx.xxxx	Dwg No: 1803-EX-11	Rev -
4.	Existing Roof Plan	Date: xx.xx.xxxx	Dwg No: 1803-EX-12	Rev -
5.	Existing South East Elevation	Date: xx.xx.xxxx	Dwg No: 1803-EX-15	Rev -
6.	Existing South West Elevation	Date: xx.xx.xxxx	Dwg No: 1803-EX-16	Rev -
7.	Existing North West Elevation	Date: xx.xx.xxxx	Dwg No: 1803-EX-17	Rev -
8.	Existing North East Elevation	Date: xx.xx.xxxx	Dwg No: 1803-EX-18	Rev -
9.	Existing Sections A-A and B-B	Date: xx.xx.xxxx	Dwg No: 1803-EX-20	Rev -
10.	Existing SectionS C-C AND D-D	Date: xx.xx.xxxx	Dwg No: 1803-EX-21	Rev –
11.	Proposed Site Plan	Date: 18/04/2019	Dwg No: 1803-GA-01	Rev G
12.	Proposed Ground Floor Plan	Date: 18/04/2019	Dwg No: 1803-GA-10	Rev H
13.	Proposed First Floor Plan	Date: 18/04/2019	Dwg No: 1803-GA-11	Rev H
14.	Proposed Roof Plan	Date: 18/04/2019	Dwg No: 1803-GA-12	Rev F
15.	Proposed South East Elevation	Date: 28/08/2019	Dwg No: 1803-GA-15	Rev B
16.	Proposed South West Elevation	Date: xx.xx.xxxx	Dwg No: 1803-GA-16	Rev B
17.	Proposed North East Elevation	Date: 28/08/2019	Dwg No: 1803-GA-18	Rev B
18.	Proposed Sections A-A and B-B	Date: 28/08/2019	Dwg No: 1803-GA-20	Rev B
19.	Proposed Section E-E	Date: 20/09/2019	Dwg No: 1803-GA-21	Rev -

Supplied Subsequent to the site investigation visit:

20.	Trial Hole Location Plan	Date: 16.10.19	Dwg No: -	Rev -
21.	Annotated Photo of Trial Hole 1	Date: 06.11.19	Dwg No: -	Rev -
22.	Annotated Photo of Trial Hole 2	Date: 06.11.19	Dwg No: -	Rev -
23.	Annotated Photo of Trial Hole 3	Date: 06.11.19	Dwg No: -	Rev -
24.	Engineers Proposed Front Extension Plan	Date: Nov 19	Dwg No: S.300	Rev P1

1.0 Scope of Survey

1.1 The survey is concerned with the arboricultural impact aspects of the site only.

1.2 The planning/pruning history of the trees was not analysed in detail.

1.3 A qualified and trained horticulturalist and arboriculturalist undertook the report and site visit. The contents of this report are based on this. Whilst reference may be made to built structures or soils, these are only opinions and confirmation should be obtained from a qualified expert as required.

1.4 Trees in third party properties were surveyed with restricted access or from within the subject property, therefore a detailed assessment was not possible and some (if not all) measurements were estimated.

1.5 Discussions took place briefly between the surveyor, the clients, architect and garden designer, but no other 3rd parties.

1.6 The trees were inspected on the basis of the Visual Tree Assessment method expounded by Mattheck and Breleor (The body language of tree, DoE booklet Research for Amenity Trees No. 4, 1994).

1.7 The survey was undertaken in accord with British Standard 5837: 2012 Trees in relation to design, demolition and construction – recommendations.

1.8 Pruning works will be required to be in accord with British Standard 3998:2010 (Tree work – Recommendations).

1.9 Underground statutory services near to trees will need to be installed in accord with the guidance given in BS5837 together with the National Joint Utilities Group Booklet 4: 2007 Guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG4). Smaller subsidiary services shall be routed outside of retained tree(s) root protection area(s), where they are necessary within RPAs they will be subject of a detailed method statement for installation to be submitted to and approved by the Local Planning Authority (LPA) and on-site supervision.

1.10 Where hard surfacing may be required in close proximity to trees, BS5837: 2012, and the principles of Arboricultural Practice Note 12: Through the Trees to Development (AAIS) 2007 (APN12) with regards to "no dig" surfacing will be employed.

1.11 Reference is made to the National House Building Council Standards, 2007, chapter 4.2: Building near trees (NHBC).

1.12 The client's attention is drawn to the responsibilities under the Wildlife and Countryside Act (1981).

2.0 Survey Method

2.1 The survey was conducted from ground level with the aid of binoculars, where required.

2.2 No tissue samples were taken nor was any internal investigation of the subject trees undertaken.

2.3 No soil samples were taken.

2.4 The height of each subject tree was estimated using a clinometer.

2.5 The stem diameters were measured in line with the requirements set out in BS5837:2012 - Trees in relation to design, demolition and construction recommendations.

2.6 The crown spreads were measured with an electronic distometer and/or steel hand held tape measure. Where the crown radius was notably different in any direction this has been noted on the Tree Survey Plan (appendix A), or in the tree table (appendix B).

2.7 The Root Protection Area (RPA) for each tree is included in the tree table, both as a radius of a circle, and as an area. The Theoretical Radial Root Protection Area is illustrated as **Pink** lines & the Site Specific Assessed Theoretical Root Protection Area is illustrated in **Orange** (where applicable) on the plan for retained trees only.

2.8 All of the trees that were inspected during the site visit are detailed on the Tree Survey plan at Appendix A. Please note that the attached plans are for indicative purposes only, and that the trees are plotted at approximate positions based on the plan provided by the surveyor. The trees on this plan are categorised and shown in the following format: COLOUR CODING AND RATING OF TREES:
Category A – Trees of high quality with an estimated life expectancy of at least 40yrs. Colour = light **green** crown outline on plan.

Category B – Trees of moderate quality with an estimated life expectancy of at least 20yrs. Colour = mid **blue** crown outline on plan.

Category C – Trees of low quality with an estimated life expectancy of at least 10yrs. Colour = uncoloured **grey** crown outline on plan.

Category U – 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 10years. Colour = **red** crown outline on plan.

The crowns and RPAs of those trees that are proposed for removal, or trees where the crown spread is deemed insignificant or irrelative in relation to the proposed development are not always shown on the appended plan; however, their stem locations are marked for reference.

All references to tree rating are made in accordance with British Standard 5837:2012 Tree in relation to design, demolition and construction – Recommendations Table 1.

2.9 Site investigation trial pits were carried out observed by Sandra Coppin with the details and finding recorded in the pictures in appendix D. Reference to this document should be made when assessing the findings, recommendations and conclusions of this report.

3.0 The Site

3.1 The subject property is located on the North West side of Templewood Avenue in North West London, within the London Borough of Camden. However, the primary trees of interest, of varied health and amenity, are located within the front and rear garden and the adjoining land. The property is within the Redington Frognal conservation area.

3.2 The front garden of the site is predominantly soft landscaped consisting of some levelled off made ground retained by the front and flank boundary walls with a gravel driveway running along the northern boundary. The rear garden rises from front to back with tiered sections which have been levelled. The rear of the garden is at a highest level. The majority of the rear garden is a combination of grass and open soil where the extremely overgrown mature Laurels and perimeter shrub beds had been removed. There are a number of small shrub beds forming part of the original planting. No topographical survey has been provided but the site survey plans indicate the location of trees.

3.3 The front garden has very little existing vegetation beyond a tall yew hedge adjacent to the front boundary and the mature trees which are subject to the imposition of a TPO. The rear garden generally has a green feel provided by the perimeter trees within it, those within the adjoining gardens and beyond. Though a number of these trees have limited contribution value on their own and some have impaired life expectancy. Due to the broader built-up nature of the area, as a whole, it is recognised that trees are a valuable resource in the cityscape creating a much needed green lung for the area and some privacy screening. The smaller trees on the property may provide some interest at a garden scale, but are inconsequential in respect of the broader conservation area. The overall feel of the site and visual amenity of the trees will be unchanged due to the single storey nature of the extension and the remodelling not significantly changing the overall height or dimensions of the building. Given that the proposed extension sits on the location of the old double width boundary wall and replaces an area of paving the differential between the elements will keep the incursion into the soil in the root protection areas to a minimum.

4.0 The Subject Trees

4.1 The details of the subject trees are set out in the schedule in Appendix B.

4.2 The overall quality of the trees, on and adjoining to the site, vary from good to poor; this is broadly split into small trees of limited form and negligible amenity; with seven large trees of good and moderate form/health on site, and three further moderate trees with unusual growth characteristics formed due to light competition and historic wind damage. There are also trees of

moderate form on site and located in the neighbouring gardens showing signs of significant stress. The Oaks (T13 & T15) are the most significant trees near the proposed development activity which have received limited crown management in the past, though the Oak (T15) has significant decay in a number of limbs and fork unions it is recommended that the owner of the tree has a full climbing inspection carried out on the specimen as a matter of priority and to continue to inspect the tree on a regular short cycle basis. The tree is showing signs of retrenchment and which may have aided in reducing some of the root activity of the tree. For the smaller trees on site, their broader amenity value is limited due to their prostate form/small size and they would also benefit from some formative pruning work once the garden design and landscaping has been formalised.

4.3 Of the Seventeen individual trees inspected on or close to the site: nine trees are located on site in the front and rear garden areas and eight trees are growing in the gardens and public highway adjoining the property. There is also a hedge and mixed vegetation on and adjacent to the site of mixed health and limited broader amenity to the local area. A couple of trees on the adjoining property appear to be of limited health, but given the distances involved, the specialist foundation designs, some constraints to the root development and limitations of their growing conditions they should not be significantly detrimentally affected any further by the proposed positioning of the small extension and remodelling building work if carried out sympathetically in accordance with the recommendations of this report. Of the seventeen individual trees surveyed: two have been assessed as BS5837 category A; three have been assessed as BS5837 category B; ten have been assessed as BS5837 category C and two have been assessed as BS5837 category U.

5.0 The Proposal

5.1 The proposal for the site is to reconfigure and remodel the house (including first floor & roof changes) with a small addition of minor ground floor extension and then for the gardens to be enhanced with associated re-landscaping. The majority of the remodelling work and alterations of the first floor and roof will be carried out close to or within the building envelope, while the small single storey flank extension of the bedroom will be constructed using an engineered shallow profile reinforced slab. The re-design of the extension's foundations is due to it being located within the Plane tree's (RPA) to accommodate the findings of the site-specific tree root trial investigation. The small light weight extension would be constructed on a specially designed reinforced slab carried between the existing foundations of the building and the replaced foundation of the current boundary wall. This solution requires very minimal excavation below the soil ground level and has been proposed to include a small turn down of the front edge of the reinforced slab for frost protection adjacent to the existing threshold of the building to keep any excavation to an absolute

minimum. The formation and location of the foundations has been re-designed to enable the scheme to be built without overly detrimental impact to the retained tree and its roots. The overall area of garden space will not change significantly with only marginal loss of open ground compared to built structures and hardstanding currently found on site.

5.2 The existing landscaping within the site is relatively minimal since the old overgrown vegetation was removed, which leaves a relatively blank canvas for a new scheme to be created. The implementation of a new garden design scheme will retain the informal nature of the site while maintaining the ability to add additional quality planting in the future as the planting matures aiming to keep a soft natural feel to the garden similar to that already seen. The recommendation to remove one standing dead stump and one tree in poor health (in the adjoining garden) are done so on safety grounds. These smaller trees have limited amenity and long-term structural defects which could be compensated for within the planting scheme.

5.3 The proposed footprint and elevations of the above structures can be seen on the plans submitted as part of the main planning application & in appendix A.

5.4 Due to the constrained nature of the site and position of the proposed small extension just within the RPA of the Oak (T15), the extensions foundation design has been prepared in close discussion with the architect and structural engineer to establish a workable and site specific solution for this scheme that would satisfy the requirements of the project, the LPA and building regulations, while maintaining the healthy retention of the trees and ensuring limited impact on the adjoining trees. A low impact foundation solution which has been used on other sites within Camden is being proposed for the small single storey extension.

5.5 Trial investigation pits were carried out on site in the location of the proposed extension foundation line to establish the presence or absence of significant tree roots and to determine the location and depths of the foundations of the existing house and boundary wall. This noted that there were a number of ephemeral feeding roots present, though many of these noted in the pictures provided were from other vegetation (very large mature Laurels etc) that had now been cleared from the garden. There was a lower level of ephemeral feeding root activity than anticipated and there were no larger arterial feeding roots noted and there was very little or no root activity found below the underside level of the house foundations at a depth of 1200mm BGL or 850mm BGL on the underside of the boundary wall foundation line. There was a hard compacted layer of backfill and rubble at around 500mm BGL, that appeared to have limited the development of roots and it would be credible to conclude that the open ground nature of the rest of the garden would have been more favourable to root development. Alternatively, the hard compacted layer could have deflected feeding roots especially given the presence of boundary wall foundations and historic changes in levels of the garden. The position of the pits was in part the location of the location in which the long

span of the downward toe of the reinforced concrete slab would be located and formed, with the depth of the toe would be no greater than 300mm BGL. There were some ephemeral fibrous feeding roots but these were limited in number and were peppered throughout the soil profile. The foundation slab is predominantly carried by the existing property's foundations and the new foundation proposed is in the same location as the existing boundary wall. The excavations required for this would only be marginally greater than that required to replace the existing paving with a well-prepared quality paved terrace (which would not require planning approval). In addition, the architect is ensuring that the positioning and depth of the services and drainage is to be kept, either outside the RPZs or that they are directed within the construction profile of the building. Therefore, the foundation floor slab has been calculated and designed to be as shallow as possible and can be built into/included within the threshold of the extension, to avoid any requirement for further excavation. The specific location of the replacement boundary wall foundation, the reinforced concrete floor slab spanning to the existing property's foundation should enable the extension to be constructed without damaging any arterial feeding roots and only affecting a small area of ephemeral roots found emanating from the Oak (T15).

6.0 Arboricultural Implication Assessment

TREE REMOVAL / RETENTION:

6.1 The proposed development does not require the removal of any trees to achieve the single storey extension or for the remodelling works to the first floor and roof. Only two small poor-quality trees are proposed for removal (in the neighbour's garden) as part of the health and safety measures. The other trees on the adjacent properties would be retained and protected and should not excessively impact on the third-party trees. There are a number of medium sized trees which have become contorted and are of poor form, they do not require removal to implement the scheme and add real character to the garden. They are of relatively prostate form rendering them of no significant amenity value in the context of the broader landscape, but the garden designer is working to retain them as they provide maturity and interest to the garden.

6.2 The remaining trees are all shown to be retained and this should be achievable with careful management of the site. The plans which have been worked up to take due consideration of being located close to or within the theoretical radial RPAs of Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11). A more considered assessment of the Site Specific Theoretical RPZ of Oak (T15) has been made and this has informed the production of a more detailed site-specific foundation design which has been assessed based on the findings of the tree root trial investigation work on site on the 24th October 2019 and 8th November 2019. Most of the construction work on site is within the

building envelope or in areas of the site away from the retained trees though caution will need to be exercised when having deliveries as the existing protected trees Oak (T13) and Ash (T14) are located within the driveway and this will limit load bearing of heavy deliveries and hiab crane offloading. There are works proposed that will be located in or close to the RPZ/RPAs of the Oak (T15), this will therefore involve caution being used when excavating and implementing the engineered type of foundation and construction solutions in this area. The existing double brick boundary wall and paved front garden area are to be removed which already covers the area designated for the new small low-rise extension. The position of the building near to, or within, the RPZ/RPAs is based on the foundation design prepared by Structural Design Studio and will only be a less than 1% incursion inset between the existing boundary wall and the flank wall of the house. The Oak (T15) has had limited pruning management in the past and it is recommended that the tree is subject to a more detailed climbing inspection as there are limbs and branch unions with significant decay pockets and deadwood. The owner of the tree should be advised to closely monitor the condition of the tree to determine future management and monitoring requirements regardless of the development proposed.

6.3 The careful design proposed for the small light weight extension with its engineered foundations and new superstructure should be achievable without overly detrimental impact to the trees. It is considered that with carefully considered foundation preparation, with the input from the retained arboricultural consultant and supervised/monitored demolition and excavations on site it would be possible to avoid unnecessary or significant root severance and therefore retain the health of the trees. The root activity within the proposed location for the small extension appears to have been minimised by various factors including the presence of the compacted backfill layer which has limited the extent of root activity. This appears to have reduced the volume/size of arterial roots as well as ephemeral feeding roots, with the tree appearing to, even limit the volume of smaller feeding roots due to the less hospitable growing conditions. Having successfully explored the location for the foundations, to avoid any significant roots that were considered possible from the Oak (T15), this has illustrated that these roots can be retained and their long-term health protected. As all the healthy trees are to be retained and worked around for the development, the overall broader arboricultural landscape character of the site and its adjoining neighbours will be retained.

6.4 The majority of the other retained trees are at sufficient distance from the proposed development and remodelling to be affected by it. There is some activity proposed just within, or close to, RPAs of Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11), careful management of the site and protection of the soil around the proposed structures will be required to provide some working area, but this will be kept to a minimum, and will be subject to approval of the proposed scheme. Where specialist foundations, or

any significant new landscaping structures are proposed in or close to the RPZ/RPAs of retained trees both on and adjacent to the site this will be hand dug, arboriculturaly supervised, maintaining them to be as small and discrete as possible. The existing proposal for the development would not require the removal of any of the trees, just careful operational activities to install the proposed scheme, which can be achieved by managing the working practices of the contractors who install the engineered foundations design, brick work, concrete form work, first floor alterations and roof structure. There will only be a need for some pruning works to the Ash (T14) to raise the low crown and balance the asymmetric nature of its crown, removing deadwood and reducing the crown due to the cavity in the main fork union, but this is only slightly more extensive than that previously carried out as part of the existing management which is unrelated to the development application. The large pieces of deadwood that are present in the lower section of the crown of the Oak (T15) should also be removed for H&S reasons, which is again unrelated to the application works. All the healthy trees would be retained and measures taken to protect these trees during the development process. The foundation design and above ground structures have been positioned and adapted to enable a suitable distance of relief space and sufficient protection of the established trees. Therefore, the broader arboricultural landscape character of the site and its adjoining neighbours will be retained.

6.5 In relation to Large Impact Landscape Trees [LILT], in or close to the site, there are five trees of note growing in or close to the site. These trees (T7, T13, T14, T15 & T17) are in the ownership of the client and adjoining property (5 Templewood Avenue and the public highway) there will only be minor spots of incursion into their theoretical radial RPAs, for general movement of operatives around the site and re-landscaping work. This incursion would only be relatively minor and mostly above ground, for which the soil can be protected with ground protection measures during the preparation work. Of these trees (T14, T15 & T17) appear to be in moderate health but are showing some signs of stress which is likely to be related to pest and disease activity, fungal infections and seasonal draught conditions earlier in the summer but still have sufficient presence and amenity value to the broader conservation area. It is considered that these retained trees would not be adversely affected by the proposed scheme due to the distances involved, the specialist foundation design and tree protection measures to be installed, with minimal excavation and construction activities, if carried out with due care and arboricultural supervision to avoid unnecessary root loss. The trees noted for retention would be retained with no significant long-term effect if implemented as discussed. There is no need to remove healthy quality LILT specimens located within the site or adjoining land. If the recommendations of this report are followed the trees shall be adequately protected and any pruning work proposed will be aimed at retaining the trees. Overall, by avoiding any tree losses for the development works and careful landscaping, this scheme should not have a detrimental impact to their longer-term health and amenity of the broader area.

6.6 The small extension closest to the Oak (T15) will have a shallow profile reinforced foundation slab constructed by hand without the need for large plant or machinery. It is considered the small size and nature of these foundations and its shallow profile would be very negligible in its impact, though due to their potential position within the root protection area of the retained tree the final location of the downward toe of the slab would need to be assessed as it is dug to determine if any significant roots are present. The location would need to be excavated with due care and no roots greater than 25mm should be cut, without first getting the approval of the retained arboricultural consultant WCEL or the LPA arboricultural Officer. However, given the position and limited chance of conflict, the likelihood of confronting a problematic root is considered to be very low and not sufficient to consider refusal of the scheme.

6.7 The Plan Dwg No: WCEL/PEW/TSP1/REV1 in Appendix A and the schedule in Appendix B identify the tree root protection areas and any pruning recommendations. These works are not considered to be excessively detrimental, controversial or a reason to refuse the scheme.

TREE PRUNING TO ACCOMODATE THE PROPOSAL OR ACCESS TO THE SITE

6.8 The crown of the Oak trees (T15) and Ash (T14) do not directly require any pruning to implement the scheme, though there is a benefit in the tree receiving some crown management as it would make access for pedestrians and delivery vehicles easier and avoid some conflict during the construction process. For the Ash (T14) it would be beneficial to raise the low crown and balance the asymmetric nature of its crown, removing deadwood and reducing the crown due to the cavity in the main fork union, but this is only slightly more extensive than that previously carried out as part of the existing management which is unrelated to the development application. The crown of the Ash has become unbalanced and biased due to light competition due to its sub-dominance to the Oak (T13) and competition with the high yew hedge along the front boundary, which would become progressively more significant if left un-managed and therefore it is considered beneficial if the tree were to receive some considered crown lifting and crown reduction regardless of the development. The pruning of the Ash (T14) is advised as part of the general re-reduction of this specimen regardless of the proposed development.

6.9 Where pruning work will be required, this will be undertaken by a trained professional and it will not be the builder or scaffolding/fencing contractor carrying out the pruning work which must be carefully protected and respected during the work. It may be possible to pull back and tie some of the fine branches out of the way for the short periods for the erection of the scaffolding around the building while this element of the construction or installation process is being undertaken. This pruning work inside the site would be required in due course regardless of the proposed application and would not have any significant detrimental visual amenity impact. If the

pruning to the trees is carried out in a judicious and formative manner this should enhance the form and long-term retention of the trees. The work recommended is considered to be similar to that already previously implemented and should not reasonably be objected to by the LPA. No other pruning works are required to implement this proposed scheme. The other work detailed is for the benefit of good arboricultural practice (where required).

6.10 The tree schedule in Appendix B identifies the pruning recommendations (where appropriate). These works are not considered to be detrimental or controversial.

ASSESSMENT OF RETAINED TREES ROOT PROTECTION AREAS

6.11 Section 4.6.3 of BS 5837: 2012 states that the Root Protection Area (RPA) of each tree should be assessed by an Arboriculturalist considering the likely morphology and disposition of the roots, when known to be influenced by past or existing site conditions.

6.12 Some activities are being carried out close to, or within, the theoretical radial RPAs and site specific theoretical RPZ of Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11) which are trees proposed for retention, on or adjacent to the site as part of this application. It is intended that the excavation required for the reinforced concrete foundation floor slab will be kept to an absolute minimum, as can be seen in engineer's construction information. Where any excavation is to be carried out into the ground/soil which was not occupied by an existing structure or is to excavated deeper than existing structures this must be arboriculturaly supervised to avoid impact to significant roots. The client, structural engineer and contractor will have to recognise the need to be flexible in the exact specification of the foundation required near to the trees, understanding that where dimensions of foundations are proposed, as intended sizes are subject to possible adjustment if roots are encountered that must not be cut. The slab design bridging to the location of the existing foundation of the building and the boundary wall (to be replaced) does provide some flexibility if roots are encountered, where these cannot be excavated to the exact location, if roots are found present, an alternative will need to be agreed with the retained arboricultural consultant and confirmed with the structural engineer, as an appropriate alternative and the slab design adjusted accordingly as it is understood that there is some flexibility within the design solution.

Therefore, if this principle is followed, as has been discussed this incursion is considered to be acceptable and will not be overly detrimental to the long-term health and amenity of the trees if designed in consultation with and approved by the retained arboricultural consultant WCEL and carried out/implemented on site under arboricultural supervision. Appendix A identifies the location of the Theoretical RPAs as a **Pink** line and the Site Specific Adapted RPZs as an **Orange**/shaded area (if considered applicable) of all of the retained trees, showing the incursion is very small for at less than 1% and

only down to approximately 300mmBGL and there should be no need to excavate below the level already undertaken as part of the site investigation works (excluding boundary wall foundation replacement location). The process of protecting the trees is via carefully detailed specifications and methodology outlined in this report protecting the tree roots and they should not be overly affected by the incursion proposed. However, from the site-investigations it has been shown that due to the distribution, location and lack of significant roots of the Oak (T15) can be worked around.

6.13 Some of the trees on site have developed with a number of restrictions and constraints to their root zones: including foundations of boundary walls; the existing foundations, backfill rubble and paving which would all have an influence. However, given the relatively deep nature of their foundations and the distribution of these features balanced with the presence of some minor feeding roots observed in the trial pits the Theoretical Radial RPAs have been used at this point in time. However, where incursions are present they are considered acceptable and should not be an issue to the positive implementation of the scheme. The location of the small volume of ephemeral feeding roots, which are found in the lower soil profile, can be worked above and only the shallower fine roots would be directly affected as can be seen in the photos from the trial investigation pits in Appendix D.

6.14 It can be seen from the plan in Appendix A that some tree root ground protection measures will need to be provided to the retained: Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11). These ground protection measures will primarily be required for any demolition, foundation excavations and construction stages near to or on the open soil or on the gravel drive for load spreading of deliveries.

6.15 No detailed landscaping scheme has been provided at this stage, but tree protection measures and sensitive design has been discussed with the garden designer. This should follow the principle of being as low impact to existing tree roots as possible. It is essential that the existing garden levels remain relatively unchanged and have soil improver carefully incorporated into the soil post-development, where possible. If this principle is followed, any negative impact to the retained trees on or adjacent to the site should be substantially reduced or eliminated. There are some minor variations of areas of hard landscaping proposed but these are to be kept to a minimum and are predominantly outside of the RPAs of the retained trees where possible. Soft landscaping should focus on providing infill planting to the scheme with the possible addition of a new tree to try to provide the next generation of tree cover for the site for when the existing trees eventually have to be removed. Carefully specified and sensitively installed boundary treatment within the RPAs of the retained trees in accordance with the guidance in this report (where required) would not have any foreseeable negative impact on the retained trees.

ASSESSMENT OF NEW HARD LANDSCAPING, FOUL AND SURFACE WATER DRAINAGE ON ROOT PROTECTION.

6.16 Overall the retained garden areas are not being adjusted dramatically, there are slight changes to enhance the garden with new planting of trees and shrubs to improve and restock the garden. However, improvements discussed will not result in any significant loss of permeability. If greater or additional changes were to be proposed, any hard surfacing will need to be permeable and appropriately designed so that no surface excavation will be carried for the sub-base within the RPAs of the retained trees. Great care will be needed when designing any decking or paving in the garden near any trees (see the guidance within this report). But, should there be any reason to disturb, excavate, remove or alter the soil level further than that agreed, or to alter the proposed hard landscaped areas within the RPAs beyond that approved as part of the planning permission, WCEL's arboricultural consultant must be contacted prior to any works being planned or implemented.

All foul and surface water drainage pipes and channels are to remain unchanged and connections to them are either within the building envelope construction profile or outside the RPA/RPZs as seen in in Appendix A, but if any changes are required this must be consulted with the retained arboricultural consultant or the LPA tree and landscape officer prior to being planned or implemented on site.

7.0 Post Development Pressure

FUTURE TREE AND STRUCTURE RELATIONSHIPS

7.1 All the healthy trees on and adjacent to the site are recommended for retention as part of the proposed implementation of the scheme, only a couple of small poor health/quality trees are proposed for removal on health and safety grounds, so the development scheme would have no notable impact to the established trees. All the trees on the adjoining site are also proposed for retention and will not be overly detrimentally affected by the development proposal. It has been identified that there will be a need for some minor pruning, but this is commensurate with, or slightly greater than, the pruning currently required for the general formative pruning of the trees and cyclic management being carried out.

7.2 The new scheme will aim to provide a robust foundation solution to limit conflict specifically designed to avoid any damage significant arterial roots. Where pruning is required this has been outlined in the report for the trees and is intended as formative or beneficial pruning only, in line with good arboricultural practices. Therefore, subject to trees being retained on their current appropriate crown management regimes (where being carried out or recommended) the trees are at a sufficient distance to the remodelled and new structures, that they are highly unlikely to give rise to any inconvenience within the near future.

7.3 The construction of the low-rise extension, will only marginally reduce the current building to tree relationship seen for the Oak (T15) and the adjoining structures, therefore the relationship is considered to be acceptable. The crown of the Ash (T14) is low, contorted and over-extended in parts, to raise the low crown and balance the asymmetric nature of its crown, removing deadwood and reducing the crown due to the cavity in the main fork union, but this is only slightly more extensive than that previously carried out as part of the existing management which is unrelated to the development application, which is considered to be acceptable. The crown of the Ash has become unbalanced and biased due to light competition due to its sub-dominance to the Oak (T13) and competition with the high yew hedge along the front boundary, which would become progressively more significant if left un-managed. The other remaining mature trees would only require some minor formative pruning for good arboricultural maintenance reasons, but extensive surgery has not been highlighted at this point in time, but where trees have been crown reduced in the past it is recommended that these be re-pruned as part of their cyclic maintenance regardless of any proposed development on site. Therefore, any proposed pruning work of the retained trees, would not have a significant impact on their health or amenity value.

7.4 The BS3998: 2010 – Recommendations for Tree Work discusses and endorses various methods of pruning can alleviate the minor inconveniences trees can cause, whilst retaining them in a healthy condition. Methods such as crown reductions (section 13.4) partial or whole, crown lifting (section 13.5) and crown thinning (section 13.6) can be used to both increase light to properties, as well as improve clearances from buildings. Trees in towns and cities are often sited in close proximity to buildings; however, resident's concerns can be readily appeased with the implementation of regular, well-planned, sensitive pruning.

7.5 Regular inspections of the retained tree(s) by a suitably trained or experienced arboriculturalist should be carried out. Subsequent remedial works will ensure that trees are maintained in a suitable manner to exist in harmony with the new structures and its occupants for many years to come.

REMEDIATION / REPLACEMENT PLANTING AND SOFT / HARD LANDSCAPING

7.6 As guidance, any new trees that are planted should be selected to ensure they do not become a nuisance and that the level of routine maintenance is low, but should aim to be native or semi-native species that can form crown dimensions of moderate proportions where space is available.

7.7 The soil type may require the guidance of NHBC as far the building foundations are concerned, but flexibility will need to be considered in such a constrained situation and alternative less significant foundation solutions will have to be administered where tree roots restrict the ability to achieve normal accepted standardised sizes of foundation design. Clearly the planting schedule must be available to assist with foundation design, but any potential for subsidence damage in the future will be designed out.

7.8 All new pathways and soft landscaping areas within the Root Protection Areas (RPAs) of the retained trees should be designed using no-dig, up and over construction and in close co-ordination with the retained arboriculturalist using porous materials (where appropriate or practical). The existing driveway and entrance path in the front garden of the property is to be retained at the same level as the existing and only require a topping up of the gravel surface and relaying of the paving stones. If the wearing course is to be replaced this should not require any excavations below that of the existing. Additional works beyond those proposed in the plans reviewed must avoid any further ground level reductions; this will need to be taken account of all the way through design, implementation and construction (including landscaping).

7.9 Where hard surfaces or foundations are to be emplaced or removed within the RPAs, site specific method statement(s) will be produced with direct input from the retained arboriculturalist and appropriately monitored with onsite supervision of the arboriculturalist for tree/tree root sensitive stages. Retaining walls and changes of levels must be avoided, but where these are necessary it is recommended to use structures such as gabions and railway sleepers which do not require excavations for foundations, which can be appropriately designed to retain variations in levels or stabilise soil etc. without the need to excavate into the soil or root systems of retained trees. But, where these are considered necessary they will need to be approved by the retained arboricultural consultant or LPA tree officers.

8.0 Tree Protection Measures and Preliminary Method Statement for Development Works

8.1 TREE PRUNING / REMOVAL

A list of all tree works that are required is included in the tree table at Appendix B. Pruning / removal has only been specified for the following reasons:

- Where work is necessary to implement the proposed scheme.
- Where works are required for safety reasons.
- Where work is needed to mitigate a legal responsibility or duty.
- Where work is required to improve tree form, enhance the appearance of overgrown areas of the site, or improve the longer-term health and management of the tree in its current surroundings.
- Where the client is considering making alternative improvements to the garden/site and is looking to open up new opportunities for enhanced tree planting.
- Where the trees are not required by the client and they are not considered worthy of the imposition of a Tree Preservation Order.

Where any tree work is needed, this work will be in accordance with British Standard 3998: 2010 (Tree Work – Recommendations).

8.2 TREE PROTECTION BARRIERS

8.2.1 Taking account of the proposed work for the remodelling of the first floor and roof while adding a small ground floor single storey extension to the property most of the trees will be at sufficient distance away from the development activity that they can be protected by the standard tree protection fencing as detailed in appendix C. However, due to the nature of the work proposed for the ground floor extension, will be close to some of the trees there will be some degree of incursion into, or close to, the Theoretical Root Protection Area/Zone (RPA/RPZ) of the Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11), so due to proximity issues ground protection measures will also be required. Combining some tree protection barriers with tree root ground protection is considered appropriate to protect these areas. There are no plans to undertake any significant changes within the retained garden areas outside the site or on neighbouring land. The preliminary details are seen within Appendix A.

8.2.2 The recommendations for preliminary tree protection barrier locations shall be agreed with the contractor prior at a pre-commencement meeting where the importance of the tree protection measures will be explained in detail. Given the relatively small and short-term nature of the development process this procedure for protection is not considered to be excessively detrimental, controversial or a reason to refuse the scheme.

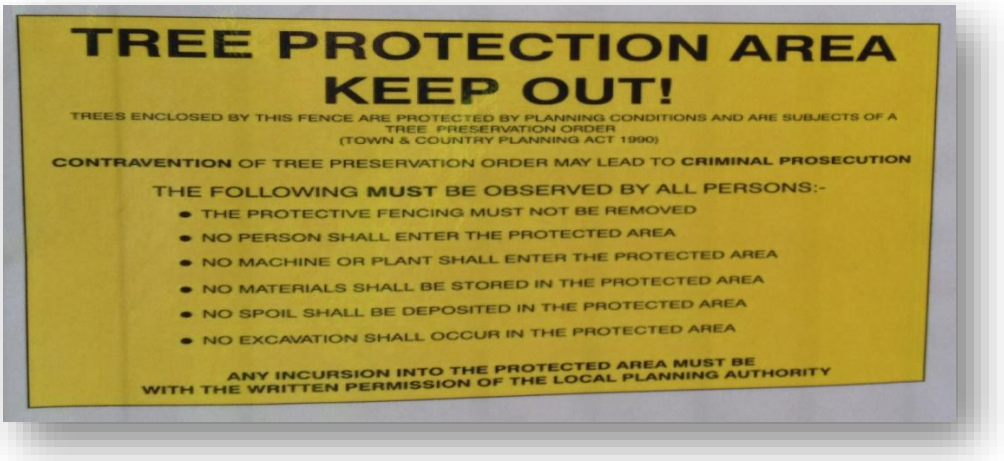
8.2.3 It is essential for the future health of the trees to be retained on or adjoining the site, that all development activity is undertaken outside root protection zone or the adjusted root protection zone, whenever this is practical. The fencing will be erected **prior** to any commencement of works on site and where soft stripping of the building is required in the close proximity of trees and removed only: when all development activity is complete; or unless agreed as part of variation of condition; or for final approved landscaping works. The protective fencing will be as that shown in BS5837 (See Appendix C). The position of the proposed protective fencing and ground protection for the site are shown on the plan in Appendix A by a **Yellow** line and **BLUE** shaded area respectively.

The position of the fence is to be marked out with biodegradable marker paint or wax chalk on site and agreed with the retained WCEL arboricultural consultant and the contractor. The fencing will be erected **prior** to the commencement of any works on site (including demolition) and where soft stripping of the building is required in the close proximity of trees. The protective fencing will be as that shown in BS5837 (See Appendix C) or given the small area requiring protection the trees may be protected by 2-2.4m High, 18mm OSB 3 or Exterior Grade Ply cross braced and fixed into position bolted against the perimeter fence/wall if deemed to be more appropriate on site.

The fence must be marked with a clear sign reading (or similar):

"Construction Exclusion Zone – No Access, Do Not Move".

Or as shown in the example below



8.3 GROUND PROTECTION WITHIN THE RPA

8.3.1 Given that some of the proposed works will require access into the RPAs/RPZs of retained trees, at some point or another, that would otherwise be protected with Tree Protection Fencing/Barriers. A percentage of the works are in or close to the Theoretical Root Protection Area/Zone (RPZ) of the Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11), so due to proximity issues ground protection measures will also be required some potential to combine some tree protection barriers with tree root ground protection is considered appropriate to protect these areas. The construction of the small extension addition and its engineered foundations as well as the positioning for scaffolding for the remodelling of the first floor and roof will require some circulation/working space around them which will open the potential for some conflict to occur while demolishing parts of the existing structures, excavating the foundations and during construction, inevitably some ground protection will be required to protect the RPAs/RPZs of the trees.

8.3.2 The recommendations for preliminary tree ground protection locations (as shown in Appendix A) shall be agreed with the contractor prior at a pre-commencement meeting where the importance of the tree protection measures will be explained in detail (when commissioned by the client). The locations would need to be agreed on site but is recommended that multiple layers of 18mm shuttering ply or OSB 3 boards are used to protect the soil from compaction when working on the open ground with the RPA/RPZ of the retained trees and that the existing paving and hard surfaces are retained in all areas that are not being directly excavated for the reinforced foundation

floor slab until the floor slab is in position. These spreader boards should be positioned in each location where the contractor is working and then moved to the next position each time a new area of work is commenced. Given the relatively small and short-term nature of the development process this procedure for protection is not considered to be excessively detrimental, controversial or a reason to refuse the scheme.

8.3.3 Due to limited room on site near to the working area, the contractor will be need to concentrate the main working area, mixing and storage of materials etc to the rear courtyard and terrace or within the internal footprint of the property away from the RPZ of Oaks (T13 & T15), Ash (T14), Eucalyptus (T12) and Pear (T11) and RPAs of all other trees shown on the plans, protecting the surface and drainage course as appropriate. The existing hard surfacing will be utilised as ground protection and overlay this surface with multiple layers of ply sheeting (bolted) or steel plates (welded) together constructed on a non-permeable barrier to avoid leaching of concrete while spreading heavy loads. It is essential that this remains in place until the completion of the active wet trades on site. A more detailed working method statement is usually provided by the contractor or consultant once planning approval has been given by way of condition (if required). On a small site such as this, ground protection measures are considered to be acceptable and the use of them within the RPZ/RPAs, if appropriately supervised and monitored is not felt to be a reason to withhold planning consent.

8.3.4 Where protection has been put in place within RPAs of retained trees on or adjoining the site (including retained hard surfaces as ground protection) it will become the Root Protection Zone [RPZ]. This ground protection/tree protection must still be treated as sensitive site zones. There can only be storage of clean lightweight materials. Non-corrosive or hazardous liquids must still be kept away from the area(s); this includes corrosive powdered products, such as, cement, lime and plaster. Storage of cement, hydro-lime, plaster or similar powdered products is **not** acceptable. Mixing of these materials is also unacceptable within the RPAs of retained trees. Should there be any reason to disturb, excavate, remove or alter the ground protection or retained hard surfacing other than that agreed, or to alter the proposed hard landscaped area within the RPAs beyond that approved as part of the planning permission WCEL's arboricultural consultant must be contacted prior to any works being planned or implemented.

8.4 DELIVERY AND STORAGE OF BUILDING MATERIALS

Due to the limited on-site storage space, it may be necessary for bulk deliveries to be split into smaller deliveries. The use of a "just in time" delivery method can also be adopted to reduce the time materials are stored on site before use. Though heavy materials, sands and chemicals must also not be stored on the gravel drive area.

8.5 SITE HUTS, WELFARE FACILITIES AND STORAGE OF EQUIPMENT, MATERIALS AND CHEMICALS

All site huts will be positioned outside of the retained trees RPAs unless agreed with the retained WCEL arboricultural consultant or LPA's arboricultural officer. It may be necessary to create a temporary raised storage platform within the RPA of retained trees; if this is the case the detailed specification will be discussed and approved by WCEL prior to implementation or installation, including ordering of materials for its construction.

8.6 MIXING OF CONCRETE

All mixing of cement / concrete must be undertaken outside of the RPA of all of the retained trees. This includes the washing out of cement mixers and rendering tubs etc.

8.7 USE OF CRANES, RIGS AND BOOMS

The location of cranes and their foundation, temporary or permanent, must be located outside the RPA of retained trees on or adjacent to the site. If the crane needs to be located inside the RPA/RPZ the detailed specification will be discussed and approved by WCEL prior to implementation or installation, including ordering of materials for its construction.

Precautionary measures must be observed to avoid contact of any retained trees when manoeuvring cranes rigs or booms into position, especially if sections of the building may be constructed using pre-made offsite sections.

8.8 INCOMING SERVICES AND SOAKAWAYS

The existing drainage system capacity/position and location for any proposed services are approximately known at the time of preparing the report and it is understood that they do not require significantly amending for this scheme. All new drains and services will be located outside of RPZ/RPAs but where specified within these are for final connection only and these will be within the building envelope within the RPZ/RPAs of retained trees as confirmed by the client as mentioned during the site visit. Any new underground statutory services near to trees will need to be installed in accord with the guidance given in BS5837 together with the National Joint Utilities Group Booklet 4: 2007 Guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG4) or by way of site specific method statement when preparing for/or installing domestic or spur utilities/services, as NJUG4 is designed for statutory main infrastructure works only.

When within the RPA of any retained tree, any new service trenches should be excavated using an airspade/airlance or pneumatic/hydraulic/percussion mole to avoid any damage to roots. Care must then be taken to ensure the new services are installed so as to avoid any roots present. Any proposal will be agreed with WCEL prior to submission to the LPA arboricultural officer and the implementation will be carried out under the strict supervision and watching brief of WCEL consultant unless not required by the LPA arboricultural officer. Any excavations or soil disturbance within the RPAs of retained trees will require appropriate supervision by WCEL as would be detailed to the LPA's arboricultural officer.

8.9 ON SITE SUPERVISION

Due to the proposed location of the demolition works, foundation excavations and construction activities some supervision is likely to be required by way of condition. The preparation work for, the location of, and the installation of these structures will be carried out under strict arboricultural supervision of retained arboriculturalist WCEL. To ensure that as little negative impact is achieved, as is practicably possible, which forms the basis of the assumptions regarding the reduced level of and acceptability of the impact to the adjoining trees.

Further supervision, if required, via a condition by the LPA's arboricultural officer, could be devised for a detailed supervision programme by the client/contractor/architect and retained arboriculturalist WCEL, ensuring that arboricultural supervision is present at the appropriate periods during construction. It would therefore be deemed necessary for the retained arboriculturalist to visit the site at the following critical points:

After commissioning or engagement of tree contractor/surgeon to agree the exact extent of the tree/shrub pruning specification and removal recommendation (if applicable) to make sure the correct trees/shrubs are to be pruned and/or removed or the extent of such work. **Date and time to be agreed, however once confirmed, these dates would be sent to the LPA's arboricultural officer.**

Erection of protective fencing to ensure it is constructed to the correct specification at the required proximity to ensure the healthy retention of the trees. **Date and time to be agreed, however once confirmed, these dates would be sent to the LPA's arboricultural officer.**

Installation of the tree root ground protection to ensure it is constructed to the correct specification at the required proximity (if applicable). **Date and time to be agreed, however once confirmed, these dates would be sent to the LPA's arboricultural officer.**

In addition to the above, an agreed number of random inspections or visits arrange at a set frequency (e.g. weekly, fortnightly, monthly) of the site may also be undertaken during construction to ensure the arboricultural responsibilities are being fulfilled by the developer. A written site note assessment of each visit would be sent the Local Planning Authority and copied to the developer at the expense of the applicant/developer/contractor. Any issues relating to tree protection would subsequently be addressed immediately.

If required by the LPA's arboricultural officer and once a commencement date has been confirmed for works on site, a representative from the applicant will contact the relevant officer from the local planning authority to arrange a pre-start site meeting. During this meeting, future requirements for site supervision will be agreed. Should the LPA's arboricultural officer be unable to, or unwilling to, attend then a written site note would be produced outlining the main points discussed at the pre-commencement meeting. The timing of arboricultural supervision and the frequency of future Tree Protection Compliance Monitoring site visits (including site notes to be submitted to the LPA arboricultural officer) will be noted so that LPA arboricultural officer can confirm the acceptability of these measures and their frequency operation.

8.10 OTHER TREE PROTECTION PRECAUTIONS

- No fires will be lit on site within 20 metres of any tree to be retained.
- No fuels, oils or substances damaging to the tree(s) shall be spilled, poured on site without the appropriate safety bunding or site specific environmental safety safeguard measures, but never within retained tree RPA's on or adjacent to the site. Visual checks of compliance should be made by the site manager every day.
- No storage of any materials within the root protections zone.

8.11 HARD / SOFT LANDSCAPING NEAR RETAINED TREES

All new pathways and hard landscaping areas within the Root Protection Areas (RPAs) of the retained trees should be designed using no-dig, up and over construction techniques, and be specified in close co-ordination with the retained WCEL arboriculturalist. Porous materials should also be used when surfacing near the trees but the careful attention must be given to the pH of the material, provision for air circulation, gaseous exchange/migration, moisture precipitation availability and guidance should be obtained from the retained arboriculturalist prior to specification preparation and/or installation. No machinery will be used for this work, which must all be carried out by hand.

8.12 LEVEL CHANGES

No level changes should occur within the root protection area of any of the retained trees, beyond those proposed for engineered reinforced concrete foundation slab and boundary wall footings, assessed as part of this report. Detailed plans and cross-sections have been provided, which are considered to be acceptable, though more detailed working contract documents will need to be prepared once planning approval is given, so that they can be verified as compliant with recommendations and restrictions found within the report. If there are any changes to these to be agreed in the RPAs of the trees these would be carried out under strict arboricultural supervision.

8.13 DISMANTLING PROTECTIVE BARRIERS

Protective barriers must only be completely removed when all machinery, and equipment has left site. A minimum of seven days notice should be given to the local planning authority prior to dismantling works begin.

9.0 Conclusion

9.1 The scheme has been prepared to keep the impact to the trees to a minimum and the proposal does not require the removal of any significant trees which will therefore have no broader amenity impact to the local area. There is only a recommendation to carry out a slightly greater level of pruning to the Ash (T14), compared to that previously implemented, and the impact of the pruning would be to balance the crown and resolve the crown conflict issues and Health & safety works to the Oak (T15). The pruning would also enable the scheme to be comfortably implemented without conflict with deliveries and re-reducing the Ash (T14) is considered inconsequential within the broader context of the area. The pruning would be recommended regardless of the proposed development. None of these pruning works are considered of sufficient merit to reasonably warrant refusal of the scheme on detrimental tree impact grounds.

9.2 The excavation of the area within the RPA/RPZ of the Oak (T15) for the engineered reinforced concrete floor slab and boundary wall foundations has been closely considered and it is concluded that it would be possible to achieve this without overly detrimental or significant impact to the tree if carried out in a sensitive manner and with no additional depth of foundations than those specified in this report and the structural engineers plans. The contractor will be required to make suitable adjustments to the down turn toe of the foundations within the edge of the RPZ if significant arterial roots are encountered that can't be damaged or cut. Further to the tree root trial investigations carried out on site, the slab design bridging to the location of the existing foundation of the building and the boundary wall (to be replaced) does provide some flexibility if roots are encountered, where these cannot be excavated to the exact location, if roots are found present, an alternative will need to be agreed with the retained arboricultural consultant and confirmed with the structural engineer, as an appropriate alternative and the slab design adjusted accordingly as it is understood that there is some flexibility within the design solution as shown on the plans and sections submitted with the planning application. It is considered that it would be possible to achieve this without significant detrimental impact to this tree if carried out in a sensitive manner and no additional depth of foundations are dug below the depth trial trench (as noted above).

9.3 The incursion into the RPA of the retained Oak (T15) will be very small and discrete, just clipping into the RPA on the outer edge. The small incursion into the RPAs of the Oak is less than 1% of the RPZ of the tree and will be kept to an absolute minimum with any excavations within the RPA being hand dug arboriculturally supervised. This incursion is a very small segment and/or volumetric area of the RPA of the tree and is considered to be acceptable and will not be detrimental to the long-term health and amenity of the tree if implemented sensitively and in accordance with the precautionary measures detailed in this report.

9.4 It is concluded that the minor disturbance would be tolerated by the established trees and is acceptable given: the site-specific investigations carried out; the bespoke foundation design; that the various trees as species can be tolerant of some relatively minor root disturbance, planning approval should be granted, subject to appropriate conditions being attached to any approval requiring the recommendations of this report being administered and adhered to.

9.5 The proposed work within the site (subject to the correct use of appropriate material, construction method and protection measures), for the purposes of demolition, excavation and construction, are negligible and should not have a foreseeable significant detrimental impact on the retained trees if implemented with strict sensitivity. In addition, the foundation design and location has been reduced in depth and designed to limit the potential impact to the adjacent Oak (T15). Therefore, there should be no significant impact on the retained trees on or adjacent to the site to warrant refusal of the scheme on detrimental tree impact grounds.

9.6 Subject to precautionary measures as detailed above including tree protection fencing/barriers, tree root ground protection and arboricultural site supervision and monitoring the proposal will not be injurious to trees to be retained on or adjacent to the site.

9.7 There will be no appreciable post development pressure, and certainly none that would oblige the council to give consent to inappropriate tree works. By ensuring the contractor is aware that only the minimum amount of pruning work is undertaken to the trees where proven to be essential, the impact of the pruning works on the broader street scene will be minimal.

9.8 Use of existing hard surfacing with the addition of overlaying extra sacrificial surface as ground protection measures is a reasonable way of maintaining root protection for the retained trees (where applicable) while maximising the available working room on site subject to LPA approval of this report.

9.9 Site supervision is outlined in this report and if the LPA approve the scheme subject to requiring site supervision. More detail could be provided as part of a release of condition, detailing timing and scheduling, which can be guided by the LPA arboricultural officer's specific requirements.

10.0 Recommendations

10.1 Some tree related guidance has been taken into account by the architect, for the benefit of reducing the Arboricultural Impact of the proposed development, as can be seen from the submitted plans.

10.2 Overall report Recommendations are primarily:

- The pruning and removal (neighbouring trees in 5 Templewood Avenue) works shall be carried out as recommended and the contractor must be made aware of the need to keep all pruning to an absolute minimum and this must be approved prior to be implemented.
- Final contract plans must show ground protection and tree protecting fencing/barriers with the cross-sections for foundation and construction level/specification drawings.
- That there is no additional digging or soil removal other than those detailed in this report and on the approved plans, unless prepared in consultation with and subject to the approval of the retained arboricultural consultant WCEL.
- No reductions in levels will be planned, prepared, implanted or carried out within the Root Protection Areas (RPAs)/Root Protection Zones (RPZs) of tree(s) on or adjacent to the site unless shown on the LPA approved plans.
- Additional tree planting should be considered within the retained rear garden landscape scheme, where possible, to aid density and maturity of the planting areas in the future, also to provide for a next generation of tree canopy cover.
- The specially engineered shallow foundation design within or close to the RPAs/RPZs of tree(s) on site should be constructed in accordance with LPA approved plans, and no excavations shall be deeper than those identified on the assessed plans other than those outside of the RPAs detailed within this report. Should there be amendment to, or variation of, the final foundation specification and design this must be prepared in consultation with and subject to the approval of the retained arboricultural consultant WCEL.
- Where conflict arising between assumptions/assessments/conclusion or recommendations made within this report and those required to implement the scheme, these will need to be discussed with WCEL prior to any work being planned/prepared or implanted on site, including the ordering of associated professional service or materials. Any subsequent variations or changes prepared must then be made in consultation with further advice to be commissioned from and subject to the approval of the retained arboricultural consultant WCEL, failure to do some will invalidate the assessment of impact to the trees on or adjacent to the site.
- All Root Protection Areas (RPAs) will become Root Protection Zones (RPZs) and appropriately protected for tree(s) both on and adjoining the site.
- Inclusion into the landscape specification, establishment maintenance and any future tree management plan: for the addition of fertiliser and PAS100 compost, incorporated into the soil, ameliorated into the ground by the introduction of additional earth worms and carbohydrate rich drench to improve the quality of growing media/soil in the rooting area of the trees retained on site.

10.3 The Planning approval should not be withheld and site works should progress as follows to ensure the healthy retention of the trees:

a. Tree works/removal, in accordance with BS3998.
b. Site setup and pre-commencement meeting
c. Installation of all tree protection measures.
d. Construction.
e. Hard & Soft landscaping.

10.4 Site supervision – An individual e.g. the site agent or WCEL's retained arboricultural consultant (if directed by the LPA within their detailed planning condition requiring arboricultural supervision), must be nominated to be responsible for all arboricultural matters on site. This person must:

a. Be present on the site throughout the project or at agreed times in any conditioned Arboricultural Method Statement.
b. Be aware of the arboricultural responsibilities.
c. Have the authority to stop any work that is or has the potential to cause harm to any retained tree.
d. Be responsible for ensuring that all site personnel are aware of their responsibilities towards trees on site and the consequences of the failure to observe those responsibilities.
e. Make immediate contact with the local authority and / or retained Arboriculturalist in the event of any related tree problems occurring whether actual or potential once initial advice or action to remedy this conflicts or breaches have been given or implanted.

10.5 It is recommended, that to ensure a commitment from all parties to the healthy retention of the trees, that details are passed by the architect or agent to any contractors and sub-contractors working on site, so that the practical aspects of the above precautions are included in their method statements, and financial provision made for these.

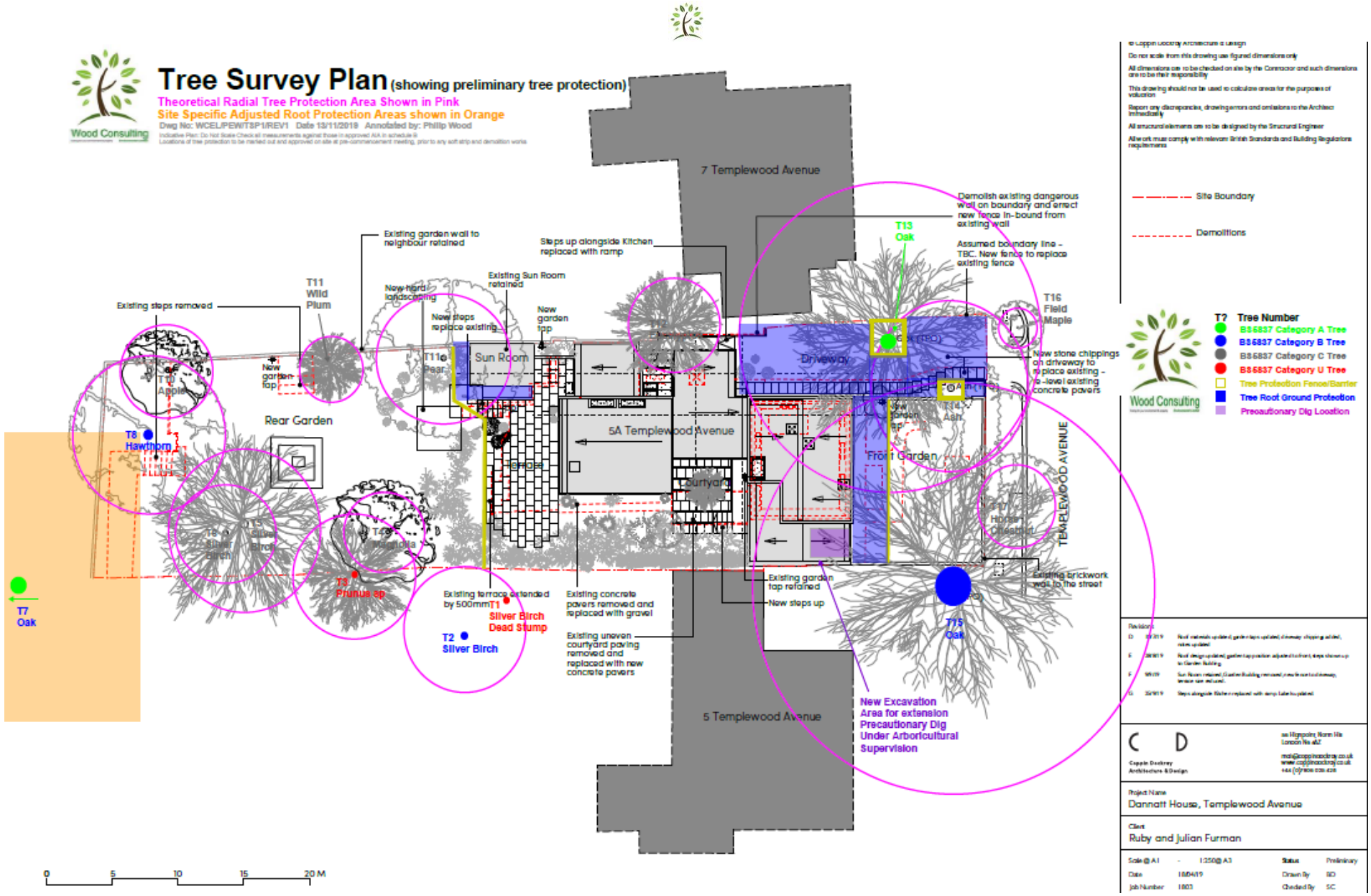
Report Date: 13th November 2019 Rev 1: n/a

Mr Philip E Wood *BSc(Hons) LAM*
Principal Consultant & Director
Wood Consulting Environmental Limited

Appendix A

Tree Survey Plan with root protection area locations, preliminary tree protection and tree root ground protection measures

See separate pdf files for higher resolution plans



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Appendix B

Tree Survey Schedule

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments / Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T1	Silver Birch (NT)	6		350	4.20	55.43	0.0	0.0	0.0	0.0	n/a	n/a	O/M	Dead 6m high standing stump, trunk has snapped and one part is held up with Ivy. Located 1.4m from boundary. Recommendations: Notify neighbour that stump should be removed as a matter of urgency. Fell to ground level.	<10	U
T2	Silver Birch (NT)	15		370	4.44	61.94	3.0				5.0	2.5	M	Tree of good vigour and moderate form, has slightly asymmetric crown caused by the presence of previous trees now removed. Recommendations: No works required to facilitate development.	20-40	B
T3	Prunis Spp.	11		370	4.44	61.94	2.5				7.0	5.0	O/M	Wild plum/Damson located on boundary. Specimen has thin crown with die back. Large Ivy and Jasmine growing in crown. Small Ganoderma bracket located at base indicating signs of heartwood decay and basal decay. Recommendations: Fell to ground level for Health & Safety reasons.	<10	C2

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments/ Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T4	Magnolia	4.5		220	2.64	21.89	3.5	3.5	1.0	3.5	1.8	2.0	M	Sparse crown probably due to competition from previous vegetation now removed. Some minor deadwood, one large trunk previously removed at base. Recommendations: No works required to facilitate development.	10-20	C
T5	Silver Birch	13		460	5.52	95.74	5.5	5.0	3.5	5.5	3.0	4.0	O/M	Very mature specimen with sparse crown, may improve not that garden has been cleared of other significant vegetation. The specimen previously Ivy covered. Recommendations: No work required to facilitate development.	10-20	C
T6	Silver Birch	15		300	3.60	40.72	5.0	2.0	3.0	5.0	5.0	6.0	M	Very mature specimen with sparse crown, very slender trunk with high crown, some bark staining present. Recommendations: No works required.	10-20	C

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments/ Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T7	Oak (NT)	14		1250	15.0	706.95	8.5				5.0	5.0	M	Large old compact specimen with light peppered deadwood evenly through crown. Located moderate distance away from boundary in neighbouring garden. Recommendations: No works required to facilitate development, owner of tree should be advised to monitor specimen and monitor.	40+	A3
T8	Hawthorne	8.5	ms	3 390 140 220	5.63	99.59	4.5	5.5	4.5	5.5	2.0	5.0	O/M	Mature specimen previously competing crown with other vegetation now removed. Some deadwood throughout crown, very minimal lower crown density. Recommendations: Crown reduce by 30%, remove deadwood and old Ivy trunk in crown.	10-20	C
T9	Domestic Apple	8.0		370	4.44	61.94	5.0	6.0	3.0	3.0	4.0	5.0	M	Moderate deadwood throughout crown, previously competed with other vegetation now removed, struggling specimen, may improve now less competition. Recommendations: Crown reduce by 25% and remove deadwood and stubs.	10-20	C

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments/ Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T10	Wild Plum	6.0		200	2.40	18.10	2.5				1.8	2.5	M	Leaning specimen from base which has grown with significant lean, small crown giving tree novelty value. Trunk originally growing near wall at base. Recommendations: Monitor specimen.	10-20	C
T11	Pear	6.0		400	4.8	72.39	0.0	4.0	5.5	4.0	1.8	2.5	O/M	Specimen growing with significant lean and sparse crown. Tree appears to have been leaning for many years with some deadwood through crown. Recommendation: Reduce back lateral spread by 2.5m and feathering in to leave natural shape. DWS.	10-20	C
T12	Eucalyptus (NT)	15		Est 300	3.6	40.72	3.5				7.0	7.0	S/M	Specimen with 2 main leaders and has sparse thin open crown, very slender specimen with deadwood within lower crown. Very limited inspection due to high boundary wall. Recommendations: Advise owner to remove deadwood and monitor.	10-20	C
T13	Oak	17		920	11.04	382.95	7.5				6.0	6.0	M	Good specimen which has had some reduction of lateral spread in the past, no evidence of fungal fruiting bodies. Recommendations: Cut back branches to provide 2.5m clearance to roof of property.	40+	A

Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments/ Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T14	Ash	13		550	6.60	136.87	3.5	5.0	5.0	3.5	6.5	7.0	O/M	Specimen with significant epicormic growth on trunk and from cavity at fork. Small Laurel shrub growing from within cavity of fork. Tree has been reduced in the past and was originally pollarded historically which has now lapsed. Recommendations: Crown reduce back to 2m below previous points of reduction, remove epicormic growth and undertake climbing inspection to assess cavity at main fork, DWS.	10-20	C
T15	Oak (NT)	12		1350	Capped 15.0	Capped 707.00	6.0				4.0	3.0	O/M	Large mature old specimen with extensive decay on some large structural limbs and at main fork with vegetation growing within cavity. Large mature beef steak fungus on south west side of trunk and east side by main fork. Large limb with dieback on north side over client's site. Recommendations: Remove deadwood over client's garden and crown lift up to 5m AGL. Advise owner to undertake a full climbing inspection of the specimen and the cavities and to undertake regular monitoring.	10-20 subject to survey 20-40	B

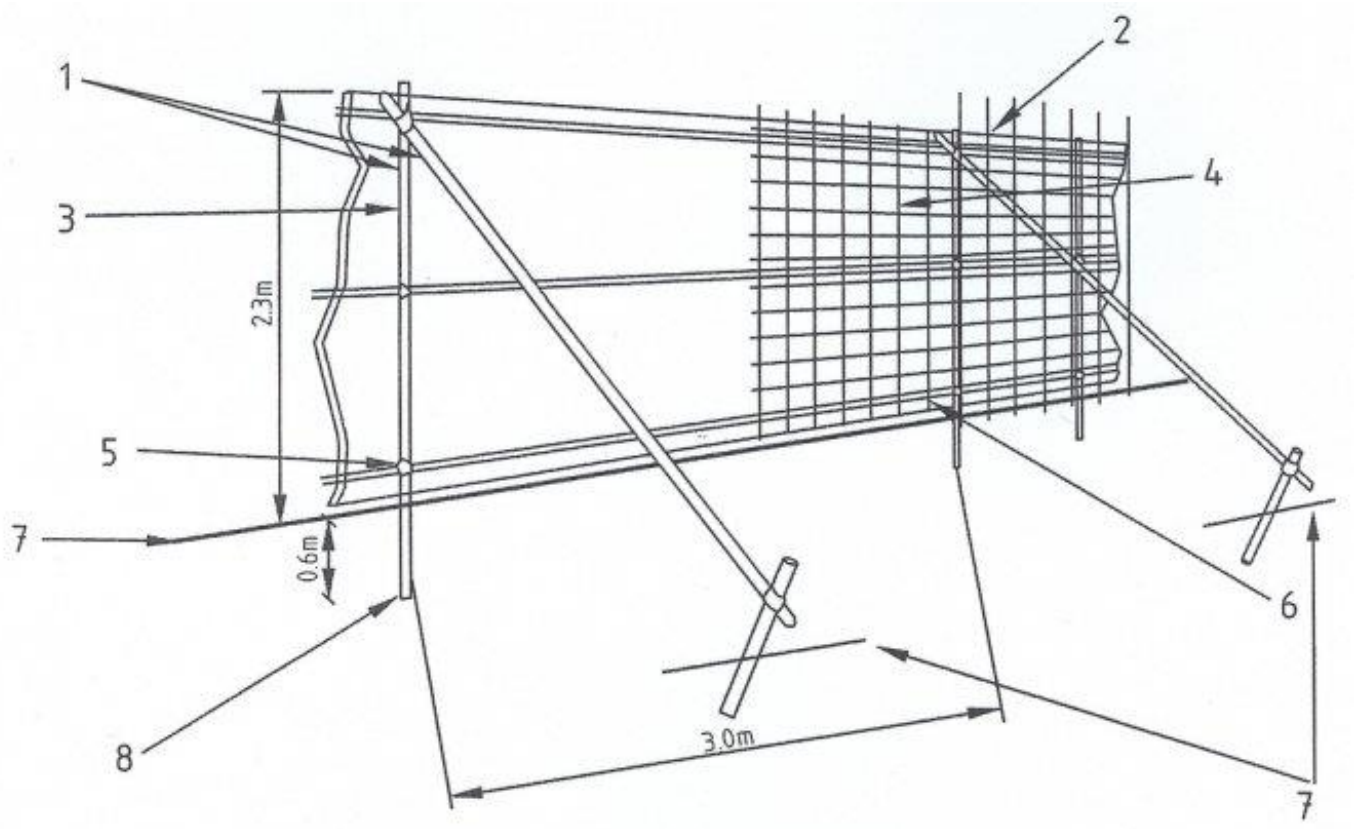
Tree No.	Tree species	Height (m)	Multi-stem? (Enter MS)	Trunk / stem count dia. (mm)	Radius of RPA if circle	RPA -Root Protection Area sq.m.	Branch spread				Height of first significant branch (m)	Height of Crown Clearance (m)	Age class	Comments/ Recommendations	Estimated remaining contribution	Assessed BS 5837: 2012 Value category
							N	E	S	W						
T16	Field Maple (NT)	5.0		100	1.20	4.53	2.0	2.0	2.0	0.5	2.0	2.0	Y	Small street tree with some bark scarring on south side of trunk with wound tissue. Overall young good specimen. Recommendations: No work required to facilitate development.	20-40	C
T17	Horse Chestnut	8.0		250	3.0	28.28	3.0	5.0	5.0	1.0	4.0	4.0	S/M	Asymmetric specimen due to competition with front hedge of property. Small recently established tree suffering from Horse Chestnut Leaf Minor and other general leaf infections. Recommendations: No works required to facilitate development.	10-20	C

KEY: Tree No: Tree number (T= individual tree, G= group of trees, W= woodland); Crown = the leaf bearing part of the tree; TFD= To Facilitate Development Proposal (subject to confirming ownership)
Tree Species: Sp.= sub species or cultivar of main species; NT = Neighbours Tree (Tree on adjoining land); EP = Epicormic Growth; GL = Ground Level; AGL = Above Ground Level; DWS = Deadwood and Stubs; NWR=No Work Required
Diameter: MS = Multi-stemmed; N/S = Not Surveyed (unable to inspect/restricted visibility or access); Age class: Young (Y), Young Mature (Y/M), Semi Mature (S/M), Mature (M), Over mature (O/M), Veteran (V); Height (Ht): Measured in metres +/- 1m

Appendix C

BS 5837: 2012

Tree Protection Barrier/Fencing



1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and, where necessary, standard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6m driven into the ground

Figure 2. – Protective fencing for RPA

Appendix D

Copy of Trial Pit Invetigation Photos

CORNER FOOTING

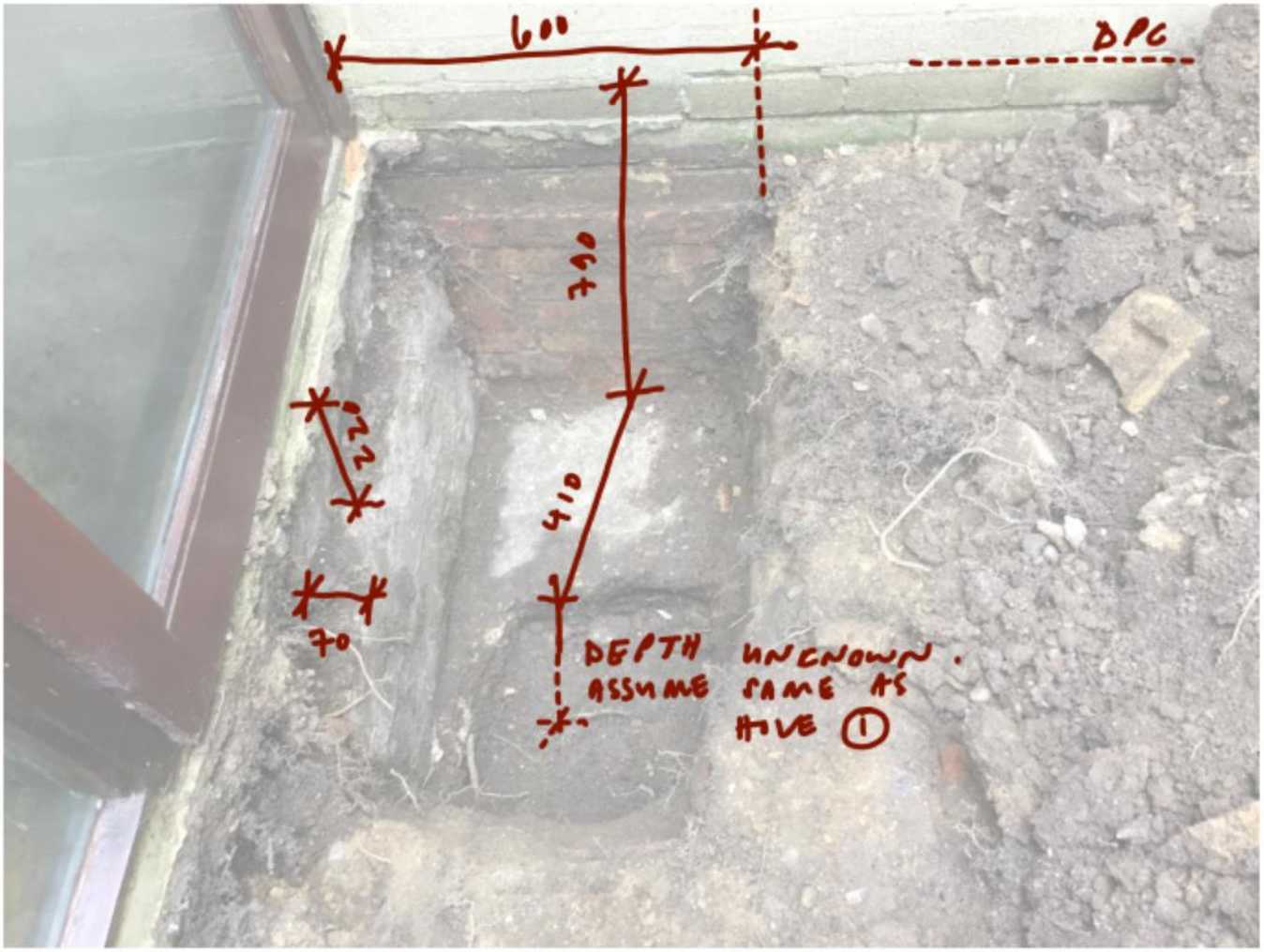
HOLE (1)

C D

TEMPLEWOOD — TRIAL HOLES

06.11.2019

HOLE (2)



C D

TEMPLEWOOD — TRIAL HOLES

06. 11. 2019

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BOUNDARY WALL

HOLE (3)

C D

TEMPLEWOOD – TRIAL HOLES

06.11.2019

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End of Report