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ASSESSMENT OF THREE TREES LOCATED WITHIN THE CURTILAGE OF NO. 1 & 2 ELMSDENE MEWS, WITH COMMENT ON THEIR CONTEMPORARY PHYSIOLOGICAL AND STRUCTURAL CONDITION AND POSSIBLE IMPLICATION IN SUBSIDENCE EFFECTS ON THE DWELLING HOUSE AND ASSOCIATED HARD-LANDSCAPING

CLIENT:	**Mr Stuart Elder**
CLIENT REF:	**SE/EMNM**
AAAL REF:	**SAL/KMA/11249**
AAAL CONSULTANT:	**Shane A Lanigan**
REPORT DATE:	**6th September 2022**

TABLE OF CONTENTS

SUMMARY

Mr Stuart Elder holds the title to the property, No. 1 Elmsdene Mews which is in Northwood, Middlesex. The British Geological Survey shows this location to be over a geological strata of shrinkable clay soil. Due to this Mr Elder is concerned about the possibility of subsidence to his property. He also wants to know more about the physiological and structural condition of the three trees nearest to the dwelling house. So far as I am aware there is no history of or ongoing subsidence, or any other tree root related problem regarding this property. However, over recent weeks during the hot dry weather, Mr Elder has noted a significant movement and displacement of the paving along the western, flank wall and to the rear, north of his house. He is further concerned about ongoing movement in the hard-landscaping features near to the front south western house corner. Having visited the site and inspected the three trees and their surroundings, I concluded that the hornbeam and oak tree are not currently affecting the dwelling house but the oak tree is significantly compromised. I further concluded that roots of the third-party owned birch tree have encroached into the curtilage of No. 1 Elmsdene Mews. The roots are growing under the paved areas located east and north of the dwelling house and are disturbing, primarily by way of upheave, most of the paving surface.

S.A. Lanigan – Chartered Arboriculturist
MICFor, Dip.Arb. (RFS), M.Arbor A, RCArborA – ISA, BCMA, CUEW,
ASCA Registered Consulting Arborist #588

Reference publications are listed at the back of this report (Appendix 3)

1. INTRODUCTION

1.1 **Instruction**: I am instructed by Mr Stuart Elder to inspect three trees, two located within the curtilage of No. 1 Elmsdene Mews and one growing in a neighbouring property. Following a visual assessment of the trees I will provide a written report advising on any potential effects by way of subsidence, on this property only. The following information is to be provided in my report:

- A schedule of trees (or single tree as the case may be) to include data regarding species, age, size, with comment on both physiological and structural condition;
- An appraisal of the trees' contemporary and future capacity to affect soil moisture levels close to and below the foundations of the dwelling house;
- Recommendations to remedy the damage caused to the paved area.

1.2 I made my site inspection on Friday 2nd September 2022 beginning at 5.39 pm and concluding at 7.13 pm. Throughout my time on site the weather was mild, dry and a little overcast. Visibility was reasonable.

1.3 The arboricultural issues in relation to this site are highlighted below with accompanying recommendations provided in Section 6.

1.4 **Documents provided**: None

1.5 **Ecological Constraints**: Impacts on wildlife must be considered prior to and during any tree works deemed necessary. Such matters are governed by various pieces of primary legislation, specifically:

- The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 and other more recent regulations, and the European Protected Species legislation. These regulations provide statutory protection for birds, bats and other tree and woodland dwelling creatures. The presence of protected species could impose constraints upon the timing and implementation of the site works. Consultation with an appropriately qualified ecologist must be undertaken should this be deemed necessary.

1.6 **Statutory Tree Protection**: I have made enquiries of the Local Planning Authority which in this instance is the London Borough of Hillingdon, to ascertain the existence or otherwise of any Tree Preservation Orders which may be applied to this site, or whether the site falls within a designated conservation area. The local authority's web site shows that the trees identified in this report are protected by Tree Preservation Order Areas Reference TPO 586 (13-14 High Elms Close & Elmside to Aviemore, Hill Road) – 11-12-1996 but the site does not appear to lie within a designated conservation area (see Appendix 3 'A Brief Explanation of Tree Preservation Orders/Conservation Areas' at the back of this report). The status of the tree preservation order and conservation area legislation is only advised at the time of writing.

1.7 **Qualifications and professional experience**: This report is based on my site inspection and assessment of the existing trees. I hold formal qualifications in arboriculture and have the benefit of fifty years professional experience in this discipline. A summary of these matters can be found in Section 9.

1.8 **Background Information**: No. 1 Elmsdene Mews is a significantly sized two-storey dwelling house with an integral single garage located to the right, eastern, side. Elmsdene Mews is a recent development (2009) of three individual properties built at the northwestern end of High Elms Close in Northwood, Middlesex. Reference to the British Geological Survey 'My Soil' application shows that the local geology is Deep (topsoil) with a texture of Clayey Loam to Silty Loam which has weathered (broken down) to form a Parent Material of Prequaternary Marine/Estuarine Sand and Silt. Such a geology is inherently shrinkable though it seems that no adverse effects to the dwelling house have been reported. The area is populated by a low number of existing trees. Those specific trees that I inspected in detail all pre-date the dwelling house – T2 and T3 by a significant time period. Over time, areas of the block paving to the front (south) and paving to the side (west) and rear (north) of the dwelling house have respectively subsided and lifted. Mr Elder wants to know more about the likely causes of this and whether there is a foreseeable prospect of damage to the dwelling house.

1.9 **Soils**: I accessed the online application of the British Geological Survey to gain insight into the type of soil present here. The app showed that the soil depth was Deep with a texture of Clayey Loam to Silty Loam, the parent material from which this has evolved by the 'weathering process' is described as Prequarternary Marine/Estuarine Sand and Silt. The app is generally a good guide to soil type within a general area but is not site-specific. Site soil testing by way of trial pits, boreholes, and technical analysis is the recognized way to obtain truly accurate site-specific results.

2. THE TREES

2.1 **Inspection of the trees of concern**: I inspected three individual trees close to Mr Elder's property and made comment on one further third-party tree located on third-party land northwest of the property curtilage. Trees 1 and 2 are growing within the curtilage of Mr Elder's property. The third tree, T3 (birch) is growing east of the property in the rear garden of No. 2 Elmsdene Mews. Tree details are summarised in the tabulation below:

Tree 1	**Hornbeam – *Carpinus betulus* L. Family: Betulaceae**
Ownership:	**No. 1 Elmsdene Mews**
Grid reference:	**TQ 084 919**
Elevation (above sea level):	**76 m**
Age Class:	**Early mature (being within the first one-third of its probable life expectancy).**
Physiological condition:	**Good – the tree has a full and healthy crown and high vitality.**
Structural condition:	**Good – though slightly compromised by being twin stemmed from around 1 m above ground level.**
Height:	**15 m (measured with a 'Haglof' Hypsometer)**
DBH (diameter at breast height)	**370/290 mm (measured using a standard diameter tape)**
Distance:	**15 m (from the front elevation of No. 1)**
TZI (theoretical zone of root influence)	**8.5 m - at full mature height – (NHBC Standards 2020)**
Comment:	**An early mature tree of low-water demand that is in overall good condition.**

Tree 2	**English (pedunculate) oak – *Quercus robur* L. Family: Fagaceae**
Ownership:	**No. 1 Elmsdene Mews**
Grid reference:	**TQ 084 919**
Elevation (above sea level):	**76 m**
Age Class:	**Mature (being within the middle one-third of its probable life expectancy)**
Physiological condition:	**Fair**
Structural condition:	**Poor – this tree is significantly structurally compromised due to colonisation by the brown-rot beefsteak fungus – *Fistulina hepatica* (Schaeff.) With. (1792). It has been subjected to much historic poor pruning practice which has contributed to significant damage and structural degradation, particularly on the upper, central stem.**
Height:	**19 m (estimated)**
DBH (diameter at breast height)	**830 mm (measured using a standard diameter tape)**
Distance:	**9 m (from the front elevation of No. 1)**
TZI (theoretical zone of root influence)	**25 m - at full mature height – (NHBC Standards 2020)**
Comment:	**Tree 2 pre-dates the building by many decades, being an estimated 120-150 years of age. Past pruning works have caused damage to the tree and it is now significantly structurally compromised by wounding, decay, poor form, and colonisation by the brown-rotting beefsteak fungus.**

Tree 3	**Birch – *Betula pendula* Roth** **Family: Betulaceae**
Ownership:	**Third-party – No. 2 Elmsdene Mews**
Grid reference:	**TQ 084 919**
Elevation (above sea level):	**76 m**
Age Class:	**Mature (being within the middle one-third of its probable life expectancy).**
Physiological condition:	**Good – the tree has a full crown and shows high vitality.**
Structural condition:	**Good – though it is twin-stemmed which slightly degrades its structural integrity.**
Height:	**20 m (estimated) – third-party tree**
DBH (diameter at breast height)	**420/410 mm (estimated)**
Distance:	**8-9 m (estimated - from the rear northeast corner of the dwelling house)**
TZI (theoretical zone of root influence)	**25 m - at full mature height – (NHBC Standards 2020)**
Comment:	**The birch is likely a self-seeded volunteer which is of mature age class and pre-dates the buildings comprising Elmsdene Mews by some decades. It is in good physiological and structural condition though a little compromised by being twin-stemmed. Birch species are noted for producing extensive shallow roots which often disrupt light structures and hard-landscaping features. This feature is very apparent within the curtilage of No. 1.**

3. THE INSPECTION

3.1 I inspected the two trees growing within the curtilage of no. 1 (see photographs 1 & 2 Appendix 1 at the back of this report) and the third-party tree T3 (birch) - (see photograph 10, Appendix 1 at the back of this report) located within No. 2 Elmsdene Mews. In the interests of completeness, I commented on an ash tree which is also growing in a third-party property.

3.2 The first tree included within this report is a hornbeam (T1) growing 15 m from the front elevation of the dwelling house. It is an early-mature tree which pre-dates construction of the mews houses though probably only by twenty years or so. The tree location, close to a property in High Elms Close (see photograph 1, Appendix 1 at the back of this report) suggests that it is likely self-seeded, having arrived by windblown seed. Hornbeam, is a tree of low-water demand (NHBC Standards 2020) with a calculated Theoretical Zone of Root Influence (TZI) of 8.5 m. Due to this it is unlikely to affect the structure of the dwelling house.

3.3 A mature English oak (T2) is growing around 9 m from the front southwest corner of the dwelling house (see photograph 2, Appendix 1 at the back of this report). It might well be classed as a veteran tree (BS 5837: 2012 Trees in relation to design, demolition, and construction – Recommendations) due to many inherent 'defects' which constitute *de-facto* wildlife habitat.

3.3.1 **Significant structural compromisation is indicated by way of**:

i) **Trunk**: the trunk base is swollen around its circumference to about 2 m above ground level (see photograph 2, Appendix 1 at the back of this report). This indicates internal heartwood degradation and 'sounding' of the trunk using a nylon-tipped mallet seemed to confirm this. It has likely been colonised by the brown-rotting beefsteak fungus (F. hepatica [Schaeff.] With. [1792]). Response growth and associated trunk swelling is more usually associated with white-rot fungi. However, this feature can arise with brown rot fungi when the wood degradation proceeds slowly. I saw an open cavity at around 7 m above ground level on the south side (see photograph 3, Appendix 1 at the back of this report) with what seemed to be a fruiting body of beefsteak fungus inside. (Beefsteak fungus is a brown-rotter which preferentially degrades the cellulose cell constituents leaving the lignin component initially intact. The likely result of this is brittle fracture.

ii) **Central leader** (upper trunk section): I saw that this area of the trunk is significantly damaged and structurally compromised (see photographs 3-6 Appendix 1 at the back of this report). There are several cavities and bark/sapwood damage apparent on this section and the leader terminates in a significantly sized (around 3 m long) dead stub (see photograph 7, Appendix 1 at the back of this report).

iii) **Poor scaffold branches**: Several of the main scaffold (structural) branches are damaged, either by way of mechanical truncation or second-order branches breaking out. One notably large scaffold branch extends excessively southwards (see photograph 2, Appendix 1 at the back of this report) and is predisposed to breakage by way of torsional-twisting induced by wind forces in severe weather events.

iv) Deadwood within the crown: There is significant deadwood present throughout the crown, though it is concentrated at high level on the south and west sides. Oak deadwood usually degrades slowly whilst still attached to the tree. However, failure of large pieces can, and does occur.

3.3.2 **Comment on subsidence issues**: Oak is a species of high-water demand with a TZI of 25 m (measured from the centre of the base of the tree). Most instances of subsidence however occur at distances much less than this. This tree is located 9 m from the nearest part of the house. It would have been in place when the house was built and so it is probable that the building foundations were designed and constructed in full consideration of this aspect.

3.3.2.1 Mr Elder is concerned about movement of the rainwater downpipe and block-paving close to the building southwest corner (see photograph 8, Appendix 1 at the back of this report). I looked closely at this area and removed both the bottom section of the downpipe and the nearest block-paviours. I found no evidence of root incursion but did see that a void was present beneath the paving.

3.4 The final tree inspected is a silver birch located within the rear garden of a third-party property (see photograph 10, Appendix 1 at the back of this report). This tree too, pre-dates construction of the mews houses. Birch trees are notorious for producing extensive shallow roots which often disrupt light structures or hard-landscaping. On this site I lifted several paving slabs to the side of, and behind the dwelling house. Under each one I found roots of significant diameter, often around 20 mm, and a network of finer, absorbing roots (see photographs 11-16, Appendix 1 at the back of this report).

4. DISCUSSION

4.1 Tree 1, the hornbeam, is probably a self-seeded volunteer. It is in good physiological and structural condition and growing outside its TZI in relation to the dwelling house, No. 1 Elmsdene Mews. It will eventually outgrow this location due to its proximity to the nearby house in High Elms Close. However, this situation can be addressed by considered reduction pruning.

4.2 A mature English oak (T2) is the second tree inspected. It is growing around 9 m from the front southwest corner of the dwelling house which is well within its TZI. It will have been in place when the dwelling house was constructed so the foundations will likely have been designed and constructed with due consideration to the tree's proximity. The area is shown to overlie a moderately shrinkable geographical stratum and so this consideration would have been especially pertinent. Some further mitigation against potential indirect (subsidence type) structural damage is afforded by the tree condition. The tree has been historically poorly pruned and as a result shows lower vitality than would be expected and evident in a higher quality oak tree. Lower vitality equates to slower growth and consequently reduced water uptake.

4.2.1 The oak tree's structural condition is of significant concern. Historic pruning works have been ill-considered, reactive, and poorly executed. All the works seem to have been performed in response to outside influences with little thought given to the tree as an integrated organism. A very large scaffold branch growing westwards over the neighbouring property has been truncated. Similar works have been undertaken on the eastern side with slightly more moderate pruning to the northern side. One particularly large scaffold branch growing southwards has barely been pruned at all and is now significantly over-extended. It is therefore now growing outside of the regular canopy outline and predisposed to wind-induced breakage.

4.2.2 There is significant damage apparent on the upper section of the central leader. The leader has been historically truncated resulting in a reduction of the supply of sugars (manufactured in the photosynthetic process) to lower parts of this section. With insufficient resources the central leader has been unable to resist decay actors and has noticeably declined as a result. It is now hazardous. Pruning works will be prescribed in section 7 to address this issue.

4.3 The third tree inspected is a third-party owned birch tree. It is in good physiological and structural condition but as is common with this species roots have grown extensively and are now encroaching into the garden of No. 1. They have grown under the paving to the side and rear of the dwelling house causing uplift, distortion, and breakage of the slabs. Unless the roots are removed this damage will continue to increase.

4.4 Whilst on site I made a cursory inspection of the ash tree growing in a second third-party property. It is a tree of mature age class growing around 10 m from the rear corner of No 1, Elmsdene Mews. I saw no visible evidence of root incursion into the garden of the property – though it is certain that at least some root activity will be taking place in this area. This tree too, will have been present when the dwelling house was built and so will also have been a considered factor in the foundation design.

5. BRIEF EXPLANATION OF TREE ROOT/FOUNDATION INTERACTION

5.1 **Tree roots and soil moisture:** Tree roots utilize considerable quantities of soil moisture in their growing seasons. On shrinkable clay soils this action can induce soil drying with resultant volumetric (shrinkage) change in the subsoil. In the dormant season trees are less active and do not utilise soil moisture to any significant degree. Given sufficient winter precipitation the subsoil will then re-hydrate and expand. If the building foundations located in the zone of influence do not extend below the affected area, then building movement can result. Actively growing trees which demand progressively more moisture can induce a persistent soil moisture deficit which prevents the soil from re-wetting fully each winter period. Continued downward movement of the foundations can result should this occur.

5.2 **Moisture deficit:** Where a persistent moisture deficit has developed over time, particularly in a shrinkable clay soil of high bulk density and low porosity, buildings can be damaged by ground heave. Heave is the result of excessive soil re-hydration and expansion following the removal or death of a tree which pre-dates construction of the building. The most common occurrence of heave is when a tree that pre-dates the building by some years is removed.

5.3 **Soil moisture extraction:** The effect of tree roots on soil moisture varies considerably. Factors that influence this include tree age, size, vitality, species, type of soil and proximity to building. Certain species tolerate polluted conditions well and can be unexpectedly successful in inhospitable conditions which can lead to a higher level of water usage than might normally be expected.

5.4 **Subsidence:** Should subsidence occur and be directly linked to water uptake by trees then removal is almost always the only effective solution. Pruning in the form of crown reduction can reduce water uptake in the short term, although if this is to be relied upon in order to maintain reduced levels of water usage then regular cyclical pruning is essential. This is harmful and disfiguring to most trees. Certain species respond to heavy pruning by producing multiple new shoots, often with softer and large leaves (juvenile foliage) than normal. This can be exceptionally effective in transpiring water to the atmosphere, often more so than the previous foliage.

5.5 **Patterns and extent of root growth:** Tree roots do not generally conform to set patterns of growth but will develop where conditions for growth are suitable. Therefore, it is unwise to rely strongly on published data in respect of zones of root influence of given species. Trees also vary in their rate of water usage at different life stages. A young actively growing tree may utilize appreciably more soil moisture than a large tree which is at a more mature state of life.

5.6 **Root influences and built structures:** Trees can cause damage to buildings by two primary means. These may be described as direct and indirect damage. The two types of damage are briefly described below.

1. Direct damage: This is commonly the result of physical forces induced by tree growth acting upon a built structure. Damage of this nature usually occurs when trees are located within 0.5m of buildings or other hard landscaping features. Expansion of tree parts, specifically incremental trunk, root and root buttress growth is capable of causing damage by way of uplift or wall distortion to light structures which are built on insubstantial foundations. Buildings of stronger construction are better able to resist the expansion growth and tree parts will commonly deform around structures such as these rather than cause displacement and cracking.

2. Indirect damage: Subsidence and heave are two types of indirect damage which trees may be party to. Clay type shrinkable soils are a necessary prerequisite for indirect damage to occur. Indirect damage most commonly occurs when trees of high-water demand are growing on shrinkable soil types near to buildings which are built on foundations of insubstantial or less than optimal design. Essentially, if trees extract significant amounts of water from a clay soil close to or under building foundations, and if this soil water is not fully replenished each year, then a persistent soil moisture deficit may develop. Over time the lower soil moisture levels lead to a reduction in soil volume which can in turn, induce movement of building foundations. Ground heave is essentially the opposite, being an expansion of shrinkable soils that have rewetted due to trees that were formerly using local soil moisture being removed.

6. CONCLUSION

6.1 Having inspected the three trees and noted the condition of the third-party owned ash tree I concluded the following:

i) **Hornbeam** (T1) – no work is needed at present but some reduction pruning will be needed in the future.

ii) **English oak** (T2) – the tree is in very poor physiological and structural condition. Remedial works are needed quite soon (pruning prescription will be provided in section 7). It is probable that the foundations of the dwelling can resist any tree root interaction. The influence of T2 is in any case declining due to its impaired condition.

iii) **Birch** (T3) – roots of T3 have encroached into the curtilage of No. 1 and are damaging the paved areas.

7. RECOMMENDATIONS

7.1 **T1 – Hornbeam** - no action

7.2 **T2** – **Oak** – reduce central leading stem by 2-2.5 m to appropriate pruning points at a union with live growth. Ensure that a detailed assessment of this section is made before actual works begins. Reduce the distal ends of the second-order branches of the over-extended southerly growing scaffold branch by 4 m and reduce all other areas by around 1.5-2.5 m as necessary to create a reasonably symmetrical and balanced form.

7.3 **T3 – Birch** – sever all roots along the eastern boundary of No. 1, install a concrete strip along the entire boundary length, which should be about 450 mm deep and 300 mm wide to restrict future root growth. Alternatively, remove the tree.
Note: strictly speaking, tree owners are responsible for any damage caused by encroaching tree parts.

7.4 **Third-party ash tree** – I saw that this tree is affected by ash dieback disease. It is therefore in declining health and the decline is likely to continue and ultimately result in tree death.

8. ASSUMPTIONS AND LIMITING CONDITIONS

8.1 Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

8.2 Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible, however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.

8.3 The consultant/appraiser shall not be required to give testimony or attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

8.4 Loss or alteration of any part of this report invalidates the entire report.

8.5 Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to who, it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.

8.6 Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant/appraiser as stated in his qualification.

8.7 This report and values expressed herein represent the opinion of the consultant/appraiser, and the consultant's/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

8.8 Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

8.9 Unless expressed otherwise, (1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and (2) the inspection was by means of visual examination of accessible items.

9. CERTIFICATE OF PERFORMANCE

I, Shane A. Lanigan, certify that:

9.1 I have personally inspected the trees and the property referred to in this report and have stated my findings accurately. The extent of the evaluation or appraisal is stated in the attached report and the Terms of Assignment.

9.2 I have no current or prospective interest in the vegetation or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved.

9.3 The analysis, opinions and conclusions stated herein are my own and are based on current scientific procedures and facts.

9.4 My analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices.

9.5 No one provided significant professional assistance to me, except as indicated within the report.

9.6 My compensation is not contingent upon the reporting of a predetermined conclusion that favours the cause of the client or any other party nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

9.7 I further certify that I am a Chartered Arboriculturist being a professional member of the Institute of Chartered Foresters and a Registered Consultant of that professional body. I am a Registered Consultant of the Arboricultural Association, and a Registered Consulting Arborist (#588) of the American Society of Consulting Arborists. I am also an ISA Board-Certified Master Arborist and hold the Royal Forestry Society Professional Diploma in Arboriculture. In matters of tree inspection, I hold the International Society of Arboriculture 'Tree Risk Assessment Qualification' (TRAQ) and have completed the LANTRA Professional Tree Inspection Module with integrated assessment and update training. I have worked full time in the field of Arboriculture for a period of fifty years.

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10. PERSONAL DETAILS OF MR SHANE A LANIGAN

Qualifications: I hold the City and Guilds Certificate in Tree Surgery and am an International Society of Arboriculture Certified Arborist, also holding the International Society of Arboriculture Municipal Arborist Accreditation and being a Board- Certified Master Arborist of that professional body.

In addition, I hold the Royal Forestry Society's Professional Diploma in Arboriculture which is a degree level qualification rated as level 6 on the qualifications and curriculum framework. It is a qualification specific to the arboricultural profession. In matters of tree safety and risk assessment I have undertaken and completed the LANTRA Awards Professional Tree Inspection Course and integrated assessment, I also hold the International Society of Arboriculture Tree Risk Assessment Qualification (TRAQ).

I am a registered consultant of the American Society of Consulting Arborists (ASCA RCA#588), a Chartered Arboriculturist, being a Professional Member of the Institute of Chartered Foresters and a Registered Consultant of the Arboricultural Association.

With regard to legal issues, I am also a Cardiff University Law School Certified Expert Witness in both civil and criminal proceedings.

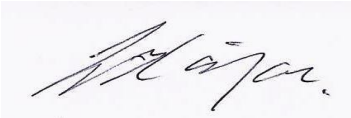
My professional memberships include:

- The American Society of Consulting Arborists
- The Arboricultural Association
- The Consulting Arborist Society
- The International Society of Arboriculture
- The Institute of Chartered Foresters
- The Royal Forestry Society

Career details: I am a second- generation arborist having worked from 1971 to 1979 for a private tree care company before forming my own arboricultural company in 1979.

Continuing professional development: I maintain and improve my professional knowledge by being an active member of the five professional bodies referred to above. In addition, I attend a high number of arboriculture related seminars and the annual conferences of the International Society of Arboriculture, the Arboricultural Association and the Institute of Chartered Foresters (ICF). I was also privileged to serve on the credentialing council of the International Society of Arboriculture educational certification department for seven years. Having served two consecutive terms as an elected member. I 'rolled off' the council in late 2020.

Currently, I am the senior consultant within Abbots Arboricultural Advice Limited. This is my consulting practice which is a forward-looking operation. In order to keep abreast of changes in arboriculture and consulting practice I attend many conferences and seminars which contribute to my CPD/CEU obligations.



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APPENDIX 1

Photographs 1 – 16

PHOTOGRAPH NO. 1 - T1 - HORNBEAM

PHOTOGRAPH NO. 2 – T2 - OAK

PHOTOGRAPH NO. 3 – T2 – OAK – OPEN CAVITY ON SOUTH SIDE OF TRUNK WITH BEEFSTEAK FUNGUS FRUITING BODY INSIDE (ARROWED)

PHOTOGRAPH NO. 4 - T2 – OAK - COMPROMISED AREAS ON UPPER CENTRAL STEM (ARROWED)

PHOTOGRAPH NO. 5 - T2 – OAK - COMPROMISED AREAS ON UPPER CENTRAL STEM (ARROWED)

PHOTOGRAPH NO. 6 - T2 – OAK - COMPROMISED AREAS ON UPPER CENTRAL STEM (ARROWED)

PHOTOGRAPH NO. 7 - T2 – OAK - DEAD 'SNAG' AT TOP OF CENTRAL LEADER (ARROWED)

PHOTOGRAPH NO. 8 - DISTURBED DOWN-PIPE AND BLOCK PAVING BY SOUTHWESTERN CORNER OF THE DWELLING HOUSE

PHOTOGRAPH NO. 9 - T3 – BIRCH – VIEWED FROM THE SOUTH

PHOTOGRAPH NO. 10 - T3 – BIRCH – VIEWED FROM THE WEST

PHOTOGRAPH NO. 11 - T3 – BIRCH TREE ROOTS IN DISTAL CORNER OF PAVED AREA NEAREST THE TREE

PHOTOGRAPH NO. 12 - T3 – BIRCH TREE ROOTS IN DISTAL CORNER OF PAVED AREA NEAREST THE TREE AND 2.5 M FROM BOUNDARY WITH NO. 2 ELMSDENE MEWS

PHOTOGRAPH NO. 13 - T3 – BIRCH TREE ROOTS CLOSE TO THE REAR ELEVATION OF NO. 1

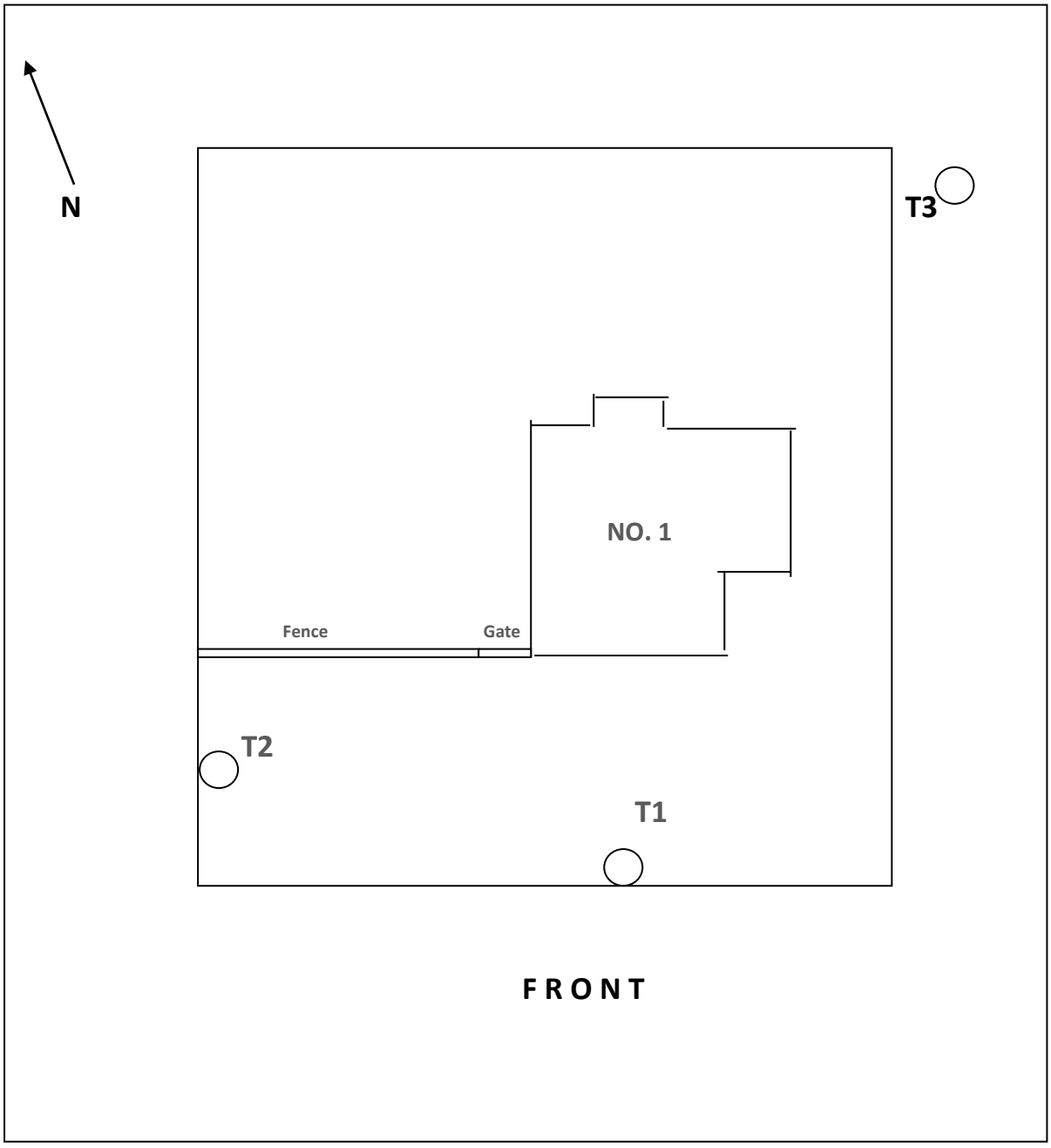
PHOTOGRAPH NO. 14 - T3 – BIRCH TREE ROOTS IN SIDE PASSAGEWAY BY EASTERN FLANK WALL

PHOTOGRAPH NO. 15 - T3 – BIRCH TREE ROOTS BY SIDE DOORWAY

PHOTOGRAPH NO. 16 - T3 – BIRCH TREE ROOTS NORTH OF CENTRAL REAR DOORWAY AT LEAST 10 M FROM T3

APPENDIX 2

SITE PLAN: NO. 1 ELMSDENE MEWS, NORTHWOOD, MIDDX HA6 2BN



This sketch plan is not to scale and may exclude certain features that are on site.

APPENDIX 3

References:

British Geological Survey Environmental Science Centre, Keyworth, Nottingham, NH12 5GG (Natural Environment Research Council, 2013) – 'My Soil App' – accessed September 2022.

BS 5837:2012 British Standards Limited (2012) *Trees in relation to design, demolition and construction – Recommendations* 4th ed. 2 Park Street, London W1A 2BS. British Standards Institution.

Cutler, D., Richardson, I.B.K., 1981. *Tree Roots and Buildings.* 1st ed. United States of America: Longman Inc, New York. p50 & 51.

Hillier J G (2014). *The Hillier Manual of Trees and Shrubs*. 14th ed. 80 Vincent Square, London SW1P 2PE;(Hillier Nurseries and The Royal Horticultural Society,).

NHBC Standards (2020). *NHBC Standards Effective 1 January 2020*. NHBC House, Davy Avenue, Knowhill, Milton Keynes MK5 8FP: NHBC.

APPENDIX 4

Statutory Tree Protection

Tree Preservation Orders/Conservation Areas

Tree Preservation Orders are made under Section 198C of the Town & Country Planning Act and applied by the 2012 Tree Regulations. They effectively prohibit unauthorised removal and pruning of trees identified within the order. Conservation areas are designated areas defined by geographic limits within which any tree with a stem diameter of more than 75mm (measured at breast height or 1.5m above ground level) is effectively protected. Certain exceptions exist under both sets of legislation, though these are limited and ideally require interpretation by a suitably qualified arboriculturist.

Felling Licenses

Felling licenses may apply for felling significant volumes of timber on sites without full planning permission. The statutory legislation in this case is the Forestry Act 1967 which is administered by the Forestry Commission.

Faculties

Faculties may be required for significant tree works on sites that fall under the jurisdiction of the church authorities. The local Parochial Church Council can advise on the need and requirements for faculties.

Hedgerow Management and Removal Notices

A hedgerow removal notice will be required for the removal of almost any hedge growing in a rural area. Certain works are permitted without notification including (j) “for the proper management of the hedgerow”. The applicable statutory legislation may be cited as “The Hedgerow Regulations 1997” (Statutory Instrument 1997 No. 1160).