



Arboricultural implications assessment  
for development at  
17 Templewood Avenue NW3 7UY

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AIA 7101

# Arboricultural implications assessment for development at 17 Templewood Avenue NW3 7UY

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# 1 Introduction

- 1.1 This arboricultural implications assessment has been commissioned by de Metz Forbes Knight Architects Ltd on behalf of Mr T Henry in relation to proposed development at 17 Templewood Avenue, Hampstead, London NW3 7UY.
- 1.2 The report assesses the trees on and adjoining the site that might influence or be influenced by the application development, outlines the key likely tree-related constraints on development and identifies issues that would need to be addressed if planning approval were granted.
- 1.3 The proposal is to:
  - demolish the existing private house
  - erect a new four-storey house to include a basement, ground floor, first floor and second floor.
- 1.4 Please read the report in conjunction with the tree constraints plan – drawing TCP 7101 rev c – which is provided as a separate document (TCP 7101 rev c.pdf), and the architects' drawings.
- 1.5 My framework for the tree survey, tree constraints plan and this report is the British Standard BS5837:2005 *Trees in Relation to Construction – Recommendations* because this is the Standard generally used by local planning authority officers when considering trees affected by development proposals. I provide outline guidance on the relevant criteria where they are mentioned.
- 1.6 Please see Appendix D for the details of other documents/information mentioned.

## Background

- 1.7 I carried out an initial site assessment on 28 June 2011 and a tree survey on 26 July, then prepared a tree constraints plan and pre-development reports.
- 1.8 As a result, the initial design concepts were altered to take greater account of tree protection.
- 1.9 I reviewed the tree survey on 20 January this year and confirmed my original assessments.

## 2 The trees in context

### Geographical and local landscape character

- 2.1 Number 17 Templewood Avenue is in an urban residential area, accessed from a public road.
- 2.2 The site slopes general towards the south east. It falls by up to 4m from the rear of the back garden to the driveway junction with Templewood Avenue, and falls by up to 2m from north to south across the front garden.
- 2.3 The British Geographical Survey 1:50,000 map indicates the local bedrock geology of the site to be Bagshot Formation (sand), and is close at this scale to an area of Claygate (clay, silt and sand).
- 2.4 Work by Geotechnical and Environmental Associates Ltd (GEA) (see *Desk Study and Ground Investigation Report* [document J11244] for details) confirms that under a layer of made ground on the site the soil is generally Bagshot formation over Claygate member. The volume change potential for the clay component of both the Bagshot formation and Claygate member is given as moderate.

### Tree protection status

- 2.5 Trees are a 'material consideration' in the planning process and local planning authorities (LPAs) have a legal duty to take them into account when determining planning applications.
- 2.6 The site is within the Redington Froggnal Conservation Area, which provides a measure of protection for all trees with a trunk diameter of 75mm or above, measured at 1.5m from ground level. This affects most of the trees on the site.
- 2.7 Four individual trees in the gardens are *also* protected by the Tree Preservation Order TPO 16H of 1957. In a telephone discussion with a tree officer, these trees have been identified as:

Tree identification number on the tree constraints plan	TPO tree number
• T1 lime	T54
• T3 sycamore	T60
• T6 lime	T61
• T13 oak	T63.

The tree preservation order (TPO) provides a higher level of statutory protection for these trees.

- 2.8 Any proposed work to 'protected' trees, or any activity that could affect the above- or below-ground parts of a tree, or its long-term health, must first be approved by the local planning authority either through a planning application or, alternatively, through separate statutory procedures for conservation areas or tree preservation orders (TPOs). There are steep penalties for damage to protected trees – for example, £20,000 per tree on summary conviction for destroying the tree or its 'amenity value', or £2,500 per tree for lesser damage.

### Prominence and amenity

- 2.9 The trees in the front garden largely screen the property from public view and most are visible from the street. The oak in the back garden, which is shown as T13 on the tree constraints plan (and as T63 on the TPO), is also visible from some parts of the street.

- 2.10 Trees visible from a public place are considered to provide local visual amenity – effectively ‘borrowed’ landscape features that contribute to the particular character and pleasantness of the neighbourhood – and there is a preliminary presumption for retaining them, if they are in safe condition.

### 3 Tree survey and tree constraints plan

#### Tree survey

- 3.1 My survey was a visual tree assessment (VTA) from ground level, following industry-standard procedures (see Appendix C). It was an independent and impartial survey of the condition of trees and woody shrubs on and around the site and was not influenced by consideration of any development plans.
- 3.2 The results of the survey are presented in two ways:
- a schedule of my findings, shown in Appendix A of this report
  - a tree constraints plan (TCP 7101 rev c.pdf) provided as a separate document.
- 3.3 The survey schedule includes preliminary recommendations for the management of the trees *regardless* of the future use of the site. Different management options would be needed for the trees T10, T11 and T12 in the light of the proposed development, and these are discussed in paragraph 4.3 below.

#### Quality/retention categories and their significance for the design

- 3.4 The survey schedule and tree constraints plan both show 'quality/retention categories' based on criteria in the British Standard BS5837:2005 *Trees in Relation to Construction – Recommendations*.
- 3.5 The categories (and their Standard colours) are:
- **R** – remove (shown in dark red)
  - **A** – high quality and value (shown in light green)
  - **B** – moderate quality and value (shown in mid blue)
  - **C** – low quality and value, or small or young trees (shown in grey).
- 3.5.1 The British Standard also suggests numerical subcategories to help to explain the reasons behind the quality/retention grading. They are:
- 1) mainly arboricultural values
  - 2) mainly landscape values
  - 3) mainly cultural/conservation values.

In practice the subcategories often overlap and some trees might warrant all three, but I have noted only one subcategory for each tree.

- 3.6 These categories provide rule-of-thumb guidance on a local planning authority's (LPA's) likely priorities when considering trees in relation to development proposals.
- It is unlikely that the LPA would countenance the removal of a category A tree.
  - There is a presumption that category B trees will be retained wherever possible.
  - The retention or removal of category C trees is not usually considered to be a significant constraint on development. Trees with a small stem diameter – usually 150mm or less – could be considered for relocation within the site, if desired.
  - Category R trees are initially graded for removal because of safety or other sound arboricultural reasons, irrespective of any possible new development. Where the development proposal would require the removal of other trees, this is discussed separately (in paragraph 4.3 below).

**My grading**

3.7 I assigned the following categories to trees on and adjoining the site:

Category **R** – T3

Category **A** – none

Category **B** – T1, T4, T6 and T13

Category **C** – T2, T5, G7, T8, T9, T10, T11, T12, G14, G15, N1, NG2, N3 and NG5.

**Tree constraints plan**

3.8 The tree constraints plan (TCP) plots most of the information derived from the tree survey, together with other relevant matters. It shows the:

- quality/retention category, given as a coloured circle in the position of the tree trunk
- indicative crown spread, shown in dark green
- minimum root protection area, shown as a circle in dark blue
- basic shading pattern of selected trees, based on BS5837:2005 criteria.

**Crown spread and clearance**

3.9 The crown spread is a *general* indication of the current length of the branches based on estimates in four cardinal directions. Trees often grown unevenly, so the *actual* position of branches should always be taken into account when designing proposed development. The vertical constraint of the lowest branch is shown in the 'crown clearance' column of the survey schedule in Appendix A.

**Root protection area**

3.10 A root protection area (RPA), calculated from formulae in BS5837:2005, indicates the area around a tree containing theoretically sufficient roots and soil to keep the tree alive, healthy and upright. Root protection areas are conventionally shown as a circle on a tree constraints plan to indicate the *minimum* area that should be left undisturbed during demolition and construction. Even so, an RPA is a guideline and does not predict exactly where roots are growing. The actual pattern, depth and extent of root growth vary with a wide range of factors, including the species of tree, soil type and the surrounding environment.



## 4 Arboricultural implications of the proposed development

### Screening

- 4.1 As a group, the trees T1 to T9 inclusive help to screen the property from public view, while providing 'amenity value'. The screening and public amenity are not threatened by the development proposal.

### Tree removal

#### **Sycamore removal and replacement, independent of the future use of the site**

- 4.2 The sycamore T3 (TPO T60) has scattered areas of lifted or absent bark from the trunk base to about 1m above ground level on the north, east and south-east of the trunk. (See example in photograph 1 in Appendix B.) Where the underlying wood is exposed, it is either stained or soft and decaying, so that a probe penetrates up to 100mm when minimal pressure is applied. There are also other small patches of dead, dark bark around the trunk to about 1.5m from ground level. Close to the trunk base on the eastern (road-facing) side is an area approximately 550mm wide and about 400mm high from ground level which sounds hollow when tapped with a rubber mallet. If the tree were to remain, its structural safety would need to be monitored, especially as it has deteriorated over the past six months. The existence of the dysfunctional wood may be linked to the tree's thin, small crown (see photographs 2 and 3 in Appendix B). In combination, they suggest that the tree is in decline and has a safe useful life of only a few years at most. I therefore graded this tree as category R (for removal) and recommended its removal and replacement *irrespective* of the future use of the site. The proposed development does not, therefore, create pressure to remove this tree. Replanting would help to maintain the screening from the road and to ensure the long-term visual amenity of the planting at the front of the garden.

#### **Removal of three young cypresses**

- 4.3 I graded the italian cypresses T10, T11 and T12 (see photograph 4 in Appendix B) as category C trees because of their uneven shape (T11 and T12), loss of lower foliage (T11), dead or diseased branches (especially T12) and lack of space to grow, even though this species grows as a narrow column. These trees would need to be removed to allow the proposed development to go ahead. They are not visible from outside the site, so their loss would not be detrimental to local amenity, and the British Standard BS5837:2005 notes that category C trees should not be a constraint on development. Replacement trees of better aesthetic value could be planted within the garden.

### Below-ground impact on the trees

#### **Construction within the existing building footprint**

- 4.4 Most of the proposed building is within the footprint of the existing building, which I understand to have been constructed in about 1997 on strip foundations, with some sheet piling for the basement. Where the proposed new building is within the existing footprint it would be unlikely to damage the trees on the site, provided that adequate tree protection measures were put in place and suitable construction techniques were used and (see paragraphs 4.14 to 4.21).

#### **Construction within the RPA of the sycamore T3**

- 4.5 The proposed basement would intrude upon about 21m<sup>2</sup> of the root protection area of the sycamore T3 (TPO T60). This is equivalent to 18.6 per cent of its total RPA. I do not, however, interpret this as a constraint on development because this tree has been identified for removal and replacement for sound arboricultural reasons irrespective of the planning proposal.

**Steps within the RPA of the oak T13**

- 4.6 Proposed steps at the north corner of the building would be within existing hard landscaping, including a sunken deck area, already within the root protection area of the oak T13. There would be no new intrusion into the RPA. If the construction method for the proposed steps minimised any below-ground intrusion, long-term harm to the tree could be avoided.

**Above-ground impact upon the trees****Line and height of build**

- 4.7 The position of the proposed new building is outside the crown spread of all the trees except the oak T13 (TPO T63).

**Pruning the oak T13**

- 4.8 Irrespective of the planning proposal, the oak T13 will need to be crown lifted and cut back from the existing building (see photograph 5 in Appendix B) to prevent damage to the tree or building from branch movement. (This work would be subject to a statutory TPO application if the proposed development did not go ahead.) In addition, regardless of any planning proposal, tree work to branches near the house would be needed periodically for the foreseeable future to manage their weight and levering effect on their potentially weak attachment points adjacent to large historic pruning wounds. The proposed development would not therefore increase requests to prune the tree because the tree already needs to be pruned periodically to accommodate the existing building.
- 4.9 The proposed second floor is just outside the crown spread and would be about 1.65m higher than the existing lift shaft. Periodic pruning would be needed to keep the oak branches away from this floor. However, past pruning, branch structure and the existing need to periodically prune the tree (if the current house were to remain) make it unlikely that the proposed development would significantly increase pressure to prune the tree, if at all.
- 4.10 If planning permission were granted for the proposed new house, it is unlikely that additional pruning would be needed to facilitate its construction, provided that adequate protective measures were taken and suitable demolition and construction techniques were used (see paragraphs 4.14 to 4.21). In particular, great care would be needed during any lifting operation near the tree.

**Pruning to facilitate construction**

- 4.11 A small amount of crown lifting to the lime T1 (TPO T54) might be beneficial to facilitate any approved construction.

**Pruning for future growth**

- 4.12 Future branch growth of the lime T1 is most unlikely to increase requests to prune this tree because the proposed building is slightly farther away from the tree than the existing building. The future growth of other trees on the site is not a constraint on development.

**Protective measures during approved construction****Working space**

- 4.13 Space would be severely limited during any permitted demolition and construction, and a number of protective measures and techniques would be required to safeguard the trees and the soil they grow in. Paragraphs 4.14 to 4.21 indicate typical protective measures that might be needed.

- 4.14 The siting of contractor parking, materials storage, site administration, skip spaces and welfare facilities would need to be shown on a construction plan. Methods should also be specified to minimise the risk of damage to trees from the movement of materials or from the use, storage or mixing of materials.

#### **Tree and ground protection**

- 4.15 The trunk, branches and root protection areas of all retained trees on the site would need to be protected during demolition and construction by the creation of construction exclusion zones formed by protective fencing, as recommended in BS5837:2005 section 9.
- 4.16 Even so, as some access would be needed within construction exclusion zones, substantial temporary ground protection would probably be required to protect the tree roots from direct damage and to protect the soil from compaction that would indirectly damage existing roots or potential planting areas.
- 4.17 Demolition of the existing building would need to avoid direct damage to trees, and a technique such as top-down/pull-back could be used.
- 4.18 Construction methods would need to be specified to minimise access over root protection areas, to minimise the movement of heavy plant and machinery and to control the lifting of materials near tree crowns. This might involve working from within the footprint of the existing building, using piling mats, using specialist lifting equipment and mini piling rigs. Any propping of the basement during construction, as recommended in the *Ground Movement and Building Damage Assessment Report rev a*, by Byland Engineering Ltd, should take account of root protection areas.

#### **Changes in soil level**

- 4.19 Other than within the existing house footprint and the RPA of the sycamore T3 (which is recommended for removal), soil levels within the root protection area of any retained tree should not be raised or lowered and there should not be any digging, soil stripping, excavation or a change in soil levels within any root protection area.

#### **Services installation**

- 4.20 New services (gas, electricity, water and so on), where needed, would ideally be connected within the existing house footprint so that there would be no new intrusion within root protection areas.

#### **Site supervision**

- 4.21 Adequate site supervision would be important to ensure that trees were not harmed directly or indirectly (by soil compaction, for example).

#### **Tree- and soil-related foundation design**

- 4.22 The design of the building foundations would need to take full account of the soil composition and any possible impact on soil movement resulting from the presence of retained trees or from the removal of trees T3, T10, T11 and T12.

## 5 Summary of conclusions

- 5.1 The screening of the site by trees would not be affected by the development proposal.
- 5.2 The public visual amenity provided by the trees would not be affected by the development proposal.
- 5.3 Three young italian cypresses would need to be removed to allow the development to go ahead. These are category C trees that are not visible from outside the site, so should not be a constraint on development. The trees could be replaced in the gardens.
- 5.4 One sycamore (T3) is recommended for removal regardless of the future use of the site. A replacement tree could be placed in the gardens.
- 5.5 The proposed development is mostly within the footprint of the existing building. The proposed basement intrudes into the root protection area of the sycamore T3, but this tree is recommended for removal and replacement for sound arboricultural reasons, regardless of the future use of the site, so should not be a constraint on development.
- 5.6 A small amount of crown lifting to the lime (T1) might be appropriate to facilitate the build. The future growth of this trees is unlikely to increase requests to prune, as the proposed building is farther away from it than the existing house.
- 5.7 If the existing house were to remain, the oak T13 would need to be pruned periodically to prevent branch and building damage from branch movement. The proposed development would be unlikely to increase the pressure to prune this tree. No additional pruning would be likely to be required to enable construction.
- 5.8 Working space on the site would be extremely restricted, and both tree protection measures and construction techniques would need to be designed to prevent immediate, direct, indirect and long-term harm to the trees. Site supervision to protect the trees would also be essential.
- 5.9 The trees' influence on the soil would need to be considered in the design of the foundations.
- 5.10 Provided that adequate tree protection measures and suitable construction methods were employed and that there was adequate site supervision, there should not be foreseeable long-term harm to the retained trees on the application site.

## APPENDIX A – PRE-DEVELOPMENT TREE SURVEY SCHEDULE

## Key to survey schedule

Tree number on plan	
T1, T2 etc	individual tree on the site
N1, N2 etc	individual tree on land adjoining the site
G1, G2 etc	group of trees
BS 5837:2005 Age class	
Y	Young: first third of life expectancy
Mid	Middle aged: second third of life expectancy
Mat	Mature: final third of life expectancy
OM	Over mature: showing signs of senescence
V	Veteran: over mature and of special conservation value
Remaining years, in age bands	
<10, 10-20, 20-40, >40	
Physiological or structural condition	
Good	no significant health problems, or no significant structural problems
Fair	some symptoms of ill health, or currently insignificant or remediable structural problems
Poor	significant symptoms of ill health, or significant structural problems
Moribund	in serious and irreversible decline
Dead	not alive
BS 5837:2005 Category of quality/retention	
R	Remove
A	High quality and value
B	Moderate quality and value
C	Low quality and value, or young tree
BS 5837:2005 Criteria for category of retention	
1.	Mainly arboricultural value
2.	Mainly landscape value
3.	Mainly cultural value, including conservation
Other abbreviations	
e	estimated
oi	measurement taken over ivy or other climber, or over basal shoots
rf	measurement taken at the root flare (base of the tree), either because the tree is multi-stemmed or because the main branches form below 1.5m above ground level
ms	multi-stemmed
hcv	high conservation value
N	north
E	east
S	south
W	west

## Tree survey schedule

Tree ident on plan	Species	Approx height in m	Stem diameter in mm @ 1.5m	Approx branch spread in m	Approx crown clearance in m	Age class	Physiological condition	Structural condition	Preliminary comments & recommendations	Est. remaining contribution in years	Category grading
T1 (TPO T54)	<i>Tilia x europaea</i> common lime	18.5	630 @ 1.4	N 5 E 5 S 5 W 5	1.5	Mat	Good	Fair-good: very uneven crown, thin in places.	Remove dead wood over footway and adjoining drive. Remove basal shoots.	>40	B2
T2	<i>Prunus avium</i> wild cherry	8.6	195	N 2.7 E 3 S 3 W 4	2.2	Mat	Fair	Good	None	20-40	C2
T3 (TPO T60)	<i>Acer pseudo-platanus</i> sycamore	17	500	N 6.5 E 5 S 4.5 W 5.5	6	Mat	Poor: sparse crown.	Poor: scattered dysfunctional wood and hollow-sounding area trunk base east.	Fell, grind out roots to about 300mm below ground level and plant replacement	10-20	R
T4	<i>Prunus avium</i> wild cherry	16	340	N 4 E 5 S 3.5 W 5.5	2.5	Mat	Fair	Fair-good: slight bottle butt (basal trunk swelling) on east.	None	20=40	B2
T5	<i>Prunus avium</i> wild cherry	4.5	120	N 2 E 3 S 2.5 W 1.5	2.2	Y	Fair: suppressed	Fair: leans east	None	20-40	C2
T6 (TPO T61)	<i>Tilia x europaea</i> common lime	15	480	N 4 E 6 S 6 W 4.5	1.7	Mat	Good	Fair-good	Remove dead wood.	>40	B2
G7	<i>Prunus avium</i> wild cherry, ms, and <i>Laburnum anagyroides</i> laburnum	4	510 rf of ms cherry	2.5 approx	3	Y	Poor-fair: suppressed	Fair: leaning south east	None	10-20	C1
T8	<i>Prunus avium</i> wild cherry	3.8	100	2.5 approx	2.5	Y	Poor-fair: suppressed	Fair: leaning south east	None	10-20	C1
T9	<i>Prunus avium</i> wild cherry	4	110	N 2.1 E 2.1 S 2.1 W 5	2	Y	Fair: suppressed	Fair: leaning south	None	10-20	C1
T10	<i>Cupressus sempervirens</i> italian cypress/ pencil cedar	6	75	N 1 E 1 S 1 W 1	0	Y	Fair	Fair, but far too close to building	None	<10	C1
T11	<i>Cupressus sempervirens</i> italian cypress/ pencil cedar	7.2	110	N 0.8 E 0.8 S 0.8 W 0.8	0	Y	Poor: sparse and dead lower growth	Fair, but very close to building	None	<10	C1
T12	<i>Cupressus sempervirens</i> italian cypress/ pencil cedar	7.1	120	N 0.9 E 0.9 S 0.9 W 0.9	0	Y	Poor: some dead and diseased branches	Fair, but very close to building	None	<10	C1

Tree ident on plan	Species	Approx height in m	Stem diameter in mm @ 1.5m	Approx branch spread in m	Approx crown clearance in m	Age class	Physio-logical condition	Structural condition	Preliminary comments & recommendations	Est. remaining contribution in years	Category grading
T13 (TPO T63)	<i>Quercus robur</i> English oak	17	1130 o1	N 6.4 E 7.7 S 8 W 10	2.4	Mat	Fair	Fair-good so far as could be seen, but ivy restricted inspection of trunk and lower crown. Past heavy pruning: very large wounds, mostly occluding.	Crown lift and cut back lowest south-east branches over house to provide about 2m clearance, depending on branch structure and available growth points, to prevent damage to the house and tree from branch movement. To facilitate better inspection, sever ivy around trunk base and leave to die. Remove once dead and only after wildlife and habitat checks.	>40	B2
G14	(x14) X <i>Cuprocyparis leylandii</i> leyland cypress hedge	7.1 max	90-140	N 1.5 E 1.5 S 1.5 W 1.5	0	Y	Fair-good	Good	None	>40	C2
G15	(x3) <i>Olea europaea</i> olive	4.7 max	80 rf	N 0.2 E 3 S 2.5 W 1.5	1.5	Y	Fair	Fair	None	20-40	C2
N1	<i>Aesculus hippocastanum</i> horse chestnut	7.6	230	N 3 E 3 S 3.5 W 2.7	3	Y	Fair: sparse crown, leaf miner damage	Poor: bleeding canker, split and lifting bark	None	10-20	C2
NG2	(x4) <i>Acer pseudo-platanus</i> sycamore	15.5	300	N 4 E 1.5 S 4 W 4.5	4	Mid	Fair	unknown	None	20-40	C1
N3	<i>Prunus</i>	-	300?	not known	-	Mid	-	-	None	not known	C
NG4	group (number unknown) yew	7.4	300	N - E 2.5 S 2 W 3	-	Mid	-	-	None	>40	C1
NG5	mixed cypress and holly hedge	4.7	120 e	approx 1.5	-	Y	Fair	unknown	None	>40	C1



## APPENDIX B – PHOTOGRAPHS



Photograph 1, of the east trunk base of the sycamore T3 (January 2012).

T3

T1



Photograph 2, taken from Templewood Avenue, showing the sparse crown of the sycamore T3 (June 2011).





Photograph 3, taken from the front garden of 17 Templewood Avenue, showing the sparse crown of the sycamore T3 (June 2011).



Photograph 4, taken from the front garden of 17 Templewood Avenue, showing the poor condition and form of the italian cypresses T10, T11 and T12 (June 2011).





Photograph 5, taken from back garden of 17 Templewood Avenue, showing the branch growth of the oak T13 that would need to be pruned if the existing building were to remain. The first and second floors of the proposed new building would be set farther back than the ground and first floors visible here (June 2011).

## APPENDIX C – SCOPE

- C1 This report and its associated drawings are based on arboricultural criteria only. Comments and drawings relating to geological, structural, legal, planning policy or other non-arboricultural matters must be viewed as provisional and referred to appropriate specialists for confirmation and specification.
  
- C2 The tree condition survey was a visual tree assessment (VTA) from ground level, following industry-standard procedures, based largely on the principles described in *The body language of trees – A handbook for failure analysis*, by Claus Mattheck and Helge Breloer, and *Principles of Tree Hazard Assessment and Management*, by David Lonsdale. This was an independent and impartial assessment of the condition of the trees and was not influenced by consideration of any proposed scheme. The survey schedule of my findings, shown in Appendix A, includes preliminary recommendations for the management of the trees regardless of the future use of the site.
  
- C3 Tree heights were measured with a digital clinometer and, where accessible, tree trunks were measured with a diameter tape at 1.5m from the ground, or at the base of the trunk for multi-stemmed trees or those branching below 1.5m. Other measurements were estimated.
  
- C4 A number of trees adjacent to the site are included in the survey because they could be affected by, or could affect, any proposed changes to the site. No access was granted to these neighboring properties, so it was not possible to carry out a comprehensive assessment of these trees.
  
- C5 No invasive investigation, such as test-boring of a tree, was carried out and no branch, leaf, fruit or root samples were collected for analysis.
  
- C6 I rely on the *Desk Study and Ground Investigation Report* by Geotechnical and Environmental Associates Ltd (GEA) for information about soil conditions.
  
- C7 The tree constraints plan – drawing TCP 7101 rev c – is based on drawings provided by de Metz Forbes Knight Architects Ltd, with permission. Reference should be made to the original drawings for all details and dimensions other than those relating to trees.
  
- C8 Trees are dynamic organisms. They change as they mature, change in response to changed conditions around them, or change for reasons that science has not yet fully explained. No tree can ever be said to be completely safe. This report is valid for 12 months from the date of the tree survey, provided there are no environmental changes such as soil disturbance, building work or mechanical damage, or severe natural events/changes such as gales, drought or heavy snow.
  
- C9 Any tree work discussed and approved must take full account of: wildlife and habitat protection legislation; Tree Preservation Orders; Conservation Area tree protection; and tree phenology (natural cycle). Tree work should be carried out to modern arboricultural standards, as recommended in British Standard BS3998:2010 *Tree Work – Recommendations*.

## APPENDIX D – REFERENCES

BS3998:2010 *Tree Work – Recommendations*; British Standards Institution, 2010.

BS5837:2005 *Trees in Relation to Construction – Recommendations*; British Standards Institution, 2005.

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