

Application for Works to Trees Protected by a Tree Preservation Order or in a Conservation Area



TOWN & COUNTRY PLANNING (SCOTLAND) ACT 1997

For Office Use	
Reference No ATW/	
Date Received	
TPO	
Conservation Area	
Planning Ref	

1 APPLICANT NAME JAMES HENDERSON
 ADDRESS 2 HOWTOWN, THORNHILL
 POST CODE FK8 3PX
 PHONE [REDACTED] EMAIL [REDACTED]

2 AGENT/TREE SURGEON NAME FIONA MELVILLE
 ADDRESS
 POST CODE
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3 LOCATION OF TREE(S) ON BOUNDARY WITH 6 HOWTOWN
 IN GARDEN OF 2 HOWTOWN

4 DESCRIPTION OF PROPOSED WORKS

Tree No on Plan	Species	Proposed Work*	Reasons – Include Arborists report Health & Safety's subsidence etc
3	POPLAR	REMOVE TO GROUND LEVEL TO ALLOW COPPING	ARBORIST'S REPORT.
2	SPRUCE	REMOVE TO GROUND LEVEL	ARBORIST'S REPORT.
WORK TO BE CARRIED OUT WITHIN 3 MONTHS, DUE TO RISKS OF TREES FALLING. POPLAR WOULD FALL ON HOUSE.			ARBORICULTURAL REPORT.

*Proposed Works e.g crown thin (% or metre); crown reduction (% or metre); crown lifting; felling; pruning

5 SKETCH PLAN

Please provide an OS or sketch plan showing as accurately as possible the location of the trees in relation to site features. Please number trees as described at 4.

ACCURATE PLAN IN ATTACHED ARBORAL CONSULTANT'S REPORT

6 REPLANTING PROPOSAL

POLLARDING OF EXISTING TREES

7 LAND OWNERSHIP

Are you the owner of the land within which the tree(s) stand

Yes No

Has the owner been notified

Yes No

Signed

[Redacted Signature]

Applicant/Agent

Date

3/1/20

Please return to Stirling Council, Planning Services, Teith House, Kerse Road, Stirling, FK7 7QA
Tel: 01786 233660, Email: planning@stirling.gov.uk

Any personal data you have been asked to provide on this form will be held and processed in accordance with the requirements of the 1998 Data Protection Act.

ARBORICULTURAL REPORT

Title: **Impact on Tree Stability at No 2 Low Town Arising from Development and Associated Access Construction on Land East and Adjacent to No 8 Low Town, Thornhill, Stirlingshire**
Planning Ref 20/00805/Full

Instructed by: **Mr and Mrs J Henderson**
No 2 Low Town
Thornhill
Stirling
FK8 3PX

Prepared by: **Fiona Melville BSc (Hons) Arb, Dip For, M.Arbor.A**
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Date: **December 2021**

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Summary

The impact on the stability of three trees at no 2 Low Town from a neighbouring development known as “Land east of and adjacent to No 8 Low Town, Thornhill” was assessed based on observations and findings arising from a site visit carried out on 25.11.21 at the request of Mr and Mrs Henderson, residents at no 2 Low Town. Attention was drawn to the advice and recommendations made in the Alan Motion Tree Consulting Ltd Arboricultural Report prepared on behalf of the developer to satisfy a tree protection planning condition. The report identified the developer’s proposal to reduce ground levels to facilitate construction of a new access road and a retaining wall both of which would incur excavation into the Root Protection Area (RPA) of two of the three trees belonging to Mr and Mrs Henderson. Hand digging was recommended prior to any construction activities to identify the presence of significant tree roots (>25mm diameter) and these roots were not to be removed without prior consultation with the appointed Arboricultural Consultant. Mr and Mrs Henderson maintain that no hand digging was carried out and excavation was by machine only within the designated RPA of two trees. No photographic evidence supports a hand dig operation, and both the developer and architect are believed to have accepted liability for any eventual fall of Mr and Mrs Henderson’s trees, an event which would have severe consequences. Observations and findings are discussed with reference to expert literature on tree roots and stability, concluding that the excavations into the RPA has increased the likelihood of failure for two of the three trees and recommendations and that both should be removed to ground level within three months of the date of site visit and that the recommended tree protection barriers are put in place without delay for the third remaining tree.

1.0 Introduction

1.1 This is a preliminary report requested by the owners of the affected property, no 2 Low Town, Thornhill with respect to the stability of three trees located on their western property boundary arising from construction activities associated with a development identified as “Land East and adjacent to No 8 Low Town, Thornhill” (Planning Ref 20/00805/Full). The report discusses the potential for tree failure based on observations and findings from a site visit carried out on the morning of 25 November 2021 and draws attention to advice and recommendations made in the Alan Motion Tree Consulting Ltd Arboricultural Report dated 28 October 2021 submitted to satisfy a tree protection planning condition.

2.0 Client’s Instructions

- To make an assessment of the likelihood of failure in relation to whole tree stability and make recommendations for mitigation of risk

3.0 Limitations

3.1 The author of this report has not previously visited the site at any time prior to 25.11.21.

3.2 A full inspection of all trees outside the ownership boundary is outwith the scope of this report unless stated otherwise.

3.3 Tree inspection has been carried out from ground level and observations have been made solely from visual inspection within the site depending on accessibility to the tree, unless otherwise stated. No invasive or other detailed internal decay detection equipment have been used in assessing trunk condition.

3.4 Whilst every effort has been made to detect obvious defects within individual trees inspected, no guarantee can be given as to the absolute safety or otherwise of any individual tree. Extreme climatic conditions can cause damage to even apparently healthy trees. The specified timeframe for the findings of this report is 12 months from date of survey i.e. 25 November 2022.

3.5 The presence of dense ivy or other vegetation (e.g. holly) and dense evergreen crowns can inhibit or prohibit proper inspection as can location of trees to busy roads.

3.6 A full assessment of the mature hedgerow on the west boundary is out with the scope of this report, however a note is made as to exposed severed roots only.

3.7 Bats and their roost sites are protected by law as are nesting birds and other European Protected Species including Red Squirrels, and care must be taken to prevent contravention of the law when carrying out tree works. Tree felling operations should avoid the bird breeding season from end of March to beginning of September and for Red Squirrels from 1st February to 30 September (Scottish Natural Heritage). If in doubt, specialist advice should be sought prior to any work being carried out.

3.8 Felling permission may be required from Scottish Forestry (formerly Forestry Commission Scotland) under the Forestry and Land (Scotland) Act 2018 if any trees are **not immediately required** to be removed for the purposes of carrying out development granted by planning permission. This only applies where there is Full approved planning consent. 'Outline planning', 'pre planning' or 'planning in principle' are not exempt as no formal approval has been given for these. <https://forestry.gov.scot/support-regulations/felling-permissions>
Trees protected by a Tree Preservation Order or trees which are located in a designated

Conservation Area and which do not form part of a full approved planning consent are also protected by law and an application for permission to carry out tree works must be made in writing to the relevant local authority within the specified timescales unless any of the specified exemptions apply.

3.9 No soil samples were taken from no 2 Low Town or the neighbouring development site identified as "Land East and adjacent to No 8 Low Town, Thornhill" (Planning Ref 20/00805/Full).

3.10 This report has been prepared for the sole use of the client and their appointed agents. Any third party referring to this report or relying on the information contained therein do so entirely at their own risk.

4.0 Author's Qualifications

4.1 Fiona Melville is a fully qualified Professional Tree Inspector (TRAQ and LANTRA Awards) and holds a First class BSc (Hons) Arboriculture, a Diploma in Forestry and has over thirty five years' experience working with trees, forests and woodlands.

5.0 Survey Methodology

5.1 From the owners' garden at no 2 Low Town, a visual assessment from ground level based on the TRAQ Level 2 Basic Assessment process, reviewing current site conditions and available site history for the three trees including signs of any obvious defects which may contribute to the likelihood of failure over and above any impact observed from construction activities. The three trees were also viewed from the development site observing ground levels in relation to likely root spread and the presence of exposed significant (>25mm) tree roots.

5.2 A professional arboricultural report has already been prepared by Alan Motion Tree Consulting Ltd (AMTC Ltd) for the development site which includes estimated dimensions for the three trees. Fiona Melville, the author of the current report took measurements of stem diameters only, at 1.5m to confirm the root protection areas (RPAs) in line with BS 5837(2012) *Trees in relation to design development and demolition – Recommendations*. In addition, the diameter of a severed root belonging to the Norway Spruce was measured using a diameter tape where each diameter class is approximately 3cm.

6.0 Site Description

6.1 Thornhill village is a designated [Conservation Area](#) (ref Stirling Council Supplementary Guidance SG07 para 5.4) given the level of contribution both private and public green space

make to the area which includes individual trees and hedges. The “site” includes no 2 Low Town and the neighbouring development site identified as “Land east and adjacent to no 8 Low Town”. The site has a southerly aspect and is moderately sloping north to south. Both properties are separated by a mature hedgerow which forms the western boundary of no 2 Low Town. The three trees of concern are positioned along this boundary immediately adjacent to the hedgerow within the garden ground of no 2 Low Town. Google Earth Aerial images taken in 2009, 2017 and 2021 (Appendix A) show the land immediately to the west of Mr and Mrs Henderson’s boundary hedgerow as being largely laid to lawn throughout this period. This is concurred by Mr and Mrs Henderson, residents of no 2 Low Town.

7.0 Background

7.1 Mr and Mrs Henderson raised concerns with the construction agent MW Consultants and Iain Jeffreys Stirling Council Senior Planning Officer in March 2021 that the planning condition titled **no 8 Landscape – Tree Protection** criteria identified in the Stirling Council Decision Notice of January 2021 **Planning Ref 20/00805/Full** and latterly the Arboricultural Report prepared by Alan Motion Consulting Ltd, had not been fully complied with which led them to worry about the stability of three of their trees and the potential risk directly to their home and to themselves and family. The most serious concern is a tall middle aged Balsam Poplar (*Populus balsamifera*) located within falling distance of the kitchen and dining room of their home. The other two trees are a Sycamore (*Acer pseudoplatanus*) which may or may not affect the neighbouring property to the north, and a Norway Spruce (*Picea abies*) which may affect the proposed new dwelling referenced in the planning consent, and /or the garden space of no 2 Low Town should it fail. Mr and Mrs Henderson have been told by the Stirling Council planning officer that the developer and the architect have accepted liability for any eventual fall of the trees but they do not have this in writing.

7.2 The development proposals and associated construction activities with potential to impact on the trees belonging to Mr and Mrs Henderson include the **construction of an entrance driveway and construction of a retaining wall**. Both require a reduction in ground levels. An array of round mounted solar photovoltaic (pv) panels are to be installed to the north of the development site which appears to be outwith the root protection area (RPA) of one of the boundary trees.

7.3 Documentation made available to the author of this report:

1. Stirling Council Decision notice dated 22.01.21 in favour of Mrs Veronica Bachelor per MW Consultants ref **20/00805/Full** in which condition no 8 states:

- **Landscape – Tree Protection:** *No development shall take place until details of trees shrubs and hedgerows to be removed and to be retained, tree protection measures, soil stripping, storage and respreading procedures have been submitted to and approved in writing by the Planning Authority.*
2. Paper Copy of Site Plan to scale 1:100@A1 dated September 2021 prepared by Murray Watt (MW) Consultants highlighting the location of the existing hedgerow and *planting to be retained with infill planting to hedge.* The plan also highlights Tree Protection whereby *no trees or shrubs to be removed and that initial excavations are to be undertaken by hand to depth of 500mm to expose any encroaching tree/hedge roots.* These excavations were to be *supervised by a suitably qualified arboriculturalist (Alan Motion Tree Consultants Ltd)*
 3. Email dated 05.03.21 from Mrs Henderson to Murray Watt of MW Consultants requesting update as to implementation of Decision Notice Condition no 8 Landscape – Tree Protection
 4. Email dated 05.03.21 response from Murray Watt to Mrs Henderson confirming “*we will be proposing industry standard methods of protection accordingly*”
 5. Email dated 11.08.21 from Iain Jeffrey Stirling Council Senior Planning Officer confirming he had emailed the agent Murray Watt requesting that “*proposals prepared by a professional eg tree surgeon to address this condition are submitted.*”
 6. Tree Survey and Arboricultural Constraints Report dated 28 October 2021 prepared by Alan Motion Tree Consulting Ltd which includes the following:
 - a **Tree Protection Plan** (Appendix B) scale 1:500@A3 which identifies:
 - the three trees belonging to Mr and Mrs Henderson labelled T1, T2, T3.
 - colour coded canopy spread according to the BS5837(2012) assigned Category (Green Cat A, Blue Cat B and Grey Cat C respectively).
 - the **extent of Root Protection Area (RPA)** coloured purple.
 - the location of **tree protection barriers** dashed orange line.
 - a **Tree Survey Schedule** (Appendix C) which includes tree species, estimated diameter and height, condition and recommendations for each tree which highlight the need to **hand dig** where roots might occur.

8.0 Arboricultural Report by Alan Motion Tree Consulting Ltd - attention is drawn to the following paragraphs taken directly from the report, highlighting key points in yellow:

- **Para 6 Constraints Posed by Existing Trees:**
 - **Para 6.1:** *In order to minimise the risk of long-term damage to trees from construction operations, particular care is required to protect them from*

physical damage. Significant damage can be caused to tree root systems by ground level changes: soil compaction: contamination from oils and cement: and changes in soil moisture content. For these reasons, BS5837:2012 'Trees in relation to design, demolition and construction- Recommendations' sets out a recommended Root Protection Area (RPA) in m² based on the stem diameter of the tree. The RPA represents the anticipated below-ground constraints presented by trees within the proposed development area.

- **Para 6.4:** '.....Whilst the RPA should generally be protected where possible, any proposed incursion into the RPA should comply with the recommendations of BS5837, sections 6 and 7. Site specific method statements may be required to accompany such proposals.'
- **Para 7 Arboricultural Impact Assessment:**
 - **Para 7.2** 'Construction of the driveway requires a reduction in ground levels in order to grade the driveway from the road level into the site. This means reducing ground levels within the recommended RPA of tree number 3, which is a mature Balsam Poplar. Ground level reductions will inevitably cause some disturbance to fine feeding roots which will encroach into the development site.'
 - **Para 7.3** Further ground level reductions are required in order to construct the house and pedestrian access around the new building. This will necessitate the construction of a small retaining wall to accommodate the alteration in levels. There will be very minor encroachment into the RPA of Tree number 2 (Norway Spruce). This is unlikely to cause any significant impact on the tree.'
 - **Para 7.4** In order to minimise the impact on tree roots that may be encroaching into the development site from adjacent ground, an initial hand-excavation is advised, which will expose the presence of any significant (>25mm) tree roots. Where any significant roots are present, they will need to be cut cleanly to allow the approved development to proceed.
- **Para 8 Tree Protection Plan**
 - **Para 8.3** There should be no movement of machinery, stockpiling of materials, or changes in existing ground levels within the Construction Exclusion Zone throughout the duration of the construction works.
 - **Para 8.4:** Where excavations are necessary and approved within the CEZ all works must comply with BS5837:2012, Section 7.2. Excavations should be dug by hand. Any small roots (<25mm diameter) damaged will be pruned back (ideally to a lateral root branch) using bypass secateurs or handsaw. Roots

larger than 25mm should not be removed without prior consultation with the appointed Arboricultural Consultant.

- **Para 8.5:** Any **exposed tree roots should be covered with clean topsoil as soon as practical to prevent desiccation.**

n.b BS5837(2012) is the British Standard industry document titled *Trees in relation to design, demolition and construction – Recommendations*. It identifies the requirement for a Root Protection Area (RPA) which forms a Construction Exclusion Zone (CEZ). This area is calculated using the **radius derived from the diameter of the tree measured at 1.5m from ground level**. Sections 6 and 7 relate to the protection of trees above and below ground during the construction process which should be described within a site specific arboricultural method statement to *demonstrate that the operations can be undertaken with minimal risk of adverse impact on trees to be retained*.

9.0 Observations and Findings

9.1 The boundary between the two sites is formed by a mature hedgerow. The three trees labelled T1 (Sycamore), T2 (Norway Spruce) and T3 (Balsam Poplar) on the Alan Motion Tree Consulting Ltd (AMTC Ltd) Tree Protection Plan are immediately adjacent to the hedgerow located within the garden ground of no 2 Low Town. The three trees are elevated and exposed to prevailing winds generally coming from a west and south westerly direction.

- No Root Protection Barriers were in place for any of the three trees T1, T2, T3, at the time of the site visit on 25.11.21 (Photo 1).
- It is unclear whether the positioning of trees T1 to T3 have been estimated or located via topographic survey for the site which may have an effect on the extent of RPAs within the development site. The trees do not appear on the scaled paper copy of MW Consultants Site Plan dated September 2021.
- It was evident that ground levels had been reduced within the RPA of poplar tree T3 and Norway Spruce T2 (Photo 2).
- The root flare of the poplar T3 on the windward west boundary viewed from no 2 Low Town garden ground, indicates that root growth in this direction i.e. towards the development site, was probable (Photo 3).
- The estimated tree diameter for T3 is given in the AMTC Ltd report as 55cm, where the radius of the RPA would be 6.6m. A scaled copy of the Tree Protection Plan was not available at time of writing; however, the plan illustrates that a significant

proportion of the designated RPA of T3 extends across the proposed access road - a reasonable estimate would be approximately one third of the total RPA shown for T3.

- The root zone of T3 viewed from the development site showed no presence of poplar roots because soil had been banked up onto the graded slope formed by the road excavation directly below the poplar tree (Photo 4). Soil would have to be removed to expose any underlying roots or parts thereof.
- The Norway Spruce labelled T2 clearly showed evidence of at least one severed lateral root of >25mm diameter, extending into the former undisturbed garden ground (Photo 5) with another severed root extending north along the boundary line. (Severed root measured approximately 6cm diameter (60mm).
- A photograph taken by Mrs Henderson on the 22 October 2021 (Photo 6), six days prior to the date of the AMTC Ltd Arboricultural Report, shows debris which includes significant tree roots piled on the new access road formation. However, there is no way of knowing if these roots belonged to the Poplar tree T3 or came from some other mature tree outwith the development site.
- Excavations have exposed hedgerow roots, some of which were severed and remained exposed (Photo 7).

10.0 Tree Roots

10.1 Tree roots have two main functions: to stabilise the tree and to transport moisture and nutrients. They are usually found within the top 600mm and exploit any suitable volume of soil for water and nutrients. Severance of main supporting structural roots via construction activities and/or installation of utilities within the Root Protection Area (RPA) can lead to instability and failure. The removal of large clumps of fine spreading fibrous roots will prevent moisture and nutrient uptake.

10.2 Construction activities such as the passage of vehicles, storage of heavy materials and frequent visitor footfall in and around the root zone can lead to soil compaction which results in the squeezing out of all the air spaces available to the fine root hairs of the tree preventing absorption of moisture and nutrients which can lead to an irreversible decline in the tree's vitality.

10.3 Structural roots which contribute to anchorage and stability, lie within the "zone of rapid taper" usually 1 to 2m from the tree (Alani et al, 2018) with smaller roots lying further from this zone also providing support via cohesion with the soil. Root systems develop in response to their environment, including the mechanical stresses they experience (Dunster et al., 2017)

One response is for the tree to lay down reaction wood to adapt to the changing loads and stresses placed upon it, this takes time. In conifers this is generally laid down as compression wood, in T2 this can be observed in the buttress root on the leeward side (Photo 8). In broadleaves e.g. T3, tension wood is laid down in response to the prevailing winds with the formation of long rope-like tension roots on the windward side and sturdy buttress like roots on the leeward side similar to the roots observed on T3 on the leeward side (Photo 9). If tension roots on the windward side are damaged, severed or decayed, the likelihood of root failure is increased (Dunster et al (2017).

10.4 Both T2 and T3 are shallow rooters with spruce trees in particular liable to become unstable if lateral root development is restricted (Lonsdale, 1999). Previously good anchorage can be impaired following a change in conditions and root severance provides entry points for decay (Lonsdale, 1999). The lowering of soil levels increases the probability of failure (Dunster et al, 2017).

11.0 Discussion and Tree Assessment

11.1 The sycamore, T1 has a lean towards the east garden ground of no 2 Low Town due to competition from the evergreen canopy of T2. There are no obvious features to indicate that T1 is unstable and as yet its RPA remains undisturbed from neighbouring construction activities. If the root barriers are put in place as recommended by the Tree Protection Plan, compaction of soils should be prevented during installation of the ground solar panels.

11.2 There is evidence of significant diameter root severance of T2, the spruce tree, on the windward side which remained exposed at time of site visit. The location of the proposed dwelling house will result in a change in wind loading contrary to the loading and stresses tree T2 has already adapted to over time.

11.3 Roots will generally grow where soil is undisturbed. In the case of T3 the poplar, the Google Earth images mentioned previously do indicate that the soil in this location was mainly laid to lawn. It was concurred by Mr and Mrs Henderson; the soil at this location remained undisturbed for a number of years until the new development created a new entrance road. T3 would under these conditions with an unimpeded soil volume, be expected to form the rope like tension roots described earlier in this report on the windward side.

11.4 The RPAs for T2 and T3 shown on the Tree Protection Plan extend across the areas of construction for the retaining wall and the access driveway. The AMTC Ltd report recommends that initial excavations are carried out by hand to expose significant roots prior to construction

and that these should not be removed without prior consultation with the appointed Arboricultural Consultant. The MW Consultants Site Plan states this operation would be supervised by a qualified arboriculturalist. However, I am unaware if any photographic, video or written records exist regarding the recommended hand digging to expose tree roots prior to construction, or if the appointed arboriculturist was consulted prior to root severance of T2 roots which can be identified as significant (>25mm diameter). Mr and Mrs Henderson maintain that a mechanical digger was used from the outset and that no hand digging was observed.

11.5 T2 and T3 are exposed to the prevailing winds from the west and southwest. Mr and Mrs Henderson's house and garden are located on the leeward side of these trees with T3 well within falling distance of the property. T2 is within falling distance of the garden area where there is also a play space for children.

11.6 The recent Storm Arwen (26 and 27 November 2021) may have weakened root systems further by subjecting trees to severe and damaging winds coming from a northerly rather than the usual prevailing wind direction against which these trees have, over time, laid down appropriate reaction wood. In addition, the location of a new dwelling may create different wind loading and stresses on T2 in particular.

12.0 Conclusions and Recommendations

12.1 A reduction in ground levels within the designated RPA was evident for trees T2 and T3 and there appears to be no record of the hand digging operations recommended by Alan Motion Tree Consulting Ltd prior to construction activities or, that supervision by a suitably qualified arboriculturalist was in place for that purpose. Mr and Mrs Henderson maintain that no hand digging was observed, only mechanical excavation. They also maintain that liability has been accepted by the developer and architect for any eventual fall of trees, but this is not confirmed in writing. Failure of T2 and T3 in any direction could have severe consequences.

12.2 It is highly likely roots were present in previously undisturbed ground and that these roots would provide moisture, nutrients and anchorage in the form of tension roots on the windward side. It was evident that significant roots >25mm in diameter, had been severed in the case of the spruce tree T2, on the windward side and that these remained exposed. The reduction in ground levels occurred within the rapid zone of taper for both T2 and T3 where supporting roots are highly likely to occur.

12.3 Based on the observations and findings discussed in this report, it is probable that the likelihood of failure has increased for T2 and T3. There appeared to be no obvious impact on

T1 at the time of visit, however this could change if the recommended protection barriers remain absent.

13.0 Management Recommendations

1. T1 erect BS5837(2012) specified protection barriers ASAP to the extent of the AMTC Ltd designated RPA or canopy spread whichever is the greater to prevent soil compaction and/or damage during installation of the ground mounted solar pv panels.
2. Remove T2 to ground level within the next three months
3. Remove T3 to ground level within the next three months and allow coppice growth.
4. Monitor hedgerow health up to two seasons post development with the developer making good any replacement planting required.
5. Monitor T1 at no 2 Low Town to identify any changes to health and/or stability up to two seasons post development with the developer making good any work required to mitigate further risk if tree protection measures are not fully complied with.
6. An application for permission for tree works must be made to Stirling Council.
7. Tree works should be carried out by suitably qualified arboricultural contractors in accordance with the recommendations given in BS3998: (2010) *Tree Work - Recommendations*.

Technical References

Alani, A.M., et al (2018) Mapping the root system of matured trees using ground penetrating radar, *University of West London, W5 5RF*

Arboricultural Association (2010) Protected Species and Arboriculture, Guidance Note 10, *Arboricultural Association, Gloucestershire*

Barrell Tree Consultancy (2021) Manual for Managing Trees on Development Sites v3, *Field House, Hampshire*

BSI 3998: (2010) British Standard Tree Work-Recommendations *British Standards Institution, London*

BSI 5837:(2012) Trees in relation to design, demolition and construction. Recommendations *British Standards Institution, London*

Dunster, J.A., (2017) *Tree Risk Assessment Manual Second Edition*, International Society of Arboriculture P.O. Box 3129, Champaign, Illinois

Lonsdale, D., (1999) *Principles of Hazard Assessment and Management*, The Stationery Office, London

Patch, D., and Holding, B., (2007) Through the Trees to Development, Arboricultural Practice Note 12, *Arboricultural Advisory and Information Service, Farnham, UK*

Roberts, J., Jackson, N., Smith, M., (2006) *Tree Roots in the Built Environment*, The Stationery Office, London

NJUG (2007) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees Vol 4, *National Joint Utilities Group*

Website links

http://nhbccampaigns.co.uk/landingpages/techzone/previous_versions/2011/Part4/section2/default.htm **NHBC Building near Trees**

<http://www.kbiuk.co.uk/> *example* **Flexible porous surfacing**

<https://www.greenfix.co.uk/> *example* **Cellular confinement systems Geoweb**

<http://www.tdag.org.uk/trees-in-hard-landscapes.html> **Tree Design Action Group**

<https://www.trees.org.uk/News-Blog/News/Biosecurity-in-Arboriculture-and-Urban-Forestry-Po> **Biosecurity**

<https://www.youtube.com/watch?v=AbbxFqHaCTk> **Example Airspade Demo**

<https://www.youtube.com/watch?v=-Q4rO2iyyXg> **Tree Root Radar case study**

Appendix A - Google Earth Images



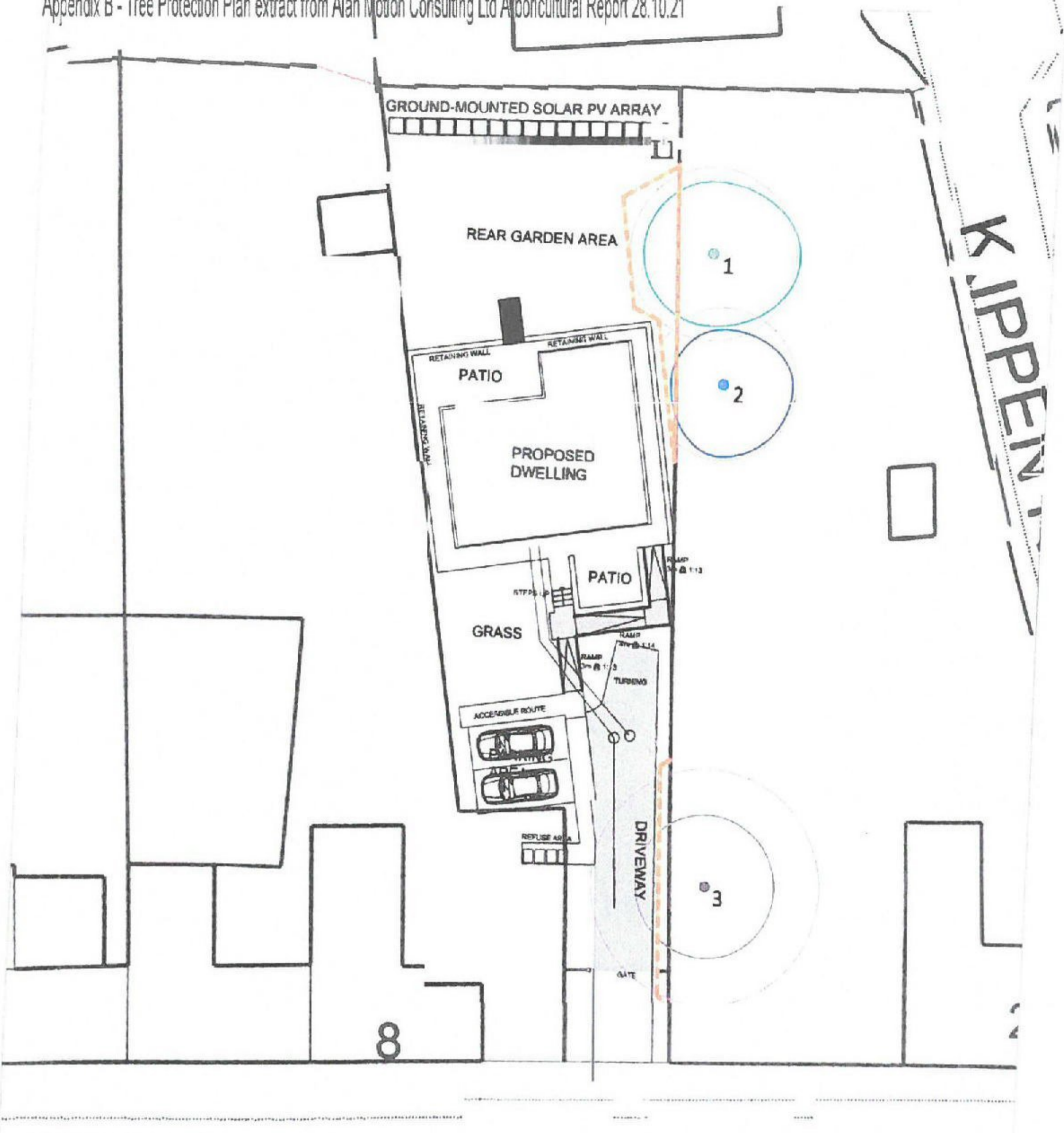
Source: Google Earth street view image capture May 2009. T3



Source: Google Earth image @2017. Red line indicates existing wood panel fence at proposed development pre-excavation/driveway construction. T1-T3



Source: Google Earth image @2021. Red line indicates existing wood panel fence at proposed development pre-excavation/driveway construction. T1-T3



- 3895 TREES CATEGORY A
- 3995 TREES CATEGORY B
- 3895 TREES CATEGORY C
- 3995 TREES CATEGORY U

- ROOT PROTECTION AREA BSS837:2012 S4.6.
- CONSTRUCTION EXCLUSION ZONE PROTECTIVE FENCE

NOTE: All trees designated for retention to be protected by the erection of fencing in accordance with Section 6.2 and Figure 3 of BSS837:2012 (Construction Exclusion Zone). Protective fencing must be installed prior to all construction operations, including demolition works. There shall be no alterations in ground levels, excavations, storage of materials, or access by machinery within the Construction Exclusion Zone through the duration of the works.

Tree survey details recorded in accordance with BSS837:2012. Numbers relate to tree tags. For detailed tree information refer to the accompanying report and schedule.

Alan Motion Tree Consulting Ltd
Chartered Forester, Arboricultural Consultant

Fairlie House - Main Street - Bushbyrie - Stirling - FK8 3LX
Tel: 07866 308254 Tel: 01250 220634
alan@alanmotion.co.uk
www.alanmotion.co.uk

CLIENT: Mrs V Batchelar
PROJECT: 8 Lowtown, Thornhill
DRAWING TITLE: Tree Protection Plan
DRAWING No: TP-01
DATE: 18-10-21
SCALE: 1:500 at A3
REV:

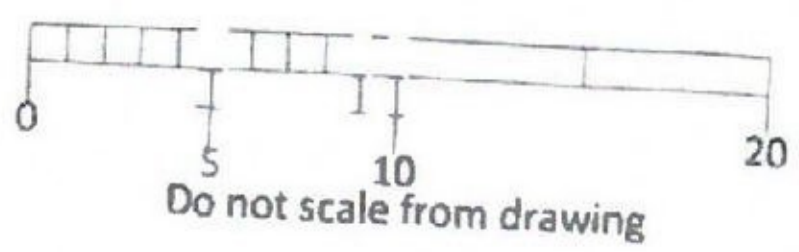


TABLE 2 TREE SURVEY SCHEDULE

Tag No	Species	DBH	N	S	E	W	Ht	C.Ht	BS Cat	Condition	Age	Stems	ERC	Comments	Recommendations
1	Sycamore	0.57	4	5	5	4	15	7	A1	Good	20+	3	40	In adjacent ground	
2	Nonzygospore	0.30	2	1	1	3	13	3	B2	Good	10-15	1	20 to 40	In adjacent ground.	Run dog nearby for risk of retaining wall.
3	Balsam poplar	0.55	6	4	4	4	15	3	C1	Fair	10-15	1	20 to 40	In adjacent ground. Poor choice of species for confined garden, will quickly outgrow space, potential to invade drives. Highly likely to cause long term disruption to surrounding walling.	Handing for line of driveway. Carefully expose any tree roots encroaching into site. Prune back roots as required to face of excavation, cover with soil to prevent desiccation.



Photo 1 Trees T1 to T3
no protection barriers 25.11.21



Photo 2 depth of excavations proximal to
T1- T3 taken by Mrs Henderson 27.10.21



Photo 3 red arrow indicates
T3 root flare to west boundary
25.11.21



Photo 4 Soil
grading to form
banking at T3
25.11.21



Photo 5 red arrows point to T2 severed spruce roots 25.11.21.



Photo 6 Pile of debris containing tree roots taken by Mrs Henderson 22.11.21



Photo 7 Exposed hedgerow roots taken by Mrs Henderson 16.11.21



Photo 8 T2 Red arrow to compression wood on leeward side 25.11.21



Photo 9 T3 Red arrow to sturdy buttress like roots on leeward side 25.11.21