HERITAGE ECOLOGICAL LIMITED

Birchwood House, Livingston Village: Tree Survey

December 2023

A report to Mill Architects Ltd. on behalf of Mr. & Mrs, Donaldson

	DATE	PREPARED	REVIEWED	REMARKS
ISSUE 1	**05/10/2022**	**MB**	**DD**	-
REVISION 1	**12/12/2023**	**MB**	**SG**	Revised following provision of new Project layout.
REVISION 2	**15/12/2023**	**MB**	**DD**	**Revised following minor comments from client**
REVISION 3				

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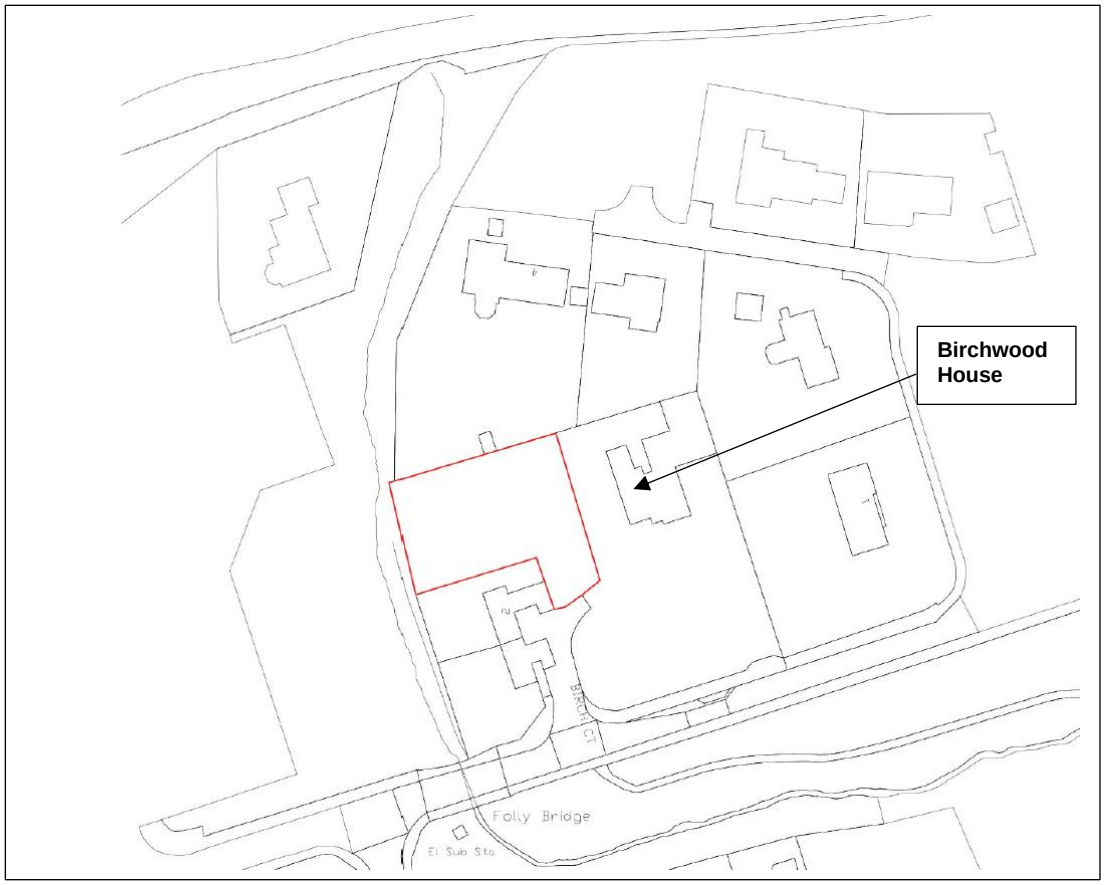
1 INTRODUCTION

1.1.1 This independent report by Heritage Ecological Ltd (HEL) has been prepared for Mill Architects Ltd. on behalf of Mr. & Mrs Donaldson (the Client), and presents the results of a Tree Survey and Arboricultural Impact Assessment (ArbIA), in relation to a planning application for a proposed development at Birchwood House, Livingston Village in West Lothian Council area. The Ordnance Survey grid reference for Birchwood House is NT 04062 67027, and the location is shown in **Figure 1** below.

1.1.2 The fieldwork and report has been completed by Mark Bates MCIEEM (HEL Director) and Simon Green MCIEEM (HEL Director), who have been professional ecologists for over 20 and 25 years respectively, and have successfully completed The Arboricultural Association course on *British Standard 5837: 2012 Trees in Relation to Design, Demolition & Construction – Recommendations* and the Lantra *Basic Tree Survey and Inspection Course*.

Figure 1: Location of Birchwood House and Project area



1.1.3 Avoidance, mitigation and/or compensation measures have been recommended where it is anticipated that the proposed Project may result in a significant effects on trees without measures being implemented or in accordance with Best Practice guidelines, or to fulfil legal obligations.

1.1.4 Scottish National Planning Framework 4 (NPF4) includes consideration of the following principles:

- Development plans should facilitate biodiversity enhancement;
- Development proposals should contribute to the enhancement of biodiversity;

- Potential adverse impacts of development proposals on biodiversity, nature networks and the natural environment should be minimised; and
- Proposals for local development should only be supported if they include appropriate measures to enhance biodiversity, in proportion to the nature and scale of development.

1.1.5 Enhancement measures are therefore recommended that are proportionate to the Project, in order to ensure biodiversity enhancement.

1.2 Policy and Guidance

1.2.1 The Tree Survey and ArbIA has been completed with specific regard to recommendations given in the following:

- British Standard 5837: 2012 Trees in relation to Design, Demolition & Construction – Recommendations (BS 5837).

1.3 Outline of Project

1.3.1 It is understood that the Project will include the development of a residential property within the north western part of the garden ground of Birchwood House, with access taken from an existing driveway (refer **Figure 1**).

1.4 Study Area

1.4.1 The location of the proposed Project (application site boundary) is shown on the drawing provided by the Client and presented in **Figure 1**. As required by BS5837 all trees >75 mm stem diameter measured at 1.5 m above ground level (agl) within or overhanging the application site boundary have been assessed.

1.4.2 The above study area has been defined in recognition of current survey guidelines and professional judgement, and is considered to be appropriate in assessing any potential arboricultural effects arising from the proposed development.

2 TREE SURVEY METHODOLOGY

2.1 Scope

2.1.1 The Tree Survey has included the following:

- Desk Study to confirm presence of any Tree Protection Orders (TPOs) and areas listed on the Ancient Woodland Inventory (Scotland) within the Project area; and
- Tree Assessment According to BS 5837: 2012 Trees in Relation to Design, Demolition & Construction.

2.2 Desk Study

2.2.1 West Lothian Council's website (https://www.westlothian.gov.uk/conservation-areas) and the Scottish Environment website (https://www.environment.gov.scot/maps/scotlands-environment-map/) were consulted in relation to TPOs, Conservation Areas and areas listed on the Ancient Woodland Inventory on 06th October 2023.

2.3 Tree Survey

2.3.1 The survey study area was systematically walked on 05th October 2023 and all trees were assessed according to the current recommendations in BS 5837. A visual assessment from

the ground was undertaken of all individual trees/sampled for tree groups >75 mm stem diameter measured at 1.5 m agl, and the following recorded in accordance with BS 5837:

- Tree position identified on topograpical survey or hand-held GPS;
- Individual tag number with tags affixed on main stem north-facing at c. 1.5 m agl;
- Common and scientific name of tree according to *New Flora of the British Isles(3rd Edition), Stace, C. Cambridge University Press*;
- Tree quality and value assessment, defining trees as Category U, A, B and C (refer to **Table 1**, below);
- Type defined as single tree (T), group (G) or hedgerow (H);
- Life stage defined as either: Y= Young (less than 1/3 normal life expectancy), MA= Middle aged trees (1/3 to 2/3 normal life expectancy), M= Mature (over 2/3 normal life expectancy) or OM= Over Mature (beyond usually expected life span);
- Height (m) recorded to the nearest half metre for heights up to 10 m and the nearest whole metre for heights > 10m;
- Number of stems;
- Stems 1-5 diameter (mm), or if >5 stems mean stem diameter (mm) rounded to the nearest 10 mm;
- 1st branch height (m) and direction, noted as north (N), east (E), south (S) or west (W);
- Canopy height (m);
- Branch spread (m) taken to the nearest half metre at the four cardinal points (N,E,S,W) measured from trunk;
- Root Protection Area (RPA) defined for single stem trees as an area equivalent to a circle with a radius x12 the stem diameter. For trees with two to five stems the combined stem diameter is calculated according to the following:

  $\sqrt{(stem\ diameter\ 1)^2 + (stem\ diameter\ 2)^2 \ldots . + (stem\ diameter\ 5)^2}$

  or trees with more than five stems the combined stem diameter calculated as $\sqrt{(mean\ stem\ diameter)^2\ x\ number\ of\ stems}$;
- Structural/physiological condition defined as Good, Fair, Poor, Moribund or Dead, and any presence of decay and/or physical defects;
- Remaining contribution of tree, defined as <10, 10-20, 20-40 or 40+ years; and
- Comments.

2.3.2 As per BS 5837 recommendation, hedgerows and stands of trees containing the same species (or mix of species) and age class/condition and which are therefore arboriculturally similar in character have been assigned either as a hedgerow (H) or tree group (G). Tree groups (G) and hedgerows (H) have not been tagged but were assigned as G1…Gn or H1….Hn respectively, and summary biometric data has been collected. Those trees and/or tree groups outwith the land ownership boundary and which could not be inspected were assessed from the site boundary, and as per BS 5837 recommendations have not been tagged, but were assigned as #T1…. #Tn, #G1 ….. #Gn and #H1…….#Hn respectively. Biometric data were estimated in this circumstance.

2.3.3 Trees are large dynamic organisms whose health and condition can change rapidly; therefore due to the changing nature of trees and other site considerations, this report and any recommendations made are only valid for the 12 month period following the site

survey which was conducted on 05th October 2023. It should be noted that the tree survey undertaken does not constitute a comprehensive Tree Hazard Survey.

2.3.4 It should be noted that no soil survey has been completed and/or used as part of this tree survey/assessment.

Table 1: Assessment of Tree Quality

Category and Definition	Criteria (including sub-categories where appropriate)			Identification on figures
Trees unsuitable for retention				
Category U **Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years**	- Trees that have serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other Category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning); - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline; - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality.			**Dark Red**
Trees to be considered for retention				
Category A **Trees of high quality with an estimated remaining life expectancy of at least 40 years**	1. **Mainly arboricultural qualities** Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue).	2. **Mainly landscape qualities** Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.	3. **Mainly cultural values, including conservation** Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood pasture).	**Light Green**
Category B **Trees of moderate quality with an estimated remaining life expectancy of at least 20 years**	Trees that might be included in Category A, but are down-graded because of impaired condition (e.g. presence of significant though remedial defects, including un-sympathetic past management or storm damage), such that they are unlikely to be suitable for retention beyond 40 years; or trees lacking the special quality necessary to merit Category A designation.	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.	Trees with material conservation or other cultural value.	**Mid Blue**
Category C **Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm**	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.	Trees with no material conservation or other cultural value.	**Grey**

Notes on Tree Categories

1. Category U trees signifies trees that are in such a poor condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years and which should, in the current proposed development context, be removed for reasons of sound arboricultural management or health and safety, irrespective of any development proposals.

2. Category A trees signifies trees that are of a high quality and value with an estimated remaining life expectancy of at least 40 years. Occasionally a veteran tree, although not in the best condition may warrant this category because of its wildlife and cultural value. The design of the proposed development should take into account the retention of Category A trees where possible. A masterplan layout that suggests the removal of Category A trees has a considerably increased risk of planning refusal.

3. Category B trees signifies trees that are of a moderate quality and value with an estimated remaining life expectancy of at least 20 years. The design of the proposed development, where feasibly possible, should take into account the retention of Category B trees.

4. Category C trees signifies trees that are of low quality and value with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm. They are generally trees that could remain and are expected to have a safe useful life expectancy of between 10 and 20 years if no development were to occur. All Category C trees; under normal circumstances would not normally be retained in a development context, unless in such a location that they do not represent a significant constraint on the development proposal – refer to relevant note at foot of Table 1 of BS5837.

5. Therefore all Category A & B trees will, under normal circumstances, be retained on development sites, and should influence and inform the design, site layout, and in some cases the specific construction methods to be used – The root protection areas of these trees will generally form a construction exclusion zone, although under certain circumstances it may be possible to build within these areas providing that appropriate specifications have been agreed between the local planning authority, the consulting arboriculturist and the developer/client.

6. Where Ash Die-back (caused by Hymenoscyphus fraxineus - an Ascomycete fungus resulting in a chronic fungal disease of ash trees in Europe, characterised by leaf loss and crown dieback and typically death of infected trees) is encountered a pragmatic approach to their categorisation is adopted. As recommended by The Tree Council in Ash Dieback: An Action Plan Plan Toolkit (2019), all ash have been categorised according to the following health classes:

    - Health Class 1 – 75-100% canopy healthy;
    - Health Class 2 – 50 – 75% canopy healthy;
    - Health Class 3 – 25- 50% canopy healthy; and
    - Health Class 4 – 0 -25% canopy healthy

    Where no Ash Die-back is recorded for a particular tree then it is assessed entirely as outlined in **Table 1** above. Where only minor symptoms of the disease are recorded (Health Class 1) then the tree is assessed as Category C with a remaining life expectancy of >10 years. However, where trees exhibit significant symptoms (Health Class 4), e.g. die-back of scaffold branches and stems, lesions on the bark, secondary infections, etc. and life expectancy is expected to be <10 years then the tree is assessed as Category U. It should be noted that trees affected with Ash Die-back, particularly those classified as Health Class 2 and 3, should be regularly checked to assess development of the disease and may require increased levels of inspection and/or arboricultural works.

2.4 Assessment of Effects

Introduction

2.4.1 The process of ArbIA has been completed where sufficient information is available during the preparation of this report. The assessment of effects has been undertaken by consideration of best practice guidance outlined in BS 5837, and professional judgement, in order to provide a methodology that is robust and fit for purpose for this Project.

2.4.2 As recommended within BS 5837, ArbIA involves consideration of the collected information and evaluation of the direct and indirect effects of the proposed project, and where necessary recommends measures to reduce impacts to non-significant levels. The following measures are considered as part of the ArbIA:

Avoidance Measures

2.4.3 Avoidance measures (where required and possible) are recommended that will avoid impacts on important tree features, such as consideration of alternative sites, revision of site layout/extent, etc.

Mitigation Measures

2.4.4 Mitigation measures are recommended where it is anticipated that a significant effect may result without measures being implemented or in accordance with Best Practice guidelines, or to fulfil legal obligations. Examples of mitigation measures include protection of root protection areas from works.

Compensation Measures

2.4.5 Compensation measures are recommended where it is anticipated that a significant residual effect may result even with avoidance and/or mitigation measures being implemented. Examples of compensation measures include replacement planting of site appropriate trees to be lost to the development.

Enhancement Measures

2.4.6 In order to ensure that the Project results in biodiversity net gain, enhancement measures will be recommended where these are considered to be proportional and relative to the scale and nature of the project.

Assessment of Residual Effects

2.4.7 An assessment of avoidance/post-mitigation/compensation effects is provided to show the overall effect of the proposed Project.

3 SURVEY RESULTS AND ASSESSMENT

3.1 Site Designations

Tree Preservation Orders

3.1.1 A Tree Preservation Order (TPO) is an order made by a Local Planning Authority in respect of trees or woodlands made under Section 160 of the Town and Country Planning (Scotland) Act 1997. The principal effect of a TPO is to prohibit the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of trees without the authority's consent.

3.1.2 None of the trees within the proposed Project site (or adjacent properties) are currently afforded TPO status.

3.1.3 Given that no TPO's will be directly/indirectly impacted as a result of the proposed Project it is considered that there will be no requirement for avoidance, mitigation or compensation measures for TPO's.; however, refer to **Conservation Area**, **para 3.1.4 – 3.1.6**.

Conservation Area

3.1.4 Trees often contribute significantly to the character of Conservation Areas, and it is an offence for any person to cut, lop, top, uproot, wilfully damage or destroy any tree in a Conservation Area unless six weeks' notice has been given to the Local Planning Authority. This gives the Council time to consider making a TPO in appropriate circumstances.

3.1.5 The study area is located within the *Livingston Village Conservation Area*.

3.1.6 Therefore, West Lothian Council will need to be consulted to see if they wish to designate any trees within the Project area.

Ancient Woodland Inventory (AWI) for Scotland

3.1.7 The Scottish Environment Website confirms that the Project area and adjacent land is not listed on the Ancient Woodland Inventory (AWI) Scotland, or listed as Native Woodland under the Native Woodland Survey of Scotland (NWSS).

3.1.8 Given that no woodland listed as AWI/NWSS will be directly/indirectly impacted as a result of the proposed Project it is considered that there will be no requirement for avoidance, mitigation or compensation measures for these designations.

3.2 General Description of Study Area

3.2.1 The study area extends to c. 0.06 hectares/ 0.5 acres and comprises the western portion of the well maintained gardens of Birchwood House. The area is delineated to the north by a wooden fence and masonry wall with the adjacent residential property; to the east by an internal garden hedgerow; the south by a wooden fence forming the boundary with an adjacent residential property; and to the west by a boundary hedgerow with the Folly Burn beyond.

3.2.2 The study area includes the mature gardens of Birchwood House, and is primarily laid to lawns with a number of hedgerows, a limited number of amenity trees and several fruit trees as part of a small orchard. Several trees are present on the northern neighbours' boundary, and are included in the tree survey.

3.3 Overview of Trees

3.3.1 **Table 2** below provides an overview of the tree survey, with **Figure 2** in **Appendix A.1** showing the location of all trees together with their associated categories and RPAs. **Table 7** in **Appendix A.2** provides a tree schedule and tree descriptions for the study site. **Photographs 1 - 4** are provided below to illustrate the trees within the study area.

Table 2: Overview of Tree Survey

Tree Category	Single Trees	Tree Groups	Hedges	Retention Value on Site
U	0	0	0	Trees with life expectancy of <10 years. The reasons for removal include trees being dead/moribund, presence of significant rot, Ash Die-back, poor form, suppression or general die-back within the tree. Details for each tree can be found in the survey data in Appendix A.2.
A	1	0	0	Trees of high quality with an estimated remaining life expectancy of at least 40 years
B	4	0	2	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years .
C	4	1	2	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm .
Total Number	9	1	4	

Category U

3.3.2 No trees were classified as Category U trees (unsuitable for retention with a life expectancy of <10 years) within the study area.

Category A

3.3.3 A single Category A tree (trees of High Quality) has been recorded from the study site, namely:

- Sycamore *Acer pseudoplatanus* (#T1) – mature tree present c. 1 m to north of northern boundary fence in adjacent neighbours garden; appears to be in good structural and physiological condition with a height of c. 25 m with a main stem diameter of c. 1000 m, and an average canopy spread of c. 11 m with an RPA of 17.52 m radius. The tree is considered to be of high arboricultural and landscape quality, A2.

Category B

3.3.4 Category B trees (trees of Moderate Quality) within the study area include 4 trees and 2 hedgerows, namely:

- European beech *Fagus sylvatica* (Tag No. 0801) – middle-aged garden tree, c. 14 m high with 2 main stems of 390 and 350 mm diameters respectively;
- Silver birch *Betula pendula* (Tag No. 0803) – mature garden tree, c. 17 m high with single main stem of 600 mm diameter. Appears to possibly be in early stages of senescence;

- Siver birch (Tag No. 0804) – middle-aged garden tree, c. 18 m high with single stem of 340 mm diameter;
- Hornbeam *Carpinus betulus* (Tag No. 0807) – middle-aged boundary tree, c. 18 m high with single stem of 460 mm diameter;
- Hawthorn *Crataegus monogyna* (70%)/ garden privet *Ligustrum ovalifolium* (20%) / snowberry *Symphoricarpos albus* (10%) (H3) – middle-aged internal garden hedge, 2.2 – 2.4 m high, cut hedge with average of 4 stems of 25 mm diameter; and
- Leyland cypress *Cupressus × leylandii* (60%) / holly (30%) / sycamore (10%) (H4) – middle-aged boundary hedgerow, 8 m high with single stem of 90 mm diameter.

3.3.5 Category B trees/hedgerows are of moderate quality for mainly landscape reasons, B2.

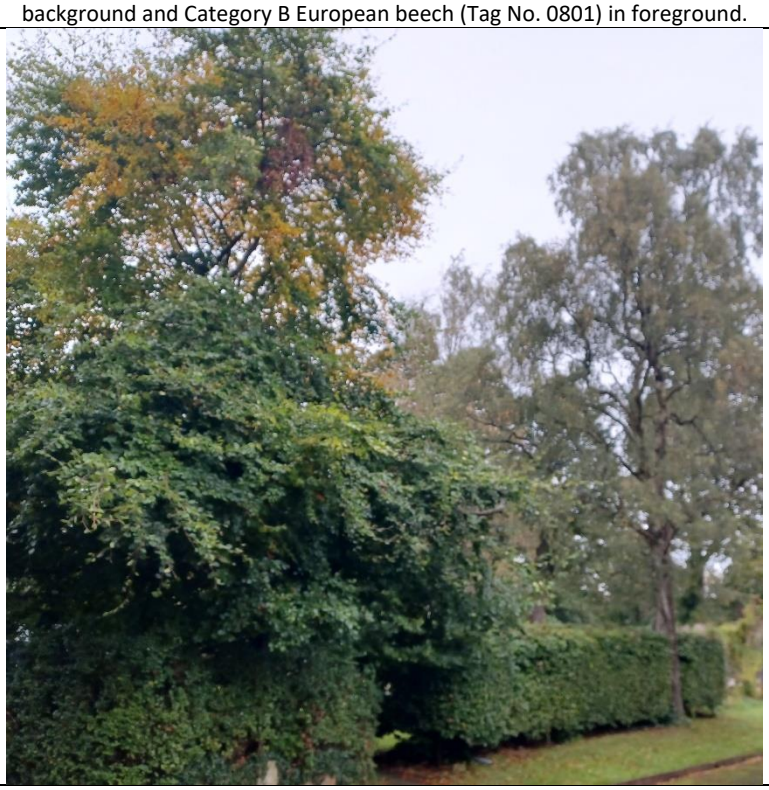
Category C

3.3.6 Category C trees (trees of Low Quality) within the study area include 4 trees, 2 hedgerows and 1 tree group, namely:

- European beech (Tag No. 0802) – middle-aged boundary tree, topped at c. 4 m above ground level (agl), with single stem of 180 mm diameter;
- Wild cherry *Prunus avium* (Tag No. 0805) – middle-aged tree part of small orchard, c. 4 m high, with single stem of 145 mm diameter;
- Domestic plum *Prunus domestica* (Tag No. 0806) - middle-aged tree part of small orchard, c. 3.75 m high, with single stem of 80 mm diameter;
- Holly (Tag No. 0808) – middle-aged boundary tree, topped at 3.5 m agl, with 3 sterms of 150, 110 and 45 mm diameters;
- Garden privet (75%) / snowberry (25%) (H1) - middle-aged boundary garden hedge, 2.5 m high, cut hedge with average of 5 stems of 35 mm diameter;
- European beech (98%) / holly (1%) / snowberry (1%) (H2) - middle-aged boundary garden hedge, 2- 2.2 m high, cut hedge with average of 4 stems of 50 mm diameter; and
- Rowan *Sorbus aucuparia* / silver birch / hazel *Corylus avellana* (#G1) – line of trees to north of northern boundary in neighbours garden, young tree, 8-12 m high with single stems of 90 mm diameter.

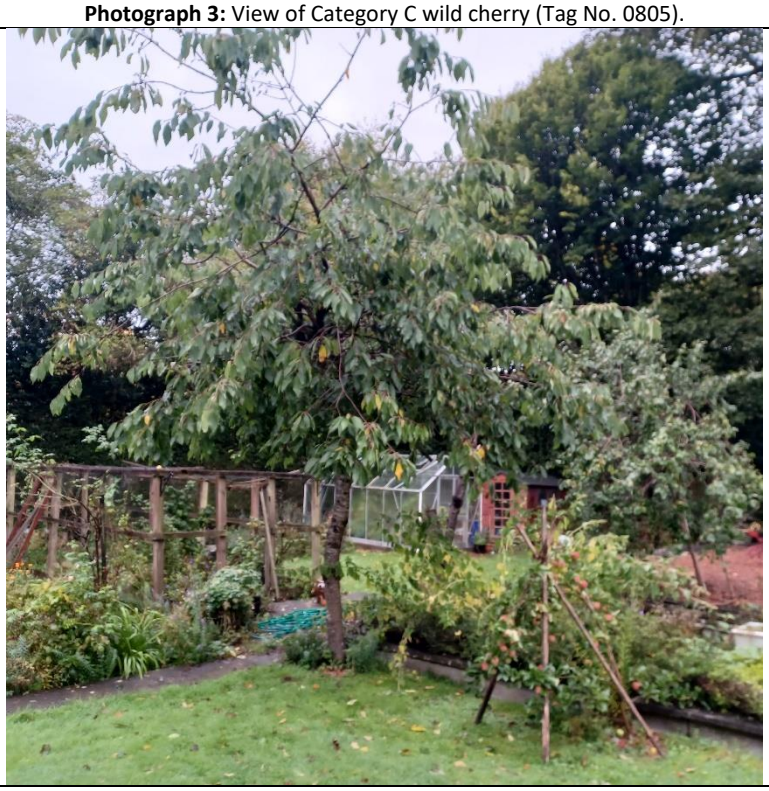
3.3.7 Category C trees within the study site are of low quality for mainly landscape reasons, C2.

Photograph 1: View of Category C beech hedge (H2), Category B silver birch (Tag No. 0803) In background and Category B European beech (Tag No. 0801) in foreground.



Photograph 2: View of Category B beech hedge (H3) and silver birch (Tag No. 0804) .

Photograph 3: View of Category C wild cherry (Tag No. 0805).



Photograph 4: View of Category A sycamore (T#1) in adjacent garden and Category C sycamore on left of summer house.

3.4 Arboricultural Impact Assessment (ArbIA)

3.4.1 The following provides an ArbIA of the proposed Project.

3.4.2 The proposed Project has been re-designed to minimise the direct loss of trees and retain trees where possible; refer to **Figure 3** in **Appendix A.1** which shows the location of proposed infrastructure and trees to be retained and lost.

3.4.3 No Category A trees would be directly lost as a result of the proposed Project. However, the Project will result in the direct loss of 3 trees and 3 hedgerows (1 partial), comprising: 2 Category B trees and 1 hedgerow; and, 1 Category C tree and 2 hedgerows (1 partial). **Table 3**, below provides a summary of the direct loss of trees according to the various tree categories.

Table 3: Overview of Direct Loss of Trees

Tree Category	Single Trees	Hedgerows	Tree Groups
A	0	0	0
B	2	1	0
C	1	2 (1 partial)	0
Total Number	3	3	0

3.4.4 **Table 4**, below shows a breakdown of those trees/hedgerows that will be directly lost by the Project, and a summary of the reason(s) for their loss.

Table 4: Analysis of Direct Loss of Trees

Tag No.	Species	Category	Tree/ Hedge	Life-stage	Reason
0802	European beech Fagus sylvatica	C	T	MA	Construction of car parking area
0803	Silver birch *Betula pendula*	B	T	M	Construction of main part of building
0804	Silver birch Betula pendula	B	T	MA	Construction of main part of building
H1	Garden privet Ligustrum ovalifolium (75%) / snowberry (25%) Symphoricarpos albus	C	H	MA	Construction of driveway resulting in loss of c. 14 m of hedge
H2	European beech Fagus sylvaticus (98%) / holly Ilex aquifolium (1%) / snowberry Symphoricarpos albus (1%)	C	H	MA	Construction of main part of building
H3	Hawthorn Crataegus monogyna (70%)/ garden privet Ligustrum ovalifolium (20%) / holly Ilex aquifolium (10%)	B	H	MA	Construction of main part of building resulting in loss of c. 15 m of hedge.

3.4.5 The loss of the above trees/hedgerows is considered to represent a significant arboricultural impact. Compensation planting to replace the 3 trees and 43 m of hedgerow is required in order to ensure negligible residual impacts and adherence to West Lothian

Council tree policy (refer to **Section 4**). **Section 5** provides enhancement tree planting to ensure the Project results in biodiversity benefit, as required by NPF4.

3.5 Damage to Trees

3.5.1 Damage to trees during the construction phase of the Project (including initial vegetation clearance and earth works) may occur to trees to be retained if the works are not carefully planned and the trees not adequately protected. This is particularly relevant within this site, which is limited in extent and also constrained by the presence of trees/hedgerows.

3.5.2 Potential damage includes physical damage to tree roots, stems and branches (during ground investigation, vegetation clearance, earthworks and construction) by plant and vehicles, and when works are within their respective RPA's by damage to their roots and compaction and/or pollution of soils which may result in early senescence and loss of trees. Soil compaction reduces the pore space within soil, resulting in a poor soil structure that damage and restricts the development and function of plant roots. Poor rooting significantly inhibits tree growth on compacted soils and can also increase the risk of trees being blown over during storm events. As well as the footprint of the new buildings, construction of car parking and associated infrastructure could also result in damage to trees if construction methods do not minimise damage and guarantee protection for the roots of adjacent trees from pedestrian and vehicular traffic.

3.5.3 For the purpose of this assessment, potential damage to trees has been defined as any Project works within RPAs (but excluding felling which is considered under **Section 3.4 Direct Loss of Trees,** above). However, all retained trees within the Project area have the potential to be adversely affected by ill-planned works. For the purpose of this assessment it has been assumed that no access/works will occur to any other part of Birchwood House gardens.

3.5.4 **Table 5** below provides a summary of the trees which may be subject to potential damage and where works are within their RPA's, according to the various categories. This includes 2 trees and 1 hedgerow, comprising 1 Category A tree, 1 Category B tree and 1 Category C hedgerow.

Table 5: Overview of potential damage to trees

Tree Category	Single Trees	Hedgerow	Tree Groups
A	1	0	0
B	1	0	0
C	0	1	0
Total Number	**2**	**1**	**0**

3.5.5 The Project will include construction of a new residential property (footprint of c.41.2 m^2) and proposed access and associated car parking. **Table 6**, below provides a summary of potential damage to trees, including work within RPAs and those trees requiring arboricultural works, and summarises proposed protection measures.

3.5.6 Of particular significance is the construction of the new residential property within the RPA of the Category A sycamore (#T1). In order to reduce the impact on this tree the layout of the Project has been modified to ensure that only a very small proportion of this tree's RPA will be affected. The current Project layout will impact on <1% of this Category A sycamore RPA. It is considered that this would represent a negligible negative impact

magnitude and would not be significant, particularly given the mitigation measures outlined in **Section 4** for pre-emptive root pruning.

3.5.7 The impact on the RPA of both the Category B tree European beech (Tag No. 0801) and Category C hedgerow (H1) is also considered to represent a negligible negative impact magnitude and would not be significant, particularly given the mitigation measures outlined in **Section 4**.

Table 6: Summary of potential damage to trees, including works and protection measures within RPAs, and also trees requiring arboricultural works

Tag No.	Species	Category	Tree/ Group	Life-stage	Tree Works Required	Summary of Works within RPA and Protection Measures
#T1	Sycamore *Acer pseudoplatanus*	A2	T	M	None	Approximately 1% of RPA is proposed as built environment, namely the patio surrounding the residential property. Avoidance is required to ensure any additional damage, by use of protective fencing. Pre-emptive arboricultural works should be undertaken to minimise damage to roots in RPA area affected by works .
0801	European beech Fagus sylvatica	B	T	MA	None	Approximately 30% of RPA is within footprint of proposed driveway and car-pasrking. . Pre-emptive arboricultural works should be undertaken to minimise damage to roots in RPA area affected by works Use of Cellular Confinement System.
H1	Garden privet Ligustrum ovalifolium (75%) / snowberry (25%) Symphoricarpos albus	C	H	MA	Partial felling of section of hedgerow to be lost	Avoidance is required to ensure any additional damage, by use of protective fencing. Pre-emptive arboricultural works should be undertaken to minimise damage to roots in RPA area affected by works. Use of Cellular Confinement System.

3.6 Indirect Impacts

3.6.1 All retained trees within the Project area may require future arboricultural management, for example as part of the standard tree risk assessments in order to ensure the health and safety of its users. On-going maintenance, potentially in the form of crown lifting/reduction, removal of any deadwood and removal of any unsafe trees, will therefore likely be required as part of this on-going arboricultural management.

3.6.2 It is important that all future arboricultural works are completed by an Arboricultural Association Approved Contractor, and according to BS 3998: 2010. Tree Work. Recommendations. This will ensure that future arboricultural works do not have a significant impact on any retained trees.

3.6.3 Falling leaves, fruit and flowers also have potential to cause minor seasonal nuisance to the Project. However, general maintenance and good housekeeping will ensure such seasonal nuisance is not a significant issue.

4 RECOMMENDATIONS

4.1 Introduction

4.1.1 The following provides a series of avoidance, mitigation and compensation measure recommendations to ensure that the arboricultural impacts of the proposed Project are not significant.

4.2 Conservation Area

4.2.1 The study area is located within the Livingston Village Conservation Area, and therefore, West Lothian Council should be consulted at an early stage of the Project to see if they wish to designate any trees within the Project area.

4.3 Additional Survey

4.3.1 It is recommended that the stem diameter of the Category A sycamore (#T1) is accurately measured, as it is located within a third party owner, and currently has only been estimated. Accurate measurement may result in an increase in the RPA of this tree.

4.4 Arboricultural Method Statement (ArbMS)

4.4.1 It is recommended that a detailed Arboricultural Method Statement (ArbMS) should be prepared for the Project to outline how the construction works will be carried out close to trees to ensure their protection and without causing damage to their crowns/stems or root systems. It is proposed that the ArbMS be prepared as a condition of planning consent for the Project.

4.4.2 The following should therefore be included within the ArbMS:

- Tree felling and other arboricultural works methods;
- Restrictions within tree protection zones;
- Pre-emptive works to roots prior to any development works within RPAs of trees;
- Specification for tree protection fencing and signage;
- Ground protection measures;
- Measures to avoid crown and stem damage;
- Any tree surgery works required;
- Installation of underground services;
- Construction of all built structures and car parking;
- Compensation proposals, including detailed planting layout and planting mix to off-set losses of trees/hedgerows; and
- Enhancement proposals, including detailed additional planting layout and planting mix to ensure the Project results in biodiversity enhancment.

4.5 Driveway and Car-parking Area

4.5.1 The construction of the driveway and car-parking area for the new residential property will be completed to minimise soil compaction and ensure protection of all trees, utilising best practice guidance, e.g. The Arboricultural Association Guidance Note 12: The Use of Cellular Confinement Systems Near Trees. It is proposed that Cellweb®TRP (or similar) is the cellular confinement system that is used, as it is specifically designed and sold for tree root protection applications (see www.geosyn.co.uk/product/cellweb-tree-root-protection). Cellweb®TRP is a no-dig solution that ensures that the loads placed upon it

are laterally dissipated rather than transferred to the soil and roots below. The walls of the cells are perforated and when combined with the infill of clean angular stone, enable free movement of water and oxygen, ensuring that nutrient supplies to the tree roots are maintained. Using the Cellweb®TRP no-dig solution within the root protection area (RPA) can reduce sub base depths by up to 50%, providing further cost savings. Cellweb® Cellweb® Tree Root Protection System complies with BS5837:2012, and is adopted for use in RPA's by councils all over the UK.

4.6 Tree Felling & Other Tree Works

4.6.1 It is important that all tree felling and other tree works are completed by an Arboricultural Association Approved Contractor, and according to *BS 3998: 2010. Tree Work. Recommendations*. The ArbMS will detail all tree works.

5 COMPENSATION MEASURES RECOMMENDATIONS

5.1.1 Compensation measures are required to off-set the loss of direct loss of 3 trees (comprising: 2 Category B trees and 1 Category C tree), and 3 hedgerows (1 partial) (comprising 2 Category B and 1 Category C hedge) with a total length of c. 43 m.

5.1.2 It is proposed that 9 trees are planted for the trees to be lost, and 50 m of new hedgerow is planted within the Birchwood House curtilage. The planting scheme should be included within the ArbMS, but would include planting of the following:

- Mixed fruit trees (domestic apple and plum); and
- Moxed species-rich native hedge.

5.1.3 It is considered that the provision of the above new planting will adequately compensate for the loss of trees/hedgerows by the Project.

6 ENHANCEMENT MEASURES

6.1.1 It is recommended that an additional 3 trees are planted within the Birchwood House curtilage to ensure that the Project results in biodiversity net gain. The planting scheme should be included within the ArbMS.

7 ASSESSMENT OF RESIDUAL EFFECTS

7.1.1 Given the proposed **Section 4: Recommendations**, **Section 5: Compensation Measures** and **Section 6: Enhancement Measures** it is considered that the Project will result in an overall positive impact on biodiversity.

8 REFERENCES

British Standards Institution. 2012 *BS 5837: Trees in relation to design, demolition and construction - Recommendations.*

British Standards Institution. 2010*. BS 3998: Tree Work - Recommendations*.

APPENDIX A.1 FIGURES

APPENDIX A.2 Table 5: Tree Survey Schedule

Tag	Species	Category	Type	Life-stage	Height (m)	No. Stems	Stem Diameter (mm)					1st Branch height (m)	Orientation (NESW)	Canopy Height (m)	Branch spread (NESW)				Structure	Physiology	Remaining Contribution	RPA Radius (m)	RPA Radius (m^2)	Notes
#T1	Sycamore *Acer pseudoplatanus*	A2	T	M	25	1	1000					2.75	S	3	7	6	7	7	Good	Good	20+	12.00	452.39	Situated c. 1 m from site boundary in neighbour's garden. Main stem is bifurcate at c. 9 m above ground level (agl). Tree has been crown lifted on garden side (south) to 5 m agl, with several relatively large limbs having been removed. Asymmetrical crown on east because of mature tree having been removed sometime in last 5 years. No obvious signs of health issues and tree is vigorous.
0801	European beech *Fagus sylvaticus*	B2	T	MA	14	2	390	355				0.5	N	O.5	4	6	8	7	Fair	Good	20+	6.33	125.82	Tree is bifurcate at 1.5 m agl and is poorly grown, with a number of small tree houses constructed in scaffold stems.
H1	Garden privet *Ligustrum ovalifolium* (75%) / snowberry (25%) *Symphoricarpos albus*	C2	H	MA	2.5	5	35	35	35	35	35	0.1	NESW	0.1	0.3	0.1	0.3	0.1	Fair	Fair	10+	0.94	2.77	Garden hedge along entrance drive; cut to c. 2.5 m agl and 0.75 m wide. Planted originally at c. 0.25 m centres.
0802	European beech *Fagus sylvaticus*	C2	T	MA	4	1	180					2	SW	2	1	2	0.5	1	Poor	Fair	10+	2.16	14.66	Tree is located within H2 and has been topped at c. 2.3 m agl and now only has several minor stems.
0803	Silver birch *Betula pendula*	B2	T	M	17	1	600					3.5	SW	2.2	3	4	6	5	Fair	Fair	10+	7.20	162.86	Mature birch appears probably to be in early stages of senescence with several cankers on scaffold stems and canopy thinning. The tree has a slight lean to the south. Ivy has been removed from base and tree has been crown reduced c. 1 year ago. Located within H2. Tree should be monitored.
0804	Silver birch *Betula pendula*	B2	T	MA	18	1	340					3	N	3	4	4.5	4	3	Good	Good	20+	4.08	52.30	Tree is located on edge of 0.75 m high retaining wall between lawns resulting in probable asymmetrical roots. Lean to east-north-east. Canopy is not particularly well developed.

Tag	Species	Category	Type	Life-stage	Height (m)	No. Stems	Stem Diameter (mm)					1st Branch height (m)	Orientation (NESW)	Canopy Height (m)	Branch spread (NESW)				Structure	Physiology	Remaining Contribution	RPA Radius (m)	RPA Radius (m^2)	Notes
H2	European beech *Fagus sylvaticus* (98%) / holly *Ilex aquifolium* (1%) / snowberry *Symphoricarpos albus* (1%)	C2	H	MA	2-2.2	4	50	50	50	50		0.1	NESW	0.1	0.15	0.4	0.15	0.4	Good	Good	20+	1.20	4.52	14 m of hedgerow planted at c. 0.3 m centres; cut to 2 – 2.2 m agle and 1 m wide.
H3	Hawthorn *Crataegus monogyna* (70%)/ garden privet *Ligustrum ovalifolium* (20%) / holly Ilex aquifolium (10%)	B2	H	MA	2.2 – 2.4	4	25	25	25	25		0.3	NESW	0.1	0.4	0.2	0.3	0.4	Good	Good	10+	0.60	1.13	15 m of hedgerow cut to 2.2 – 2.4 m agl and 1 m wide.
#G1	Rowan *Sorbus aucuparia* / silver birch *Betula pendula*/ hazel *Corylus avellana*	C2	G	Y	8-12	1	150					2	S	2	2	2	2	2	Good	Good	10+	1.80	10.18	Line of probably planted trees within adjacent garden to north.
0805	Wild cherry *Prunus avium*	C2	T	MA	4	1	145					2.4	SE	2	2.5	3	3	2.5	Fair	Fair	10+	1.74	9.51	Crown lifted to 2 m agl and evidence of some pruning.
0806	Domestic plum *Prunus domestica*	C2	T	MA	3.75	1	80					0.5	W	0.75	2	2	1	0.75	Fair	Fair	10+	0.96	2.90	Typical plum with messy crown and general branching, with signs of previous pruning.
H4	Leyland cypress, *Cupressus × leylandii* (60%) / holly *Ilex aquifolium* (30%) / sycamore *Acer pseudoplatanus* (10%)	B2	H	MA	8	1	90					0.1	NESW	0.1	0.2	0.2	0.2	0.2	Fair	Good	10+	1.08	3.66	Boundary hedge with Leyland cypress planted at c. 0.5 m centres, with sycamore and holly invading from adjacent trees. Hedge is cut on garden side only.
0807	Hornbeam *Carpinus betulus*	B2	T	MA	18	1	460					2	N	10	6	4	6	7.5	Fair	Poor	<10	5.52	95.73	Tree has been crown lifted on garden side, with wounds forming tear-outs with associated pockets of rot now present. Tree should be monitored.

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Tag	Species	Category	Type	Life-stage	Height (m)	No. Stems	Stem Diameter (mm)					1st Branch height (m)	Orientation (NESW)	Canopy Height (m)	Branch spread (NESW)				Structure	Physiology	Remaining Contribution	RPA Radius (m)	RPA Radius (m^2)	Notes
0808	Holly *Ilex aquifoliium*	C2	T	MA	3.5	3	155	110	45			2	NW	2	2	3	1.5	3	Poor	Poor	<10	2.34	17.26	Tree has been topped at c. 3.75 m agl and crown lifted on garden side (south), with wounds forming tear-outs with associated rot now present.