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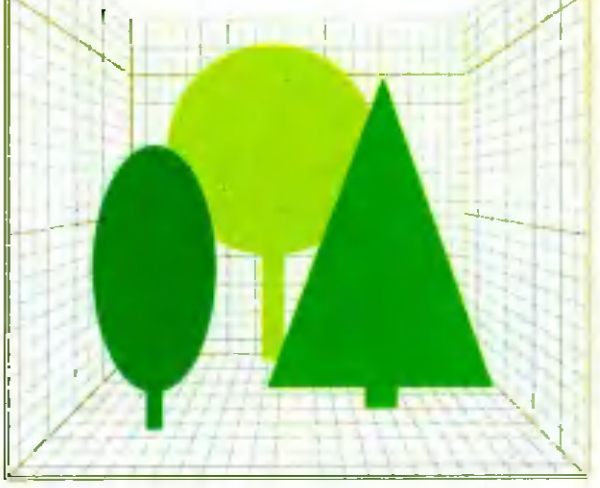
Consulting Arborists



Arboricultural Report

Trees at Proposed Site at
Boden Villas
Taylors Lane
Ballyboden
Dublin 16
January 2022

The Tree File Ltd
Consulting Arborists
Ashgrove House
Kill Avenue
Dun Laoghaire
Co Dublin
01-2804839

Contents

Associated Drawings

This report must be read in conjunction with the drawings noted below

	Drawing Title	Drawing Subject
1)	**Boden Villas Tree Constraints Plan**	**Tree Constraints Plan** A plan depicting the predevelopment location, size, calculated constraints, and simplified tree quality category system
2)	**Boden Villas Tree Impacts Plan**	**Tree Impacts Plan** This plan represents the effects of the proposed development works on the above tree population and depicts trees to be retained and removed.
3)	**Boden Villas Tree Protection Plan**	**Tree Protection Plan** This plan depicts the nature, location and extent of tree protection measures required to provide for sustainable tree retention.

1 Report Summary

1.1 This report relates to the reassessment of trees in respect of an amended and reduced development proposal.

1.2 The proposals will result in the removal of one tree within the site and one outside of the site. The remaining trees, to the south and outside the site will be unaffected by the proposed works. The loss of the partially collapsed Laburnum within the site will, will result in no visual loss to the public road. Regardless of future tree growth issues, the loss of Tree No.5 outside of the site, could be mitigated by replacement planting within, or next to, the post development landscape.

1.3 The tree survey described several trees on the grassy verge beside the Palmer Park access road. Because of the trees' proximity to the site, specific investigations were undertaken to explore the nature and extent of any constraints.

1.4 The original tree review (2020) noted higher ground outside the boundary wall (east). An exploratory pit of over 650mm (over a metre relative to roadside levels) was dug inside the site but perpendicular to tree No.3. The excavation revealed no tree roots beneath the wall or its foundation, but one root had gotten through the mortar joint between the two. The wall appears to have acted as a natural constraint on tree root growth, preventing root growth throughout the site.

1.5 The original site review also noted recent heavy cutting of the 6 roadside Maple. The occupant explained that this was due to complaints and work done for the local council to reduce nuisance and trespass. However, the trees are still growing and, given their age, the problem will reoccur.

1.6 It also mentions the planting of trees near a retaining wall. Planting trees close to a "lightly laden structure" requires a minimum of 2 metres clearance (BS 5837: 2005 Trees in Relation to Construction Recommendations). In this case, the disparate ground levels mean that the tree's growth forces are not counteracted by any soil mass within the site, due to its lower level.

2 Introduction

2.1 This report was commissioned by-
Darragh Lynch Architects
For and on behalf of
Mr Ken Keegan.

This report has been prepared by-
Andy Worsnop Tech Arbor A, NCH Arb (PTI LANTRA)
The Tree File Ltd
Ashgrove House
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Co Dublin

Report Brief

2.2 An Arboricultural report has been requested in respect of the proposed development. As "BS5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations" is the accepted frameworks for such reports, then its composition, inclusions and recommendations have been followed as a general basis for such reporting.

Report Context

2.3 This report comprises an Arboricultural review of the proposed development project. This includes an assessment of the sites existing tree population within its current context, as well as an assessment of their potential for sustainable retention in the post-development scenario and the likely effects and repercussions of the development and construction process upon those trees. It also provides information regarding the necessary tree protection and the avoidance of damage to trees during the construction process, necessary to achieve sustainable tree retention.

2.4 This assessment summarises the Arborists findings and recommendations, arrived at after reviewing the proposed project details as provided, and after an evaluation of trees as defined and described in the tree survey at "Appendix 2". This report also includes a preliminary "Arboricultural Method Statement" at "Appendix 1" as well as a Tree Protection Plan that illustrates the requisite conservation and protection methodologies necessary to maintain tree sustainability. This report is not intended as a critique of the proposed development but is an impartial assessment of the development implications relating to the sustainable retention of trees, whether that be any, some, or all trees. This report is for planning purposes only and may be deficient for construction phase use.

Report Limitations

2.5 This report relates the Arborists interpretation of information provided to him before the report compilation and gained by him during the undertaking of the site review and tree survey. The site review data is subject to the limitations as set out under "Inspection and Evaluation Limitations and Disclaimers" in "Appendix 2" of this report. The findings and recommendations made within this report are compiled, based upon the knowledge and expertise of the inspecting Arborist.

2.6 The "Implication Assessment" element of the report builds on assumptions and estimates, particularly in respect of how construction works might proceed on a day to day basis and appreciates the "design" stage of the project, as opposed to "detail design" or "construction" detail.

2.7 Many elements of the "Arboricultural Method Statement" are deliberately broad and generic. They will require review, amendment and consolidation at the construction stage, for example in respect of the size and nature of the equipment, plant and machinery that might be utilised by any potential building contractor and any details as may change at "detail design" or "construction detail" stages.

2.8 Accordingly, this assessment is premised on all its elements/recommendations, and the omission or alteration of any part of it, particularly the application of tree protection methodologies, can radically alter outcomes in respect of sustainable tree retention.

3 Site Description

3.1 The site area effectively involves land to the rear (south) of an existing house. As the adjoining roadside strip (east) supports several trees, the review area has included these, even though they arise from a position outside of the site boundary line.

3.2 The site area includes an existing domiciliary plot, including an existing house and its attendant garden. The house is towards the northern end of the plot, with the southern end forming a garden. The garden supports a slope, with the southern end higher than the north.

4 Pre-Development Arboricultural Scenario

4.1 The site area supports only three significant trees. These include a poor quality and failing Laburnum, an Ivy smothered Wild Cherry and a large multi-stemmed Lime. The Laburnum, being located toward the centre of a lawn area, suggests planting as part of a garden layout. The Cherry and Lime remain broadly healthy but raise concerns regarding sustainability. The Cherry is suppressed and distorted, arising from a position directly adjoining a retaining boundary wall and a stream culvert. The lime is multi-stemmed from a low level, with evidence of low stumps, suggesting that the tree is made up of re-growth from the stump of a previously cut tree. Unfortunately, its form is mechanically poor, and it is at higher risk of mechanical failure: a considerable concern as the tree is large and located beside a neighbouring house and other gardens.

4.2 Outside the sites eastern boundary there are six Maples. These trees are still young and assert immense potential for continued growth. The trees have been harshly cut in the past, to deal with trespass and encroachment issues. This causes concern continued growth suggests a need for ongoing management, thereby illustrating a contextual incompatibility.

4.3 The boundary context involved disparate levels to the east and west of the boundary wall. The wall already shows signs of mechanical breakage and cracking at various potions. The garden area is lower that the grassed strip beside the public footpath. Ground surface level differences range from 400mm at tree no. 5 to 500mm at tree no.2. This effectively illustrates a retaining wall scenario. This raises concern because each of the 6 trees are positioned at ranges between 750mm and 1250mm from the boundary wall. Therefore, each of the trees fails against the guidance of Table A1, BS 5837: 2005 Trees in Relation to Construction – Recommendations, that suggests any potentially large growing tree planted within 2000mm of a "lightly laden structure" is likely to cause damage to that structure. This concern is compounded considering the disparate levels and the fact that any growth-related displacement of soil and generation of mechanical forces, is not counteracted by a soil mass to the west of the wall.

4.4 The proximity of the trees to the site was considered enough to call for investigation in respect of tree root trespass into the site. It was appreciated that the trees where separated from the site by a boundary wall, but it was not know if the wall was a true physiological barrier to tree root development in a westerly direction, into the site. An exploratory pit was excavated inside the site, but perpendicular to tree no.3. The pit found that the wall and its foundation, extends to circa 650mm below garden levels, and therefore circa 1050mm below roadside verge levels.

4.5 A comparative study by Jackson et al. (1996) indicates that in temperate climates, 82% of broadleaf tree root material be found within the upper 500 mm of soil accordingly, and notwithstanding any additional wall foundations, it is reasonable to assume that the rooting medium associated with these trees, being circa 400-500 mm above garden levels, will have acted as substantial barrier to root growth. Adding to this, substantial material associated with the wall foundations, then it is reasonable to assume that root extent into the site will be associated with these trees. For this reason, we commonly find that structures, whether natural or built, deflect and redirect tree root development that tends to stay at favourable levels.

4.6 The excavation illustrated that with one exception, the wall structure had prevented tree root access. This related primarily to the depth to which the wall and its foundation extended. The only exception to this related to one root that had penetrated the mortar joint between the wall and the foundation.

4.7 To corroborate the above findings, a photographic record was kept, as per the figures below.

Fig 1

The excavation was undertaken at a position inside the site but perpendicular the tree no.3 The small Plum was removed to facilitate the dig.

Fig 2

The excavation extended to circa 650mm below garden levels and more than 1 metre below roadside verge levels. The excavation found and extended below wall foundation levels, so as to identify any root material as might pass beneath the wall footing.

Fig 3

The only root material entering from outside of the site, had passed through the mortar at the joint between the wall base and the wall foundation. This suggests poor workmanship as well as a likely cause of wall damage over time.

5 Planning Scenario in Respect of Tree

5.1 In respect of trees as they relate to planning within the **South Dublin County Council** area, note is made of two areas of guidance including - **The South Dublin County Council Development Plan 2016-2022** and **South Dublin County Council's Tree Management Policy 'Living with Trees'.**

South Dublin County Council's Tree Management Policy 'Living with Trees' "and the Amendments to Tree Management Policy 2015-2020 'Living With Trees' (as well as an interim internal review in February 2019) that incudes substantial amounts of information in respect of tree management. planting and pertinent to this application, information pertaining to trees on development sites as outlined in Section 7, Trees and Development.

Within the **South Dublin County Council Development Plan 2016-2022**. trees and tree issues are dealt with regularly, including **Chapter 4, Economic Development and Tourism,** section 4.3.3, ET3 Objective 5 calling for the retention of trees on commercial development sites. Under Chapter 6, Transport and Mobility notes that the design of urban roads and street should incorporate tree planting.

As expected, trees are mentioned widely in **Chapter 8, Green Infrastructure**, with objectives to protect, and preserve trees and woodlands as per G2 Objective 9 and G6 Objective 1 and well as to include new tree planting as per Objective G2 Objective 11.

Also, **Chapter 10, Heritage, Conservation and Landscapes**, mentions trees, particularly HCL10 Objective 3, HCL11 Objective 5, HCL15 Objective 3 and HCL17 Objective 1. Within Chapter 10, trees are also mentioned specifically in respect of Section 9.2.4 GRAND CANAL where trees are considered an integral part of the canal landscape.

Specifically, **Chapter 10, Heritage, Conservation and Landscapes**, includes Section 9.5.0 Tree Preservation Orders, including their application as well as defining the 4 existing orders located at, St. Brigid's (now Newlands Garden Centre), New Road, Clondalkin, Beaufort Downs, Rathfarnham, Townland of Quarryvale and Brooklawn, Palmerstown and Newcastle Road, Lucan.

In **Chapter 11, Implementation** and under "Masterplan Considerations", "Open Space and Landscape" and particularly "Section 11.5.5 Landscape" again mentions the importance of retaining trees and hedges

5.2 Notwithstanding the above, a review of the current development plan shows no evidence of specific tree related planning objectives or Tree Preservation Area, applicable to the site or its immediate environs.

6 Construction Works and Trees (General)

6.1 Tree retention is costly in respect of available space and there is a substantial difference between physically retaining a tree in situ and gaining any realist expectation of it surviving into the future and remaining safe.

6.2 Trees are living organisms and are highly reliant upon a continuity of environmental factors, the changing of which can easily undermine health and sustainability. As a perennial plant, a trees nature is to necessarily become larger on an annual basis. The survival of the plant and its funding of continued growth requires a minimum import of water and various nutrients, a large proportion of which are provided by the soil in which the tree is rooted.

6.3 A tree is highly dependent upon the ground from which it arises, the nature of that ground and a continuity of conditions and provisions that that ground provides. Any change extending beyond the short-term has the potential to affect a tree's metabolism, health, and sustainability.

6.4 Development works typically result in the loss, changing or denaturing of this ground and thereby is contrary to sustainable tree retention. Critically, a tree is fundamentally reliant on the nature and environment of the ground that supports it. Any action that affects or denatures the existing soil environment in respect of gas flux, hydrology or soil strength can quickly make a soil incapable of supporting plant function. Therefore, these effects must be avoided in the areas upon which a tree is reliant.

6.5 BS 5837:2012: Trees in relation to design, demolition and construction - Recommendations, is a standard referred to and recommended in DCC documentation including the Dublin City Development Plan 2016-2022, and the Dublin City Tree Strategy 2016-2020, sets out guidelines and parameters by which we can assess impacts to and protect trees from damage, thereby providing some degree of realistic expectation regarding sustainable tree retention.

6.6 BS 5837:2012 sets out a procedure and calculation whereby a minimum amount of ground space can be defined in respect of the requirement for the maintenance of a tree of any particular size. This calculation is based primarily on tree size considering issues of hydrological capacity, nutrient availability and anchorage.

6.7 The standard generates a "root protection area" (RPA) intended to define a minimum zone of conservation and preservation centred about the tree. This area is typically expressed in a symmetrical fashion and most commonly as a circle about the tree however, it is appreciated that physiological issues can have a bearing upon this and can radically alter what might otherwise be a symmetrical rooting pattern.

6.8 Examples of "RPA" distortion include physical features such as bedrock and its extent above and below ground level thus comprising a physical barrier to natural root development, rivers or watercourses extending to depths beneath normal root development depths and comprising soil conditions beneath their course that would be inhospitable to tree root growth or areas where materials or soil composition is beyond that capable of being exploited by trees, for example compressed and compacted areas such as hardcore and sub-bases to existing roads or areas where substantial or historic

trafficking has caused soil compaction, high soil strength or a high CBR's (California Bearing Ratio)

6.9 In respect of the above, the tree survey information provided, intends to show the areas of minimum conservation associated with the sustainable retention of trees within the scope of a development project. In the case of the proposed development, these minimum areas are often exceeded, thus creating a scenario whereby it is reasonable to assume that the development works will have no direct effect or repercussions on tree health.

6.10 In other instances, obvious conflicts exist either total and direct whereby the tree's location will be wholly consumed by the position of a new building or structure or, partial whereby there is an encroachment upon this protection zone, meaning the minimum RPA cannot be achieved.

6.11 This latter issue occurs to varying degrees at various positions across the site. Where it occurs to a minor extent then consideration might be given to clause 5.3.1, a) and b) whereupon minor encroachments may be considered allowable and potentially inconsequential. Nonetheless, there are larger encroachments that would exceed this consideration and may constitute an impact harmful to tree health and sustainability. Such issues do not necessarily require the immediate removal of the tree and oftentimes construction works can be achieved without their removal, however, the impact may well lead to deterioration in tree health, limited sustainability, and early death.

6.12 Such issues must be considered in two forms. Firstly, affects to sustainability and long-term retention. Such issues might still consider the benefits of interim and short-term retention, for example during the establishment of new plantings. Secondly however, it must also appreciate that direct physical effect on tree root systems can also affect stability and safety and therefore considerations might be given to site safety factors.

6.13 In light of the above, we must be appreciated that any benefits gained by short to medium-term retention, will be subject to ongoing and regular review, with regard to any developing symptoms of ill-health. In this respect, short to medium term retention might be achieved either with or without other management input.

6.14 In respect of the above, tree health-related affects and issues typically manifest themselves over time and only the most severe impact generates immediate effects. Tree damage relating to environmental change and disturbance can often result in a slow deterioration and decline, only becoming apparent after some years (2 - 5 years) with a slow deterioration where death may not occur for anything between 3 and 15 years. Understanding the timescale of possible interim benefits must appreciate the fact that its full extent or rate cannot be quantified at an early stage.

6.16 The Arboricultural report has identified many tree specimens that are considered wholly suitable for retention. Notwithstanding the natural and expected deterioration of an

ageing tree population, many would offer a substantial degree of sustainability over time.

Typical Construction Issues

6.19 The new buildings and particularly their foundations require the excavation of ground space. Foundation digs are often substantially larger than the building footprint, with depth often requiring safety relates battering or benching of the excavation edges to avoid collapse. This issue will apply to this site; however, some critical areas have adopted the use of retaining structures and methodologies such as secant piling, that affectively limits excavation to the pile structure.

6.20 Similarly, the new access drive will require foundations. The combination of these typically can result in the loss or denaturing of the soil volume that a tree would be reliant upon.

6.21 Underground services require excavation and trenching, with the added complication that gravity led systems can often require the modification of ground levels to achieve necessary gradients and minimum overburdens, a factor that can often influence the finished levels of both the roads and building noted above.

6.22 Achieving the above typically involves the use of substantial plant, equipment, and vehicles. The movement and activity of such machinery quickly denatures the ground, destroying the soil profile and structure, rendering them inhospitable and of no use the to the supported trees.

Contextual Issues

6.25 Some of the tree losses are of limited concern because of poor-quality, ill-health or ongoing deterioration, where the potential for and longevity of keeping such trees would be limited regardless of any site development. Examples of this include the "Border Planting" within the garden, whose proximity to the wall makes it unsustainable.

6.26 many of the trees recorded have the potential to become much larger with time. It is likely that this will generate encroachment issues previously acknowledged and acted upon. It is likely that if retained, ongoing tree management will be required over time in respect of crown growth, however stem and root growth cannot be managed effectively and so wall damage may need to be accepted over time.

6.26 Tree canopy cover varies by species and can change by season. Therefore, their relationship with the post development site must be considered in respect of additions issues, including shadow-cast and light admission and littering. The potential for the roadside trees to grow and to encroach upon the proposed dwellings must be considered.

6.27 While the retention of trees within a development is commendable, tree retention close to buildings must consider the blockage of views and light, and the possible effects on daylight analysis. Trees can have a material effect on these issues and can lead to post development request for more tree removal, for example based on a requirement for artificial light during daylight hours.

6.28 Deciduous tree shed leaves each autumn that can be subject to local wind patterns, creating local drifts and accumulations. Such issues may require management and can lead to drainage issues including the blockage of drains and gullies.

6.29 These roadside trees have already been the subject of prior management, intending to alleviate encroachment and trespass. These issues are likely to redevelop over time, thereby questioning the sustainability and suitability of these trees at this location.

7 Project Works and Likely Impacts

7.1 The proposed development will see the creation of anew dwelling.

7.2 Considering the scope and scale of the propsed development, it is considered likely that most of the issues dealt with at "Construction Works and Trees" above, will apply at various points and particularly regarding-

a) Direct conflict with proposed structures, thus requiring tree removal.
b) A partial conflict where the "Root Protection Area" is encroached upon by works or ground amendments and cannot be preserved/protected in full.
c) Environmental damage e.g. compaction, capping, sealing – changing the existing ground environment to one that can no longer support tree root function.
d) Construction activity and the use of large plant and machinery that can denature the ground.
e) A change in site context or a change in occupation or use that makes a tree unsuitable for retention.

7.3 It is unreasonable to assume that trees can be fully protected within the site area. Accordingly, it is suggested that within the site, Laburnum no.7 must be removed.

7.4 Outside of the site and to provide new access, the proposed drive entrances will require the loss of Norway Maple no.5

7.5 As the site area and the adjoining roadside verge are at differing levels and separated by a substantial wall and foundation, it appears that little root material has managed to access the site. Accordingly, it appears that works within the site area is unlikely to result in root disturbance of tree nos.1 to 4.

8 Identification of Development Impacts to Trees

8.1 The expected tree impacts have been represented graphically on the tree impacts drawing "**Boden Villas Tree Impacts Plan**", as well as within the narrative of this report. This drawing combines the tree constraints plan information with the current stage development details including the architectural and services layouts below, thereby allowing for simple direct comparisons to be made between the existing site context and the development proposals in respect of new structures.

8.2 In this drawing, trees denoted with "Broken Pink" crown outlines are to be removed and those denoted with "Continuous Green" crown outlines are to be retained.

8.3 Detail of the development proposals where gained from drawings provided by Darragh Lynch Architects including

8.4 The evaluation is primarily based on minimum protection ranges as defined paragraphs 4.6.1, 4.6.2 and 4.6.3 of BS 5837:2012. Any structure, action or apparent need to enter or otherwise disturb/convert the "root protection area" of a site tree has been considered likely to have a negative impact, with the potential to render a tree wholly unsuitable for retention, unsafe or unsustainable.

8.5 The broader assessment attempts to consider both direct and indirect implications, based on perceived construction requirements, as well as how a tree will likely interact with the development in respect of growth, hazard development, light blockage and other social concerns in respect of the changing context, including its effect on tree amenity value.

9 Design Iterations and Arboricultural Considerations

9.1 The tree survey works began in October 2020. This identified trees both within and adjoining the site that could be affected by site works.

9.2 Concerns arose resulting in additional investigation and the exploratory excavations described at 4.7 above

9.3 These investigations suggested that the proposed works would not adversely affect the trees outside of the site. The investigations did however suggest that there where contextual, structural and growth-related issues that undermined the sustainability of these trees.

10 Tree Retention and Loss

10.1 The drawing "Boden Villas Tree Impacts Plan" comprises the tree survey drawings overlaid by the development drawings, thus providing a graphic representation of the relationship between tree constraints and the development elements. In this drawing, the trees that will be removed, are highlighted in "pink dashed" outlines.

10.2 the review are reports on a total of 9no. individually described trees and an additional shrubby group, which, for the purposes of this report, will be regarded as 10no. items.

- No category "A" trees,
- 3no, category "B" trees,
- 6no. category "C" trees,
- 1no. category "U" group

10.4 Normally, all category "U" trees (Border Planting 1) identified in the survey would be removed. Many should be removed regardless of development, though some might be reviewed in respect of partial/limited retention, dependent upon retention context.

10.5 Of the site's ostensibly retainable trees, the proposed works would require the removal of 2no. Category "C" trees.

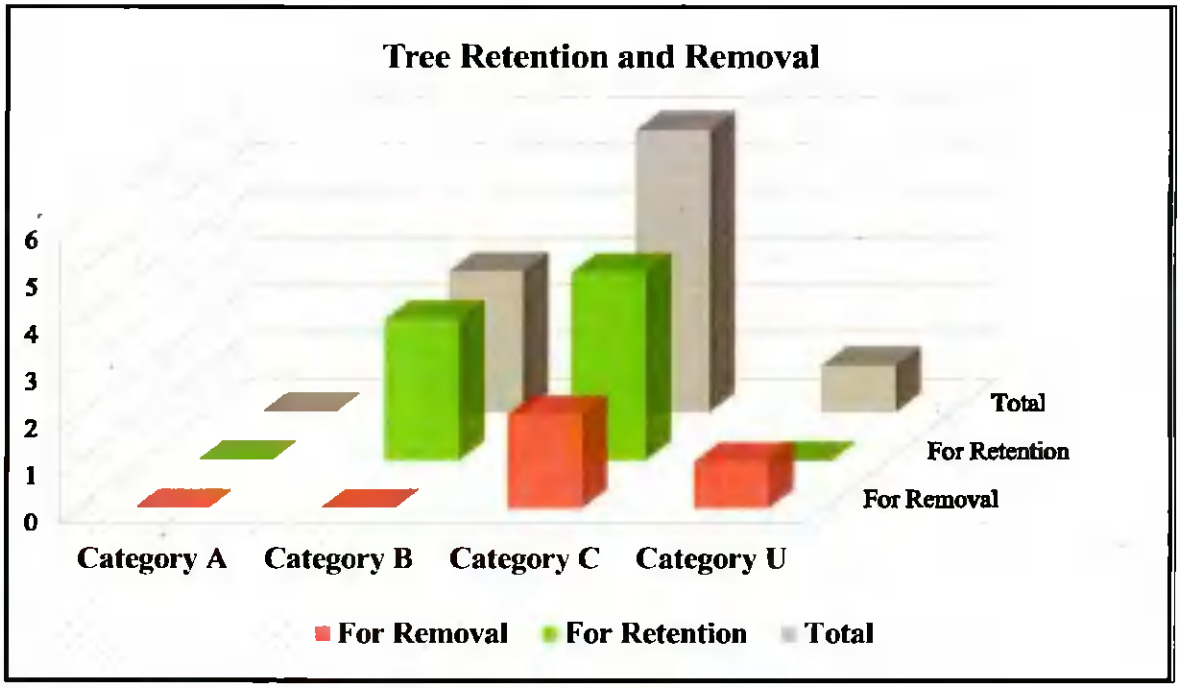

Fig 5 Graphic Representation of Tree Loss/Retention Scenario

10.6 Notwithstanding the above, it must be noted that each of the 6no. roadside Maples are of dubious sustainability. They stand outside of the site's jurisdiction and therefore cannot be removed. Nonetheless, the issues noted in this report would suggest that they are not suitable for retention, and that removal and replacement with a more suitable alternative would offer a better and more sustainable approach.

10.7 Of the site's category "poor" quality "C" trees, the development works appears to require the removal of nos. 5, and 7.

10.8 Of the site's category U trees , the development will require directly, the removal of "Border Planting 1"

10.9 The "construction" related tree loss breakdown for the proposed developemnt will be-

- 2no. category "C" trees
- 1 category "U" group (Border Planting 1)

11 Tree Protection within the Scope of a Development

11.1 The design and management recommendations as set out in "BS5837:2012" are considered as "best practice" regarding the selection, retention, protection, and management of tree within the scope of new developments.

11.2 In respect of tree protection, whether vertical or horizontal, all must conform or equate to the recommendations of Section 6, BS5837: 2012, must be fit for purpose and commensurate with the nature of development and the expected day-to-day activities of the site works.

11.3 This report provides a "Preliminary Arboricultural Method Statement" at "Appendix 1" to this report, as well as the associated "Tree Protection Plan" drawing "Boden Villas Tree Protection Plan".

11.4 In the drawing, the "Construction Exclusion Zone" is defined by an orange hatching with bold "Orange" lines representing the proposed location of the primary protective "Construction Exclusion Fencing".

11.5 The above drawing provides only a representation of the protection locations and extents that must be located, positioned and erected under the guidance of the project Arborist. This drawing may require referral to a figured and dimensioned, "construction stage" version of the "Tree Protection Plan" drawing. All recommended protection measures will be installed before the commencement of any site works and must remain in situ (unless under the guidance of the site Arborist) until the completion of all site works.

12 Preliminary Management Recommendations

12.1 Provided in the tree survey table (Table 1) are "Preliminary Management Recommendations". These recommendations relate to the trees as they existed at the time of the tree review. Therefore and in line with the changing context of the site, such recommendations may no longer apply. Examples include where the felling of trees or other specific works are necessary to facilitate development requirements.

12.2 Many of the concerns raised in the tree survey relate to evidence suggesting mechanical failure to trees, ill-health or contextual issues. These may continue to a point where a trees suitability for retention may change over time.

12.3 It is noted that some of the trees intended for retention exist at positions outside of the site jurisdiction. Such trees can only be managed with the permission of their owners.

A1 Appendix 1 - Arboricultural Method Statement (and Tree Protection Plan)

Method Statement Outline

A1.1 This method statement intends to provide guidance in respect of tree protection on a development site. This is a broad and prescriptive method statement, intended to provide general advice and guidance in respect of trees and tree protection on a typical development site, dealing with issues known at planning stage.

A1.2 Any inability to conform to the recommendations of this method statement or the associated tree protection plan could readily change the sustainability of trees and/or their suitability for retention.

A1.3 This method statement addresses, amongst others, two primary issues, those being –

a) The avoidance/prevention of physical damage to a tree to be retained.

b) The avoidance/prevention of physical damage or disturbance to the ground/earth upon which a tree is reliant.

Drawings

A1.4 This Arboricultural Method Statement must be read with the associated "Tree Protection Plan" drawing, "Boden Villas Tree Protection Plan". The "planning stage" drawing must be updated for "Construction" stage purposes, to include tree protection ranges/dimensions as defined for that tree within the tree survey table or unless otherwise defined by the project Arborist.

Method Statement Use

A1.5 This Method Statement should be used under the direct guidance of the project Arborist. As limited "construction stage" detail was available at planning stage, it may require amendment and adjustment to address construction stage issues.

Amendments and Modifications to Tree Protection Plan

A1.6 Any amendment to the tree protection plan must be agreed with the project Arborist, including the adoption of specific methodologies and/or procedures and structures for access into/use of certain parts of the above defined "Construction Exclusion Zones". Such procedures, including the provision of suitable ground protection may allow for the relocation of the "Construction Exclusion Fencing" to provide access to and across the previously protected areas.

Works Related Impacts

A1.7 In respect of any necessary and unavoidable structures/works required within or entry into the "RPA" zone, all efforts must be made to minimise impacts. Aerial issues may require "access facilitation pruning" or clearance pruning. Subterranean works that require excavation must, by design, location, and action, minimise impacts to trees.

Tree Works Specification Updates

A1.8 Many of the tree management recommendations stipulated within the "Preliminary Management Recommendation" section of the primary tree survey, relate to the "as was" site scenario. Because of changing site contexts, these may no longer apply and may require modification to account for the changes that the built project will cause.

General Method Statement

1.0) Overview and Implementation

1.1 **Prior to any site works, this method statement will be addressed and discussed by all member of the construction team management, prior to any site works or construction/demolition related works or access.**

1.2 The project Arborist or another suitably qualified person will oversee the application of all tree protection measures and any necessary modifications to this Method Statement (any issues as may have arisen in respect of planning conditions or details as may have changed between the design stage) to provide a basis upon which tree protection will be managed on the construction site.

1.3 Any situation that requires entry into the "root protection zones" of a tree intended for retention must be brought to the attention of the Project Arborist regarding the adoption/amendment of suitable tree protection measures.

1.4 As unforeseen tree losses may compromise project planning permissions, it is imperative that issues relating to tree protection and/or tree damage be brought to the immediate attention of the project Arborist for review and possible discussion with the relevant planning authority.

2.0) Works Sequence

2.1 No construction related works or mechanised site access will occur until the agreed level of tree protection, in accordance with the "Tree Protection Plan", is completed.

2.2 The only exception to the above will relate to the undertaking of tree works and felling as defined in the Arboricultural report and/or grant of permission.

2.3 On completion of tree felling/site clearance works, the tree management plan will be reviewed, accounting for (if necessary) the updating of the "preliminary Management Recommendations" stipulated in the original Tree Survey.

2.4 Any revised pruning/cutting works will be agreed with the local authority and applied at the earliest possible opportunity.

2.5 After the completion of primary tree clearance, but prior to the commencement of construction works, all "Construction Exclusion" and "Protective" fencing must be erected and "signed-off" as complete, by the Project Arborist.

2.6 Only on completion of all construction works will any/all tree protective measures be removed, and only then in a manner, that does not compromise the "Protection Zones". Such works must be agreed and overseen by Project Arborist.

2.7 At construction works completion stage, all retained trees will be reviewed regarding their condition and longer-term management recommendations and regarding site hand-over.

3.0) Tree Protection

3.1 All tree protection measures and locations must be agreed, overseen, and verified by the Project Arborist prior to works commencement.

3.2 All construction, works or access areas must be enclosed and defined by protective fencing, this comprising the "Construction Exclusion Zone" based upon drawings "Boden Villas Tree Protection Plan" (Construction Stage version).

3.3 Unless specifically stipulated by the project Arborist, the default minimum range of the protective fencing from a tree is the range stipulated for that tree within the "RPA" (root protection area) column of the original survey.

3.4 Such a fence must be fit for purpose and commensurate with the nature of activity expected upon the site and should comply with "Section 6.2" of BS5837: 2012.

3.5 The fence should be affixed with notification signs such as "TREE PROTECTION AREA - KEEP OUT"

3.6 Structures such as "lock-ups", offices or other temporary site building, not requiring excavation or underground ducting, might be positioned such as to comprise part of the "Construction Exclusion Zone" fencing. All remaining fencing must be continuous with such features and effectively prevents access to protected ground.

3.7 If entry into the "RPA" (Root Protection Area) zones becomes unavoidable, ground protection systems agreed with the project Arborist, will be utilised.

3.8 No amendment, alteration, relocation, or removal of the tree protection fencing shall occur without prior liaison and approval from the Project Arborist.

4.0) Provision of Ground Protection (If Required)

4.1 No vehicular/mechanised access whatsoever will be allowed onto unprotected "Construction Exclusion Area" ground.

4.2 Ground protection can comprise the use of proprietary materials/structures (installed to manufacturer's specifications and recommendations) or procedures that avoid ground damage/disturbance/compaction, or the use of procedures that avoid such effects e.g. manual/pedestrian installation procedures.

4.3 Any system utilised must effectively spread load-weight, avoid compaction, maintain drainage/percolation/aeration, and be installed in a manner that avoids these issues.

4.4 Newly provided access will be strictly limited to the area of the new protection structure.

4.6 Protection installation will require a progressive laying down of ground protection, with previously laid material providing vehicular access to the next zone will be accepted as an approved methodology.

5.0) Works within "RPA" Zone

5.1 Only works and construction practices, agreed with the Project Arborist prior to commencement, will be allowed in the "RPA" area.

5.2 All works will be undertaken under the supervision and guidance of the Project Arborist who will have the authority to stop works if activities are considered such as to have the potential to damage trees.

5.3 Preference must be given to manual labour and techniques within the fenced "RPA" zone.

5.4 On completion of the required works, the area will be inspected by the Project Arborist regarding the reinstatement of the original protection and the relocation of the protective fencing to a position relating to the original "RPA" area.

6.0) Service Installation

6.1 The "Project Arborist" must be consulted for advice and procedural recommendations, in respect of any installation of services within or requiring entry into the "Root Protection Area" of any tree intended for retention.

6.2 Any such works found to be unavoidable, must be undertaken with special care, incorporating the recommendations of both "BS5837: 2012 and the National joint utility groups, guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG 10)

6.3 Preference must be given to trench-less techniques including Mole-piping, Directional-drilling manual hydro-trenching (high-pressure water), "Air-Spade" or broken-trench techniques.

7.0) Tree Management and Works

7.1 All tree works should be undertaken under the guidance of the project Arborist

7.2 The primary site clearance and felling should be undertaken at the earliest stage of the overall development works, to enable the re-assessment of all ostensibly retainable trees and the updating of the "Preliminary Management Recommendations" to account for context changes and construction access and/or other issues coming to light.

7.3 All Tree Works must adopt safe work procedures and must be undertaken by staff suitably trained for the purpose at hand and compliant with all legislative, safety and insurance requirements.

7.5 All additional works will be agreed with the local authority and/or other stakeholders and applied at the earliest possible opportunity.

7.6 On completion of site works, the retained tree population will be reviewed and re-evaluated regarding its ongoing condition and the likely requirements of any ongoing or future monitoring or management needs.

8.0) Demolition

8.1 All demolition procedures must be agreed and overseen by the Project Arborist or other suitably skilled staff to monitor for damage and to protect exposed roots/cut-trim exposed roots/oversee backfilling of exposed roots.

8.2 Where access into unprotected "RPA" zone becomes unavoidable then suitable ground protection, provided in accordance with an engineer's direction and agreed with the Project Arborist will be installed.

8.3 Care will be taken to avoid damage to soil volumes beneath and adjoining demolished structures that may contain tree root material.

8.4 Whilst existing foundations/structures may provide temporary protected access to areas within the "RPA" zone, preference must be given to the location of demolition plant outside of the "RPA" zone.

8.5 Where tree(s) exist near a structure to be demolished then the demolition should be undertaken inwards within the footprint of the existing building (top down, pull back).

8.6 Underground structures (services etc.) within the "RPA" zone should be reviewed with regards to decommissioning and retention in situ in the interest of avoiding tree damage.

8.7 Preference should be given to the retention existing sub-bases where hard surfaces are removed, particularly if the hard surface is to be replaced.

9.0) Ancillary Precautions

9.1 The methodologies as set out in this document apply to all undertakers of work upon or adjoining the site as may require access to the "Construction Exclusion Zone" or the "RPA" area of any tree.

9.2 This document will be disseminated to all persons requiring access to the work site, with all persons undertaking works either before or after the principal development (site investigation works, Landscape Contractors) are subject to the above requirements

9.3 Works outside the "Construction Exclusion Zone" must be controlled to create no potential secondary hazard to tree health.

9.4 Large loads accessing the site must be reviewed regarding clearance and potential tree damage.

9.5 Care must be taken regarding materials that may contaminate the ground. No concrete mixings, diesel or fuel, washings or any other liquid material may be discharged within 10 metres of a tree.

9.6 No fires can be lit within 5 metres of any tree canopy extent.

9.7 No tree will be used for support regarding cables, signs etc.

9.8 The trees should be reviewed on a regular basis throughout the development process and on completion. At that time, additional recommendations regarding tree management may be required.

9.9 Any issue that has the potential to affect site trees must be brought to the attention of the Project Arborist for review and comment.

9.10 Any circumstances that become known whilst the development project is ongoing that either involves trees or access to/works within the construction exclusion zone must be brought to the attention of the Project Arborist for evaluation and advice regarding approach and methodology.

9.11 It is possible that liaison/agreement will be required with the Local Planning Authority regarding compliance with, as well as the verification of the required tree protection measures.

A2 Appendix 2 - Tree Survey

Nature of Survey

A2.1 The criteria put forward in "BS5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations" have provided a basis for this report.

A2.2 The data collected has been represented in table form as "Table 1" within "Appendix 1" to this report. This appendix includes a Survey Methodology, Survey Key, Survey Abbreviations, Condition Category Definitions and a brief resume of the typical application of Tree Protection measures as defined within the above standard and as relates to the "RPA" zones defined both within the survey table and on the "TCP" drawing.

A2.3 The survey, its findings and management recommendations relate to the site and the conditions thereon at the time of the survey. It relates to a "do nothing" or "as is" scenario and intends to provide an impartial representation of the site's tree population, regardless of any possible development works. It is likely that changes in site usage, development or other environmental changes will require an amendment of any tree's potential retention status and its preliminary management recommendations, and in some instances, may require the re-classification of a tree's suitability for retention.

Drawing References

A2.4 The survey must be read with the "Tree Constraints Plan" drawing "Boden Villas Tree Constraints Plan" regarding the representation of tree positions, crown forms, "RPA" extents and colour reference to category systems. Trees omitted from the supplied drawing may be "sketched in" to "Boden Villas Tree Constraints Plan". Any such trees should be located and plotted by professional means to identify the constraints such trees have upon the site.

A2.5 A green coloured outline represents each tree crown. It is scaled to represent the north, east, south, and west crown radii as denoted in the survey table. Each tree (categories A-green, B-blue, and C-grey only) have been apportioned a "Root Protection Area" (RPA see below) denoted as a dashed orange circle.

A2.6 The development of a Tree Constraints Plan (TCP) provides a design tool regarding tree retention. Such a plan combines the topographical land survey drawing with additional information as provided by the tree survey. The aspects of the tree's existence recorded on the "TCP" are, firstly, the tree canopies, represented by the four cardinal compass point radii (Sp: R in survey Table 1). Secondly, and following paragraphs 4.6.1, 4.6.2 and 4.6.3 of BS5837: 2012, we represent each tree's "Root Protection Area" (RPA). For design purposes, it approximates the position of the tree protection fencing

to be erected before the commencement of any site works, thus excluding all site activities other than those dealt with by way of the "Arboricultural Implication Assessment" and "Arboricultural Method Statement".

A2.7 The "Tree Constraints Plan" (TCP) depicts the extent and location of constraints, placed upon the site by the trees. The "TCP" represents both the true canopy form (north, east, south, and west radii) but also the "RPA" as defined above. These constraints are provided to advise regarding the design and layout of a proposed development.

Survey Intent and Context

A2.8 This document intends to highlight the extent and nature of the material of Arboricultural interest on the site in question.

Survey Data Collection and Methodology

The Survey

A2.9 The original survey was carried out in January and February of 2020. This survey portion of the overall report is not an Implication Assessment though but provided some of the basic information regarding its compilation. The compilation of this survey was guided by the recommendations of BS 5837: 2012. This survey typically includes trees of stem diameters exceeding 150mm at approximately 1.50 metres from ground level. The survey relates to current site conditions, setting and context.

A2.10 Each tree in the survey has a consecutive number that relates directly to the survey text. Measurements are metric and defined in metres and millimetres. All trees referred to in the survey text have been measured to provide information regarding canopy height and canopy spread (north, east, south, and west radii), level of canopy base and stem diameter at 1.50 meters from ground level. The dimensions provided are intended to provide a reasonable representation of a tree's size and form. While efforts are made to maintain accuracy, visual obstruction, especially regarding trees in groups, requires that some tree dimensions be estimated only.

Inspection and Evaluation Limitations and Disclaimers

A2.11 The information set out in this report relates to the review of a tree population on the site in question. As such, the information provided is based on a general review of trees and does not constitute a detailed review of any one of the individual specimens. Such an evaluation (tree report) would require the gathering of substantially more information than that dealt with in this survey.

A2.12 The survey is not a safety assessment and the parameters reviewed within this survey context would be substantially deficient in extent to provide for a reliable safety assessment. The survey is intended to provide a general and qualitative review to assist

in gauging the suitability of an individual tree for retention within a development context. All trees are subject to impromptu failure and damage. The assessment of risk as may be presented by a tree requires the review of numerous factors more than those noted herein and as such, remains outside the scope of this document and any attempt to use the information herein for such proposes will render the information invalid.

A2.13 A competent and experienced Arborist has completed all inspection and tree assessment. The inspection involves visual assessment only, which has been carried out from ground level. No below ground, internal, invasive, or aerial (climbing) inspection has been carried out.

A2.14 Trees are living organisms whose health, condition and safety can change rapidly. All trees should be re-evaluated regarding their condition on an annual basis or after substantial trauma such a storm event, other damage, or injury. The results and recommendations of this survey will require review and reassessment after one year from the date of execution. This survey does not constitute a review of tree or site safety. Attempts to use the contents herein for such purposes will render the contents invalid.

A2.15 Throughout the undertaking of the survey, several factors acted against the inspectors, contriving to reduce the accuracy of the survey.

Seasonality

A2.16 The original survey was carried out during the winter periods. Some of the signs, typically symptomatic of ill-health or defect within a tree, may not have been available to view at the time of the survey or may have been obscured by seasonality related factors. Some of the fruiting bodies of various fungi, parasitic upon or causing decay or disease in trees, may have been out of season and unavailable to view. This survey can only comment upon symptoms of ill-health or defects visible at the time of the inspection.

Survey Key

Species	Refers to the specific tree species
Age	Referred to in generalized categories including: -
Y - Young	A young and typically small tree specimen.
S/M - Semi-Mature	A young tree, having attained dimensions that allow it to be regarded independently of its neighbours but typically, would be less than 50% of its ultimate size.
E/M - Early-Mature	A specimen, typically 50% - 100% of ultimate dimensions but with substantial capacity for mass and dimensional increase remaining.
M - Mature	A specimen of dimensions typical of a full-grown specimen of its species. Future growth would tend to be extremely slow with little if any dimensional increase.

O/M - Over-Mature	An old specimen of a species having already attained or exceeded its naturally expected longevity.
V - Veteran	An extremely old, veteran specimen of a species, usually of low vigour and typically subject to rapid decline and deterioration or of very limited future longevity.
Tree Dimensions	All dimensions are in meters. See notes regarding limitation of accuracy.
Ht.	Tree Height
CH	Lowest canopy height
N, E, S, W	Tree Canopy Spread measured by radii at north, east, south, and west
Dia.	Stem diameter at approx. 1.50m from ground level.
RPA	Root Protection Area, as a radius measured from the tree's stem centre.
Con	Physical Condition
G Good	A specimen of generally good form and health
G/F Good/Fair	
F Fair	A specimen with defects or ill health that can be either rectified or managed typically allowing for retention
F/P Fair/Poor	
P Poor	A specimen whom through defect, disease attack or reduced vigour has limited longevity or maybe un-safe
D Dead	A dead tree
Structural Condition	Information on structural form, defects, damage, injury, or disease supported by the tree
PMR – Preliminary Management Recommendations	Recommendation for Arboricultural actions or works considered necessary at the time of the inspection and relating to the existing site context and tree condition. Works considered as urgent will be noted.
Retention Period	
S – Short	Typically, 0 -10 years
M – Medium	Typically, 10 -20 years
L – Long	Typically, 20 – 40 years
L+	Typically, more than 40 years
Category System	The Category System is intended to quantify a tree regarding its Arboricultural value as well as a combination of its structural and physical health.
Category A	A typically a good quality specimen, which is considered to make a substantial Arboricultural contribution
Category B	Typically including trees regarded as being of moderate quality
Category C	Typically including generally poor-quality trees that may be of only limited value.
	The above categories are further subdivided regarding the nature of their values or qualities.
Sub-Category 1	Values such as species interest, species context, landscape design or prominent aspect.

Sub-Category 2	Mainly cumulative landscape values such as woods, groups, avenues, lines.
Sub-Category 3	Mainly cultural values such as conservation, commemorative or historical links.

Table 1 – Tree Data Table

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural condition	PMR	Yrs	Cat
1	Silver Maple *(Acer saccharinum)*	E/M	G/F	15.00	1.75	4.50	4.50	4.00	3.00	1	503	6.04	A relatively young and still vigorous specimen supporting minor imbalance to south. Western stem face is less than is less than 900 mm from boundary wall. Pavement adjoining tree has been recently replaced. Wall position adjoining tree's stem shows evidence of substantial cracking.		M	B
2	Norway Maple *(Acer platanoides)*	E/M	F	13.00	1.50	3.00	3.00	3.50	2.00	1	477	5.73	Tree supports typical imbalance to east. Has undergone substantial cutting and removal of major stem resulting in major wound at 2.50 m. Tree still is vigorous. Tree's position at circa 1.00 m from wall face.		M	C
3	Silver Maple *(Acer saccharinum)*	E/M	G/F	15.00	1.25	3.00	3.50	3.50	1.50	1	535	6.42	Tree is young and still vigorous with immense capacity for continued growth. Tree is heavily divided at 2.00 m. Tree is located at 0.75 m from boundary wall.		M	B
4	Norway Maple *(Acer platanoides)*	E/M	G/F	12.50	3.50	3.00	5.00	3.50	1.50	1	497	5.96	Young and still vigorous. Tree has undergone substantial pruning particularly on eastern side of lower crown. Tree is located at circa 1050 mm from wall.		M	C

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural condition	PMR	Yrs	Cat
5	Norway Maple *(Acer platanoides)*	E/M	G/F	13.50	2.50	3.50	3.50	3.00	1.50	1	579	6.95	A relatively small, young and vigorous specimen located at circa 1.10 m from wall face. Tree has undergone substantial prior pruning resulting in major wounds between 2.00 and 2.50 m. Crown is affected by compression fork commencing at circa 1.25 m and continuing to above 2.00 m. that may undermine structural integrity.		M	C
6	Norway Maple *(Acer platanoides)*	E/M	G/F	12.50	2.50	3.00	4.00	4.00	2.00	1	369	4.43	Young and vigorous, tree is located at circa 1.10 m from boundary wall. Tree asserts immense potential for continued growth.		M	B
7	Laburnum *(Laburnum anagyroides)*	M	P	4.00	1.50	4.00	3.50	1.50	2.50	1	388	4.66	Heavily unbalanced to north-east suggesting early life partial collapse. Specimen is of poor quality supporting extensive deadwood and evidence of decline. Tree is considered unsustainable beyond immediate short-term.		S	C
8	Wild Cherry *(Prunus avium)*	M	F/P	12.00	1.50	3.00	3.50	5.00	3.00	3	493	5.92	heavily enveloped with Ivy cover preventing detailed visual appraisal. Viable crown appears to be limited to higher levels.	Cut Ivy and rereview.	M	C
9	Lime *(Tilia europea)*	E/M	F/P	14.00	0.00	4.50	5.00	5.00	5.00	3	780	9.36	A large, multi-stemmed specimen arising from bank of small stream. Configurations suggests coppice regeneration and sucker growth from a previous tree with evidence remaining of previous/additional failed stemmed within grouping general vigour and vitality is good though tree should be considered to be of mechanically impaired form with increased risk of failure.	Cut Ivy and rereview.	M	C

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural condition	PMR	Yrs	Cat
BP1	Border Planting 1 Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Domestic Plum *(Prunus Sp.)* Lilac *(Syringa vulgaris)* *Pyrocantha*	S/M	F/P	1.50-3.00	0.00	Spread Variable, Contiguous				m/s	n/a	n/a	Several young plants arise from within the site area but adjoining the footing of the boundary wall, including plum, lilac, Sycamore and Ash and Pyracantha. These trees, though small at present potential for substantial growth and therefore and with particular regard to species such as Sycamore and Ash, their location is unsustainable, arising effectively from the footing of the wall structure. Such material should be removed.		N/A	U