

**Arboricultural Report**  
**Trees at Proposed Site at**  
**Sandyford Central**  
**Sandyford Industrial Estate**  
**Dublin 18**

**November 2019**

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## Contents

<u>Report Page</u>	<u>Subject</u>
1	<b>Introduction</b>
3	<b><u>Report Summary</u></b>
9	<b><u>Appendix 1 – Preliminary Arboricultural Method Statement (With Tree Protection Plan)</u></b> <b>Overview</b> <b>Tree Protection</b> <b>Ground Protection</b> <b>Works within “RPA” Zone</b> <b>Service Installation</b> <b>Tree Management</b> <b>Demolition</b> <b>Works Sequence</b> <b>Ancillary Precautions</b> <b>General</b>
15	<b><u>Appendix 2 - Tree Survey</u></b> <b>The Survey</b> <b>Nature of Survey and Report</b> <b>Drawing Reference</b> <b>Site Description</b> <b>Survey Data Collection and Methodology</b> <b>Survey Key and Explanations</b>
18	<b>Table 1 - Tree Survey Table</b>

### Associated Drawings

This report is to be read with the drawings noted below

<u>Drawing Title</u>	<u>Drawing Subject</u>
1) <b>D1-TCP-Sandyford-11-19</b>	<b>Tree Constraints Plan</b> A plan depicting the predevelopment location, size, calculated constraints and simplified tree quality category system
2) <b>D2-AIA-Sandyford-11-19</b>	<b>Tree Impacts Plan</b> This plan represents the effects of the proposed development works on the above tree population and depicts trees to be retained and removed.
3) <b>D3-TPP-Sandyford-11-19</b>	<b>Tree Protection Plan</b> This plan depicts the nature, location and extent of tree protection measures required to provide for sustainable tree retention.



## **Introduction**

This report has been prepared by-  
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## **Report Brief and Context**

This report was requested by “**Sandyford GP Limited**” (acting in its capacity as general partner for the Sandyford Central Partnership). It comprises an Arboricultural review of the proposed development project. The various elements of this report provide an assessment of the sites existing tree population in respect of suitability for retention and sustainability in their current scenario, as well as an assessment of their potential for sustainable retention in the post-development scenario and the effects of the development process. It also provides information in respect of the necessary tree protection and the avoidance of damage to trees during the construction process, required to achieve sustainable tree retention.

This assessment summarises the Arborists findings and recommendations, arrived at after the screening process and considerations defined within the “Implication Assessment Scope” 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 and 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.

This report must be read with the three associated drawings.

1. The “Tree Constraints Plan” drawing “D1-TCP-Sandyford-11-19” that provides a graphic representation of tree survey data, depicting the constraints asserted by the site trees, as well as a categorisation of their condition and potential value.
2. The drawing “Arboricultural Implication Plan” drawing, “D2-AIA-Sandyford-11-19” depicts the expected impacts by overlaying the tree constraints information with the architectural and engineering information.
3. The “Tree Protection Plan”, “D3-TPP-Sandyford-11-19” depicts the location and extent of the tree protection measures required to prevent damage and disturbance to trees intended for retention.

## **Report Limitations**

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.

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. 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. Accordingly, the accuracy of this assessment premised on all its elements/recommendations, and the omission or alteration of any part can radically alter outcomes in respect of sustainable tree retention.

## **Report Summary**

In light of significant contextual and sustainability issues it is advised that no attempt be made at retaining the sites existing tree population, in favour of the development of a new, design led and sustainable planting scheme.

## **Site Description**

The site area is broadly rectangular, longest about its north-east to south-west axis. The site is located between Carmanhall Road to the south-west and Blackthorn Avenue to the north-east.

The site is highly artificial, comprising almost total hard-standing.

The site supports little vegetation, with the bulk located adjoining the sites south-western boundary with sporadic hedging and small trees about the northern half of the south-eastern boundary.

## **Pre-Development Arboricultural Scenario**

To the south-east of the site, four young Norway Maple remain healthy however, have been severely cut back to facilitate ongoing works access to the adjoining site. Accordingly, they are wholly one sided and support numerous, sometimes large pruning wounds. They arise from disturbed, constrained and sometimes compacted ground that suggest their current health status will not be sustainable over time. Additionally, the trees are noted to exist at circa 1.50 m from what is a retaining wall to the adjoining site to the east. The scenario is considered such as to raise risks of structural damage in respect of tree and tree root growth in line with “Table A1” of BS 5837:2012 – Trees in Relation to Design, Demolition and Construction.

The south-western boundary of the site, adjoining Carmanhall Road supports a notable block of vegetation, dominated by an alignment of Leyland Cypress. Whilst healthy, these trees have already outgrown their existing context and cannot be managed in any realistic manner. The species is broadly criticised and regarded as unsustainable in respect of its apical growth pattern, that does not readily allow for management by pruning. In this instance, they have already badly affected adjoining trees by causing chronic suppression, resulting in notable and sometimes chronic growth distortions.

On the northern side of the Cypress line and arising from a steep embankment that descends to and existing car park edge, there is a mixed ornamental planting of Norway Maple, Italian Alder and Laburnum. These trees, though young are of dubious retention merit, firstly because of the distortion caused by suppression, but also because of the existing context that includes a notable slope between the higher levels of Carmanhall Road and the car parking area. Additionally, the young nature and typically small stature of the trees mean that they could readily be replaced with substantially better-quality new stock.

Also adjoining the Carmanhall Road boundary, we note that outside of the site, there is an alignment of young Norway Maple within the soft margin adjoining the footpath and roadway. Whilst broadly healthy, many of these trees have been damaged in the recent past as a result of pathway works, with buttress and surface root damage plainly visible. Of greater interest is the fact that the trees cannot be regarded as sustainable within their current context as these generally young and still small trees are located such that their stem bases and buttress flairs are already in contact with the cement pavements, meaning that pavement damage is inevitable (See Table A1 – BS5837-2012). Therefore, and in light of the chronic growth distortions caused by the suppressive effects of the adjoining Cypresses, then consideration might best be given to replacement planting after the removal of the Cypresses, utilising context suitable species installed in a structures manner, accounting for need for a durable pavement in their immediate vicinity.

The northern portion of the site is highly artificial, comprising large areas of hard standing with little or no vegetation of interest. The greater proportion of vegetation noted on the site comprises naturally arising Buddleia growing from the edges of hard standing and areas of spoil. Such material is of minimal interest or value regarding retention. The eastern boundary of this area supports some vegetation much of which appears to arise from the neighbouring property but has through ongoing growth, extended through the apparent boundary fence into the site. Such material is of poor quality, but the parent plants are beyond the site jurisdiction.

In conclusion, it is suggested that through poor species selection, no locational or sustainability consideration in respect of pavements and tree growth, a lack of management and sometimes poor and harsh past pruning, or small statures that allow for simple and ready replacement with new planting stock, then none of the material encountered is considered to be of a value or offers a degree of sustainability that warrants retention. Accordingly, replacement planting using sustainable species (size and growth rates) in structures and designed planting scenarios, will offer a far greater degree of Arboricultural sustainability over time.

### **Nature of Proposed Works and Likely Impacts**

Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership) intend to apply to An Bord Pleanála for permission for a strategic housing development at a 1.54 ha site at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

The development, which will have a Gross Floor Area of 49,342 sq m will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments) is part 10 to part 11 No. storeys over basement; Block B (68 No. apartments) is 8 No. storeys over basement; Block C (33 No. apartments) is 5 No. storeys over lower ground; Block D (103 No. apartments) is part 16 to part 17 No. storeys over lower ground; Block E (48 No. apartments) is 10 No. storeys over semi-basement; and Block F (168 No. apartments) is 14 No. storeys over semi basement.

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a creche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

Whilst the footprint of the proposed structures and buildings, access roads, parking area and paths are readily understandable regarding the spatial requirements, additional and ancillary space is commonly required for construction works and associated activities and access. Additionally, it is noted that the proposed development will require some amendments to current ground levels across the site.

Site trees can readily be affected by one of three primary impacts including-

- 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. A change in site context or a change in occupation or use that makes a tree unsuitable for retention.

It is noted that the scale and context of the proposed development, in combination with the nature and quality of the trees reviewed within the tree survey, offers minimal potential for sustainable tree retention.

### **Design Iterations and Arboricultural Considerations**

From the outset, the entire design team was made aware of the nature and extent of trees both upon and adjoining the site area, and particularly, their quality and existing contextual issues.

This combined with the typically small stature of many specimens saw the rapid development of a design strategy whereby the entire existing tree population would be replaced with new sustainable stock, in a manner that would compliment the proposed development and avoid the contextual and growth related management issues arising in respect of the existing population.

### **Identification of Impacts**

The review of likely Arboricultural implications is based upon the recommendations and criteria as defined within BS5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations. The “assessment” tends to concentrate on any activity that affects the tree, its local environment, or the context within which it might be retained.

This report, its findings and recommendations have arisen from the scrutiny of development proposal drawings as provided by Henry J Lyons Architects, drainage and levels information as provided by OCSC Consulting Engineers and by Bernard Seymour Landscape Architects in conjunction with the most recent tree survey data (as appended to this report). The evaluation is primarily based on minimum protection ranges as extrapolated from the tree survey data in accordance with paragraphs 4.6.1, 4.6.2 and 4.6.3 of BS5837: 2012, and any element of the proposed development of works associated with it that affects the defined protection areas.

In respect of tree impacts and notwithstanding any pre-existing physiological/contextual issues, 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. Additionally, the tree specimens have been evaluated in respect of health, sustainability and suitability for retention within the new context and adjoining the proposed development. Such considerations can readily affect the “predevelopment suitability for retention” scenario.

The perceived development impacts have been illustrated graphically on drawing “D2-AIA-Sandyford-11-19”, where trees denoted with “Broken Red” crown outlines will be removed and those denoted with “Continuous Green” crown outlines will be retained.

### **Arboricultural Implications of Proposed Development**

The proposed development and its constituent parts that comply with current development expectations and planning densities, require the unavoidable consumption of space to provide for the proposed apartment blocks and basement parking, access roads and paths, as well as various other services and facilities.

Additionally, contextual and sustainability issue have arisen, substantially undermining any potential to retain existing site trees. Examples of this relate to the hugely disparate topography associated with the southern edge of the site and the fact that many trees exist in conjunction with a steep, partially engineered slope that must be radically modified to develop the site.

Also, issues have been noted in respect of species use and existing context. This includes the Leyland cypress associated with Tree line 1 “a” and “b” that are broadly regarded by all authorities as being unsustainable and unmanageable over time. As these trees are already spreading and beyond management, then their retention cannot be justified. Similarly, the existing planting of Norway Maple along the edge of Carmanhall Road has been compromised by poor planting design in that their current small stature has already interfered with existing pavement and attempted repair works has seen notable damage to the trees. Considering their current small size and capacity for growth then ongoing issue can only be realistically dealt with by replacement.

It is noted that the extent of tree planting envisaged across the site will in part mitigate the above losses. Details have been provided within the proposed landscape plans as provided by Bernard Seymour Landscape Architecture.

### **Particulars of Tree Loss**

The drawing “D2-AIA-Sandyford-11-19” comprises the tree survey drawings overlaid by the development drawings, thus providing a graphic representation of the tree related impacts, with those trees that will be removed, being denoted by red dashed outlines.

The nature and extent of the proposed development and its unavoidable need to convert or otherwise disturb the existing site conditions effectively requires the removal of all site trees as outlined below-

The review area supports a total of 27No. individual trees and 2 tree lines/hedges, totalling some 29No. items, including

- 0 category “A” trees,
- 2 No, category “B” trees,
- 23 No. category “C” (22 No. trees as well as 1 No. category “C” “hedge”)
- 4 No. category “U” items including 2No. trees, 1No. “tree line” and 1No. shrub group

Normally, all category “U” trees will be removed (many need removal regardless of development) (4 items cumulative)

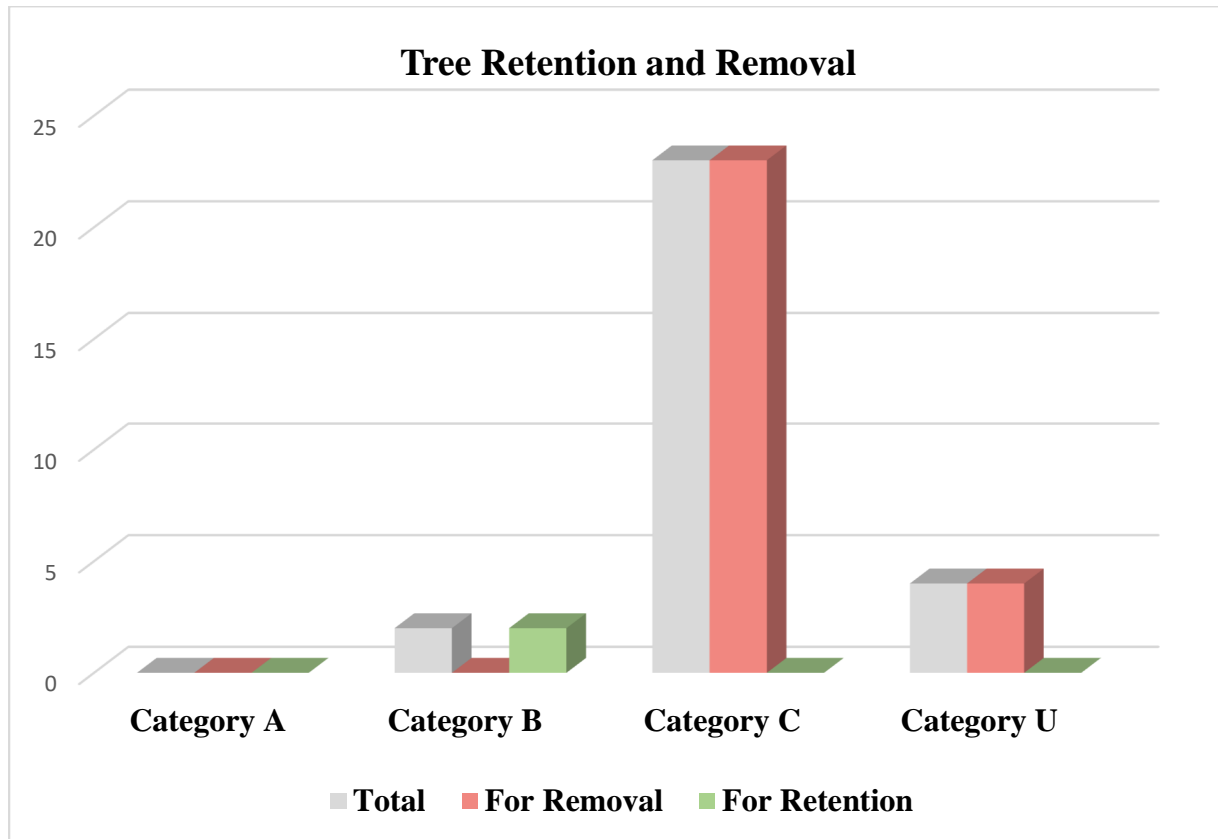
Of the review area’s “fair” quality, category “B” trees, the development works will require the removal of no trees.

Of the site’s category “poor” quality “C” trees/lines/hedges, the development works appears to require the removal of all specimens.

The tree loss breakdown for the site will be-

- 4 No. Category U trees and 1 No. category “U” Line (14 No. items)
- 0 No. Category B trees

- 23 No. category C trees and 5 No. category “C” Lines (10 No. items)



### **Tree Protection within the Scope of a Development**

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.

In respect of tree protection, whether vertical or horizontal, all must conform or equate to the recommendations of Section 9, 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.

This report provides a “Preliminary Arboricultural Method Statement” at “Appendix 1” to this report, as well as the associated “Tree Protection Plan” drawing “D3-TPP-Sandyford-11-19”.

In this drawing, the edges “Construction Exclusion Zone” is defined by the bold “Orange” lines that represent the proposed location of the primary protective “Construction Exclusion Fencing”, with the “Orange” hatched area representing the primary “Construction Exclusion Zone”.

In the case of this development, tree protection issues relate only to trees “A” and “B” adjoining but outside of the site’s eastern boundary.

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 and may require referral to a figured and dimensioned 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.

### **Preliminary Management Recommendations**

While “Preliminary Management Recommendations” are provided within the scope of the basic tree survey, the fact that all site trees will be removed means that such recommendations are irrelevant. Equally and as the only trees to be retained (Trees “A” and “B”) are located outside of the site’s jurisdiction, then their management or otherwise, other than protection at construction time, is beyond the scope of site works.

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

### **Method Statement Outline**

Set out below is a broad and prescriptive method statement, intended to provide advice and guidance for most events, occurrences and issues that arise in respect of trees and tree protection on typical development sites. This statement intends to instruct and to advise regarding the execution of the proposed development works in a manner that will be least detrimental to the retained tree population.

### **Drawings**

This Arboricultural Method Statement must be read with the associated “Tree Protection Plan” drawing, “D3-TPP-Sandyford-11-19”. This drawing, as was submitted as part of the Arboricultural planning package must be updated and confirmed for “Construction” stage purposes, for example by the inclusion of specific tree protection ranges and dimensions. Accordingly, and in respect of tree protection ranges from any tree, reference must be made to the root protection area radius as defined for that tree within the tree survey table.

### **Method Statement Use**

This Method Statement should be used under the direct guidance of the project Arborist, as site/project specific issues arise, and new information becomes available, it may be amended and adjusted by him/her to address project-specific issues. In this respect, limited “construction management” detail was available at compilation time, and therefore this method statement deals with tree protection in its broadest terms and may require modification to deal with project specific details to this development, e.g. to account for specific plant/machinery/access issues.

### **Amendments and Modifications**

In some situations, and with the adoption of specific ground protection procedures and structures, parts of the above defined “Construction Exclusion Zones” might still be utilised during the construction process. In respect of vehicular/plant/machinery access, the provision of suitable ground protection measures that avoid soil compaction and maintain drainage/percolation and breathability, that are acceptable to the project Arborist and subject to engineering confirmation, can be utilised. Such might include the various form of “roll-out” temporary access surfaces or might include the “three-dimensional cellular confinement systems that utilise specific forms of confined hard-core. The effective use of either system is subject to the avoidance of excavation and level changes, by use upon existing ground surfaces. Where provided, the above systems would allow for the relocation of the “Construction Exclusion Fencing” to exclude and provide access to and across the newly protected areas.

### **Works Related Impacts**

In respect of any necessary and unavoidable structures 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. The adoption of “manual only” procedures so that root damage can be minimised, for example by hand digging or the use of “air-spades” for excavation or trenching, may be required. All such works must be undertaken under the guidance of the project Arborist who will advise on likely repercussions and necessary tree management issues.

## Tree Works Specification Updates

It must be noted that many tree management recommendations, as stipulated within the “Preliminary Management Recommendation” section of the primary tree survey, were made prior to any grant of permission, relate to a changing site context and may no longer be applicable, or may require modification to account for the changes that the built project will cause.

## General Method Statement

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.

### 1.0) Overview and Implementation

- 1.1 **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 A review must be undertaken to identify any issues as may have arisen in respect of planning conditions or details as may have changed between the design stage and construction stage development details.
- 1.2 The project Arborist or another qualified person will oversee the application of all tree protection measures and any necessary modifications to this Method Statement to provide a basis upon which tree protection will be managed on the construction site.
- 1.3 The tree constraints (radial range) associated with any tree to be retained on site is to be regarded as sacrosanct and is not to be entered for any reason without confirmation by, and agreement with, the project Arborist.
- 1.4 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.
- 1.5 As unforeseen tree losses may compromise project planning permissions, it is imperative that issues relating to tree protection 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 including tree felling and cutting as defined in the Arboricultural report.
- 2.3 The Project Arborist will oversee and liaise with the tree works contractor regarding the nature and extent of tree/woodland access to facilitate felling works.
- 2.4 On completion of the felling works, the tree management plan will be reviewed by the Project Arborist to address changed context, land use, rates of occupation and use and to account for potential impacts upon the newly built environment, thereby amending (if necessary) the “preliminary Management Recommendations” stipulated in the original Tree Survey.
- 2.5 Any revised pruning/cutting works will be agreed with the local authority and applied at the earliest possible opportunity.
- 2.6 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.

- 2.7 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”. This must be completed in a “Progressive” manner, with each section being removed whilst utilizing protection systems still in situ. Such works must be agreed and overseen by Project Arborist.
- 2.8 At construction works completion stage, all retained trees will be reviewed regarding the condition and longer-term management recommendations and regarding site hand-over.

### **3.0) Tree Protection**

- 3.1 All tree protection measures must be agreed, overseen and verified by the Project Arborist prior to works commencement and regarding maintenance for the duration of site works
- 3.2 Tree protection will be based upon drawings “D3-TPP-Sandyford-11-19” (Construction version) that relates to all trees for retention, as well as the location of all tree protection measures.
- 3.3 Unless specifically stipulated by the project Arborist, the default minimum range of protective fencing or construction exclusion fencing is the range stipulated in the primary tree survey for that tree and within the “RPA” (root protection area) column.
- 3.4 If entry into the “RPA” (Root Protection Area) zones becomes unavoidable, ground protection systems agreed with the project Arborist, that allow for the relocation of the “Construction Exclusion Fencing”, will provide for an extension of accessible ground space.
- 3.5 All construction, works or access areas must be enclosed and defined by protective fencing, this comprising the “Construction Exclusion Zone”
- 3.6 Such a fence must be fit for purpose and commensurate with the nature of activity expected upon the site and should be 2.00 metres in height, constructed of robust materials and be suitably braced to withstand impact and may include sheet panels attached to timber posts or weld-mesh panels supported upon a scaffold bar system. All footings must be firm and immobile and must not use mobile rubber or cement footings, (an illustration (Fig 1-facsimile of BS5837: 2012, is appended to this document to illustrate a possible option for the construction of the protective fencing)
- 3.7 The fence should be affixed with notification signs such as “TREE PROTECTION AREA - KEEP OUT”
- 3.8 Where applicable, 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.
- 3.9 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 ground.
- 4.2 Ground protection can comprise the use of proprietary materials/structures 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 structure
- 4.5 Where proprietary ground protection systems are utilised, it is imperative that the manufacturer’s specifications and recommendations are adhered to in full regarding the provision and installation of this type of ground protection.
- 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 The “RPA” zone associated with all retained trees must be protected from the effects of construction works.
- 5.3 Amended tree protection measures as agreed with the Project Arborist and including the relocation of fencing and the provision of ground protection will be installed in accordance with the tree protection measures prior to commencement.
- 5.4 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.
- 5.5 Preference must be given to manual labour and techniques within the fenced “RPA” zone.
- 5.6 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 No open trenching will be allowed. All works must be commensurate with the preservation of the affected tree root system.
- 6.4 Preference will be given to trench-less techniques including Mole-piping, Directional-drilling manual hydro-trenching (high-pressure water), “Air-Spade” or broken-trench techniques.
- 6.5 All works carried out within the “RPA” zone or “Construction Exclusion Zone” must be agreed with and supervised by the Project Arborist.

## **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 in respect of possible amendments to the “Preliminary Management Recommendations” and 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.
- 7.4 Additional works including formative pruning, crown reduction etc., may be nominated for various trees in the interests of mitigating the potential effects of exposure and isolation.
- 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 All Tree Surgery/Pruning works will be undertaken under the guidance of the Project Arborist; the precise nature and extent of work being agreed before commencement.
- 7.7 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.
- 9.3 All persons undertaking works either before or after the principal development (site investigation works, Landscape Contractors) are subject to the above requirements
- 9.4 Works outside the “Construction Exclusion Zone” must be controlled to create no potential secondary hazard to tree health.
- 9.5 Large loads accessing the site must be reviewed regarding clearance and potential tree damage.
- 9.6 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.
- 9.7 No fires can be lit within 5 metres of any tree canopy extent.
- 9.8 No tree will be used for support regarding cables, signs etc.
- 9.9 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.
- 9.10 Any issue that has the potential to affect site trees must be brought to the attention of the Project Arborist for review and comment.
- 9.11 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.
- 9.12 It is likely 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.



## **Appendix 2 - Tree Survey**

### **Nature of Survey**

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

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.

The survey, its findings and management recommendations relate to the site and the conditions thereon at the time of the survey. It is likely that changes in site usage, development or other environmental changes will require an amendment of a 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**

The survey must be read with the “Tree Constraints Plan” drawing “D1-TCP-Sandyford-11-19” 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 “D1-TCP-Sandyford-11-19”. Any such trees should be located and plotted by professional means to identify the constraints such trees have upon the site.

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.

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”.

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**

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**

The original survey was carried out in January of 2019. 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.

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 are estimated only.

### **Inspection and Evaluation Limitations and Disclaimers**

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.

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 purposes will render the information invalid.

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.

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.

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

### **Seasonality**

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**

<b>Species</b> .....	Refers to the specific tree species
<b>Age</b> .....	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.
<b>Tree Dimensions</b> .....	All dimensions are in meters. See notes regarding limitation of accuracy.
<b>Ht.</b> .....	Tree Height
<b>CH</b> .....	Lowest canopy height
<b>N, E, S, W</b> .....	Tree Canopy Spread measured by radii at north, east, south and west
<b>Dia</b> .....	Stem diameter at approx. 1.50m from ground level.
<b>RPA</b> .....	Root Protection Area, as a radius measured from the tree's stem centre.
<b>Con</b>	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
<b>Structural Condition</b>	Information on structural form, defects, damage, injury or disease supported by the tree
<b>PMR – Preliminary Management Recommendations</b>	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.
<b>Retention Period</b>	
S – Short.....	Typically, 0 -10 years
M – Medium.....	Typically, 10 -20 years
L – Long.....	Typically, 20 – 40 years
L+.....	Typically, more than 40 years
<b>Category System</b> .....	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 U.....	Typically relates to trees that are dead, dying or dangerous. Such trees may present a threat or suffer from a defect or disease that is considered irremediable.
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	Norway Maple ( <i>Acer platanoides</i> )	S/M	P	6.00	1.50	1.50	2.50	2.50	1.00	1	255	3.06	Heavily cut on western side to facilitate works access. Basal region supports notable distortion because of arising in contact with cement base. Lower stem has sustained notable damage. Is of dubious retention merit.		M	C2
2	Norway Maple ( <i>Acer platanoides</i> )	S/M	F/P	5.50	0.75	1.50	3.00	2.00	1.00	1	258	3.09	Heavily cut on western side to facilitate works access. Arises from constrained and disturbed ground.		M	C2
3	Norway Maple ( <i>Acer platanoides</i> )	S/M	F/P	5.50	2.00	1.50	2.50	2.50	1.00	1	261	3.13	Heavily cut on western side to facilitate works access. Arises from constrained and heavily compacted ground. Is of dubious sustainability.		S	C2
4	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	5.50	2.00	1.50	2.00	2.50	1.00	1	248	2.98	Heavily cut including reduction and removal of much of western crown. Arises from constrained compacted ground.		M	C2
955	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	6.00	2.25	1.50	3.00	3.50	2.50	1	290	3.48	Heavily cut in past with much of northern and eastern crown now removed. Arises from constrained ground environment with hard-core imported to north.	Review regarding retention context.	M	C2
956	Norway Maple ( <i>Acer platanoides</i> )	S/M	G/F	6.00	2.00	3.00	2.00	2.50	1.50	1	181	2.18	Distorted through suppression but is maintaining reasonable vigour and vitality.		L	C2
957	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	6.50	1.50	2.50	1.50	2.00	1.50	1	175	2.10	Suppressed by proximity of near neighbours. Arises from notably disturbed ground with extensive hard-core dumping to north. Lower stem has suffered minor damage.	Review regarding retention context.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
958	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	7.50	2.00	3.50	3.00	1.50	1.50	1	204	2.44	Notably distorted through suppression resulting from encroachment by adjoining Cypresses.	Review regarding retention context.	M	C2
959	Norway Maple ( <i>Acer platanoides</i> )	S/M	F/P	9.00	2.00	4.00	2.50	0.50	1.50	1	134	1.60	Particularly tall and drawn-up, spindly nature raising concerns regarding sustainability. Arises from position directly adjoining kerb edge and upon sloping ground.	Review regarding retention context.	S	C2
960	Italian Alder ( <i>Alnus cordata</i> )	E/M	F	12.00	2.00	5.00	3.00	0.00	2.50	1	315	3.78	Wholly one-sided and heavily unbalanced and north as result of substantial encroachment by adjoining Cypress.	Review regarding retention merit.	S	C2
961	Laburnum ( <i>Laburnum anagyroides</i> )	M	P	3.50	0.00	3.50	1.50	1.00	1.50	1	153	1.83	Heavily cut and extensively suppressed with entire crown unbalanced to north.	Remove and replace.	N/A	U
962	Italian Alder ( <i>Alnus cordata</i> )	S/M		10.00	1.50	5.00	2.50	0.00	3.00	1	216	2.60	Supports chronic imbalance to north. Is considered unsuitable for retention.	Remove.	N/A	U
963	Laburnum ( <i>Laburnum anagyroides</i> )	E/M	P	4.00	1.00	4.00	3.00	0.00	3.00	1	185	2.22	Wholly one-sided and heavily unbalanced to north. Arises from extensive ascending embankment.	Review regarding retention context.	S	C2
963a	Italian Alder ( <i>Alnus cordata</i> )	S/M	F	6.50	0.00	3.00	1.50	1.50	2.00	1	124	1.49	Young and vigorous but having suffered root damage and exposure whilst arising from unstable bank. Is considered of dubious retention merit.	Consider early removal.	S	C2
963b	Italian Alder ( <i>Alnus cordata</i> )	S/M	F/P	7.00	0.00	3.00	2.00	1.50	1.50	3	115	1.38	Distorted and arising from embankment adjoining derelict surface.	Review regarding retention context.	S	C2
SG1	Buddleia ( <i>Buddleia davidii</i> )	M	P	4.50	0.00	2.50	4.00	2.50	4.00	m/s	191	2.29	An area of natural scrub redevelopment.		N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
TL1a TL1b	Tree Line 1 (a & b) Leyland Cypress ( <i>Cupressocyparis leylandii</i> )	E/M	F/P	12.00-14.00	1.00	Contiguous 9.00-12.00m Spread				1	477	5.73	Apparently planted at circa 1.00 – 1.25 m centres and intended as a hedge. Crown systems are now contiguous and self-suppressing with proximity to one another leading to exacerbated crown spread to north-south and chronic suppression in an east-west fashion. This has led to the development of fan shape crown profiles with early signs of localised storm damage already in evidence. Leyland Cypress is considered particularly difficult to manage and of dubious if any sustainability over time. In this instance, such issues are compounded by the elevated nature of the alignment relative to the rest of the site and particularly in respect of what appears to be excavation related curtailment of natural root spread to north. Is considered unsustainable.	Consider early removal.	N/A	U
5	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	10.00	2.25	2.00	5.00	4.50	3.50	1	302	3.63	Heavily suppressed on northern side as result of proximity to adjoining Cypresses. Buttress roots have suffered notable damage with evidence to suggest the path installation resulted in further root damage.	Review in respect of sustainability and suitability pretension.	M	C2
6	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	7.00	1.75	2.50	3.50	3.50	4.00	1	261	3.13	Young and still vigorous but arising from highly constrained environment cement footpath area exhibits evidence of prior damage. Underground services are known to exist within 1.00 m to north-west regarding retention context.		M	C2



No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
7	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	10.00	2.25	2.50	3.50	2.50	4.00	1	306	3.67	Distorted and slightly unbalanced. Has suffered notable buttress root damage. Is in extreme proximity to existing footpath growth related issues are considered inevitable.	Review regarding retention context and sustainability.	S	C2
8	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	9.00	2.00	1.50	4.00	3.00	3.50	1	280	3.36	Distorted and slightly unbalanced. Is in extreme proximity to existing footpath growth related issues are considered inevitable.	Review regarding retention context and sustainability.	M	C2
9	Norway Maple ( <i>Acer platanoides</i> )	S/M	G/F	7.50	2.00	2.00	4.50	4.00	4.50	1	283	3.40	Young and vigorous but has suffered root damage during installation of footpath. Is known to exist near known underground services. Proximity to footpath will result in damage over time	Review regarding retention context and sustainability.	M	C2
10	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	9.00	2.00	2.00	4.00	2.50	2.00	1	248	2.98	Has suffered stem and buttress root damage. Installation of footpath has resulted in root damage. Proximity to path will see conflicts and root sorry path disturbance over time.	Review regarding retention context and sustainability.	M	C2
11	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	7.00	2.25	2.50	2.50	2.00	2.50	1	248	2.98	Young and still vigorous. Supports minor surface root buttress root damage. Proximity to footpath suggest high potential for damage over time. Is known to exist in close-proximity to underground services as depicted by existing service hatch as.	Review regarding retention context.	M	C2
A	Holm Oak ( <i>Quercus ilex</i> )	S/M	F	6.00	0.00	3.00	3.00	3.00	2.50	1	293	3.51	Young and vigorous but arising from within confines of adjoining property. Tree appears to arise from raised embankment scenario relative to site levels.	Review regarding retention context.	M	B2
B	Holm Oak ( <i>Quercus ilex</i> )	S/M	F	5.50	0.50	3.50	3.00	2.00	2.00	1	261	3.13	Slightly suppressed and one-sided as result of proximity to near neighbours.	Review regarding retention context.	M	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
C	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	5.00	2.00	3.00	2.50	2.50	2.50	1	175	2.10	Young and vigorous but arising from raised planter behind retaining wall scenario.	Review regarding retention context.	M	C2
D	Norway Maple ( <i>Acer platanoides</i> )	S/M	F	4.00	0.75	2.50	1.50	2.00	2.00	1	134	1.60	Young and vigorous but arising from retained scenario.	Review regarding retention context.	M	C2
H1	Hedge 1 Elaeagnus ( <i>Elaeagnus Sp.</i> ) Viburnum ( <i>Viburnum Sp.</i> ) Gorse ( <i>Ulex europaeus</i> ) Berberis ( <i>Berberis Sp.</i> )	E/M	F/P	2.50-4.00	0.00	Contiguous 2.00-4.00m Spread					159	1.91	A highly variable hedge apparently arising from neighbouring property but growing through dividing boundary fence. Quality is highly variable with much being overrun by Ivy. Suitability for and potential for retention will be dependent upon likely boundary treatments.	Review regarding retention context.	S	C2