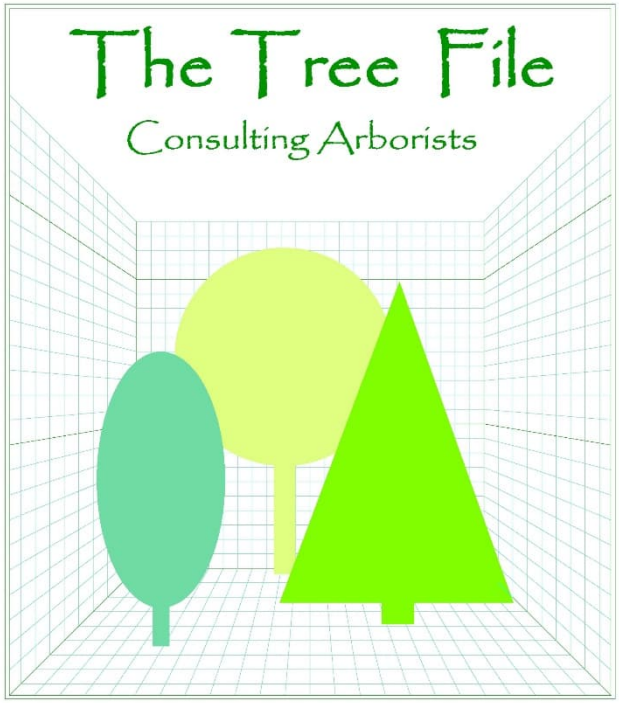

Arboricultural Report

Proposed Public Realm Improvements for a Pedestrianised New Street Malahide Co Dublin

April 2023

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Contents

Associated Drawings

This report is for reading in conjunction with the drawings noted below:

	Drawing Title	Drawing Subject
1)	New Street Tree Constraints Plan	Tree Constraints Plan A plan depicting the predevelopment location, size, calculated constraints, and simplified tree quality category system
2)	New Street Tree Impacts Plan	Tree Impacts Plan This plan represents the effects of the proposed improvement works on the above tree population and depicts trees to be retained and removed.

1.0 Executive Summary

1.1 As outlined below and expanded on within this report, substantial sustainability issues relate to the trees within the current New Street context. Existing and ongoing damage cannot be mitigated or sustainably repaired and these issues, together with continued growth over time, will result in an unavoidable and inevitable need to remove these trees in the future. The trees on New Street are generally young and still small specimens, having attained much less than 20% of their ultimate species mass. As they are existing within a constrained environment, it is advised that they are replaced with new trees. This would allow for species choices better suited to the constrained context and positioning at better ranges from buildings. These trees would benefit from purpose designed planting scenarios, that would better guarantee sustainability without encroachment or growth-related damage issues over time.

2.0 Arboricultural Scenario

2.1 Though inarguably urban, much of the current New Street visual context relates to its population of eleven Norway Maple. While the tree survey notes many trees remaining vigorous, some have suffered some mechanical damage. This might suggest the trees potentially offer sustainability. However, due consideration must be given to what tree retention might entail and result in over time. Particularly, attention must be drawn to the fact that the predominant species, Norway Maple, has the potential to become a large tree over time. Many authorities cite heights between 25.00 and 30.00 metres (Mitchell et al.) with potentially similar crown spread. Such trees will stand on immense stems, arguably diameters more than 1.00 m (W.J. Bean, 1980).

2.2 Such trees only exist at the sufferance of the ground environment in which they grow. The development of these trees, and particularly their stem bases, buttress regions and zone of structural roots, can only exist within soil, either by its compression or its displacement. The results of this issue are plain to be seen across the site area. Examples are well illustrated by the ground surfaces directly adjoining the tree stems, that are becoming uplifted and by both lateral and rotational displacement of surface structures, most notably the kerb edges and paved surfaces.

2.3 Currently, the street functions predominantly as a pedestrian zone, with vehicle access restricted to 7am - 11am daily and two-way vehicular access available to Ross Cottages on the east side at all times. A footpath of varying widths runs the full length of the street between the kerb and buildings lines, with mature trees growing at intervals in the footpath. Notwithstanding this, the context remains one of an urban streetscape. The central road corridor is of typical tarmacadam, exhibiting evidence of numerous intrusions over time, as depicted by the patchwork of various surface repairs and excavation areas. The pavement context is equally hostile, comprising the existing granite kerb stone, but with block pavers as a pedestrian surface together with retained areas of reconstituted rubber carpet near trees. Much of the pedestrian context exhibits evidence of extensive underground infrastructure including what appears to be gas, water, and telecoms. For the much of the western side, the pedestrian surface maintains circa 2.50 to 2.80 m widths, however, the eastern side is often reduced to circa 1.75 m at its northern end, with a limited area, north of the street centre, extending to circa 3.30 m.

2.4 In Arboricultural terms, the streetscape would be regarded as a hostile environment. Historical thoroughfares tend to be based on hard, compacted soils resulting from long-term historical use. This issue is often compounded by modern construction requirements for minimum "California Bearing Ratios" (CBR's) required to provide stability, avoid subsidence, and maximise durability of surface structures. In practice, this often results in ground environment that can be inaccessible to tree roots.

2.5 Tree root morphology within such urban contexts is difficult to estimate in either depth, range, or form. In practice, streetscape tree rooting systems rarely develop symmetrically or conform to the typical root protection area as might be estimated under the auspices of BS 5837-2012. Most likely, tree roots will proliferate where they can and where they can maintain optimum root function given the poor ground environments. Invariably, this relates to areas of ground where gas exchange and water infiltration can occur notwithstanding the typical covering of ground surfaced by impermeable, watersheds and materials. Therefore, we commonly see tree roots proliferating and following channels of prior disturbance, i.e., trenches created during the installation of infrastructure or at the interfaces between various materials such as buildings and pavements, roads and kerbs or paths and kerbs. Additionally, and only confirmable by additional, exploratory excavations, it is quite likely that a high proportion of tree roots will be shallow. It is often the case that tree roots proliferate directly beneath artificial surfaces, because of moisture build-up. This water tends to relate to daily temperature changes and the condensation of soil moisture about the lower face of the constructed surface.

2.6 Appreciating the trees currently reviewed are all relatively young and arguably substantially less than 20% of their ultimate size, then an issue of future growth and unavoidable ground disturbance must be considered. The current scenario provides no capacity to accommodate future growth. Furthermore and otherwise hostile environment within which they are growing then, any future growth is unlikely to be accommodated by way of downward compression and distinctly more likely to be accommodated by upward movement and uplifting of lightly laden surfaces (table A1 – “BS 5837, Trees in Relation to Design, Demolition and Construction – Recommendations”) and structures located above any tree roots.

2.7 Considering the degree of uplifting and distortion existing at present and relating to still small trees, then the potential to retrofit a new surface without causing substantial damage becomes highly questionable. This issue is compounded by existing threshold levels to adjoining properties and the maintenance of universal access and sustainable, nonintrusive drainage.

2.8 Most trees within the west of New Street exist at a range of circa 2.20 – 2.30 m from the adjoining buildings, with trees to the east of the roadway being as little as 1.50 and 1.60 m from the adjoining buildings. These minimal ranges require the consideration of "lightly laden structures", such as paved surfaces, that may be subject to growth-related disturbance over time, in line with "Table A1" of BS 5837-2012. Additionally, and considering the ultimate potential of these trees to grow much larger, there is the potential for maximum stem growth to provide a distinct impingement existing on pedestrian space, and a far greater extent of the existing pavement will be subject to uplifting and distortion. The ultimate size of the trees, considering their small size to date, will be such that the already existing overhanging encroachment on buildings will increase greatly.

2.9 Considering the above, and particularly the ultimate size of the trees, the almost inevitable likelihood of ongoing damage disturbance and encroachment, combined with limited potential for retrofitting sustainable new surfaces and what will prove to be an inevitable and costly ongoing management regime over time would combine to suggest that the best course of action would be, rather than retaining the existing trees, to consider the replacement of the trees with new trees, of more contextually compatible species, within a sustainable, purpose designed underground planting environment and potentially at ranges better selected from the fronts of adjoining buildings.

3.0 Introduction

3.1 **Dermot Foley Landscape Architects**
Argus House,
Malpas Street,
Blackpitts,
D08 DD56

3.2 The survey has been prepared by:
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The Tree File Ltd
Brookfield House
Carysfort Avenue
Blackrock
Co Dublin

Report Brief

3.3 In line with the requirement for Arboricultural information in respect of the proposed New Street project, the intention of the tree survey is to register, describe and evaluate the trees regarding their current health status and current condition within their current context. The survey is based upon and has been compiled considering the recommendations of BS5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations.

Report Context

3.4 In line with the recommendations of "BS5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations", this assessment has been advised by the results and findings of a tree survey, the findings of which are included as "Appendix 1" to this report. This comprises a simple qualitative tree survey describing the material of Arboricultural interest, upon and adjoining the subject site. The survey provided the basic information that assisted in the compilation of the broader report.

3.5 This tree report should be read in conjunction with the Tree Constraints Plan "New Street Tree Constraints Plan". This drawing provides a graphic representation of the tree survey depicting the nominally calculated constraints and the spatial retention requirements of the trees, as well as colour-coded categorisation of their condition and potential value.

3.6 In line with the recommendations of “BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations”, this report provides an accurate understanding of the Arboricultural implications of the proposed improvement works and to explain the issues at hand.

3.7 As the recommended outcome of this report is to replace the existing trees with new trees, within specifically designed and constructed contexts, and that no trees will be retained within the proposed works zone, then this report does not include a Tree Protection Plan or Arboricultural Method Statement,

Report Limitations

3.8 This report is based on the Arborists interpretation of information provided to them prior to report compilation and gathered from the site during the undertaking of the site review. The site review data is subject to the limitation as set out under "Inspection and Evaluation Limitations and Disclaimers" in "Appendix 1" to this report. The findings and recommendations made within this report are based upon the knowledge and expertise of the inspecting Arborist.

4 Site Description

4.1 Currently, the street functions predominantly as a pedestrian zone, with vehicle access restricted to 7am - 11am daily and two-way vehicular access available to Ross Cottages on the east side at all times. A footpath of varying widths runs the full length of the street between the kerb and buildings lines, with mature trees growing at intervals in the footpath.

4.2 The streetscape consists of a central, tarmacadam and roadway currently designed for one-way traffic only. The roadway is adjoined to both the east and west by pedestrian footpaths of varying widths. It is from these footpaths that the review of tree population arises. The footpath configuration typically comprises a block paver scenario with, for the most part, granite kerb edge stones. A clear majority of the trees reviewed arise from position immediately adjoining the kerb edge or within 200 – 300 mm thereof. Note is made that in many instances, the paving surface directly adjoining the tree stems has been swapped from hard block pavers to the use of reconstituted rubber matting.

4.3 In many instances, trees exist at ranges in or about 2.00 m from the fronts of buildings including residential and commercial premises. Accordingly, and in line with the age of trees encountered, the streetscape includes a substantial overhang of adjoining properties.

5 Pre-Development Arboricultural Scenario

5.1 The species encountered on New Street, Norway Maple, is originally from eastern and central Europe was introduced in the 17th century. Most authorities regard the species as large and fast growing, capable of attaining 20 to 25 metres height and developing stem girths can exceed 3 metres (more than 1 metre diameter) (WJ Bean, 1980). Considering that such tree stems will have (and will continue to develop) significantly greater buttress flairs near ground level, illustrates that their potential to disturb and uplift ground in the New Street contexts is immense.

5.2 This report acknowledges that a majority of the subject trees are of fair health and might, under other circumstances, offer substantial sustainability. However, within the context in which the trees exist, any expectation of sustainable retention is undermined. Limited available space and already visible, growth-related disturbance, relating to trees that are still small (see Appendix 2), illustrates a fundamental lack of sustainability. The lack of foresight, poor species selection, poor planting contexts, and the provision of no capacity for future growth, mean that these trees will inevitably cause damage and will raise insurmountable management issues over time.

5.3 Future tree growth is inevitable. Tree root development is unlikely to be accommodated by downward compression of soil. However, it is more likely to be accommodated by upward movement and uplifting of lightly laden surfaces and structures located above any tree roots. This issue is highlighted and cautioned against in “Table A1” of “BS 5837, Trees in Relation to Design, Demolition and Construction – Recommendations”.

5.4 The retrospective installation of engineered tree pits or suspended pavement is impossible. Equally, issues of future growth space provision and raising pavement levels are complicated by the fixed threshold levels of existing homes and businesses. Equally, tree retention and protection during any redevelopment and construction phase

will prove particularly onerous to works and particularly any necessary excavation, construction or changing of levels near the trees.

5.5 Despite the reasonable health of the trees inspected and the benefits of incorporating trees into future landscapes, it is difficult to see how the existing trees can be kept. The young age of the trees, their proximity to existing buildings, and the constraints that tree retention would place on the nature and extent of any work would be highly restrictive on what can be achieved, its durability and how regularly it would be subject to ongoing repair. This suggests that a future "tree-scape" should consist of new, context-appropriate trees, planted in conjunction with a properly designed and engineered ground context. This option offers the best chance of attaining long-term and sustainable arboricultural outcomes.

5.6 Some concern relates to the fact that these trees are growing from a highly artificial and restrictive environment, they will not have developed a naturally symmetrical root system. It is more likely that the developed root systems are highly asymmetrical, their patterns being influenced and governed by the availability and location of “hospitable ground” and deflected by many underground obstacles. It is likely that these tees have developed elongated connective root systems, proliferating for absorptive purposes at what may be limited and distant locations. Such physically influenced root systems cannot realistically be “lifted” without extensive works and bespoke engineering. Equally and if replanting is attempted, they will require bespoke stabilisation which, because of s lack of a symmetrical and consolidated root system would likely require aerial guying, thereby diminishing their value within a new landscape. Fundamentally, the lifting and relocation of these trees cannot be justified on the grounds of enormous expense and minimal likelihood of success. Appreciating this and the availability of purpose-produced trees at heights of 10 metres and more, then the more sustainable option would be to buy in new trees and to plant them in a sustainable manner, by providing engineered tree pits at suitable locations.

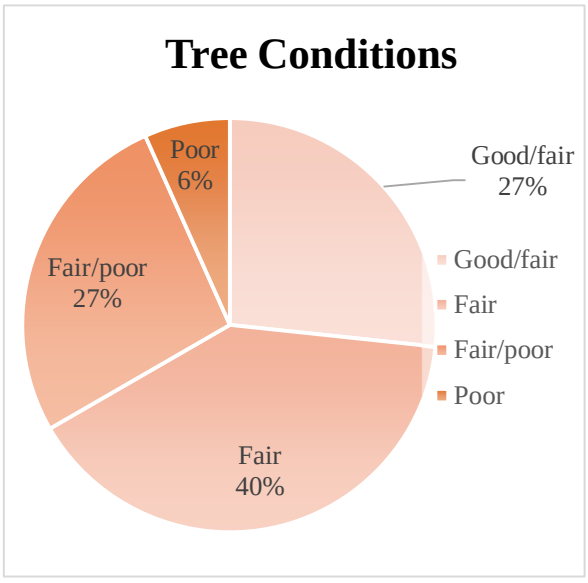

Fig 1

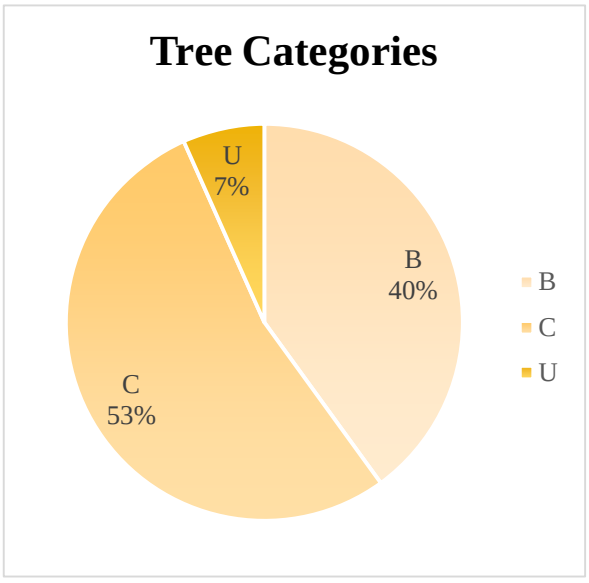

Fig 2

5.7 The tree-by-tree review, as illustrated in figures 1 to 4, would appear to illustrate a tree population that offers notable sustainability. The typically younger age profile appears to correlate well with the high proportion of “good-fair” and “fair” quality trees, which

in turn is mirrored in the high proportion of category "B" and "C" trees. An issue is illustrated in respect of "useful life expectancy" in that when reviewed in respect of age, health and condition, they appear to offer substantial sustainability. However, such sustainability must be qualified and in this instance, such sustainability comes with issues and risks of damage and disturbance to adjoining infrastructure.

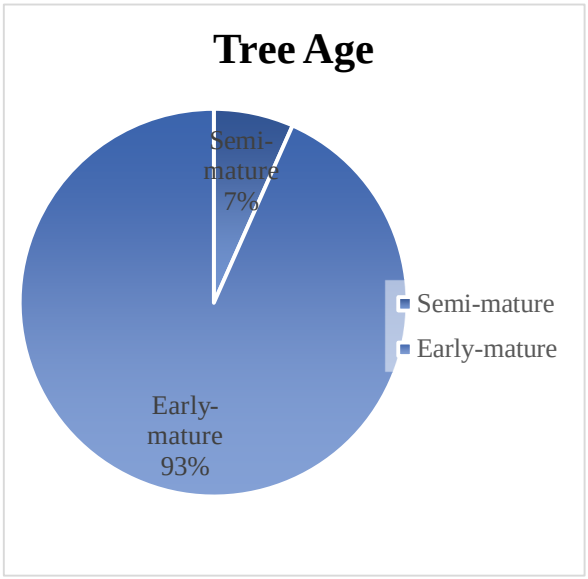

Fig 3

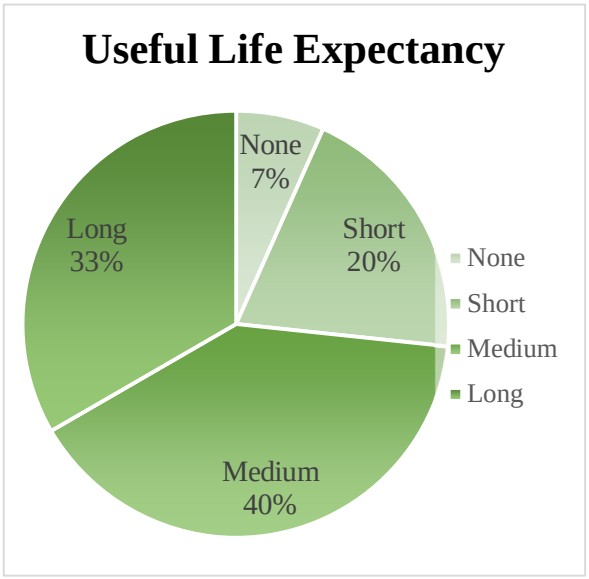

Fig 4

6 Pre-Planning Scenario in Respect of Tree

6.1 Planning guidance has been gained from two principal documents including "Fingal Development Plan 2023-2029" and "The Forest of Fingal - A Tree Strategy for Fingal"

6.2 Trees, hedges, and woodlands are often included in development plans as important elements of green infrastructure, which provide a range of environmental, social, and economic benefits. Trees, for instance, help improve air and water quality, mitigate climate change, and provide habitat for wildlife. Hedges also provide a habitat for wildlife and help prevent soil erosion. Woodlands, on the other hand, provide recreational opportunities, help maintain biodiversity, and contribute to carbon sequestration. In the context of development plans, the protection, preservation, and enhancement of trees, hedges, and woodlands are often addressed through specific policies and guidelines.

6.3 Trees beautify and shelter wildlife. They improve air quality in cities and provide wildlife homes while beautifying a region. "The Forest of Fingal - A Tree Strategy for Fingal" outlines the Council's street tree planting, management, and maintenance policies. Trees are increasingly valued as green infrastructure as well as aesthetics and placemaking. Trees improve air quality and surface water management in metropolitan areas by up to 60%. Trees mitigate climate change and decarbonise cities. The Tree Strategy aims to "protect and enhance Fingal's trees to maximise both the benefits they offer and the character they bring to the County to ensure a greener, healthier Fingal for

now and future generations". The strategy outlines policies, goals, and activities to achieve this vision.

6.4 Within the "Tree Strategy" document, particular protection is drawn to section 4.8 which discusses tree protection and, with particular regard to planning applications for new construction projects, to section 4.9, planning and design guidelines for trees and woodlands. Within this section, particular note is made of section 4.9.2, protection of existing trees on development site which stipulates the application of "BS 5837 – 2012, Trees in Relation to Design, Demolition and Construction – Recommendations" for the effective preservation of trees within the development context. Also, section 4.9.3 goes on to stipulate that a "Tree bond" may be placed on trees intended for protection to act as a guarantee of successful and ongoing protection throughout the development process. The above issues are highlighted again in "Section 5" and particularly under section 5.2, which describes an objective of – "protection and retention of existing trees".

6.5 While trees are mentioned widely throughout the development plan, the emphasis is particularly broad in respect of Sections 9 "Green Infrastructure and Natural Heritage" and Section 14, "Development Management Standards"

6.6 Within Section 9, "Green Infrastructure and Natural Heritage", trees, hedges and woodlands gain extensive mentioned in this particular section. Objective GI N/A H023 – policies relates the objective to implement the Forest of Fingal – a tree's strategy for Fingal, keeping it green – and open space strategy for Fingal and space for play – a play policy for Fingal during the lifetime of the development plan corrections/scratch that previous one and limited to the Forest of Fingal – A Tree Strategy for Fingal.

6.7 Throughout this section, great emphasis is placed on the value of trees, woodlands and hedgerows both in their individual right but also in respect of the provision of green corridors correction green and ecological corridors.

6.8 Section 9.6.9, protection of trees and hedgerows in this section, a number of specific policies and objectives are outlined including policies GINHP 21 protection of trees and hedgerows, GINHP 22 – tree planting and objectives GINH045 hedgerow categorisation, objective GI NHO46 tree removal, Objective GI NHO47 woodland development schemes, objective GI NH048 – wildlife act and roads act

6.9 Section 9.6.10, protected trees (Tree Preservation Orders) stipulates the ability to apply as well as existing tree preservation orders within the county area. Specific objectives include GINH049 – tree preservation order review outlining the desire to review existing tree preservation orders within the county. GINH050 – tree preservation orders outlines the possible future use of tree preservation orders to protect other important trees or groups of trees or woodlands.

6.10 Within Section 14, “Development Management Standards”. This section deals with the protection of trees during construction, attention is drawn to section 14.9.7, bonds relating to the correction relating to the provision of a bond or cash lodgement to be used by way of guarantee of the satisfactory completion and protection of trees during construction.

6.11 Objective DMS031 – infill development also specifically mention trees and landscaping with regard to the retention of the physical character within such developments. In respect of private open space (14.13.3.3) note is made of objective DMS070 – replacement of trees outlining the requirement for replacing trees removed from residential areas where appropriate and as soon as resources allow.

6.12 Section 14.18.1, “Tree Policy” acknowledges the importance and value of trees to the landscape. Section references the Forest of Fingal – Tree strategy for Fingal which sets out the councils policies in respect of trees and woodlands. The section supports a number of tree related objectives including DMSO125 – management of trees and hedgerows, DMSO126 – protection of trees and hedgerows during development, DMSO128 – demarcation of town land boundaries, DMSO129 – tree selection, DMSO130 – planting of large canopy trees, DMSO131 – street tree planting plans, DMSO132 – planting along distributor roads, DMSO133 location of new trees, DMSO134 – site summary of specimen removal retention and planting, DMSO135 tree planting and subsurface archaeology, DMSO136 tree selection within developments and DMSO137 – replacement and removal of trees. Of the above, particular attention is made of DMSO126 – protection of trees and hedgerows during development that stipulates tree protection in accordance with BS 5837 – 2012, trees in relation to design, Demolition and Construction – Recommendations.

6.13 In respect of natural heritage and particularly biodiversity, note is made of objective DMSO140 – protection of existing landscape that includes the retention of large trees and hedgerows. Section 14.18.2.4 ecological corridors and steppingstones including trees and hedgerows also makes specific mention of trees hedges and woodlands the importance of trees is also noted with regard to any proposals relating to designed landscapes – historic gardens, domains knees and country stage as defined under section 14.19.4.

6.14 Elsewhere in the development plan, various mentions are made of trees, woodlands and hedges. Examples of these include:-

- Under section 2, planning for growth, core strategy, settlement strategy, note is made of numerous references to trees, hedges and woodlands. These include core strategies CS 010, CS 054 and CS 061 orientated toward the conservation of boundary feature hedges and tree lines, including the effect of new entrances. There are also numerous objectives orientated toward the retention and conservation of trees and hedges including objectives GI 9, GI 18, GI 19, GI 20, GI 21, SW 6, GI 3, GI 4, and GI 29.

- In Section 3 -Sustainable Place Making and Quality Homes, note is made of Objective SPQH039 notes the retention of features within infill development including landscape features such as trees. Objective SPQH055 requires that the design of new house access be such as to avoid the need for the removal of longer significant stretches of roadside hedging and trees. Similar relates to objective SPQH069 that stipulates the new vehicular entrances must limit the loss of hedgerows and trees and that such losses must be replaced with the same type of boundary, specifically using native species for replacement.
- In Section 4, "Community Infrastructure and Open Space", particular attention is drawn to Objective CI OS 052 – Trees to protect and preserve and ensure the effective management of trees in groups of trees.
- Under section 5, "Climate Action", sub-section 5.5.8, "Nature-based Solutions and Green Infrastructure", trees, the planting of trees and the value of trees with regard to carbon capture are specifically noted.
- In Section 6, "Connectivity and Movement", Objective CMO48 – roads and streets and green infrastructure outlines a desire for the planting of native trees hedgerows and pollinator species in medians and on roadside verges where appropriate.
- In Section 10, "Heritage, Culture and Arts", trees, groups of trees and woodlands are mentioned concerning their value in respect of historic designed landscapes as well as how climate change may affect the retention of older, mature planting schemes.
- Trees get minor mention in Section 11, Infrastructure and Utilities, normally concerning design detail for new plantings in respect of sustainable urban drainage systems.

6.15 Notwithstanding the notes above, the current development plan shows no specific objectives to protect and preserve trees and woodland on or near the New Street site. Equally, the site area supports no Tree Preservation Orders.

7 Other Legislative and Legal Constraints

7.1 Under the Forestry Act 2014, the felling of a tree standing in a county area requires a felling license unless the trees are exempted under Section 19 of the Act. An exemption applies where trees are being felled in line with a specific detail of a grant of planning permission. This derogation may apply should the proposals be granted permission.

7.2 Some "Section 19" exemptions are not applicable to the development scenario, for example, those applying to fire control, forest survey or gene pool protection relating to horticultural use or Christmas tree production.

7.3 Some exemptions are pertinent to the development scenario, particularly Section 19(1)(M)(ii), where "the removal of which is specified in a grant of planning permission".

7.4 Additionally, other non-specific exemptions may apply, including-

- Trees standing in an urban area.
- Trees within 30 metres of a building (other than a wall or temporary structure), but excluding any building built after the trees were planted.

- Trees removed by a public authority in the performance of its statutory functions.
- A tree within 10 metres of a public road and which, in the opinion of the owner (being an opinion formed on reasonable grounds), is dangerous to persons using the public road on account of its age or condition.

7.5 The above derogations may not apply where-

- The tree is within the curtilage or attendant grounds of a protected structure under Chapter 1 of Part IV of the Act of 2000.
- The tree is within an area subject to a special amenity area order
- The tree is within a landscape conservation area under section 204 of the Act of 2000.
- The tree is within a monument or place recorded under section 12 of the National Monuments (Amendment) Act 1994, a historic monument or archaeological area entered in the Register of Historic Monuments under section 5 of the National Monuments (Amendment) Act 1987, or a national monument in the ownership or guardianship of the Minister for the Arts, Heritage and the Gaeltacht under the National Monuments Acts 1930 to 1994 or is within a European Site or a natural heritage area within the meaning of Regulation 2(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

7.6 For further clarification, contact should be made with Forest Service (Department of Agriculture, Fisheries and Food). The Felling Section of the Forest Service is based in Johnstown Castle, Co. Wexford

7.7 Other legislation may affect tree cutting and felling. Particular note should be made of the "Wildlife Act 1976 (as amended), as well as the EU Habitats Directive. These offer protection to animals, including Bats that often root or even breed in trees. The protection afforded by the above legislation means that particular care must be taken in the pruning of felling of trees that may contain Bats. For this reason, specific specialist advice should be sought.

8 Construction Activities and their Effect on Trees

8.1 Retaining trees requires space. There is a big difference between physically preserving a tree and ensuring its future survival. Sustainable tree retention often depends on the extent and nature of construction protection.

8.2 Like all living things, trees are highly dependent on the environment in which the exist, and particularly on a continuity in supplies of water and nutrients from the soil. Any long-term change in ground conditions can easily affect a tree's metabolism, health, and sustainability.

8.3 Particularly, development and construction activities can easily damage the soil environment. Removing, disturbing or denaturing soil can irreparably damage tree roots and can render the soil incapable of supporting plant root function. Most modern construction requires large plants, equipment, and vehicles. Such machinery causes soil profile destruction and compaction that denatures the soil.

8.4 The sustainability of a tree's health and safety can be compromised where the above issues occur within the minimum "root protection area" defined by "BS5837-2012", then the affected tree is likely to be regarded as unsustainable and unsuitable for retention.

8.5 Sustainable tree retention must accept changing contexts and increased management in the future. Where rates of occupation and use increase, then any retained trees have the potential to cause harm or damage. This issue may be exacerbated where shelter loss and exposure occur regarding the retention of individual trees.

8.6 Retained trees should be considered in respect of shadow-cast, light admission, and view-blocking. Wind patterns can affect leaf shedding, causing drifts and accumulations, creating management issues around drains and gullies, or creating slippery surfaces.

9 Nature of Project Works

9.1 The proposed works include Public Realm Improvements for a Pedestrianised New Street, Malahide. The development extends to the full length of New Street from Main Street/ The Mall (also known as The Diamond) in the south to Strand Street to the north and including parts of Main Street/ The Mall, Ross Terrace and Strand Street all at Malahide, Co. Dublin. The site is located within Malahide Architectural Conservation Area.

9.2 The proposed public realm improvements will comprise: -

(i) Widening of footpaths and provision of new kerb edges with existing kerbstones retained, realigned and protected within the widened footpaths and public spaces.

(ii) Realignment and narrowing of the trafficable section of New Street (c.150m in length, 0.22ha) and insertion of control measures and all necessary signage to provide for a pedestrianised street with associated traffic flow routes and restrictions allowing for time limited one-way access from 7am to 11am each day for deliveries and emergency vehicles from Main Street/ The Mall to New Street and a two-way access from Strand Street to Ross's Terrace via New Street.

(iii) Upgrade of all street surfaces.

(iv) Provision of 2no. loading bays at the southern and northern ends of New Street and an accessible parking space in front of the HSE building.

(v) Installation of cycle stands at 6no. locations on New Street with capacity for 23no. cycle parking spaces.

(vi) Removal and replacement of 11no. existing trees with 37no. trees of species appropriate to the location and environment and provision of soft landscaping and green infrastructure with planting zones for seeded, planted and hedging areas and associated bioretention and tree pit areas.

(vii) Provision of outdoor dining zones including tables and chairs and other ancillary moveable structures.

(viii) Provision of street furniture including seating, benches and litter and recycling bins and a water feature.

(ix) New public lighting.

(x) Upgrade of the watermain and foul drainage networks and upgrade and relocation of the surface water drainage network including provision of sustainable urban drainage systems (SUDs) features as part of hard and soft landscaping.

(xi) Provision of ducting for existing and future utilities and piped infrastructure.

9.2.1 Fingal County Council will be providing regulatory traffic signs in accordance with Section 95 of the Road Traffic Act 1961 (as amended).

9.3 Many of the issues dealt with at "Construction Works and Trees" above could apply, 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) 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 which makes a tree unsuitable for retention.

10 Development Related Issues and Arboricultural Concerns

10.1 The greatest issues affecting trees relates to the need to repair and replace existing surfaces, particularly pedestrian surfaces when they have already been distorted and uplifted by tree growth. The levels of these new surfaces are fixed and relates to the existing thresholds of adjoining homes and businesses. This requires that the uplifted pavements must be lowered to original levels, a process that will conflict with existing tree roots, and will be affected by any future tree and tree root growth in the future. Additionally, the form and extent of existing pavements will be changed. This includes the realignment of existing kerbs and gullies for drainage purposes. Such work cannot be achieved without damaging the trees.

10.2 The trees found within the New Street context are all Norway Maple. The trees are still young and small compared with their species potential but have nonetheless begun to cause damage to pavements. The extent of damage noted to date must be considered as a small fraction of the potential damage as would relate to fully grown specimens. This issue relates both to tree size and the incremental reduction of pedestrian passage space, ongoing encroachment onto the existing building, and most importantly, the substantial uplifting, breakage, and distortion of the existing pavements over time.

10.3 It is considered that the existing tree population is contextually incompatible with its existing context and is unsustainable. Attempted retention must accept what will eventually become irreparable damage and issues such as trip hazards.

10 Design Iterations and Arboricultural Considerations

11.1 The sustainability issues outlined in this report were brought to the design team's attention at an early stage of the design process. Accordingly, and appreciating that tree sustainability could not be improved within the existing scenario, a design intent was adopted that incorporated the replacement of the existing trees with new tree specimens, in line with the new street layouts.

12 Identification of Development Impacts to Trees

12.1 The expected tree impacts have been represented graphically on the tree impacts drawing "**New Street Tree Impacts Plan"** and 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 between the existing site context and the development proposals regarding new structures.

12.2 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.

12.3 Detail of the development proposals where gained from drawings provided by-

- Punch - Consulting Engineers – Drainage and Engineering information overlaid on Masterplan
- Dermot Foley Landscape Architects – Proposed Landscape Masterplan

12.4 The evaluation is primarily based on the likelihood of the proposed works to damage or otherwise interfere with trees within or adjoining the works zone. 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. Particularly pertinent to this project is the fact that tree growth uplifting and disturbance of existing ground surfaces means that repairs and replacement surfaces called up in the proposed works

cannot be achieved without substantially damaging tree, and furthermore cannot be completed without risk of damage from future tree growth.

12.5 Where applicable, this assessment attempts to consider both direct and indirect implications. The assessment is based on perceived construction requirements and how a tree will likely interact with the development. The assessment appreciates issues including growth, hazard development, light blockage and other social concerns regarding the changing context, including its effect on tree amenity value.

13 Tree Retention and Loss

13.1 The drawing "New Street 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 proposed works extents. In this drawing, the trees that will be removed, are highlighted in "pink dashed" outlines.

13.2 In line with the findings of this report, all trees located within the works area of New Street will be removed and replaced in line with the new landscape proposals.

13.3 In line with the above, tree numbers 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782 and 1783 will be removed as part of the proposed works.

14 Bibliography

14.1 British Standards Institution (2010) BS 3998:2010: Tree Work - Recommendations. London: British Standards Institution.

14.2 British Standards Institution (2012) BS 5837:2012: Trees in Relation to Design, Demolition and Construction - Recommendations. London: British Standards Institution.

14.3 Jackson, R.B et al (1996) A Global Analysis for Root Distribution in Terrestrial Biomes Oecologica, 108 (1996) pp389-411, Springer Verlag

14.4 Lonsdale, D. (2005) Principals of Tree Hazard Assessment and Management, London, TSO

14.5 Mattheck, C. and Breloer, H. (1994) The Body Language of Trees, London, TSO

14.6 Roberts, J. and Jackson, N. and Smith, M. (2006) Tree Roots in the Built Environment, London, TSO

14.7 Strouts, R.G. and Winter, T.G. (1994) Diagnosis of Ill-Health in Trees, London, HMSO

14.8 WJ Bean (1980) Trees and Shrubs Hardy in the British Isles (eighth edition), London, John Murray

A1 Appendix 1 - Tree Survey
Nature of Survey

A1.1 The criteria put forward in "BS5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations" have provided a basis for this report.

A1.2 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.

A1.3 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 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

A1.4 The survey must be read with the "Tree Constraints Plan" drawing "New Street 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 "New Street Tree Constraints Plan". Any such trees should be located and plotted by professional means to identify the constraints such trees have upon the site.

A1.5 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.

A1.6 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".

A1.7 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

A1.8 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

A1.9 This survey was compiled in October of 2022. 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.

A1.10 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

A1.11 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.

A1.12 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.

A1.13 A competent and experienced Arborist has completed all inspection and tree assessment. The inspection involves visual tree assessment (Mattheck and Breloer 1994) only, which has been carried out from ground level. No below ground, internal, invasive, or aerial (climbing) inspection has been carried out.

A1.14 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.

A1.15 Several factors acted against the tree inspector, contriving to reduce the accuracy of the survey. Particularly, the survey have been completed during specific seasons. 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 generalised 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 U	Particularly poor quality, dangerous or diseased trees that offer no realistic sustainability
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
1773	Norway Maple *(Acer platanoides)*	E/M	F	14.00	3.50	3.50	4.00	5.00	3.50	1	423	5.08	Young and vigorous, arises from area tarmacadam patch within block-paved area. Adjoining kerb edge is distorted and exhibits evidence of prior works and repair. Nonetheless, current kerb alignment is distorted having been pushed to east. Vigour and vitality are good. Lower middle crown has suffered repeated mechanical collisions with wounds at 2.50 and 3.00 m.		L	C2
1774	Norway Maple *(Acer platanoides)*	M	G/F	12.00	2.50	4.50	5.00	4.50	3.50	1	392	4.70	Young and vigorous, arising from reconstituted rubber mats section within block-paved area. General vigour and vitality are good. Tree stem has suffered extensive wounding at circa 2.50 m. Kerb edge in vicinity of tree shows evidence of minor uplifting and rotation to east. Western crown already over sales and is in contact with adjoining rooms.		M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1775	Norway Maple *(Acer platanoides)*	S/M	F	11.00	3.00	3.00	2.00	2.50	3.00	1	248	2.98	A relatively small specimen suggesting installation at date after many of its peers. Vigour and vitality remain good. Tree arises from reconstituted rubber matting area within area of block-paved. Tree stem in contact with and has shifted in easterly direction, adjoining kerb edge. Tree over sales roof of adjoining property.		M	C2
1776	Norway Maple *(Acer platanoides)*	E/M	F	12.00	3.25	3.00	3.00	4.00	3.00	1	334	4.01	Young and still vigorous. Arises from area of rubber matting within broader block-paved area. Proximity to kerb edge has seen notable uplifting and shifting to east. Tree greatly over sales adjoining roof to west. Tree stems have suffered damage on eastern side presumably in relation to vehicular damage. Exposed buttress region shows evidence of early life root girdling.		M	B2
1777	Norway Maple *(Acer platanoides)*	E/M	G/F	13.00	4.00	4.00	3.50	5.00	4.00	1	395	4.74	A young and vigorous specimen stem has suffered mechanical damage on eastern side at circa 2.25 m. Tree arises from area of rubber matting within broader block-paved area. Trees growth has resulted in substantial lifting of rubber mat as well as uplifting rotate action and shifting of kerb edge in easterly direction.		L	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1778	Norway Maple *(Acer platanoides)*	E/M	F/P	14.00	4.00	3.50	4.00	5.00	3.50	1	423	5.08	Large specimen of apparently good vigour and vitality. Tree arises from area of hard tarmacadam infill within broader area of block-paving. Evidence exists to suggest prior repair including cement infill of granite kerb edge. Nonetheless, uplifting and rotation of kerb edge is evident. Tree greatly overhangs roof of adjoining Malahide antiques stems have suffered damage at circa 2.50 – 3.00 m in respect of vehicular collision. Higher crown vigour and vitality is impaired with some twiggy deadwood though because of same is not evident at present.	Review regularly.	M	C2
1779	Norway Maple *(Acer platanoides)*	E/M	G/F	11.00	4.00	3.00	2.50	2.50	3.00	1	328	3.93	Young and vigorous arising from area of rubber matting within broader block-paving context. Vitality appears fair with no major damage to tree stem. Kerb edge misalignment is limited to area south-east of stem.		L	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1780	Norway Maple *(Acer platanoides)*	E/M	F/P	12.00	4.00	2.00	2.50	2.50	2.50	1	286	3.44	Arises from area of reconstituted rubber matting within broader area of block-paving. Evidence exists to show uplifting of kerb edge immediately to east of stem. General vigour by cavity is particularly poor with crown vigour being heavily variable. Crown exhibit evidence of sectional dieback and deadwood development remaining crown appears to be of good vigour and vitality.	Retention might be afforded by cleaning out works, subject to regular review.	S	C2
1781	Norway Maple *(Acer platanoides)*	E/M	F	12.00	4.00	3.00	3.00	4.00	2.50	1	337	4.05	Young and still vigorous. Tree arises from combined area of tarmacadam and rubberised matting. Large section of kerb edge has been replaced immediately east of tree by cement. Large buttress root is in contact with this and adjoining matting resulting in exacerbated fracture and uplifting.		M	C2
1782	Norway Maple *(Acer platanoides)*	E/M	P	10.00	4.00	3.00	2.50	3.25	2.00	1	296	3.55	Tree has suffered extensive damage at circa 2.00 – 3.50 m on eastern side of stem with repeated bark wounding together with decay and fracture of underlying timber. Tree is regarded as unsuitable for retention.	Remove.	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1783	Norway Maple *(Acer platanoides)*	E/M	F/P	10.00	4.00	3.00	1.50	3.50	3.50	1	283	3.40	Tree has suffered extensive wounding at circa 2.50 m including area of developing decay at 3.00 m. Tree supports notable imbalance to north-west. Vigour and vitality are fair but variable. Tree arises from area of reconstituted rubber matting adjoining cement kerbing. Cement kerb is fractured and dislodged. Tree is of questionable sustainability.		S	C2
1784	Norway Maple *(Acer platanoides)*	E/M	F	9.00	2.50	3.50	4.00	3.50	3.00	1	302	3.63	Young and vigorous. Arises from area of rubber matting within block-paved area. Granite kerb edge has been both uplifted and rotated to west. Stem has suffered minor damage at circa 3.00 m. Tree greatly oversales adjoining shop.		M	B2
1785	Norway Maple *(Acer platanoides)*	E/M	F/P	11.00	3.00	2.50	2.50	2.50	2.00	1	334	4.01	Tree arises from small area of which mastic tarmacadam within broader block-paved area. Proximate matting has been heavily uplifted with adjoining kerb stones both uplifted and shifted to west. Tree has suffered extensive wounding between circa 2.00 m and 3.00 m exposing underlying timber to decay and longitudinal fracture. Tree appears to offer limited sustainability.		S	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1786	London Plane *(Platanus x hispanica)*	E/M	G/F	15.00	3.25	4.50	5.00	6.00	3.00	1	576	6.91	Relatively young and vigorous. Tree arises from area of rubberised matting within broader area of block-paved. Granite kerb edges to east exhibit classic signs of shifting and uplifting to east. Tree becomes notably multi stemmed at 2.50 m. Stem has suffered collision damage with circa 1 m long wound to east. Vigour and vitality are good. Tree greatly overhangs adjoining buildings.		L	B2
1787	Norway Maple *(Acer platanoides)*	E/M	G/F	12.50	3.00	3.50	3.50	3.50	4.00	1	392	4.70	Young and still vigorous. Arises from area of reconstituted rubber matting within broader area of block-paving. Kerb edge immediately north of stem has been amended and cut to fit. Buttress area real signs of physical root damage. Principal stem shows evidence of vehicular collision and bark damage at circa 2.50 m. Tree partially overhangs adjoining commercial properties.		L	B2

Appendix 2 – Photographic Information

Photo 1
This image illustrates the overall context of the streetscape within which the subject trees exist. Note should be made of the limited range between trees and buildings, as well as the current extent of the crown overhang of the buildings

Photo 2
Tree No. 1773
The ongoing growth of this relatively young tree has already required the adaptation of kerb stones, but still shows evidence of ongoing uplifting and kerb rotation.

Photo 3
Tree No. 1774
While the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing and uplifting is already apparent.

Photo 4
Tree No. 1775
As with 1774, the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing and uplifting as well as kerb stone distortion is already apparent.

Photo 5
Tree No. 1776
As with 1774 and 1775, the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing as well as causing substantial uplifting and distortion of the kerb edge.

Photo 6
Tree No. 1777
As with 1774 to 1776, the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing and uplifting as well as kerb stone distortion is already apparent.

Photo 7
Tree No. 1778
As with 1774 to 1777, the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing, and uplifting. The kerb stone has suffered distortion and partial replacement.

Photo 8
Tree No. 1781
As with 1774 to 1778, the "rubber mat" surface about the tree has absorbed some surface distortion, mat fracturing and uplifting as well as kerb stone distortion is already apparent. Additionally, much of the original kerb edge has required replacement.

Photo 9
Tree No. 1782
As with previous trees, the "rubber mat" surface around the tree has absorbed some surface distortion. The adjoining kerb edge has suffered uplifting and shifting towards the road centre.

Photo 10
Tree No. 1783
As with previous trees, the "rubber mat" surface about the tree has absorbed some surface distortion. Additionally, the adjoining kerb edge is showing signs of uplifting and rotation distortion.