

**Arboricultural Report  
Proposed Development at  
Northwood  
Santry  
Dublin 9**

**November 2019**

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### 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-Santry-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-Santry-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-Santry-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 “**Cosgrave Developments**”. 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 a screening process to review the likely implication of the proposed development works 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-Santry-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-Santry-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-Santry-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**

This review is the culmination of an ongoing review scenario that has followed various degrees of design change based on issues raised and requests made during earlier periods of the planning application process. Particularly, this iteration of the Arboricultural report considers concerns raised in respect of trees to be retained to the east of the proposed development and particularly, earlier iterations of underground services provision and drainage systems that had the potential to disturb trees.

Additionally, and subsequent to a site meeting and on-site discussions with the Parks Section of FCC, certain elements of work already undertaken, including the eradication of scrub thicket to the west of the ditch and general pruning works have also been undertaken to the hedge/tree line and young trees specimens about and to the east of the ditch, intending to improve access, visibility, surveillance and to admit more light to the area. Typically, this latter element of work entailed the removal of no trees but did see the selective removal of lower crown twigs and branches to create more continuous and uniform ground clearance throughout what is developing into a woodland area.

As previously discussed, the substantial ditch located between the proposed works area and the tree belt, has been considered as a tangible physiological barrier to root development. Its historic and water bearing nature means it is particularly unlikely that any vegetation and all trees arising from the east of the ditch line will have roots extending beyond the ditch base or to areas west of the ditch. Accordingly, and by design, development has incorporated an ethos of intending to restrict all substantive works to the western side of the ditch only.

Earlier iterations had seen the ditch void itself being used for attenuation purposes however, the drainage systems are now amended and all engineering including the provision of drainage and mains water is located entirely to the west of the ditch and outside the root protection zone.

## **Site Description**

The primary site area is broadly devoid of trees, with the only vegetation on note being limited to the easternmost edge of the site.

The site area supporting trees comprises a broad corridor between the existing Gulliver's Retail Park to the west and by Northwood Park and Swift Square to the east.

The corridor runs approximately north to south and parallel with a substantial ditch and embankment feature. The ditch feature is noted to support a slow moving but notable watercourse.

## **Pre-Development Arboricultural Scenario**

The general vegetation of interest exists as a broad swathe between the access road of Cedar View and the subject site. In this respect, much of the land to the east of the corridor has been substantially modified in recent years, comprising a broad grass margin and a cycle/footpath scenario. This area has been widely planted and supports numerous young trees (Young Tree Planting) the majority of which offer substantial sustainability. Those planted close to and indeed beneath the larger tree alignment may however raise sustainability issues because of suppression.

The primary more historic planting appears to be associated with a substantial (circa 1.25m high) than embankment that runs along the western edge of a substantial and water bearing ditch. This broad embankment appears to have been planted on its eastern side by several Oaks whose size may be commensurate with the earthworks.

Additionally, and typically associated with the eastern descending slope of the embankment, there is the relic of a Hawthorne hedge. This is now very intermittent and broken with the thicket like affect been provided more by a combination of Bramble, Ivy, Dog Rose and the original Hawthorn. Nonetheless, and notwithstanding its somewhat suppressed status, its small stature is such as to present little if any threat and therefore its retention should appear to be broadly risk-free.

Note is made of the fact that all Oaks within the survey review support extensive crown imbalances to the east of a form highly suggestive of prior competition and suppression. This factor in line with the extensive and typically poor quality alignment of Lime suckering along the upper western edge of the earth than embankment suggest a high likelihood of their having been earlier Lime population in this position. Current review finds no mature limes however, specimen No.82 is indicative of a relatively recent (within 2 decades) failure of a once larger tree and therefore, it appears likely that this alignment may once have supported a significant population of Lime.

Most of these Limes arising from the upper western edge of the embankment are substantially multi-stemmed, suggesting re-suckering from the stumps of previous trees. In effect, these trees currently exist as a tall hedge-like feature. The southernmost element of the hedge appears to be dominated by Lime with the sole exception of some poor-quality sapling Ash. Note is however made that at the northernmost 15% of the alignment and typically north Oak No.82, that English Elm becomes notable within the species mix. This latter fact complicated issues in as much as the advent of Dutch Elm disease within the broader Dublin area is known to be widespread currently and therefore the sustainability of these trees remains questionable. Nonetheless, the principal species, Lime would be regarded as being relatively young and still vigorous however, their structural forms must be regarded as being poor. Their current stature being relatively small appears such as to present little if any threat at present however, distortions, multi-stem statures and development of compression forks lead to impaired structural safety and an increased predisposition towards mechanical failure. Therefore, the ultimate sustainability of these trees over time must be questioned.

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

The proposed development will consist of the construction of:

- 4 no. 7-storey plus penthouse apartment blocks containing 331 no. apartment units over a shared basement accommodating car and bicycle parking spaces comprising and ancillary uses;
- Shared residential services to include multi-function area, concierge and gym within Block A;
- A childcare facility within Block C;
- 5 no. ground floor mixed use commercial units within Blocks B and C;
- Associated landscaping, public open space, play areas, ESB substation, pedestrian and cycle paths and services.

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.

## **Design Iterations and Arboricultural Considerations**

The design process has led to the moving westward of the building, the relocation of the ESB substation and the relocation and consolidation of the play areas, just north of the ESB substation.

In Arboricultural terms, the most significant design iteration relates to the changes in drainage systems and the fact that the ditch located immediately to the west of the trees will no longer be used to support drainage features. Therefore, its modification and incorporation into the broader landscape can now be achieved with far greater degrees of delicacy and care and thus, the current design iteration presents far fewer threats of damage or disturbance to trees.

## **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 McCrossan O’Rourke Manning Architects, drainage and levels information as provided by J. B. Barry and Partners Limited, Consulting Engineers and by Kevin Fitzpatrick Landscape Architects in the form of AutoCAD drawing 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, 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-Santry-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**

Considering the constraint to natural tree root development provided by the historic ditch, then most of the development works can be achieved without any likely impact to trees.

There are exceptions to this, relating specifically to the provision of site engineering and drainage, as well as the landscape proposals that include the filling of the ditch, the provision of a useable levels area, the creation of “play” elements on those areas and the creation of pedestrian across routes across the ditch and tree line.

As previously noted, the historic ditch has created a scenario whereby tree root development has been limited and concentrated within and along the eastern embankment of the ditch. This is in many ways helpful but requires that tree preservation and protection be premised on the preservation of ground conditions to the east of the tree line as well as the protection of the eastern face and bank of the ditch.

The proposed “filling” of the ditch raises few issues in principal; however, particular care will be required in respect of how this is achieved and that the eastern bank particularly, is protected from any disturbance. Equally, it is advised that any fill should be inert and porous to both gas and water, for example by using clean “Clause 804” type stone.

Note is made of slight disparities on ground levels between the embankment that supports the trees and the lands to the west of the ditch and the land to the east of the embankment. It is advised that the higher tree supporting level must be maintained and that, for example, the proposed footpaths pass across this level, as opposed to cutting into it. This may create a small issue to the east of the bank, where the banks raised levels may require the creation of “ramps” to descend to the lower levels to the east. Where this is required, it will be necessary to detail “minimum impact” strategies where the raising of soil and building of ramps can be minimised and localised. Equally and in respect of construction, it will be necessary to review construction methodologies, particularly in respect of mechanised/vehicular access.

Lesser issues will relate to the linear play features, as for the most part, these will be located upon the artificial ground associated with the filled ditch. Nonetheless, it is advised that construction plans should include for access and construction from the west only.

Notwithstanding the provision of a preliminary “Arboricultural Method Statement” as part of this report, it is advised that a project specific version will be required to identify in detail, the potential issues associated with the proposed works and outline the best possible approach in respect of maximising tree sustainability. In general terms however, it is advised that all works will be restricted by the use of construction exclusion fencing, until specific strategies and methodologies are adopted, such as the use of localised temporary ground protection should mechanised access be required within that area.

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 Kevin Fitzpatrick Landscape Architecture.

## Particulars of Tree Loss

The drawing “D2-AIA-Santry-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 black 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 16No. individual trees (5 of which exist outside of red line area)

- 0 category “A” trees,
- 9No, category “B” trees,
- 6No. category “C” trees,
- 1No. category “U” tree

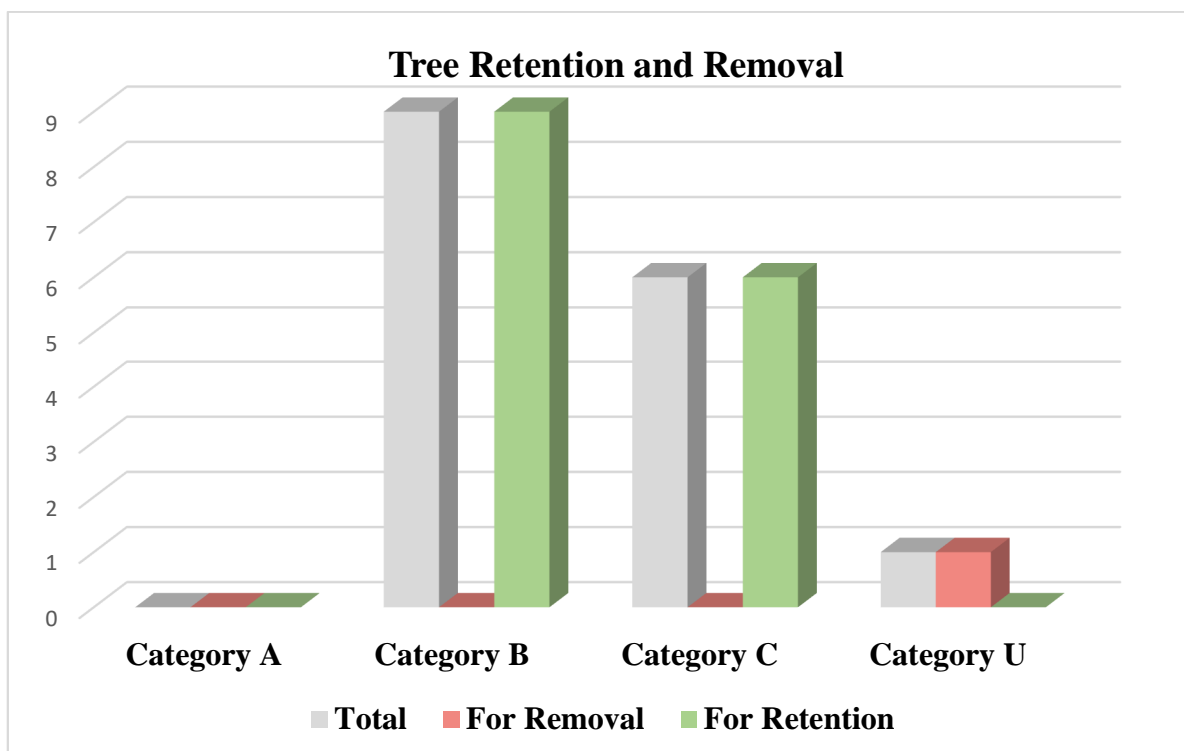
Normally, category “U” trees will be removed (most require removal regardless of development). In this instance, the only “Category U” tree exists at a position substantially outside of the red line area.

If the proposed development works can be achieved as outlined in this report, then no category “B” or “C” trees will be lost.

Accordingly, the tree loss breakdown for the site will be-

- 1 No. Category U tree
- 0 No. Category B trees
- 0 No. category C trees

Plus, one small area of shrubbery to facilitate the proposed ESB substation.



## **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-Santry-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”.

The tree protection plan includes the use of special materials and methodologies intended to minimise the impacts of structures near trees. Examples of this includes the proposed east-west pedestrian links that cross the ditch and embankment and pass between trees. In these areas, nominated as “Controlled Work Zones” and depicted by pale blue hatching on the tree protection plan “D3-TPP-Santry-11-19”, it is intended to use manual procedures and low impact methodologies that limit need for excavation or ground disturbance and maintain the drainage and porosity of the ground volume beneath. This will be particularly pertinent in respect of the provision of the “cross-ditch” pedestrian paths and the “filling” of the ditch void and creation of a more useable, level landscape area.

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**

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

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

Additionally, the proposed development and particularly its unavoidable loss of trees will raise exposure and shelter loss issues in respect of those trees that will remain. For this reason, all retained

trees should be reviewed immediately after the primary site clearance works with a view to updating and amending the “preliminary management recommendations” provided in the original tree survey and intending to address such issues as may arise. On an ongoing basis, all retained trees must be reviewed regularly so that early intervention and action is applied promptly.



## **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-Santry-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-Santry-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-Santry-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-Santry-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 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
68	Lime ( <i>Tilia europea</i> )	E/M	P	10.00	2.00	3.00	2.50	1.50	2.00	1	347	4.16	A poor-quality specimen arising from debt area. Entire lower stem is subject to bark damage with ring barking extending to circa 50% of stem circumference. Tree appears to have been reduced in past however ongoing dieback is evident. Is considered unsustainable beyond short to medium term.	Consider removal and replacement.	N/A	U
69	Crack Willow ( <i>Salix fragilis</i> )	E/M	G/F	12.00	0.00	5.00	4.50	4.50	4.00	1	395	4.74	Young and still vigorous with immense potential for continued growth. Arises from open space immediately north of decking area.	Review regarding growth potential and proximity to paved area. Review regularly if retained.	L	B2
70	Oak ( <i>Quercus robur</i> )	M	F	12.00	3.00	3.00	4.50	5.50	3.00	1	544	6.53	Slightly unbalanced to south. General vigour and vitality appear good however tree has suffered historic damage, supports bark wounding and deadwood. Ivy cover is entire principal stem.	Clean-out and cut Ivy, review regularly.	L	B
71	Oak ( <i>Quercus robur</i> )	M	F/P	13.00	3.50	4.00	5.50	6.50	5.00	1	748	8.98	Typically unbalanced to south. Vigour and vitality are highly variable with apex and southern crown particularly exhibiting evidence of classic decline and dieback.	Clean-out and review on regular basis.	M	C2
72	Oak ( <i>Quercus robur</i> )	M	F	11.00	2.50	4.50	5.00	5.50	4.50	1	780	9.36	Tree supports minor imbalance to south. Vigour and vitality are variable with evidence of twiggy decline throughout. Ivy is developing on principal stem.	Clean-out review regularly.	M	C2



No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
73	Oak ( <i>Quercus robur</i> )	M	F	9.00	2.25	2.00	6.00	5.00	3.00	1	592	7.10	Is typically unbalanced to east. Vigour and vitality are reasonable but variable with evidence of twiggy decline throughout. Ivy is developing on lower stem.	Cut Ivy and cleanout.	M	C2
74	Oak ( <i>Quercus robur</i> )	M	G/F	13.00	2.50	5.50	6.00	5.50	5.00	1	853	10.24	A large and dominating specimen with within overall alignment. Vigour and vitality are reasonable but variable with evidence of small twiggy dead-wood development throughout. Ivy-covered is developing on principal stem.	Clean-out and cut Ivy.	L	B
75	Oak ( <i>Quercus robur</i> )	M	F	11.00	1.50	3.00	7.00	6.50	2.00	1	917	11.00	Wholly one-sided and typically unbalanced to south-east. Vigour and vitality are reasonable but variable with crown supporting some small diameter dead-wood.	Clean-out and review regularly.	L	B2
76	Oak ( <i>Quercus robur</i> )	M	F	12.00	3.50	2.50	5.00	5.00	3.00	1	608	7.30	Typically unbalanced to south-east. Lower stem supports developing Ivy cover. General vigour and vitality are fair though some small diameter deadwood is noted.	Cut Ivy and clean-out.	L	B2
77	Oak ( <i>Quercus robur</i> )	M	G/F	12.00	2.50	4.00	7.00	7.00	5.00	1	942	11.31	Typically unbalanced to south-east. General vigour and vitality appear good notwithstanding support of minor dead-wood. Ivy development is minimal on lower stem.	Clean-out.	L	B2
78	Ash ( <i>Fraxinus excelsior</i> )	S/M	F/P	7.00	2.50	4.50	0.00	1.00	3.00	1	226	2.71	Suppressed, distorted and of reduced vigour. Appears to be naturally arising from within general thicket development.	Review regarding suitability for retention.	M	C2
79	Oak ( <i>Quercus robur</i> )	M	G/F	12.00	2.00	3.00	7.00	7.00	5.00	1	602	7.22	Is typically one-sided and unbalanced to south-east. General vigour and vitality appear good notwithstanding support of minimal dead-wood.	Review regularly and cut Ivy.	L	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
80	Lime ( <i>Tilia europea</i> )	S/M	F	10.00	0.00	2.00	3.50	4.00	4.00	2	334	4.01	A young specimen arising as part of the broader lime alignment. Remains vigorous though is affected by chronic Ivy cover.	Cut Ivy and cut back basal suckers. Review regularly	L	B2
81	Ash ( <i>Fraxinus excelsior</i> )	S/M	F/P	9.00	2.50	2.50	0.00	0.00	4.00	1	261	3.13	Heavily suppressed and distorted with much of crown covered in Ivy. Tree is heavily unbalanced to north-west.	Cut Ivy and rereview.	S	C2
82	Oak ( <i>Quercus robur</i> )	M	G/F	16.00	2.00	7.00	13.00	12.00	7.00	1	1229	14.74	A particularly large specimen supporting minor imbalance to south-east. General vigour and vitality appear good notwithstanding support of deadwood within crown. Ivy development is notable to circa 9.00 m.	Cut Ivy and cleanout.	L	B1-2
83	Lime Group ( <i>Tilia europea</i> )	M	P	15.00	0.00	6.50	5.50	5.00	5.00	6	955	11.46	A multi-stemmed community indicative of regrowth subsequent to the failure of previous tree. Dominant stem to north is subject to chronic wounding and decay suggesting a possible remnant part of the previous tree. Community is structurally poor though vigorous. Sustainability will be subject to review of retention context and potential safety threats.		S	C2
	Young Tree Plantings	S/M	G/F	5.00-6.00	2.00-2.50	2.00	2.00	2.00	2.00	1	150	1.80	A relatively recent planting arising from both sides of existing foot/cycle path. Young age sees generally good health status however, population densities and proximity to one another has resulted in suppression, as has some tree locations, being beneath the canopy of larger mature trees.		L	B2