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Tree Risk Management | Trees, Planning & Development | Expert Witness | Arboricultural Clerk of Works | Government Support

Client: **Dublin City Council**
Site: Glover Court
Dublin 2

ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENTS

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Prepared by:

John Morris Arboricultural Consultancy Ltd
Executive Suites
Weavers Court
Belfast
BT12 5SH

+44 (0) 7830 793 487
info@johnmorristrees.com
www.johnmorristrees.com

Prepared for:

Dublin City Council
Civic Offices
Wood Quay
Dublin 8

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Purpose of Document

This report provides an assessment of trees on land at Glover Court, Dublin 2, in accordance with BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. It provides an overview of the constraints posed by trees on or within influencing distance of the site, and assesses the impacts of the development proposal to those trees.

It includes:

- A **Tree Schedule** that provides information for each tree;
- A **Tree Constraints Plan** that illustrates the location and constraints posed by trees;
- An **Arboricultural Impact Assessment** that considers the impacts of the development proposal to those trees, including proposals for arboricultural mitigation and improvements;
- An **Arboricultural Method Statement** that outlines how retained trees will be protected during construction, and;
- A **Tree Impact & Protection Plan** that illustrates the impact of the proposal upon trees and protection measures that should be adopted during construction.

The information contained within this report is provided to allow Dublin City Council to assess tree related issues associated with the development proposal.

Executive Summary

The proposed development will consist of deep retrofit, amalgamation and extension of the two existing York Street and Mercer Street blocks at Glover Court, and all associated site works.

The trees form three distinct linear groups around the outer perimeter of Glover Court. A line of five young silver birch in fair health, four mature wild cherry with patches of bark death and decay within the main stems and primary limbs and nine recently planted hawthorn and crab apple within a shrub bed, some of which have sustained damage and vandalism to bark on stems.

The proposal will require removal of the four cherry trees on the eastern boundary with Mercer Street, eight young flowering crab apple trees from along the northern boundary, and a silver birch on Bow Lane.

The landscape plan proposes new trees and planting to help mitigate the removal of trees for the proposed works. These trees will be planted around the play area, plaza, parking area and perimeter of the site to provide visual amenity in the local streetscape.

The new planting will help screen, soften and integrate the proposal into its environment, provide an improvement in species diversity to help increase both quantity and quality of canopy cover in the local streetscape.

The following measures are required to ensure the protection of retained trees during construction:

- Tree Protective Barriers for street trees within influencing distance on Bow Lane.

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DOCUMENT TITLE	DOCUMENT REFERENCE
TREE SCHEDULE	23-507-01
TREE CONSTRAINTS PLAN	23-507-02
TREE IMPACT & PROTECTION PLAN	23-507-03

1. INTRODUCTION

Instruction

1.1. Instruction was received from Dublin City Council on 8th December 2023 to undertake a tree survey and prepare an arboricultural report in connection with the proposed retrofit, amalgamation and extension of residential apartment blocks at Glover Court, Dublin 2.

Scope

1.2. The survey has been carried out in accordance with BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*

2. TREE SURVEY

Site Visit

2.1. The tree survey was undertaken 9th January 2024.

2.2. Details of the survey methodology and assessment criteria can be found in Appendix 1.

2.3. The survey data is summarised on the Tree Schedule (Ref: 23-507-01) and illustrated on the Tree Constraints Plan (Ref: 23-507-02) attached to this report.

2.4. The tree survey considered all trees that have the potential to be impacted by the proposal including those outside the application area, but within influencing distance.

2.5. The above ground constraints posed by canopy spread are plotted as a continuous line around the tree and shaded in the corresponding BS5837 retention category colour, whilst the below ground constraints posed by the Root Protection Area (RPA) have been plotted as a continuous magenta line with the text RPA inscribed.

Description of Trees

2.6. The trees form three distinct linear groups around the outer perimeter of Glover Court. A line of five young silver birch in fair health, four mature wild cherry with patches of bark death and decay within the main stems and primary limbs and nine recently planted hawthorn and crab apple within a shrub bed, some of which have sustained damage and vandalism to bark on stems (Figures 1-3).

2.7. The more recently planted trees have a fair chance of reaching maturity being quite well suited to their environment and with enough rooting space to develop. The wild cherries, although displaying features associated with trees in the latter part of their lifespan, may still have the potential to contribute to the streetscape over the next 10-20 years.

2.8. A summary of tree quality is contained in Table 1.

Table 1. Overview assessment of tree quality by BS5837 retention category.

	Category A	Category B	Category C	Category U	Total
Trees	0	0	18	0	**18**

2.9. A summary of the tree population age classification is contained in Table 2.

Table 3. Summary of age class.

	Young	Semi-mature	Early mature	Mature	Over Mature	Ancient or Veteran
Trees	14	0	0	4	**0**	**0**

Figure 1. Mature wild cherry along verge in Glover Court overlooking Mercer Street.

Figure 2. Bacterial cankers on mature cherry by Mercer Street.

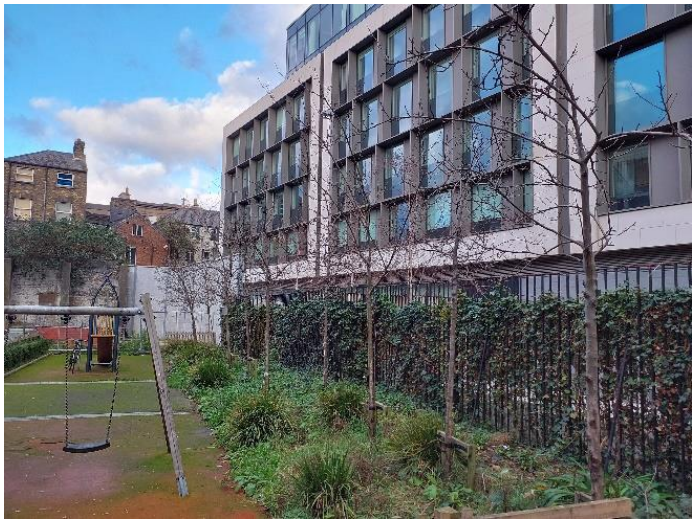

Figure 3. More recent planting of crab apple, hawthorn and birch in courtyard shrub beds.

3. ARBORICULTURAL PRINCIPLES

Trees and Development

3.1. Trees provide a multitude of economic, environmental and social benefits to individuals and communities including (but not limited) to visual amenity and landscape value, ecosystem services and habitats for local wildlife. Trees can also hold historic and cultural importance by providing links to the past that create a sense of place and belonging.

3.2. They are living, self-optimising, mechanical organisms that grow in and react to the environment in which they are located and are capable of being wounded or infected by objects or other organisms that can cause a decline in health or result in death.

3.3. Development proposals that will impact trees should consider the value and contribution made by those trees, the impacts of development activity upon their health and an assessment of future conflicts that may arise between trees and the development proposal.

Below Ground Constraints

3.4. Soils contain organic and mineral material, air and water that provides a medium essential for root growth. The physical properties of soils including texture, porosity and bulk density can greatly impact the availability of water, nutrients and oxygen in the soil available to support the function and growth of tree roots. Protection of the soil environment in which trees grow is therefore essential to ensure tree vitality.

3.5. Tree roots provide support and anchorage and allow the uptake and transport of water, nutrients and oxygen for tree function and growth. Roots are commonly found in the upper 600-1000mm of soil, however depth can vary significantly depending on soil and local site conditions. Typically, tree root systems comprise a network of lateral roots that provide structural support and smaller fibrous roots that function in the uptake of water, nutrients and oxygen. Protection of the tree roots is therefore essential to ensure tree vitality.

Impacts of Construction & Development

3.6. The processes of construction including the movement of machinery and equipment near trees can cause soil compaction that can starve roots of oxygen and water, resulting in tree decline or death. Increasing ground levels near trees can cause similar impacts, whilst belowground soil excavations can damage root bark or lead to root severance and impair structural stability. Further impacts include (but are not limited to) contamination of soils by toxic substances such as cement or chemicals and root desiccation due to inadequate protection during exposure.

Root Protection Areas

3.7. In accordance with BS5837, the Root Protection Area (RPA) indicates the notional minimum area of ground around a tree deemed to contain sufficient roots and rooting volume to avoid adverse physiological or structural impairment and to support future tree function, growth and health.

3.8. The RPA is calculated in accordance with Section 4.6 of BS5837 and is summarised in Appendix 2.

3.9. The RPA is plotted as a continuous circle centred on the base of the stem, however where pre-existing site conditions such as the presence of built structures, changes in topography, soil type and structure or past management are likely to act as barriers, or alter normal distribution, BS5837 allows modifications to the shape of the RPA can be made based upon sound arboricultural assessment.

3.10. The default position should be that no development works occur inside RPAs, however in accordance with BS5837 when there is an overriding justification, it may be appropriate to implement specialist methods of construction or technical solutions that will reduce or eliminate the impact to roots and soil environments.

3.11. Additionally, where an area of RPA is lost, it should be demonstrated that the tree can remain viable with the area lost from encroachment compensated elsewhere contiguous with its RPA, based on the species, age, condition and past management of the tree, pre-existing site conditions and nature of operations proposed is undertaken.

Above Ground Constraints

3.12. Tree stems and crowns can restrict the availability of space on a development site that may result in conflicts between trees and the new built environment. The design and layout of a site should take into consideration the presence of tree canopies, as well as individual species characteristics and future growth requirements in order to create a harmonious relationship between trees and the new built environment.

4. PLANNING POLICY, STATUTORY CONSIDERATIONS & TREE LEGISLATION

Planning Policy

4.1. The National Planning Framework 'Project Ireland 2040' and National Development Plan (2021-2030) underpin planning policy across Ireland. These documents recognise the need to manage future growth in a planned, productive and sustainable way.

4.2. At the heart of Green Infrastructure Planning is to protect, preserve and enhance national capital by:

> *"protecting and valuing important and vulnerable habitats, landscapes, natural heritage and green spaces".*

4.3. The Site falls within the jurisdiction of Dublin City Council, which has a statutory obligation to ensure that provision is made for the protection of trees, woodlands and hedgerows under the Local Government Planning and Development Act (2000), through implementation of a Development Plan. The current plan for Dublin City Council is the **Dublin City Development Plan (2022-2028).**

Dublin City Development Plan (2022-2028)

4.4. The Dublin City Development Plan contains various policies in relation to trees and proposals for development including:

Chapter 10 - Green Infrastructure and Recreation

GI40 *Tree Planting - General*

To require appropriate and long-term tree and native hedgerow planting in the planning of new development, urban spaces, streets, roads and infrastructure projects. New development should seek to provide for additional tree planting using a diversity of species including native species as appropriate to the location of the development in the interests of natural heritage, amenity, environmental quality and climate resilience.

GI41 *Protect Existing Trees as Part of New Development*

To protect existing trees as part of new development, particularly those that are of visual, biodiversity or amenity quality and significance. There will be a presumption in favour of retaining and safeguarding trees that make a valuable contribution to the environment.

GI44 *Resilient Urban Forest*

To deliver and manage a resilient urban forest for the City to help increase resilience to the effects of climate change to consist of native and exotic trees and to target and prioritise locations in the city with a low canopy cover for an increased level of tree cover.

GIO42 *Trees as Wildlife Corridor or 'Stepping Stones'*

To protect trees, hedgerows or groups of trees which function as wildlife corridors or 'stepping stones' in accordance with Article 10 of the EU Habitats Directive.

Dublin City Tree Strategy (2016-2020)

4.5. The Dublin City Tree Strategy (2016-2020) also contains various policies and objectives in relation to trees and proposals of development.

4.6. The Dublin City Development Plan (2022-2028) and Dublin City Tree Strategy (2016-2020) have influenced the design proposals submitted as part of this application, by ensuring that the existing trees have been considered in the context of planning policy and retained where appropriate.

Tree Preservation Orders & Conservation Areas

4.7. Tree Preservation Orders (TPOs) may be made under Section 45 of the Local Government (Planning and Development) Act, 1963 and subsequent acts. Part XIII of the Planning and Development Act 2000 sets out the provisions for TPOs. A TPO can be made if it appears to the planning authority to be desirable and appropriate in the interest of amenity or the environment. A TPO can apply to a tree, trees, group of trees or woodland.

4.8. The principle effect of a TPO is to prohibit the cutting down, topping, lopping or wilful destruction of trees without the planning authority's consent. The order can also require the owner and occupier of the land subject to the order to enter into an agreement with the planning authority to ensure the proper management of the tree, trees or woodland. A review of the Dublin City Development Plan (2022-2028) indicates that at the time of the development

plan, there were no TPO's in place upon the Site (Figure 4).

Special Amenity Area Orders

4.9. A National Special Amenity Area is a designation for a landscape of national importance for its aesthetic and/or recreational value.

4.10. Planning authorities are empowered (under section 202 of the Planning and Development Act 2000), to make a Special Amenity Area Order (SAAO) for reasons of outstanding natural beauty or its special recreational value and having regard to any benefits for nature conservation. The purpose is to preserve and enhance landscape character and to prevent and limit development.

4.11. A review of the Dublin City Development Plan (2022-2028) indicates that the Site is not within a SAAO.

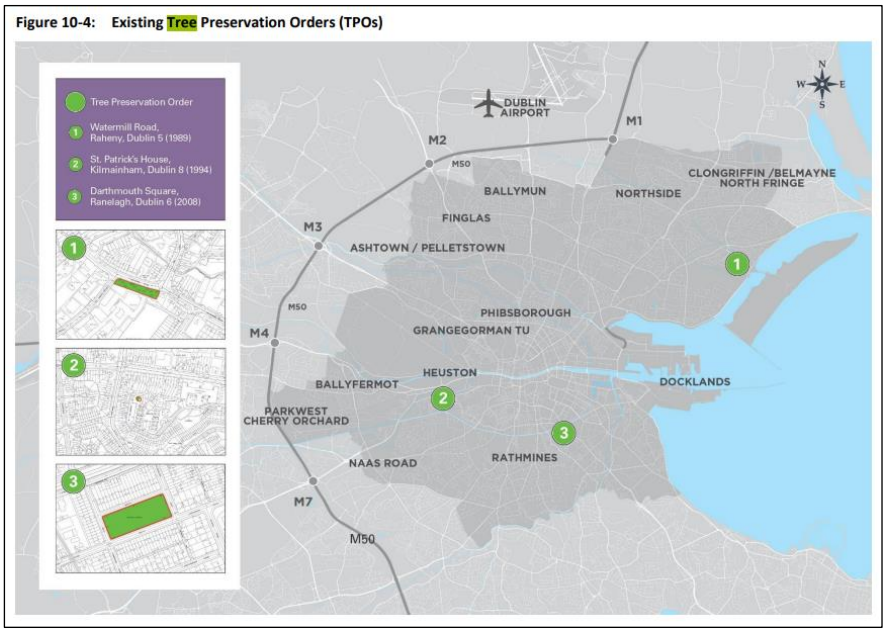

Figure 4. Figure 10-4 Existing Tree Preservation Orders (Dublin City Development Plan 2022-2028).

Felling Licences

4.12. It is an offence for any person to uproot or cut down any tree unless the owner has obtained permission in the form of a felling licence from the Forest Service, with the exception of the following scenarios (under section 19 of the Forestry Act 2014):

- A tree in an urban area. (An urban area is an area that is comprised of a city, town or borough specified in Part 2 of Schedule 5and in Schedule 6 of the Local Government Act 2001, before the enactment of the Local Government Reform Act 2014 (this act dissolved Town Councils, however, the old boundaries of these areas are still considered as urban for the purpose of the Forestry Act 2014).
-

- A tree within 30 metres of a building (other than a wall or temporary structure) but excluding any building built after the trees were planted.
- A tree less than 5 years of age that came about through natural regeneration and removed from a field as part of the normal maintenance of agricultural land (but not where the tree is standing in a hedgerow).
- A tree uprooted in a nursery for the purpose of transplantation.
- A tree of the willow or poplar species planted and maintained solely for fuel under a
- short rotation coppice.
- A tree outside a forest 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.
- A tree outside a forest, the removal of which is specified in a grant of planning permission, providing it was indicated on the lodged plans as being planned for removal as part of the application
- A tree outside a forest of the hawthorn or blackthorn species growing in a hedge.
- A tree outside a forest in a hedgerow and felled for the purposes of its trimming the hedge providing that the tree does not exceed 20 centimetres diameter at 1.3 metres above ground level.
- Agricultural holdings can fell a limited small number of trees not exceeding 3 cubic metres.
- The maximum number of trees permitted to be felled under that exemption per year is 4 trees (12 cubic metres)
- Outside a forest, apple, pear, plum, or damson species are exempt from the need for a felling license.

Wildlife

4.13. The cutting of hedges is prohibited during the period 1st April to 31st August every year with limited exceptions under the Wildlife Acts 1976-2008.

5. ARBORICULTURAL IMPACT ASSESSMENT

Development Proposal

5.1. The regeneration and redevelopment is proposed for the existing Glover Court Estate bounded by York Street, Mercer Street, Bow Lane and Aungier Street, in Dublin 2. The existing 0.22 hectare site currently comprises of 2 no. five-storey housing blocks providing 38 homes which form the Glover Court Estate Flats social housing scheme. The project comprises the deep retrofit, amalgamation and extension of the two existing York Street and Mercer Street blocks. The proposed redevelopment, which will be managed by Dublin City Council, comprises of:

- Amalgamated building comprising a 5 and 6 storey block to York Street and a 7-storey block to Mercer Street
- Provision of 53 dwellings (15no. 1-beds, 30no. 2-beds and 8no. 3-bed apartments)
- Deep retrofit and extension to the 2 no. existing housing blocks
- York Street block to be extended/ side bay at both ends and by one additional upper floor
- Mercer Street blocks to be extended/ side bay on the corner with York Street and by two additional upper floors
- New stairs and lift cores are to be accommodated within the grid of the existing frame, one in each block
- Include a new external façade throughout with new access deck to the internal courtyard and balconies to the street facing facades

  New vehicular entrance and pedestrian exit from Bow Lane, with associated street/ road improvement works

  Provision of 9 no. new designated resident car parking spaces, to included 1no. accessible and 4no. EV charging spaces with 100% ducting infrastructure included
- Upgrade of communal amenity space to inner courtyard, new landscaping, ancillary structure/ pavilion for secure resident bicycle parking, associated site infrastructure works/ supporting infrastructure, public lighting, revision to access, pavements, boundary treatments and all other necessary enabling works and associated public realm improvements.

The Impact

5.2. The proposed layout requires an extension on the eastern aspect of the building by Mercer Street. In this location, there are four wild cherry trees growing within a cobble and concrete surfaced verge, within 4m of the building. The canopies of these trees almost touch the building and the theoretical root protection areas extend right up to the building edge. The tree canopies have been pruned in the past to provide clearance from the building.

5.3. The proposed extension would cause significant ground and root disturbance, thereby impacting the structural and physiological condition of the trees. The trees would lose a significant portion of their root system and need to be extensively pruned to provide clearance for the extension and scaffolding during construction. The extent of root pruning required is likely to compromise the structural integrity of the trees, and the extent of crown reduction required would significantly impact the physiological health and long-term viability of the trees.

5.4. Landscaping works along the northern boundary including a new cycle storage and hardstanding's will require removal of eight young crab apple.

5.5. A new vehicular entrance from Bow Lane will require removal of a single young silver birch.

5.6. The tree to be removed is illustrated on the Tree Impact & Protection Plan (Ref: 23-507-03), attached to this report.

Construction Phase

5.7. All site compounds, facilities and routes to allow the movement of construction traffic across the site should be sited beyond influencing distance of retained street trees.

Ground Levels & Incursions within RPAs

5.8. There is no requirement for changes in ground levels or incursions within the RPA of any retained tree.

Service Routes

5.9. A review of the proposed services confirms no services are required within the RPA of any retained tree.

Boundary Treatments

5.10. There is no requirement for boundary treatments within RPAs.

Landscaping

5.11. There is a requirement for soft landscaping within the RPA of a retained tree. Arboricultural Method Statements to minimise impacts on tree roots are provided in Chapter 6 of this report.

Mitigation & Improvements

5.12. The landscape plan proposes new trees and planting to help mitigate the removal of trees for the proposed works. These trees will be planted around the play area, plaza, parking area and perimeter of the site to provide visual amenity in the local streetscape.

5.13. The new planting will help screen, soften and integrate the proposal into its environment, provide an improvement in species diversity to help increase both quantity and quality of canopy cover in the local streetscape.

6. ARBORICULTURAL METHOD STATEMENTS

Purpose

6.1. The purpose of this statement is to provide a system of working to ensure retained trees are protected at all times during construction. It should be read in conjunction with the Tree Impact & Protection Plan (TIPP) attached to this report.

6.2. A copy of this report must be made permanently available for the duration of the development. It can be:

- Included in tender documents to identify and quantify tree protection and management requirements;
- Used to plan timing of site operations to minimise the impact upon trees, and;
- Referenced on site for practical guidance on how to protect trees.

6.3. The compliance of arboricultural method statements is a recommended as a condition of planning and is necessary to ensure the protection and vitality of retained trees.

Pre Commencement Meeting

6.4. A pre-commencement meeting will be held prior to commencement of any demolition or construction works on site. The pre-commencement meeting may require the attendance of:

- The Main Works Contractor;
- Landscape Architect;
- Structural/Civil Engineer;
- Project Arboriculturist; and
- Any other parties as required.

6.5. The purpose of this meeting will be to agree the details of the tree protection measures and ensure that all aspects of tree protection are understood. The Project Arboriculturist and Main Works Contractor will agree and mark the location of the tree protective fencing and temporary ground protection and any other specific tree protection measures, as required.

Key Responsibilities

6.6. It is the responsibility of the main contractor to ensure that all site personnel fully understand the protection measures on the site, that tree protection measures are adhered to at all times, and that the project arboriculturist is contacted if there are any issues related to trees.

Protection of Street Trees

6.7. The stem of the tree is to be wrapped in hessian or rope, then a 1.5m high cleft chestnut fence layer, followed by 3no. layers of orange plastic site hazard fencing, to provide a cushioning barrier. Alternatively, a wooden frame 1m x 1m and 2m high should be built around the stem of the tree with plywood boards fixed to the frame (Figure 5).

Figure 5. Examples of tree protection for street trees.

6.8. The following principles will be adopted by site personnel within the CEZ during construction, to ensure protection of retained trees:

- No level changes.
- No excavations.
- No fires.
- No use of herbicides.
- No storage of materials, machinery or access for construction workers.

Site Compounds & Facilities

6.9. Site compounds and facilities will be located outside of all RPAs and CEZs as identified on the TIPP.

Site Cranes, Piling Rigs and Machinery

6.10. The location of all site cranes, piling rigs and other machinery should be sited outside of RPAs to avoid soil compaction.

Pollution Control

6.11. Any storage or mixing station located outside of the construction exclusion zone will be located in a place that minimises the risk of contaminated runoff entering to prevent adverse physiological impacts on trees that may result from contact with rooting environments. This may be achieved by using a non-permeable membrane on the ground, surrounded by sandbags or sawdust to contain any spillage.

Temporary Ground Protection

6.12. Where it is not practical to protect RPAs by use of protective fencing, BS5837 allows for the fencing to be set back and the soil shielded by ground protection. A range of methods can be used including retaining existing hard surfaces or structures that already protect the soil, installing new temporary surfaces, or a combination of both. Whatever the choice of method, the end result must be that the underlying soil remains undisturbed and retains the capacity to support existing and new roots.

6.13. If fences are to be set back on a temporary the following specifications are recommended for use as temporary ground protection to protect roots and soil.

6.14. For pedestrian traffic, a plywood board with a minimum thickness of 40mm should be laid on a minimum of 100mm deep woodchip, with geotextile membrane beneath.

6.15. For small plant machinery with a gross weight of up to 2 tonne, interlinking aluminium or composite tracks with sufficient load bearing capacity should be laid on a minimum of 150mm deep woodchip, with geotextile membrane beneath.

6.16. For heavy machinery with a gross weight of up to 3.5tonne, interlinking aluminium or composite track with sufficient load bearing capacity should be laid over a minimum layer of 200mm deep woodchip, with a geotextile membrane beneath.

6.17. Any temporary protective surfaces must remain in place until all construction activity is finished.

6.18. Upon completion of construction works, the temporary ground protective measures should be removed working backwards from on top of the system. This will need to be done carefully ensure that there is no excavation or compaction of the original surface or change in ground levels.

6.19. Once this material has been removed vehicular access to this part of the site will not be permitted.

6.20. The location of where temporary ground protection is to be located and at what stage of development is illustrated on the TIPP attached to this report.

Excavations and Removal of Existing Surfaces

6.21. All excavation must be carried out carefully using spades, forks and trowels, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air such as an Air Spade may be an appropriate alternative to hand digging, if available.

6.22. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of small roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage.

6.23. If digging by hand, a fork should be used to loosen the soil and help locate any substantial roots. Once the roots have been located the trowel should be used to clear the soil away from them without damaging the bark. Exposed roots that are to be removed should be cut cleanly with a sharp saw or secateurs 100-200mm behind the final face of the excavation.

6.24. Roots temporarily exposed must be protected from direct sunlight, drying out and extreme temperatures by appropriate covering. Roots greater than 25mm in diameter should only be cut in exceptional circumstances. Roots greater than 100mm in diameter should only be cut after consultation with the project arboriculturist.

Upgrading Existing Surfaces

6.25. Where upgrading of existing hard surfaces is required, the preferred option will be to leave the surface in place and install the new surface specification on top.

6.26. If the retained surface is impermeable, it may be appropriate to remove or puncture sections to create a more favourable environment for roots beneath, before the new surface is laid, through consultation with the project arboriculturist.

6.27. Where the existing surface is to be removed or upgraded, the surface layer should be excavated down the existing subbase and the new surface specification installed on top, to prevent any damage to roots beneath.

6.28. It is recommended that where possible, new and upgraded hard surfaces should be porous (e.g.

permeable brick paving, porous resin bound aggregate or tarmac) to allow the flow or water and oxygen to roots. Wet concrete should only be poured if an impermeable geotextile fabric has first been installed to prevent soil contamination from toxic leachate.

6.29. New surfaces and upgraded surfaces should be set back from the base of stems by a minimum of 500mm to allow space for future growth and minimise the risk of distortion with new surface.

7. ABOUT THE AUTHOR & LIMITATIONS

Authors Qualifications & Experience

7.1. This report has been written by John Morris, Director and Principal Arboricultural Consultant at John Morris Arboricultural Consultancy Ltd. John has a First Class BSc (Hons) in Housing (Ulster University) and a Post Graduate Diploma (UK NQF Level 7) in Arboriculture & Urban Forestry (Myerscough College & University of Central Lancashire). John has worked in the housing, development and arboricultural sectors combined for 20 years and regularly undertakes continuous professional development (CPD) in all areas of arboriculture and wider business administration. John is a Professional member of the Arboricultural Association (AA) and Associate member of the Institute of Chartered Foresters (ICF).

Limitations

7.2. This report is for planning purposes and is not a detailed assessment of the health and condition of trees, however where defects have been identified works have been recommended to ensure site safety.

7.3. This report does not take responsibility for the effects of extreme weather conditions, vandalism, accidents or any works to trees that occur without the authors knowledge, or that are not recommended within this report.

7.4. Tools used during the assessment have been limited to a sounding mallet, probe or binoculars. No invasive or diagnostic equipment has been used, nor have any aerial inspections, belowground root investigations, or soil, leaf or root samples been taken for further testing or analysis.

7.5. Trees were assessed on 9th January 2024 and the information gathered during the survey pertains to that moment in time. The observations within this report will remain valid for two years from the date of inspection. It is recommended that trees are inspected again within two years of the date of this report to assess what works are required for reasons of good arboricultural management and to enable the client to manage their legal reasonability in terms of tree risk management.

7.6. The location of trees places reliance on the accuracy of the topographical survey unless otherwise caveated within the report.

7.7. All works recommendation as a result of the survey should be undertaken by a suitably qualified and insured arborist in accordance with BS3998:2020 *Tree Works – Recommendations* to prevent any structural or physiological impairment to trees.

Appendix 1: Tree Survey Criteria (BS5837:2012)

The assessment of the trees has been carried out in accordance with the guidance provided in Annexe C of BS5837, which requires that any tree on or influencing distance of the site with a stem diameter of over 75mm at 1.5m above ground level be recorded.

Stem diameter measurements were taken using a girthing tape or Biltmore stick, and in accordance with Annexe D of BS5837.

Height, crown spread, and canopy clearance measurements are recorded in accordance with the measurement convention detailed in paragraph 4.4.2.6 of BS5837.

The trees are categorised in an order defined in **Table 1** of BS5837, a copy of which can be seen below in **Figure 1**, but which can be summarised as:

- **Category A** Trees of high quality and value in such a condition as to be able to make a substantial contribution for a minimum of 40 years.
- **Category B** Trees of moderate quality and value in such a condition as to make a significant contribution for a minimum 20 years.
- **Category C** Trees of low quality and value currently in adequate condition and able to remain until new planting can be established with a minimum useful life expectancy of 10 years, and young trees with a stem diameter less than 150mm.
- **Category U** Trees in poor structural condition or physiological decline that cannot be realistically retained in the context of current land use for more than 10 years.

Further subcategories 1-3 indicate the area(s) in which a tree or group retention value lies.

- Mainly arboricultural.
- Mainly landscape.
- Mainly cultural, including conservation.

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

John Morris Arboricultural Consultancy

Appendix 2 – Calculation of the Root Protection Area

Circle Radius

The circle radius has been calculated by obtaining the stem diameter (measured at 1.5m above the ground) in millimetres and multiplying it by 12. Where the tree is multi-stemmed, an average stem diameter is calculated by the following formula specified in section 4.6.1 (a) & (b) of BS5837.

For trees with two to five stems, the combined stem diameter should be calculated as follows:

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

For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

This total is then divided by 1000 to provide a circle radius in metres.

RPA Areas

The RPA has been assessed according to the recommendations set out in section 4.6 of BS5837. It is calculated by multiplying the radius squared by 3.142 (π).

Length of sides of a square

Section 5.5.3 of BS5837 recommends that the ground protection and barriers should be shown as a polygon surrounding the stem of the tree. With a circle, the distance from the edge of the circle to the centre will remain constant, but with a square, the distance from the centre of the tree to the sides of the square is less than the distance to the corner of the square. The area of the square must remain the same as the area of the circle. In order to ensure that it is the case, the length of side of the square is calculated at the square root of the RPA area.

Minimum barrier distance

This is the closest point that a side of the square can be to the centre of the tree.

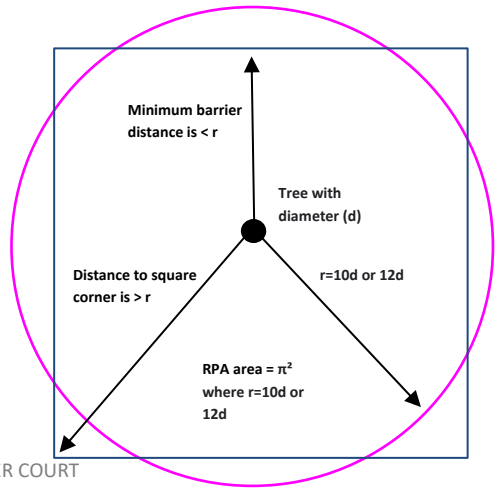

Figure 1. Illustration of area calculations and minimum barrier distances

Figure 1 illustrates the differences between a square and a circle in area. Where the distance from the centre of the tree to the corner of the square is greater than the radius of the circle (r), but the distance from the centre of the tree to the side of the square is greater than the radius of the circle (r), the total area will remain the same. The minimum barrier distance from the tree is calculated by taking the length of the side and dividing it by two.

Clarification note on the RPA radius

The RPA radius is not the automatic minimum distance of the tree protection. It is a notional figure for use as a means of calculating the actual area of the RPA. BS5837 clarifies this under *Section 3.7 Root Protection Area (RPA) – layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the trees viability, and where the protection of the roots and soil structure is treated as a priority.*

Appendix 3 – Example of Tree Protective Signs