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Client: **Land Development Agency**
Site: Hacketstown
Skerries

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ARBORICULTURAL IMPACT ASSESSMENT, METHOD STATEMENTS & PLANS

John Morris Arboricultural Consultancy

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Purpose of Document

This report provides an assessment of trees on land at Hacketstown in Skerries, in accordance with the guidelines outlined in BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.

It provides an overview of the constraints and opportunities posed by trees on or within influencing distance of the site and demonstrates how existing trees have influenced the development proposal.

It includes:

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

The information contained within this report allows An Bord Pleanála to assess tree related issues associated with the development proposal.

Executive Summary

The development entails 345 no. residential units comprising of 84 no. 1-bed units, 104 no. 2-bed units (68 no. 2-bed apartments and 36 no. 2-bed duplexes), 157 no. 3-bed units (118 no. 3-bed duplexes and 39 no. 3 - bed houses) ranging in height from 2 no. – 4 no. storeys on a site of 6.7 ha. located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin.

A tree survey of the site was undertaken in accordance with BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations* independently and without knowledge of any future development proposals. The survey identified 22 individual trees, one group of trees and nine hedgerows which have been categorised as follows:

0 of high arboricultural quality	(Category A)
4 of moderate arboricultural quality	(Category B)
23 of low arboricultural quality	(Category C)
5 of poor arboricultural quality	(Category U)

The design and layout of the site has been influenced by local planning policy in relation to trees, as detailed in The Fingal Development Plan (2017-2023) and The Forest of Fingal – A Tree Strategy for Fingal'.

The aim has been to include those arboricultural features that are capable of providing a substantial future contribution in terms of their amenity, landscape, and ecological value, including those that contribute to the landscape character of the local area. These include mature boundary hedgerows and mature self-sown hedgerow trees that help to provide screening and enclosure to the Site.

To mitigate the removal of eleven low quality category C arboricultural features from central areas of the Site, a landscape plan submitted as part of the application proposes a diverse mix of new trees and vegetation across the site to function in harmony with the existing natural and new built environment. This new planting will include species rich native hedgerows and individual specimen trees that will increase species diversity and canopy cover in the local landscape. To mitigate the removal of a single moderate quality category B Ash it is proposed to plant three semi mature Scots Pine in its place.

The location of new and supplementary planting has been strategically positioned to enhance and complement existing features, providing connectivity to trees and hedgerows and green corridors in the wider local landscape for both visual amenity and ecological value. The new planting will include pollinator friendly species in recognition of Fingal County Councils partnership status in the All-Ireland Pollinator Plan, offering benefits in terms biodiversity and to local wildlife.

The aim should be to ensure the benefits provided by new planting will increase year on year, therefore reducing the magnitude of impact and creating an improvement on the pre-development baseline. To accelerate the timeframe over which these benefits are realised and to provide an immediate impact, it is proposed to use a mixture of extra heavy standard and semi mature trees, and a variety of rich native mixed species hedgerow planting.

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

- Tree Protective Fencing
- Construction Exclusion Zones

CONTENTS

ATTACHMENTS

DOCUMENT TITLE	DOCUMENT REFERENCE
TREE SCHEDULE	22-054-01
TREE CONSTRAINTS PLAN	22-054-02
TREE IMPACT & PROTECTION PLAN	22-054-03

1. INTRODUCTION

Instruction

1.1. Instruction was received from Land Development Agency on 29th January 2020 to undertake a tree survey and prepare an arboricultural report in connection with a planning application for the construction of a residential development located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin. (hereinafter referred to as 'the Site).

Scope

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

1.3. The information collected during the survey has been used in the preparation of a report in connection with a planning application.

Site Location

1.4. The site is located at Hacketstown in Skerries (Figure 1). It is bound by residential dwellings at Ballygossan Park to the north, Golf Links Road to the east and south and an Irish Rail suburban railway line to the west. The site is currently accessible via a field gate off Golf Links Road to the south.

Figure 1. Site at Hacketstown, Skerries (Source: Google Earth, 2022).

2. TREE SURVEY

Site Visit

2.1. The tree survey was undertaken on 06th February 2020, with a further tree survey undertaken on 07th March 2022.

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

2.3. A copy of the survey data can be found in the Tree Schedule (Ref: 22-054-01) attached to this report.

2.4. The extent of the tree survey has been marked on the Tree Constraints Plan (TCP) (Ref: 22-054-02) attached to this report

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

2.6. 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.

2.7. The purpose of the tree survey was to provide guidance to the design team on the constraints and opportunities posed by trees to inform the design and layout of the Site.

2.8. The results of the survey allow the opportunity to balance the retention of significant trees against the opportunity to enhance the existing tree stock through proactive management.

2.9. A summary assessment of the tree quality is contained in Table 1.

Table 1. Overview assessment of tree quality.

	Category A	Category B	Category C	Category U	Total
Trees	0	3	15	4	**22**
Groups	0	1	0	0	**1**
Hedges	0	0	8	1	**9**
Total	**0**	**4**	**23**	**5**	**32**

Description of Trees and Hedgerows

2.10. The Site has previously been used as agricultural pasture and is divided into fields by a series of ditches and hedgerows. The main component of these hedgerows is mature Hawthorn *(Crataegus monogyna)* with occasional Blackthorn *(Prunus spinosa),* Elder *(Sambucas nigra)* and young to semi mature Ash *(Fraxinus excelsior).* These central hedgerows are clad with thick bramble and ivy, and a number are sparse and scrawny with gaps that are now dominated by long grass and other ground vegetation.

2.11. The boundary hedgerows comprise a similar species mix with occasional early mature and mature self-sown Ash and Sycamore *(Acer pseudoplatanus)*, particularly along the western

boundary between the Site and Irish Rail line and along the eastern boundaries between the Site and residential dwellings.

2.12. The hedgerows show signs of past management, but many of the central hedgerows are now in decline and would benefit from intervention through new supplementary planting and ongoing maintenance. The boundary hedgerows provide mature canopy cover with visual amenity and ecological value and are important features that contribute to the landscape character of the local area.

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.

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.

3.6. The protection of the soil environments and tree roots is essential to ensure tree vitality.

Impacts of Construction & Development

3.7. 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

3.8. 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.

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

3.10. The notional RPA is typical 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.

3.11. 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.

3.12. 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

3.13. 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 & NON-STATUTORY CONSIDERATIONS

Planning Policy

4.1. The National Planning Framework 'Project Ireland 2040' and National Development Plan (2018-2027) 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 Fingal County Council (FCC), 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 Fingal is the **Fingal Development Plan (2017-2023)**.

4.4. The Fingal Development Plan (2017-2023) provides guidance for trees in relation to proposals of development as follows:

Fingal Development Plan 2017-2023

Chapter 3 | Placemaking

Objective PM64

"Protect, preserve and ensure the effective management of trees and groups of trees".

Chapter 8 | Green Infrastructure 8

Objective GI16

"Set targets in the Green Infrastructure Strategy for the provision of different green infrastructure elements in urban areas, such as trees in urban areas and green roofs in town centres, so that a net gain in green infrastructure is achieved over the lifetime of this Development Plan".

Chapter 9 | Natural Heritage

Objective NH27

"Protect existing woodlands, trees and hedgerows which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their protection and management".

Principles for Development

"Existing tree belts should be retained and managed and older stands of trees restocked. Roadside hedging should be retained and managed. Proposals necessitating the removal of extensive field and roadside hedgerows or trees should not be permitted. Strong planting schemes using native species, to integrate development into these open landscapes, will be required".

Chapter 12 | Development Management Standards

Tree Policy

"Trees provide both valuable amenity and wildlife habitat. Visually they add to an area, softening the impact of physical development on the landscape while also fulfilling an important role in the improvement of air quality in urban areas and providing wildlife habitats. 'The Forest of Fingal –A Tree Strategy for Fingal' sets out the Council's policy for street tree planting, management and maintenance".

Objective DMS77

"Protect, preserve and ensure the effective management of trees and groups of trees.

Objective DMS78

"Ensure during the course of development, trees and hedgerows that are conditioned for retention are fully protected in accordance with 'BS5837 (2012) Trees in relation to the Design, Demolition and Construction – Recommendations' or as may be updated".

Objective DMS79

"Require the use of native planting where appropriate in new developments in consultation with the Council".

Objective DMS80

"Ensure trees, hedgerows and other features which demarcate townland boundaries are preserved and incorporated where appropriate into the design of developments".

Objective DMS81

"Consider in tree selection the available rooting area and proximity to dwellings or business premises particularly regarding shading of buildings and gardens".

Objective DMS82

"Promote the planting of large canopy trees on public open space and where necessary provide for constructed tree pits as part of the landscape specification".

Objective DMS83:

"Ensure roadside verges have a minimum width of 2.4 metres at locations where large trees are proposed and where necessary provide for constructed tree pits as part of the landscape specification. Road verges shall be a minimum of 1.2 metres wide at locations where small canopy trees are proposed".

4.5. **'The Forest of Fingal – A Tree Strategy for Fingal'** is also a key consideration where trees are impacted by proposals of development.

4.6. The Fingal Development Plan (2017-2023) and 'The Forest of Fingal – A Tree Strategy for Fingal' have formed the basis of the design layout by ensuring that important trees and hedgerows have been considered and incorporated in the layout where possible.

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.

4.9. A review of the FCC website did not allow a search for TPOs to be conducted, to ascertain if any TPOs exist upon the Site.

Special Amenity Area Orders

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

4.11. 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/enhance landscape character and to prevent/limit development.

4.12. A review of the Fingal County Council Development Plan (2017-2023) indicates that the application site is not currently designated a SAAO.

Felling Licences

4.13. 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

4.14. The Wildlife Act 1976 and Wildlife (Northern Ireland) Order 1985 as amended by the Wildlife and Natural Environment Act (Northern Ireland) 2011 provide statutory protection to birds, bats and other protected species that may inhabit trees. Bats are also protected under the European Communities (Birds and Natural Habitats) Regulations 2011. These Acts and Regulations include provisions making it illegal to:

- Deliberately kill, injure or capture (take) bats.
- Deliberately disturb bats (whether in a roost or not)
- Damage, destroy or obstruct access to bat roosts

4.15. It is essential to check for nesting birds, bat roosts, badgers and hibernating animals such as

hedgehogs under trees before pruning or removing trees as negligent disturbance is an offence under the EC Habitat Directive 1992.

4.16. In general, autumn tree work: September to November is least disruptive to bats and birds.

4.17. The cutting or felling of trees is prohibited during the period 1st April to 31st August every year with limited exceptions under the Wildlife Acts 1976 and Wildlife (NI) Order 1985.

5. ARBORICULTURAL IMPACT ASSESSMENT

Development Proposal

5.1. The development entails 345 no. residential units comprising of 84 no. 1-bed units, 104 no. 2-bed units (68 no. 2-bed apartments and 36 no. 2-bed duplexes), 157 no. 3-bed units (118 no. 3-bed duplexes and 39 no. 3 - bed houses) ranging in height from 2 no. – 4 no. storeys on a site of 6.7 ha. located at Hacketstown in the townlands of Milverton, Townparks and Hacketstown, Skerries, Co. Dublin. The subject lands are accessed via Golf Links Road to the south and Ballygossan Park Phase 1 to the north.

5.2. The proposed development is set out in 8 blocks which comprise the flowing:

- Block A1 comprises 39 No. units at 4 storeys in height (Comprising a mix of 26 No. apartments & 13 No. Duplexes)
- Block A2 comprises 33 No. units at 4 storeys in height (Comprising a mix of 22 No. apartments & 11 No. Duplexes)
- Block B1 comprises 16 No. units at 3 storeys in height (Comprising all 3 bed Duplexes)
- Block B2 comprises 16 No. units at 3 storeys in height (Comprising all 3 bed Duplexes)
- Block C comprises 42 No. units at 2-3 storeys in height (Comprising 15 No. apartments & 27 No. Duplexes)
- Block D comprises 32 No. units at 2-3 storeys in height (Comprising 12 No. apartments and 20 No. houses)
- Block E comprises 62 No. units at 2-3 storeys in height (Comprising 38 No. apartments & 24 No. Duplexes)
- Block F comprises 66 No. units at 2-3 storeys in height (Comprising 39 No. apartments & 27 No. Duplexes)
- Block G comprises 25 No units at 2-3 storeys in height. (Comprising 20 No. Duplexes and 5 No. houses)
- Block H comprises 14 No units at 2-3 storeys in height. (Comprising 14 No. houses)
- Public Open Space of c.16,670 sqm (25% of net developable area) is proposed including the parkland and main public square, in addition to the linear park of c.2,427 sqm;

- c.2,272 sqm communal open space is proposed to serve the apartments;
- 414 car parking spaces in total are proposed including 70 visitor spaces, creche set down and 3 for creche staff parking within undercroft and at surface level.
- 802 No. bicycle parking spaces comprising including 128 No. visitor spaces and 10 No. to serve the creche;
- Childcare and community facility of c.377 sqm. located in Block C;
- Upgrades to the Golf Links Road including new pedestrian and cycle infrastructure with frontage on Golf Links Road; and
- Vehicular access off the Golf Links Road is to be provided to the south east of the subject site.
- In addition, the proposal will provide a new internal link road. This internal road link will connect to the adjacent lands to the north, for which a separate planning application has been made to Fingal County Council under Reg. Ref. F21A/0287 (ABP Reg. Ref. 312189-21).

5.3. The proposed apartments include the provision of private open space in the form of balconies and winter gardens to all elevations of the proposed buildings. The development also includes vehicular, pedestrian, and cycle accesses, bicycle stores, lighting, landscaping, amenity spaces, drop off areas, boundary treatments, refuse facilities, services, utilities, substations, internal roads, footpaths and shared surfaces and all associated ancillary and site development works.

Design Principles

5.4. The design layout has been directly and indirectly influenced by the existing tree cover on Site. The default position has been to avoid development within the canopy or RPA of any retained tree, however where this has not been possible a hierarchy of mitigation has been applied, as illustrated in Figure 2.

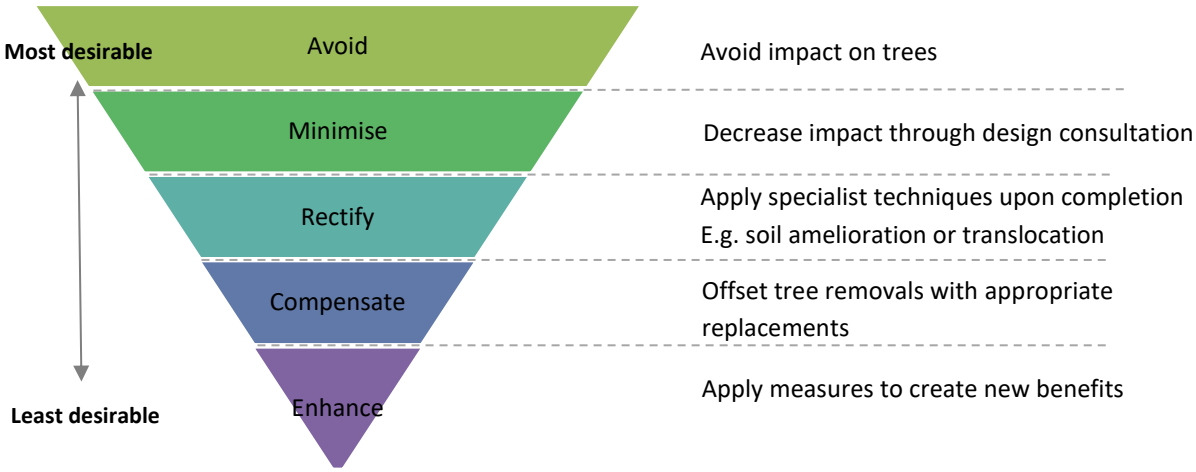


Figure 2. Trees and Development Mitigation Hierarchy (John Morris Arboricultural Consultancy, 2020).

Tree Removals & Pruning

5.5. Tree removals and pruning have been limited to that which is necessary and unavoidable to allow the development proposal to be implemented, with consideration given to species attributes, the tolerance of individual trees to disturbance, and to the presence of surrounding trees and features of the site which may have an influence on retained trees.

5.6. The pruning of trees may also be required for reasons of good arboricultural practice or management to promote tree health and longevity, to remove hazards for reasons of health and safety, or to limit the impacts of the development proposal upon trees where incursions into RPAs are unavoidable.

The Impact

5.7. The development proposal will require the removal of 11 individual trees and four hedgerows.

5.8. The reason for these removals is to facilitate new residential dwellings and to provide connectivity around the new development.

5.9. The agricultural nature of the land (e.g. being divided into a series of field compartments by hedgerows) means it is not possible to create a functional residential development without some tree and hedgerow removals. The extent of these removals has been limited to that which is necessary to allow the construction of new residential scheme of a sustainable density and to enable essential connectivity and movement around the development.

5.10. The aim has been to preserve and incorporate mature boundary hedgerows into the design layout in recognition of importance they hold in the local landscape, in particular those along the western boundary between the Site and the Irish Rail line and those along the eastern boundary between the Site and neighbouring residential dwellings.

5.11. In locations where trees and hedgerows are to be removed, it is proposed to provide new compensatory planting schemes using native species to integrate the development into its surroundings (see Mitigation & Improvements).

5.12. This approach is taken in accordance with the Fingal Development Plan 2017-2023.

5.13. A further four trees are recommended for removal irrespective of the development proposal due to poor health or decline meaning they cannot realistically be retained in the context of current land use for longer than 10 years.

5.14. Those tree and hedgerows to be removed are illustrated on the Tree Impact & Protection Plan (TIPP) (Ref: 22-054-03), attached to this report.

5.15. All tree works are outlined in the Tree Schedule attached to this report and should be undertaken by a qualified and insured contractor in accordance with BS3998:2010 *Tree Works – Recommendations.*

Ground Levels & Incursions within RPAs

5.16. There is a requirement for an increase in ground levels of c. +1m along the eastern boundary to

5.17. facilitate construction of Block B1 and Block B2. It is understood that grading to meet these desired levels will occur outside of the RPA for all trees located on neighbouring residential land just beyond the eastern boundary (Figure 3).

5.18. There is no requirement for changes in ground levels within RPAs or within influencing distance of RPAs to any other tree or hedgerow to be retained.

5.19. There will be a minor incursion within the RPA of T2 (mature Ash) and T3 (mature Sycamore) to install new water and wastewater services. These incursions will be minimal (T2 - 6m² or 4% and T3 - 22m² or 14.6%) and will be unlikely to cause any physiological or structural impact upon trees. A method statement for the installation of services within RPAs is provided in Chapter 6 of this report, in accordance with National Joint Utilities (NJUG) 10, Vol 4, Issue 2, 2007 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees'.

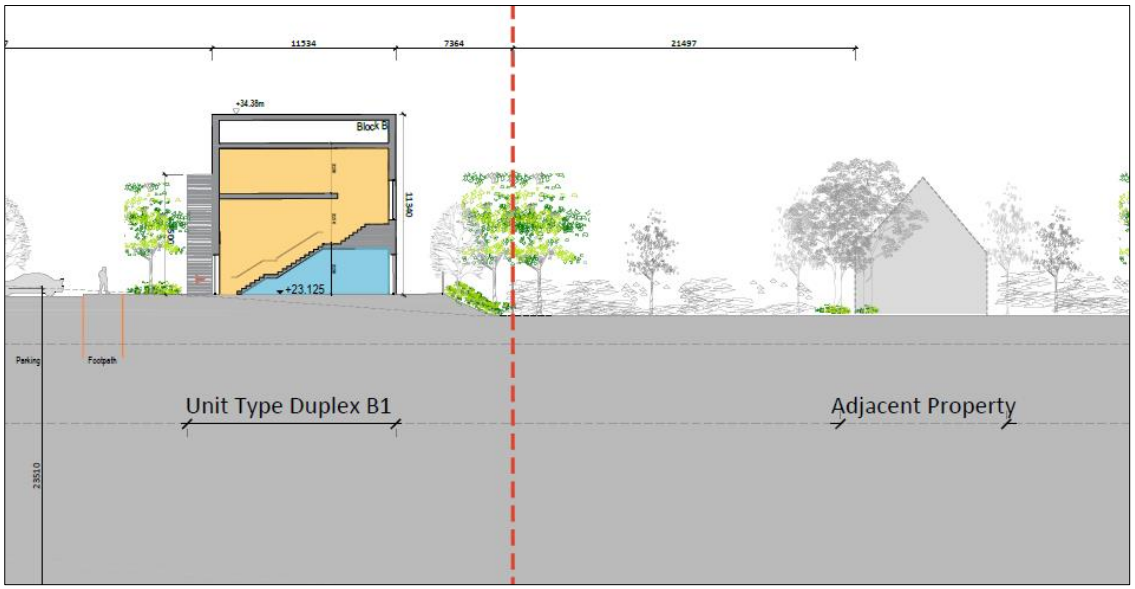


Figure 3. Section of proposed levels for Block B1 along eastern boundary (Source: O'Mahoney Pike, 2022)

Boundary Treatments

5.20. It is understood that a variety of boundary treatments are proposed including chain link fences, precast concrete post and panel fences and a stone wall and in some cases, these boundary treatments will be within RPAs. These boundary treatments should be installed using minimally invasive techniques to reduce the impact upon tree roots and surrounding soils. A method statement that provides guidance for the installation of boundary treatments within RPAs can be found in Chapter 6 of this report.

Construction Phase

5.21. All site compounds, facilities and routes to allow the movement of construction traffic across the Site should be sited outside influencing distance of RPAs for all retained trees and hedgerows.

Magnitude of Impact

5.22. The overall magnitude of impact for proposed tree removals has been assessed using the criteria in Table 4.

Table 4. Magnitude of arboricultural impact (John Morris Arboricultural Consultancy 2020).

Magnitude Rating	Description of Impact	Mitigation
High	Major loss or alteration to the main arboricultural features or characteristics of the site that will result in a post-development situation that is significantly different.	Realistic and feasible mitigation measures should be implemented that will reduce the magnitude of impact within a reasonable timeframe and/or create a post-development situation that improves on the pre-development baseline.
Medium	Partial loss or alteration to the main arboricultural features or characteristics of the site that will result in post-development situation that is partially different.	
Low	Minor loss or alteration to the main arboricultural features or characteristics of the site that will result in a post-development situation that is similar to before.	
Negligible	Very minor loss or alteration to the main arboricultural features that will result in a post-development situation that is unchanged.	
None	No loss or alteration to arboricultural features.	

5.23. The proposed layout will require the partial loss of main arboricultural features or characteristics of the Site and as such the magnitude of impact will range within the category of **medium**.

5.24. To reduce the magnitude of impact, feasible and realistic measures must be implemented to reduce the timeframe over which the impact will take to recover, and for which replacement features will take to provide compensation for benefits that were lost.

Mitigation & Improvements

5.25. The aim has been to include those arboricultural features that are capable of providing a substantial future contribution in terms of their amenity, landscape, and ecological value, including those that contribute to the landscape character of the local area. These include

mature boundary hedgerows and mature self-sown hedgerow trees that help to provide screening and enclosure to the Site.

5.26. To mitigate the removal of low quality arboricultural features from central areas of the Site, a landscape plan submitted as part of the application proposes a diverse mix of new trees and vegetation across the site to function in harmony with the existing natural and new built environment. This new planting includes species rich native hedgerows and individual specimen trees including Scots Pine *(Pinus sylvestris),* Silver birch *(Betula pendula),* Lime *(Tilia cordata),* Wild cherry *(Prunus avium)* and Horse chestnut *(Aesculus hippocastanum)* that will increase species diversity and canopy cover in the local landscape.

5.27. The location of the planting has been strategically positioned to enhance and complement existing trees and hedgerows, providing connectivity to hedgerows and green corridors in the wider local landscape for both visual amenity and ecological value. The species mix of this new planting is understood to be pollinator friendly in recognition of Fingal County Councils partnership status in the All-Ireland Pollinator Plan, offering benefits in terms biodiversity and to local wildlife.

5.28. The aim should be to ensure the benefits provided by this new planting will increase year on year, therefore reducing the magnitude of impact and creating an improvement on the pre-development baseline. To accelerate the timeframe over which these benefits are realised, it is proposed to use a mixture of extra heavy standard and semi mature trees, and a variety of rich native mixed species hedgerow planting.

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.

Monitoring

6.6. Once works commence upon the site the role of the project arboriculturists role will switch to monitoring compliance with arboricultural planning conditions, provision of advice in relation to tree related matters and supervision of sensitive works that may impact upon retained trees.

Key Responsibilities

6.7. 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.

Tree Protective Fencing

6.8. A protective fence will be erected around retained trees, prior to the commencement of materials or machinery being brought onto site, removal of soil or any form of construction. The area within this fencing will form the construction exclusion zone (CEZ) and it will be afforded protection at all times. No works will be undertaken within this zone that causes compaction to the soil, severance of tree roots or damage to tree canopies.

6.9. The fence is to be sited in accordance with the TIPP attached to this report.

6.10. Details of the minimum distance for fencing from trees can be found in the Tree Schedule attached to this report.

6.11. The precise form of fencing can vary provided it is fit for purpose and prevents damaging activities within the CEZ. For a proposal of this nature, a number of fencing/protection solutions will be required including the Heras 151 system of fencing, timber boards and hessian sacking wrapped in chestnut cleft pale.

6.12. Details of the various types of fencing is provided in Appendix 2.

6.13. The fence will have signs attached to it stating that it defines a CEZ and that no works are permitted beyond it.

6.14. An example of a tree protection sign is provided in Appendix 3.

6.15. The protective fencing may only be removed following completion of all construction works.

6.16. 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

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

Site Cranes, Piling Rigs and Machinery

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

Pollution Control

6.19. 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

6.20. 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.

6.21. 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.

6.22. 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.

6.23. 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.

6.24. 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.

6.25. An example of temporary ground protection measures can be found in Appendix 4.

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

6.27. 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 to ensure that there is no excavation or compaction of the original surface or change in ground levels.

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

6.29. 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.

Permanent Ground Protection

6.30. Where permanent hard surfaces are required within the RPA, there must be no excavation into the soil, either through the lowering of levels and/or scraping, other than the removal of turf or other surface vegetation, using hand tools only.

6.31. A 'No-dig' solution should be implemented in accordance with industry best practice and in particular with reference to Arboricultural Practice Note 12 (APN12) which provides details of the 'No-dig' method of construction. The area directly beneath the finished hard surface and on top of the RPA should be protected by the installation of a three-dimensional cellular confinement system, or a suitable alternative solution (e.g. pile and beam, screw piles or other root bridging technique) as specified by the project structural engineer.

6.32. The suitability and type of permanent ground protection required will depend on the existing properties and load bearing capacity of the soil, and the future use and load bearing capacity requirements of the site and should therefore be specified by the project structural engineer.

Three-Dimensional Cellular Confinement Systems

6.33. This is a load bearing system which protects roots from the effects of compaction from regular vehicular, cycle or pedestrian movement. A range of products are offered by various manufacturers but whatever system is used, the end result must be that the underlying soil or rooting environment remains undisturbed and retains the capacity to support existing and new root growth.

6.34. Details of three-dimensional cellular confinement system and general guidance on its installation can be found in Appendix 5. It will be the responsibility of the contractor to ensure that whatever system is used, it is installed in accordance with the latest guidelines provided by the relevant manufacturer.

Installation of Lighting Columns / Railings / Fences

6.35. The erection of a new posts or lighting columns will require 'hand-digging' in the location where any foundations or posts are required within RPAs, to prevent damage to tree roots.

6.36. Any soil removal during excavations must be undertaken with care to minimise root disturbance and avoid any damage to root bark.

6.37. Exposed roots that are to be removed should be cut cleanly with a sharp saw or secateurs 10-20mm behind the final face of the excavation.

6.38. Roots greater than 25mm diameter should only be cut in exceptional circumstances and following approval by the project arboriculturist.

6.39. Fibrous clumps of roots must be retained where possible, with any exposed roots protected from desiccation by covering them with a damp hessian sack or damp sharp sand (**builders' sand must not be used**).

6.40. Prior to backfilling, roots must be surrounded with topsoil or sharp sand before the excavated earth is replaced. The soil must be free of contaminates and any foreign objects that may be potentially harmful to roots.

Installation of Services

6.41. All services and utilities will be installed within existing service routes and where possible outside of RPAs.

6.42. Where installation of utilities or services is required within RPAs, working practices will be adopted in accordance with the National Joint Utilities (NJUG) 10, Vol 4, Issue 2, 2007 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees'.

6.43. In accordance with 4.1.3 of NJUG 10 2007, acceptable techniques in order of preference include: a) Trenchless; b) Broken Trench; and c) Continuous Trench. Trenchless methods involve the use of thrust boring machinery, whilst broken and continuous trench methods require that excavations within RPAs are carried out using hand tools only.

6.44. For a proposal of this nature, broken or continuous trench methods are the most appropriate and should be employed as per NJUG 10, to prevent any damage to tree roots or disruption to soil rooting environments.

Soft Landscaping

6.45. To avoid damage to existing tree roots and prevent soil compact, any machinery used to remove existing surfaces and ground vegetation for purposes of soft landscaping (e.g. seeding new lawns or laying turf) should be sited outside of RPAs. If this is not possible, hand tools must be used.

The removal of the surface layer within RPAs must not exceed 50mm, to prevent exposure and

damage of tree roots beneath.

6.46. Soft landscaping works must not involve raising or lowering of the existing ground level within any RPA as this can starve roots of oxygen and cause irreversible physiological damage to trees.

6.47. The use of rotavators within RPAs is prohibited.

6.48. Any level changes outside RPAs must be graded to marry existing soil levels within RPAs.

Excavations and Removal of Existing Surfaces

6.49. 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.

6.50. 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.

6.51. 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.

6.52. 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

6.53. 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.

6.54. 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.

6.55. 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.

6.56. 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.

6.57. New surfaces and upgraded surfaces should be set back from the base of stems by a minimum of 50mm 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 over 15 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), Associate member of the Institute of Chartered Foresters (ICF) and Chartered member of the Institute of Housing (CIH).

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 last surveyed on 07th March 2022 and the information gathered during the survey pertains to that moment in time.

7.6. The observations within this report will remain valid for two years from the date of inspection.

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

7.8. 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.

Appendices

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

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 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.

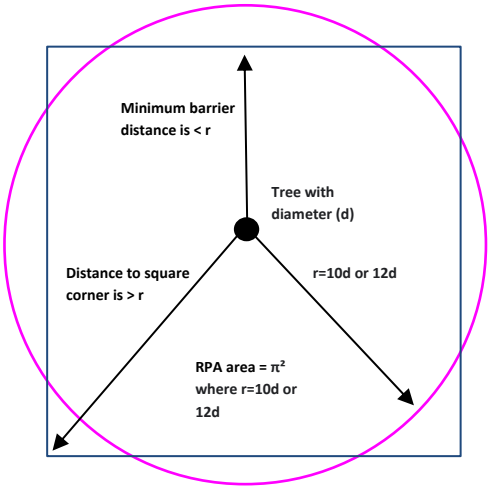


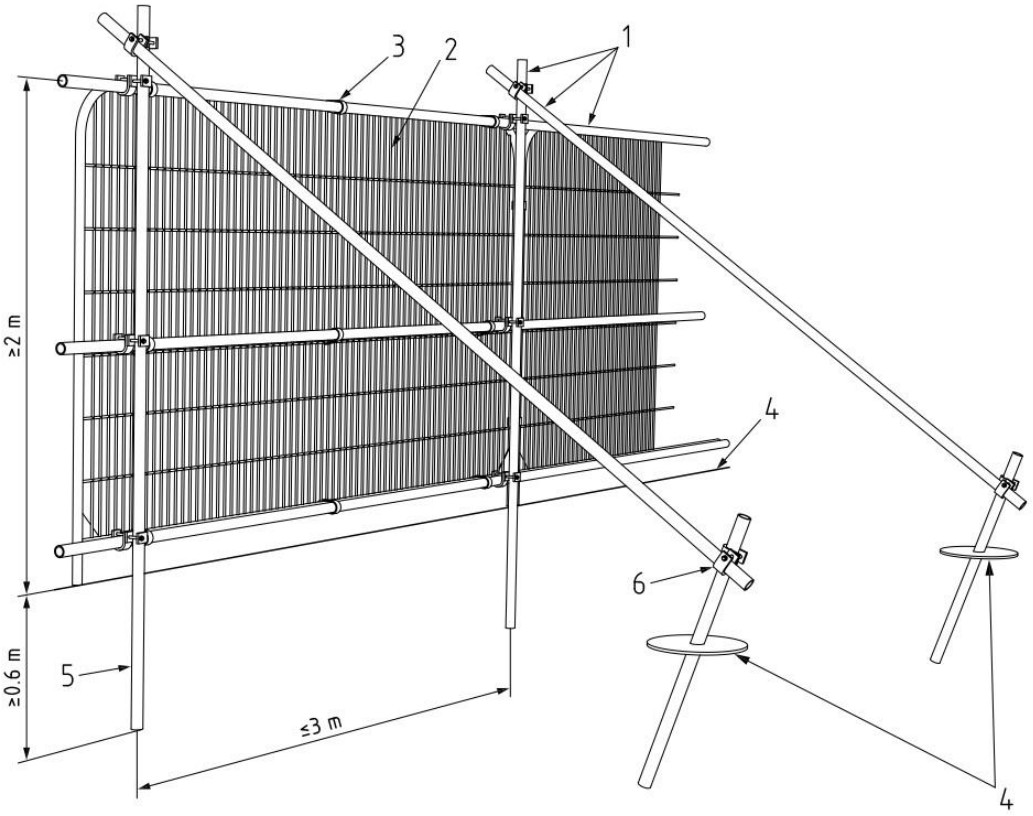
Figure 1. Illustration of area calculations and minimum barrier distances

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 Fencing

Figure 2 **Default specification for protective barrier**



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Appendix 4 – Example of Tree Protective Signs

Appendix 5 – Example of Temporary Ground Protection

DuraDeck

PRODUCT SPECIFICATIONS
DD1

Traction Surface: **Double-traction tread design includes two parallel traction treads positioned at 90 degrees to adjacent double traction tread sets.**

Module Size:
Length: 8' / 2.44 m
Width: 4' / 1.22 m
Module Size: 32 sq/ft / 2.973 sq/meters
Thickness: ½" thick mat + 3/8" cleat

Module Weight: 86 lbs. / 39.01 kg.
Per Square Foot: 2.69 lbs. / 43 oz. / 1.22 kg. / 1219 grams
Per Square Meter: 28.60 lbs. / 12.97 kg.

Colors: Black, White.
Custom colors available (minimum order required).

Material: Black High-Density Polyethylene (HDPE) post-industrial recycled plastic, naturally UV resistant due to the carbon black used for color. White mats available.

Test Results:

	ASTM	Units	Typical Values
Melt Index	D 1238	g/10min	4.9
Density	D 792	g/cm^3	.960
Tensile Strength @ Yield 50mm/min	D 638	mpa (psi)	30 (4,350)
Elongation @ Break 50mm/min	D 638	%	1 500
Flexural Modulus	D 790	mpa (psi)	1 240 (180,000)
Hardness, Shore D	D 2240	--	70
Compressive Strength:		D695-02a	psi 2,843
Flammability Resistance:	UL-94 HB		Passed

Tread Pattern: **DD1:** Rugged double-traction tread on both sides

Support Structure: Matting incorporates multi-directional structural support (cleat design) allowing for distribution or dispersion of PSI weight factors. Not intended for bridging.

Weight Loading: Varies, depending on sub-surface, up to 80 tons capacity.

Ground Surface: DuraDeck mats are designed to be used with no ground preparation over grass, gravel, soil, concrete, asphalt, mud and sandy soil conditions.

Connection System: DuraDeck mats have eight holes: one in each corner and four in the center line (two on each 8ft side) to create multi-directional roadways of nearly any size or shape. Mats can be connected using metal DuraLink connectors. DuraLinks do not require tools to install.

Shipping:
Pallet maximum is 50 units (4' x 8')
20' Ocean Container: 250 – 4' x 8' unit order and/or equal to 29,240 lbs.
40' Ocean Container: 500 – 4' x 8' unit order and/or equal to 43,000 lbs.

Warranty: 7 years against cracking and breaking under normal use.

Appendix 6 – Guidance on Three-Dimensional Cellular Confinement Systems

Preparation

During the preparation stages it is important to consider any activity that may cause damage to tree roots or soils beneath, resulting in compaction and therefore an increase in bulk density that could result in oxygen depletion and reduction in soil water availability. The clearance of vegetation could also result in direct damage to rook bark or severance of roots that are vital for tree survival.

The location and movement of site traffic should therefore give due consideration to ensure roots and soils do not undergo any form or compaction, or excess excavation of earth to remove any surface vegetation. Further risk factors include the creation of an imperviable surface, causing a rise in the water table due to construction, increasing ground levels and contamination of sub soils.

When looking at site conditions and future use requirements, the following information should be considered to enable a load bearing structure capable of supporting proposed traffic:

- Californian Bearing ratio (CBR) – Standard test method for measuring soil strength
- Soil types
- Water table
- Maximum load requirements
- Acceptable rut depth
- Reinforcement type (I.e. depth of three-dimensional cellular confinement system)
- Type and depth of engineered infill material (E.g. Clean, angular stone, usually 40mm to 20mm).

Excavations

The precise location and depth of roots within the soil is unpredictable and can only be established once digging has commenced. Ideally, all RPAs should be no-dig, but this is often not possible on undulating surfaces. New surfacing normally requires an evenly graded sub-base layer, which can be made up to high points with granular, permeable fills such as crushed stone or sharp sand. This sub-base must not be compacted. Some limited excavation may be required to achieve this, and this is not necessarily damaging to trees if it is done carefully and no large roots are cut. The top 50mm of soil on grass surfaces is unlikely to contain any tree roots and therefore the removal of this will not impact the tree. It may be possible to dig deeper than this depending on local conditions, but this would need to be assessed by the retained project arboriculturist.

On undulating surfaces, finished gradients/levels must be planned with sufficient flexibility so as to allow changes to occur if the excavation of high points reveals unexpected large roots. If roots are less than 25mm in diameter, it would normally be acceptable to cut these. However, for roots over

25mm diameter, cutting them may cause damage to the tree and further excavation may not be possible. In this case, the surrounding levels must be adjusted to take account of these high points, by filling with suitable material. If this is not possible and it is necessary to cut larger roots, discussions should be held with the retained project arboriculturist before any final decision is made.

Installation

Generally, it is best practice to place a geotextile separation filtration layer over the prepared sub-grade and overlap dry joints by 300mm.

The three-dimensional cellular confinement system should be expanded to the full length, with panels secured in place using staking pins to anchor open the cells. Adjacent panels should be stapled together to create a continuous mattress and the structure infilled with a no fines angular granular fill (typically 4-20mm) within each open cell.

A treated timber edging is usually acceptable for an edge restraint, however other suitable materials may include railway sleepers or metal pins.

Surfacing Options

Generally, a variety of surface finishes can be installed including block paving, gravel, tarmac and concrete but will depend on the individual manufacturer's specification and product requirements.

Appendix 7 – Example of Three-Dimensional Cellular Confinement System

CellWeb™

Tree Root Protection System

The CellWeb™ TRP cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load-bearing surface for vehicular traffic.

Potential loss of existing tree due to poor construction techniques.

CellWeb™ offers an alternative to the traditional methods of constructing roadways and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases leads to death. CellWeb™ can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees during and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:

- Root severance caused by excavation, leaving trees open to decay, less stable and with a diminished capacity to utilise soil water and nutrients.
- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.
- Need for construction access, new roadways and hard surfaces that require engineering-standard load-bearing foundations that meet building regulations.
- Need for high-performance, cost-effective driveways and roadways in the vicinity of tree roots.

The CellWeb™ system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.

Glynebourne Wood.

Pedestrian path to recreational wood and built using a CellWeb™ foundation which was covered with DuoBlock and then filled with woodchip to create a porous surface.

Product features

CellWeb™ comprises an expandable cellular mattress that is then filled with a clean stone sub-base and above a Treetex T300 Geotextile.

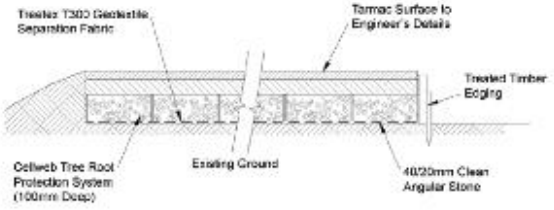
The honeycomb-like structure is made of robust high-density polyethylene (HDPE) that is simply stretched out and filled with clean angular material. Just like traditional roadways, the strength of the structure comes from the binding together of the infill, but with CellWeb™ this is achieved without compaction and without reduction in permeability.

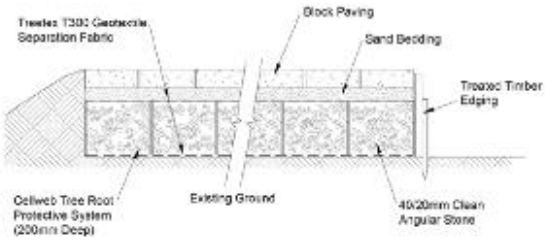
Perforated cell walls allow the angular infill to bind with the contents of the adjacent cell, but with sufficient space for the movement of water and air to nearby tree roots. As the infill contains no fines and the geotextile layers prevent clogging from particles washing into the system, the structure remains permeable to water over time and protects the roots for the lifetime of the tree.

As well as being quick and easy to install, CellWeb™ also dramatically cuts down the depth of sub-base required, in most cases by as much as 50%, further reducing costs. CellWeb™ significantly reduces surface rutting, increasing the long-term performance of the finished surface and ensuring that tree roots remain protected from vertical loads.

CellWeb can be used as a permanent solution or alternatively the system can be used in a temporary situation. In a temporary application the system can be used for the required period of time, then removed for use on another site or recycled, thereby adding to CellWeb's green credentials.

- No excavation – Soil structure remains undisturbed; risk of root damage minimised.
- Porous infill – Allows tree roots to conduct moisture and gas exchange.
- No compaction – No need to compact the infill to achieve a load-bearing structure.
- Lateral stability – Structure remains rigid to vertical loads.





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Client	O'Mahoney Pike Architecture & Urban Design
Project / Site	Hacketstown, Skerries
Reference	22-054-01
Survey Date	06th February 2020 and 07th March 2022

Abreviation	Definition	Age Class		Physiological Condition		Structural Condition		Category		U.L.E	Sub category	
H	Height (m)	Y (Young)	Newly planted (<10 yrs old)	Good	No obvious health problems	Good	No visible defects	A	High value and conservation	40+	1	Mainly arboricultural
Stem Dia.	Stem diameter (mm)	SM (Semi-mature)	First third of life expectancy	Fair	Intervention may improve health	Fair	Defects may require intervention	B	Moderate value and conservation	20+	2	Mainly landscape
C.C	Crown clearance (m)	EM (Early mature)	Second third of life expectancy	Poor	Serious ill health or dying	Poor	Dangerous or no remedy	C	Low value and conservation	10+	3	Mainly cultural
L.B.H	Lowest (significant) branch height (m)	M (Mature)	Full age for species					U	Not suitable for retention	<10		
L.B.D	Direction of lowest (significant) branch	OM (Over mature)	Beyond life expectancy & in decline									
U.L.E	Minimum useful life expectancy (yrs)	V (Veteran)	Ancient characteristics or conservation value		Prefix							

*G - Group H - Hedgerow W - Woodland P - Tree is on private land *Tree is not on topographical survey and therfore position remains indicitive # Measurements estimated (tree is inaccessible)*

Tree No.	Tag No.	Species	Botanical Name	H (m)	Stem Dia.	No of Stems	Crown Spread (m)				C.C (m)	L.B.H (m)	L.B.D	Age	Physiological	Structural	Comments	Recommendations	U.L.E	Cat.	RPA (m2)	RPA Radial distance (m)
							N	E	S	W												
H1	N/a	Mixed Species Hedgerow	*N/a*	6	280	1	3	3	3	3	0	0	East	M	Fair	Poor	Mixed species hedgerow comprising hawthorn, blackthorn, elder and ash along raised bank, bordering railway line, clad with thick bramble and ivy.	Maintain as hedgerow, will benefit from new supplementary planting.	10+	C2	10	2
2	51	Ash (Common)	*Fraxinus excelsior*	10	572	2	6	6	6	5	2	2	East	M	Fair	Poor	Twin ivy clad stem arising from bank, basal decay with cavities to 2m, included bark between stems forming weak union but well sheltered by surrounding vegetation, broad symmetric spreading canopy provides mature screening from railway.	Reduce crown by 2m, crown clean, crown lift to 5.2m and remove ivy.	10+	C1	150	7
3	52	Sycamore	*Acer pseudoplatanus*	12	582	2	7	6	7	6	2	2	South	M	Fair	Fair	Singe ivy clad stem with large limb arising from stem west at 2m, growth has occluded barb wire fence, limb damage north and south, deadwood <100mmØ in lower canopy, pruned west over railway line.	Crown lift to 5.2m.	20+	B1	150	7
4	53	Ash (Common)	*Fraxinus excelsior*	12	380	Multi	6	5	6	5	4	4	North	EM	Fair	Fair	Multistem, ivy clad arising from hedgerow with sreading canopy, previously pruned east over site, torn limbs (likely from historic failure of neighbouring tree) hanging from hedgerow.	Remove dead/dying stems and crown lift to 5.2m.	10+	C1	28	3
5*	N/a	Ash (Common)	*Fraxinus excelsior*	14	320	1	5	6	5	4	4	4	South	EM	Fair	Fair	Single ivy clad stem forming spreading crown, from field ditch surrounded by dense vegetation.	None.	10+	C1	48	4
H6	N/a	Mixed Species Hedgerow	*N/a*	6	90	1	2	2	2	2	0	0	South	OM	Poor	Poor	Linear hedgerow comprising hawthorn and ash with ivy and bramble understorey, predominantly growing north of ditch, in decline with gaps throughout and limited useful life expectancy.	Remove c.6-8m² to facilitate access road to application Reg. Ref. F21A/0287 & ABP Reg. Ref. 312189-21.	<10	U	5	1
7	N/a	Hawthorn (Common)	*Crataegus monogyna*	6	260	1	2	2	2	2	1	2	East	M	Poor	Poor	Single ivy clad stem into canopy located by gate, only partial canopy visible due to ivy.	Remove ivy to allow light exposure to crown.	10+	C1	18	2
8	N/a	Ash (Common)	*Fraxinus excelsior*	12	380	4	6	6	7	6	4	5	North	EM	Fair	Poor	Multistem, ivy clad, arising from offsite vegetation south of fence on raised bank, spreading symetric canopy.	Crown lift to 5.2m and remove ivy to allow full visual inspection.	10+	C1	55	4
H9	N/a	Mixed Species Hedgerow	*N/a*	8	280	1	3	3	3	3	0	0	North	M	Fair	Poor	Boundary hedgerow on raised bank comprising hawthorn, ash, blackthorn, elder with dense bramble and ivy understorey.	Maintain as hedgerow, will benefit from new supplementary planting.	10+	C2	7	2
10	54	Elder	*Sambucus nigra*	6	215	2	3	3	3	2	0	0	South	M	Fair	Fair	Twin stem, ivy clad arising from dense vegetation.	Fell to facilitate development proposal.	10+	C1	23	3
11	N/a	Hawthorn (Common)	*Crataegus monogyna*	5	110	1	2	1	2	2	0	0	South	M	Fair	Fair	Single ivy clad stem arising from dense vegetation.	Fell to facilitate development proposal.	10+	C1	5	1
12	N/a	Hawthorn (Common)	*Crataegus monogyna*	4	135	2	1	1	1	1	0	0	South	M	Fair	Fair	Single ivy clad stem arising from dense vegetation.	Fell to facilitate development proposal.	10+	C1	7	2
G13*	N/a	Beech (Common)	*Fagus sylvatica*	8	140	1	3	3	3	3	1	1	West	SM	Fair	Fair	Linear group of 21 located offsite in neighbouring garden, 1.2m from boundary barb wire fence, overhang site west by 2m at furthest point.	None.	20+	B2	10	2
H14*	N/a	Beech (Common)	*Fagus sylvatica*	1	90	1	1	1	1	1	0	0	East	SM	Fair	Fair	Linear boundary hedge in neighbouring garden, tight to wooden fence and 1m from barb wire fence.	None.	10+	C2	3	1
15	N/a	Sycamore	*Acer pseudoplatanus*	15	480	1	6	8	7	8	6	8	East	M	Fair	Fair	Single ivy clad stem, offsite south of road arising from hedgerow, spreading symetric canopy, outside influencing distance.	None.	20+	B1	102	6

Reference	22-054-01										
Survey Date	06th February 2020 and 07th March 2022										
Abreviation	**Definition**	**Age Class**		**Physiological Condition**		**Structural Condition**		**Category**		**U.L.E**	**Sub category**
H	Height (m)	Y (Young)	Newly planted (<10 yrs old)	Good	No obvious health problems	Good	No visible defects	A	High value and conservation	40+	1 Mainly arboricultural
Stem Dia.	Stem diameter (mm)	SM (Semi-mature)	First third of life expectancy	Fair	Intervention may improve health	Fair	Defects may require intervention	B	Moderate value and conservation	20+	2 Mainly landscape
C.C	Crown clearance (m)	EM (Early mature)	Second third of life expectancy	Poor	Serious ill health or dying	Poor	Dangerous or no remedy	C	Low value and conservation	10+	3 Mainly cultural
L.B.H	Lowest (significant) branch height (m)	M (Mature)	Full age for species					U	Not suitable for retention	<10	
L.B.D	Direction of lowest (significant) branch	OM (Over mature)	Beyond life expectancy & in decline								
U.L.E	Minimum useful life expectancy (yrs)	V (Veteran)	Ancient characteristics or conservation value	Prefix	G - Group H - Hedgerow W - Woodland P - Tree is on private land *Tree is not on topographical survey and therfore position remains indicitive # Measurements estimated (tree is inaccessible)						

Tree No.	Tag No.	Species	Botanical Name	H (m)	Stem Dia.	No of Stems	Crown Spread (m)				C.C (m)	L.B.H (m)	L.B.D	Age	Physiological	Structural	Comments	Recommendations	U.L.E	Cat.	RPA (m2)	RPA Radial distance (m)
							N	E	S	W												
H16	N/a	Hawthorn (Hedgerow)	*Crataegus monogyna*	4	110	1	1	1	1	1	0	0	North	EM	Poor	Poor	Boundary hedgerow with gaps throughout comprising hawthorn, ivy and bramble understorey.	Fell to facilitate development proposal.	10+	C2	5	1
17*	55	Ash (Common)	*Fraxinus excelsior*	8	190	1	4	4	2	3	3	4	North	SM	Fair	Fair	Pair of ivy clad stems arising from hedgerow, conflict with overhead cables, unsuitable for long term retention.	Fell to facilitate development proposal.	<10	U	18	2
18	56	Ash (Common)	*Fraxinus excelsior*	16	950	1	7	7	7	8	2	2	East	M	Fair	Fair	Single stem from raised bank by gate, ivy clad into canopy, deadwood <100mmØ in lower canopy, previously heavily pruned south over road and overhead cables.	Fell to facilitate development proposal.	20+	B1	408	11
H19*	N/a	Hawthorn (Common)	*Crataegus monogyna*	3	90	1	1	1	1	1	0	0	South	Y	Fair	Fair	Linear boundary hedgerow comprising hawthorn with bramble, between wooden and barb wire fences.	Maintain as hedge.	10+	C2	3	1
H20	N/a	Hawthorn (Common)	*Crataegus monogyna*	6	280	1	2	2	2	2	0	0	East	M	Fair	Fair	Linear hedgerow dividing fields comprising hawthorn with elder, ivy and bramble understorey, overhead cables.	Fell to facilitate development proposal.	10+	C2	34	3
21*	57	Hawthorn (Common)	*Crataegus monogyna*	4	160	4	2	2	2	2	0	0	South	M	Fair	Poor	Multistem, ivy clad from overgrown vegetation comprising bramble, ivy and gorse.	Fell to facilitate development proposal.	10+	C1	10	2
22	58	Hawthorn (Common)	*Crataegus monogyna*	3	170	3	2	2	2	2	0	0	South	M	Fair	Poor	Multistem pair, ivy clad from overgrown vegetation comprising bramble, ivy and gorse.	Fell to facilitate development proposal.	10+	C1	14	2
23	59	Hawthorn (Common)	*Crataegus monogyna*	5	190	3	2	2	2	2	0	0	South	M	Fair	Poor	Multistem arising from vegetation.	Fell to facilitate development proposal.	10+	C1	18	2
24	60	Hawthorn (Common)	*Crataegus monogyna*	6	180	4	3	3	3	2	0	0	South	M	Fair	Poor	Multistem arising from vegetation.	Fell to facilitate development proposal.	10+	C1	14	2
25	N/a	Elder	*Sambucus nigra*	5	120	1	2	1	3	1	0	0	South	OM	Fair	Poor	Multistem arising from vegetation.	Fell to facilitate development proposal.	<10	U	7	2
26	61	Hawthorn (Common)	*Crataegus monogyna*	4	140	1	2	2	2	1	0	0	South	EM	Fair	Poor	Single ivy clad stem, assymetic canopy from vegetation.	Fell to facilitate development proposal.	10+	C1	10	2
27	62	Hawthorn (Common)	*Crataegus monogyna*	3	195	4	1	1	2	2	0	0	East	M	Poor	Poor	Multistem, dense ivy clad into canopy from vegetation.	Fell to facilitate development proposal.	10+	C1	18	2
28	63	Hawthorn (Common)	*Crataegus monogyna*	3	150	2	1	1	1	1	0	0	East	EM	Poor	Poor	Twin stem, ivy clad into canopy from vegetation.	Fell to facilitate development proposal.	10+	C1	10	2
H29	N/a	Hawthorn (Hedgerow)	*Crataegus monogyna*	6	160	1	2	2	2	2	0	0	East	M	Poor	Poor	Linear hedgerow with gaps throughout comprising hawthorn with bramble understorey.	Fell to facilitate development proposal.	10+	C2	10	2
H30	N/a	Mixed Species Hedgerow	*N/a*	6	160	1	2	2	2	2	0	0	South	M	Fair	Poor	Linear mixed species hedgerow comprising hawthorn, ash and elder with ivy and bramble understorey.	Fell to facilitate development proposal.	10+	C2	14	2
31*	N/a	Ash (Common)	*Fraxinus excelsior*	6	120	1	2	2	2	0	0	0	South	Y	Fair	Poor	Multistem arising from hedgerow, advanced stage hymenoscyphus fraxineus.	Fell to facilitate development proposal.	<10	U	5	1
32	N/a	Ash (Common)	*Fraxinus excelsior*	6	140	1	3	3	3	0	0	0	South	Y	Fair	Fair	Single stem arising from hedgerow, intermediate stage hymenoscyphus fraxineus.	Fell to facilitate development proposal.	<10	U	7	2

LEGEND

- Category A trees (Stem and Canopy Spread)
- Category B trees
- Category C trees
- Category U trees
- Root Protection Area
- Existing Layout
- Site Boundary

NOTES

Tree positions place reliance on topographical survey 3789.

Positions of trees that have not been recorded during the topographical survey remain indicative and can be identified by an asterisk on the accompanying Tree Schedule (Ref: 22-054-01)

Scale is for illustration purposes only.

Plan should be read in colour.

Category A
Trees of high arboricultural quality and value in such condition to be able to make a significant contribution for a minimum of 40 years.

Category B
Trees of moderate arboricultural quality and value in such condition to be able to make a substantial contribution for a minimum of 20 years.

Category C
Trees of low arboricultural quality and value currently in adequate condition until new planting can become established with a minimum useful life expectancy of 10 years, or stem diameter of <150mm.

Category U
Trees in poor physiological or structural condition that cannot realistically be retained in the context of current land use for longer than 10 years.

TITLE: Tree Constraints Plan - Insert 1

PROJECT / SITE: Hacketstown, Skerries

CLIENT: Land Development Agency

DRAWING REF: 22-054-02

REVISION: v2

DATE: 21.03.2022

SCALE: 1:500@A3

DRAWN BY: JM

CHECKED BY: JL

John Morris Arboricultural Consultancy Ltd
Executive Suites, Weavers Court, Linfield Road, Belfast, BT12 5GH
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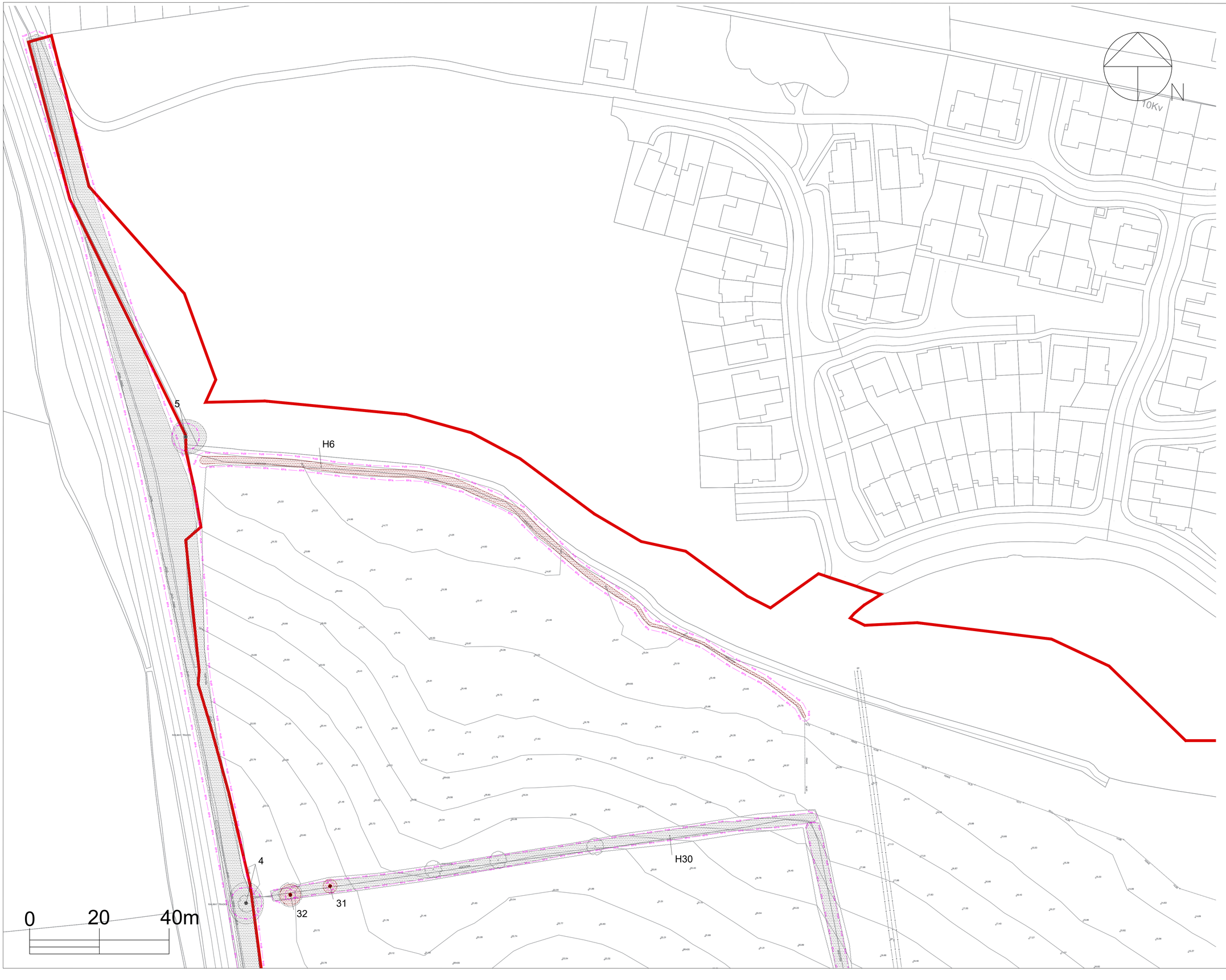
Web: www.johnmorristrees.com



LEGEND

- Category A trees (Stem and Canopy Spread)
- Category B trees
- Category C trees
- Category U trees
- Root Protection Area
- Existing Layout
- Site Boundary

NOTES

Tree positions place reliance on topographical survey 3789.

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Category U
Trees in poor physiological or structural condition that cannot realistically be retained in the context of current land use for longer than 10 years.

TITLE:
Tree Constraints Plan - Insert 2

PROJECT / SITE:
Hacketstown, Skerries

CLIENT:
Land Development Agency

DRAWING REF:
22-054-02

REVISION:
v2

DATE:
21.03.2022

SCALE:
1:500@A3

DRAWN BY:
JM

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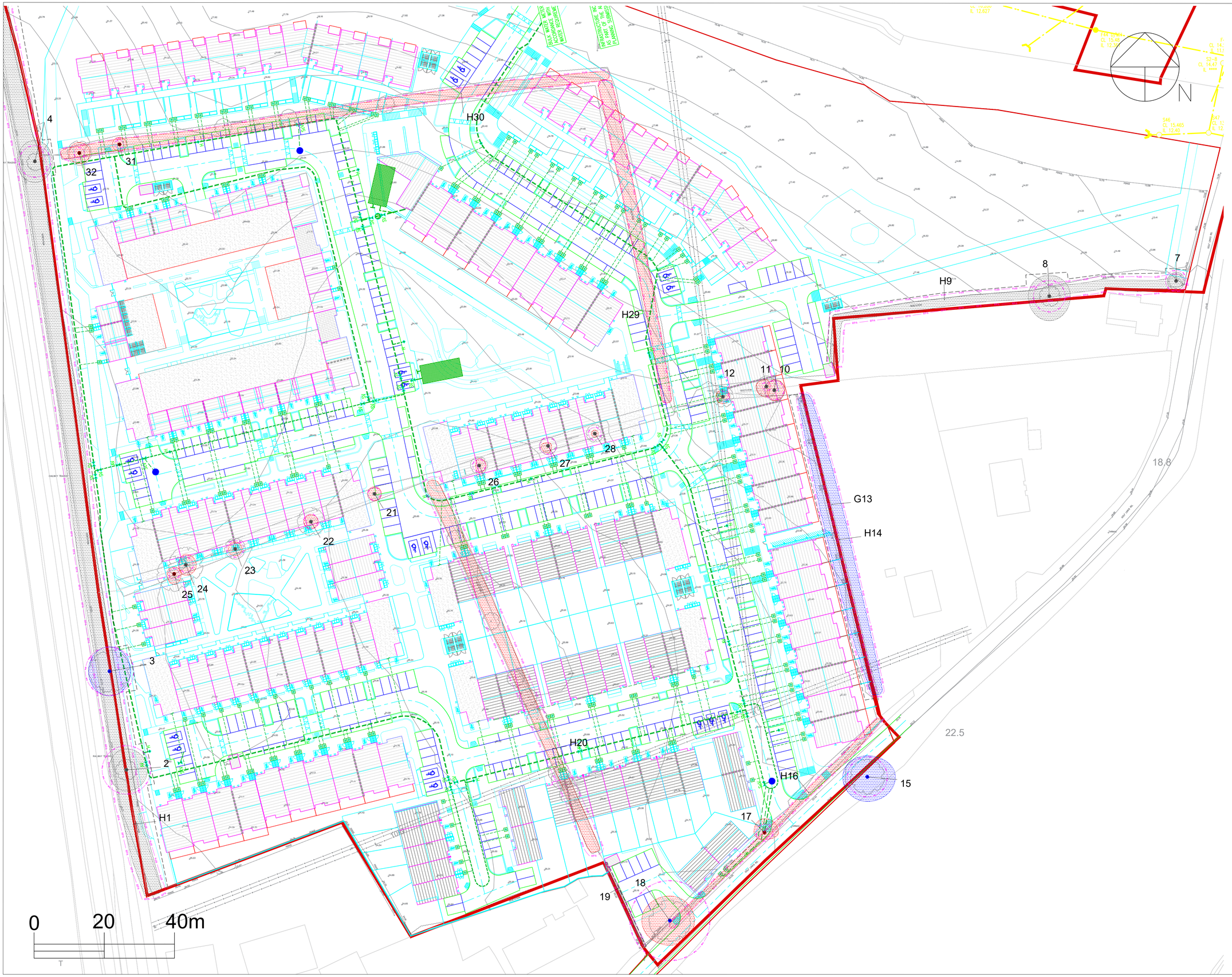

LEGEND

- Category A trees (Stem and Canopy Spread)
- Category B trees
- Category C trees
- Category U trees
- Root Protection Area
- Trees / Hedgerows for removal
- Site Boundary
- Existing Layout
- Proposed Layout
- Tree Protection Fencing (area within forms 'Construction Exclusion Zone' and is required to protect retained soil, tree roots, stems and canopies)

TITLE:	Tree Impact & Protection Plan - Insert 1
PROJECT / SITE:	Hacketstown, Skerries
CLIENT:	Land Development Agency
DRAWING REF:	22-054-02
REVISION:	v2
DATE:	21.03.2022
SCALE:	1:500@A3
DRAWN BY:	JM
CHECKED BY:	JL

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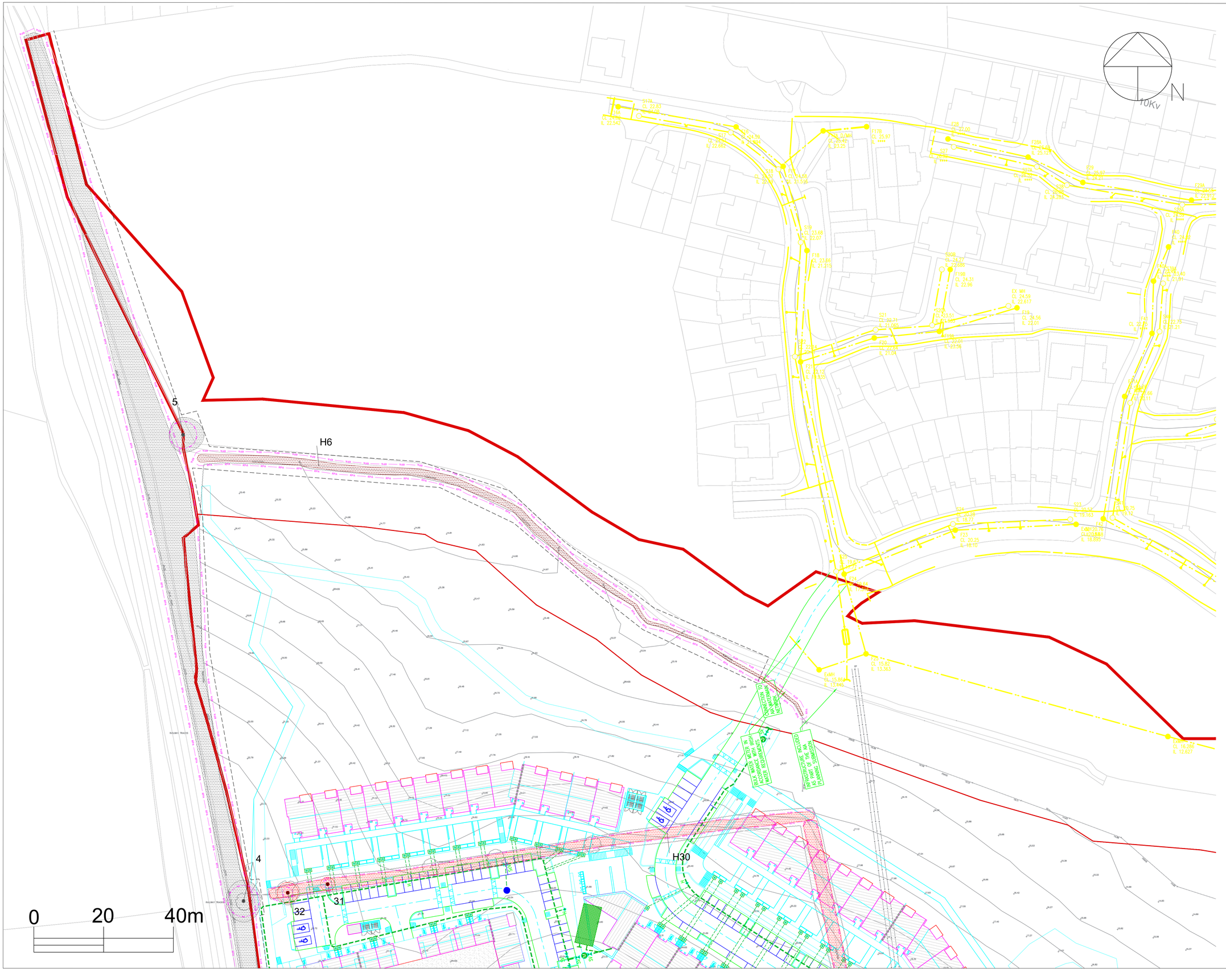

LEGEND

- Category A trees (Stem and Canopy Spread)
- Category B trees
- Category C trees
- Category U trees
- Root Protection Area
- Trees / Hedgerows for removal
- Site Boundary
- Existing Layout
- Proposed Layout
- Tree Protection Fencing (area within forms 'Construction Exclusion Zone' and is required to protect retained soil, tree roots, stems and canopies)

TITLE:	Tree Impact & Protection Plan - Insert 2
PROJECT / SITE:	Hacketstown, Skerries
CLIENT:	Land Development Agency
DRAWING REF:	22-054-02
REVISION:	v2
DATE:	21.03.2022
SCALE:	1:500@A3
DRAWN BY:	JM
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