

Arboricultural Report

Tree Survey,
Arboricultural Impact Assessment &
Arboricultural Method Statement

In relation to the development proposal at:

31 & 31a Ravens Rock Road
Sandyford Business Park
Dublin

March 2022

210126-PD-11-C

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Contents

Section 1: Arboricultural Impact Assessment	3
1 Summary	3
2 Introduction	4
3 Observations & Context	6
4 Local Planning Policy	9
5 Technical Information	11
6 Analysis of the Proposal in Respect of Trees	12
7 Discussion & Conclusion	18
8 Recommendations	19
Section 2: Arboricultural Method Statement	20
Appendices	26
Appendix A – Tree Schedules	26
Appendix B – Plans	27
Appendix C – Ground Protection	28
Appendix D – Cellular Confinement System	29

Section 1: Arboricultural Impact Assessment

1 Summary

- 1.1 This arboricultural report has been instructed by Ravensbrook Ltd., to provide information to assist all parties involved in the planning process to make balanced judgements with regard to the arboricultural features in relation to the proposed development at No. 31 & 31a Ravens Rock Road, Sandyford Business Park, Co. Dublin (the 'Application Site').
- 1.2 This report includes:
- an assessment of the trees, their quality and value in accordance with BS 5837:2012 - Trees in relation to design, demolition and construction;
 - the site context and observations on the trees;
 - local planning policies relevant to the consideration of trees on the site;
 - the impact of the proposed development upon the tree population in and around the site;
 - methods of reducing impacts on trees; and
 - measures to be taken to protect trees during the proposed works.
- 1.3 My conclusions are that the proposed development is achievable in both arboricultural terms and in relation to local planning policy as it relates to trees.
- 1.4 The proposal will require the removal of one poor quality Leyland cypress hedgerow and one low quality and value Leyland cypress tree group. It is also required that one dead mature beech tree be removed for health and safety purposes.
- 1.5 The loss of trees and the hedgerow is not considered to be significant and will not have an adverse impact on the character and appearance of the local surrounding landscape, due to their low and poor quality and value.
- 1.6 Tree impacts have been assessed and tree protection measures have been specified in accordance with best practice and are sufficient to safeguard retained trees during the proposed works.

2 Introduction

Instructions

- 2.1 This arboricultural report has been instructed by Ravensbrook Ltd., to provide information to assist all parties involved in the planning process to make balanced judgements with regard to the arboricultural features in relation to the proposed development at No. 31 & 31a Ravens Rock Road, Sandyford Business Park, Co. Dublin (the 'Application Site').

Development proposal

- 2.2 The development proposal is for the demolition of the existing industrial building and the construction of a built-to-rent residential development comprising 101 no. apartments including internal and external amenity space, car and bicycle parking, public open space site wide landscaping and all associated services and infrastructure required to facilitate the development

Qualification and experience

- 2.3 This report has been prepared by Charles McCorkell. Charles is a Chartered Arboricultural Consultant that deals with trees in relation to all forms of human activity, including the built environment. He is a Professional Member of the Institute of Chartered Foresters, a Professional Member of the Arboricultural Association, a qualified professional tree inspector (LANTRA), and has a BSc Honours Degree in Arboriculture from the University of Central Lancashire.

Scope and limitations

- 2.4 The survey is not a health and safety inspection of trees; however, trees identified as imminently dangerous will have been highlighted and recommendations made, where appropriate.
- 2.5 The contents of this report are the copyright of *Charles McCorkell Arboricultural Consultancy* and may not be distributed or copied without the author's permission.

Methodology and guidance

- 2.6 The author has referred to *British Standard 5837: Trees in relation to design, demolition and construction (2012)* which provides a methodology for the assessment of trees and other significant vegetation on development sites.

- 2.7 BS 5837:2012 is intended to assist decision making with regard to existing and proposed trees and sets out the principles and procedures to be applied in order to achieve a harmonious relationship between existing and new trees and structures that can be sustained for the long term.
- 2.8 The BS 5837:2012 recommends the National Joint Utilities Group (NJUG) document *Guidelines for the planning, installation and maintenance of utility apparatus in the proximity to trees*. Volume 4, issue 2. London: NJUG, 2007, as a normative reference for guidance on the installation of utilities within proximity to trees.

Supporting information

- 2.9 This report should be read in conjunction with the following supporting documents attached to this report.

Document	Reference	Location
Arboricultural Method Statement	N/A	Section 2
Tree Schedule	210126-PD-10	Appendix A
Tree Work Schedule	210126-PD-12	Appendix A
Tree Survey Plan	210126-P-10	Appendix B
Tree Works Plan	210126-P-11	Appendix B
Tree Protection Plan	210126-P-12	Appendix B
Ground Protection	N/A	Appendix C
Cellular Confinement System	N/A	Appendix D

Definitions

- 2.10 **Root Protection Area (RPA)** – a layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree.
- 2.11 **Tree Protection Zone (TPZ)** – an area based on the RPA in m² identified by an arboriculturist, to be protected during development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.

3 Observations & Context

Site visit

- 3.1 The site was visited by Charles McCorkell on the 5 March 2021, to survey on and off-site trees and vegetation which may be of significance to the proposed development. The survey was carried out in accordance with BS 5837:2012 and from ground level only.

Site location and description

- 3.2 The Application Site is located within Sandyford Business Park. It comprises of an unoccupied commercial building that is situated on the south-western corner of Ravensrock Road and Carmanhall Road (Map 1). The car parking area of the site is currently used as a food truck marketplace. The surrounding area is largely commercial, comprising of industrial and office buildings, with some residential apartments.
- 3.3 The main tree cover on the site is located along the northern boundary, between the existing building and Carmanhall Road. This group of trees include four pedunculate oak and two common beech, one of which (T14) is dead. The soil environment in which these trees are growing is significantly compacted. This is having a direct impact on their overall health and condition. The remaining tree cover on the site comprises of two Leyland cypress groups which are located along the southern and north-western boundaries.



Map 1 (Google 2021): Yellow line showing the location of the site within the local area.

Views of the site and trees



Photo 1: View of the dead beech tree (T14) from Carmanhall Road.



Photo 2: View of C Category beech tree T13 from Carmanhall Road. This tree is showing signs of physiological stress as a result of the compacted rooting environment.



Photo 3: View of oak trees (T9 to T12) and silver maple street trees (T3 to T5) located along Carmanhall Road.



Photo 4: View of the site and existing building from Ravensrock Road.

4 Local Planning Policy

- 4.1 The Dún Laoghaire County Development Plan 2016 – 2022 was adopted on 16 March 2016 and sets out the County Council's policies for continuing sustainable development. Tree related policies relevant to this application include:

Section 4 – Green County Strategy

Policy OSR7: Trees and Woodlands - It is Council policy to implement the objectives and policies of the Tree Strategy for the County – 'dlr TREES 2011-2015' - to ensure that the tree cover in the County is managed and developed to optimize the environmental, climatic and educational benefits which derive from an 'urban forest'.

With regards to existing trees, this policy states: *"Trees, groups of trees or woodlands which form a significant feature in the landscape or are important in setting the character or ecology of an area should be preserved wherever possible. They make a valuable contribution to the landscape and biodiversity of the County and significant groups of trees worthy of retention have been identified in the Development Plan Maps."*

Section 8 Principles of Development

8.2.8.6: Trees and Hedgerows

New developments shall be designed to incorporate, as far as practicable, the amenities offered by existing trees and hedgerows and new developments shall have regard to objectives to protect and preserve trees and woodlands as identified on the County Development Plan Maps.

Arboricultural assessments carried out by an independent, qualified arborist shall be submitted as part of planning applications for sites that contain trees or other significant vegetation. The assessment shall contain a tree survey, implications assessment and method statement. The assessment will inform the proposed layout in relation to the retention of the maximum number of significant and good quality trees and hedgerows. Tree and hedgerow protection shall be carried out in accordance with BS 5837 (2012) 'Trees in Relation to Design, Demolition and Construction – Recommendations'. All requirements for arboricultural assessment should be determined at pre-planning stage.

The retention of existing, planted site boundaries will be encouraged within new developments, particularly where it is considered that the existing boundary adds positively to the character/visual amenity of the area. New developments should have

regard to the location of new buildings/extensions relative to planted boundaries. Prior to construction, the applicant shall provide details of adequate measures on site to protect all planting/trees to be retained and this protection shall be maintained throughout the development during the construction period.

Where it proves necessary to remove trees to facilitate development, the Council will require the commensurate planting or replacement trees and other plant material. This will be implemented by way of condition. A financial bond may be required to ensure protection of existing trees and hedgerows during and post construction.

Section 2 Policy Statements - dlr TREES 2011-2015

Trees and Development – Paragraph D.1.1 Existing Trees

The Council requires consideration of existing trees on public and private development sites, roads and public realm schemes and the submission of a tree survey, tree constraints plan, arboricultural implications assessment, method statements and tree protection plan, in accordance with BS 5837 and the Council's Guidelines for the Development and Taking-in-charge of Public Open Space. Adequate provision shall be made for the protection and retention of important trees. Where existing trees are removed, an area of comparable size is to be identified to facilitate new tree planting. Where trees and hedgerows are to be retained the Council will require a developer to lodge a tree bond to ensure the correct retention and protection of trees. Refer to the Council's Guidelines for the Development and Taking-in-charge of Public Open Space.

Land Use Zone

- 4.2 According to Map 6 of the County Development Plan 2016 – 2022, the northern boundary trees have been specifically highlighted to protect and preserve.



Map 2: Extract from Map 6 of the Development Plan 2016-2022 showing the requirement to protect and preserve the northern boundary trees. Red line indicates the main site area.

5 Technical Information

Tree data

- 5.1 The Tree Survey Plan at Appendix B illustrates the location of trees, the extent of the spread of their crowns and their root protection areas. Dimensions, comments and information for each tree are given in the Tree Schedule at Appendix A.

Life stage analysis

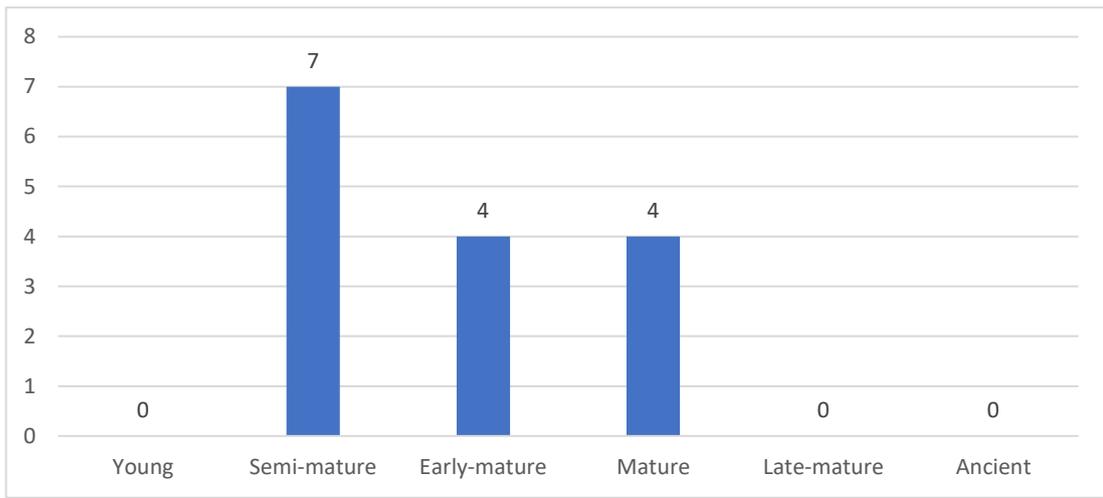


Figure 1: Life stage analysis of the 15 survey entries recorded.

BS5837 (2012) category breakdown

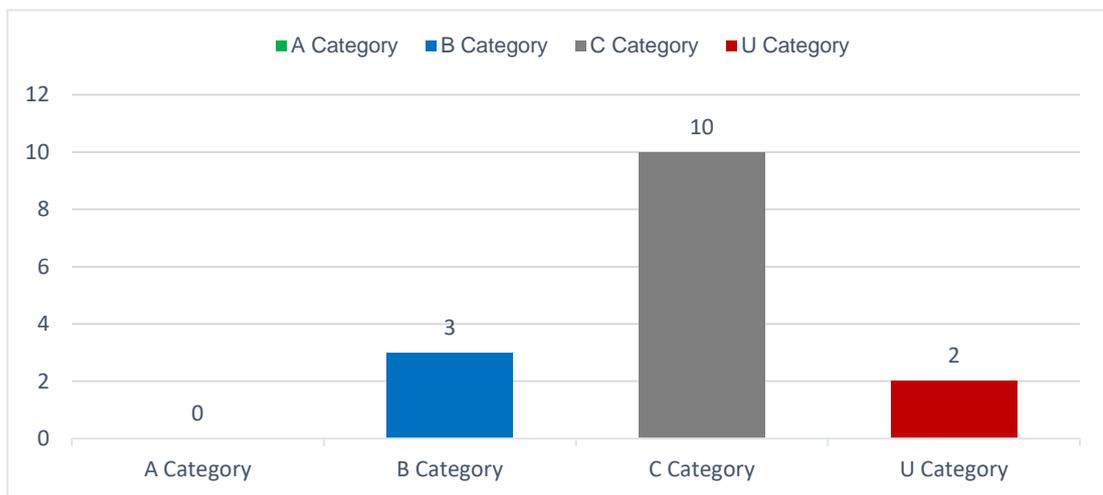


Figure 2: Breakdown of BS5837:2012 categorise of the 15 survey entries recorded on and adjacent to the site.

6 Analysis of the Proposal in Respect of Trees

Arboricultural Impacts

- 6.1 **Loss of trees** – The proposed development will require the removal of one poor quality Leyland cypress hedgerow (H8) and one low quality and value Leyland cypress tree group (G15). One dead mature beech tree (T14) is also required to be removed for health and safety purposes. Details of the proposed removals are specified within the Tree Work Schedule at Appendix A and shown on the Tree Works Plan at Appendix B. Figure 3 shows a breakdown of the proposed removals in comparison with the number of trees assessed.



Figure 3: Proposed removals in comparisons to the total number of survey entries recorded and their category in accordance with BS5837.

- 6.2 The loss of trees and the hedgerow is not considered to be significant and will not have an adverse impact on the character and appearance of the local surrounding landscape, due to their low and poor quality and value. The development proposal has been carefully designed to protect and retain the better quality trees on the site. These trees will enhance the visual appearance of the development and ensure that the character of the streetscape and surrounding landscape is maintained.
- 6.3 **Pruning works to facilitate the development** – Pruning works are required to retained trees T9, T11 and T12 in order to provide a 2m separation between their canopies and the proposed building elevation. These works will provide adequate

space for the installation of scaffolding and create a more harmonious separation between the trees and building.

- 6.4 The extent of pruning works required is considered to be minor and will result in the shortening of lower lateral limbs only. A height reduction is not required so the trees will maintain their visual character and value. Details of the proposed pruning works are specified within the Tree Work Schedule at Appendix A and the extent of the lateral reduction is shown on the Tree Works Plan at Appendix B.
- 6.5 **Site access** – The use of the proposed site access, which is situated off Ravensrock Road, can be used to facilitate the development without impacting the retained trees.
- 6.6 **Compound area** – The proposed site compound area has not yet been designed; however, there is space located within the proposed car parking area to the south of the site, which if used, would avoid impacting the retained trees.
- 6.7 Prior to works commencing, the site manager must liaise with the arboricultural consultant to locate and agree on the final location of the site compound area to avoid impacting retained trees.
- 6.8 **Demolition of existing building** – The existing building is located away from the crown spreads and outside the RPAs of retained trees. The demolition of this building can be carried out using conventional methods without impacting retained trees.
- 6.9 To ensure trees and the soil environment in which they are growing is adequately protected during these site operations, all tree protection measures must be installed as indicated on the Tree Protection Plan at Appendix B.
- 6.10 **Demolition of existing hard standing** – There are currently large areas of hard standing within the RPAs of retained trees T9 to T13. The rooting environments of these trees is in poor condition and seriously compacted. As part of the proposed works, the existing hard standing within the tree RPAs is required to be removed.
- 6.11 To minimise the impact on these trees, the removal of hard standing within RPAs will be carried out under arboricultural supervision using a combination of a lightweight track machine and manual tools, depending on the surface to be removed. The main principle during these works will be that no excavation is carried out beyond the depth of the existing sub-base layer. This is likely to vary across the tree rooting areas, so preliminary trial hole investigation works are required to be carried out before the main removal works occur.
- 6.12 Once the existing hard standing has been removed, the soil environment within the tree rooting areas will be decompacted to a depth of approx. 20-30cm using an air-

lance. As part of these works, organic biochar and a nutrient mix will be added to help improve the growing conditions for the trees. Following these works, the rooting areas of the trees must be fenced until the final landscaping works are complete. The site manager is required to liaise with the arboricultural consultant to coordinate these works to ensure they are carried out at an appropriate time during construction operations.

- 6.13 **Construction of proposed building** – The footprint of the proposed apartment building is located outside the RPAs of retained trees, therefore no special methods of construction are required. It is necessary that during all construction works, the tree protection measures, as shown on the Tree Protection Plan at Appendix B, will be installed and maintained until works are complete.
- 6.14 **Shading of buildings** – As the trees are deciduous and located on the north-eastern aspect of the proposed building, shading by trees of habitable rooms is not considered to be a significant issue in relation to this proposal.
- 6.15 **Shading of trees by the proposed building** – The Parks Department of the Local Planning Authority raised a concern during the S247 Pre-Planning Meeting regarding the height of the building and the potential impact it may have on the retained trees.
- 6.16 The proposed building is approx. 40m in height and situated on the south-western side of retained trees T9 to T13. These trees range in height from roughly 10m (T11) to 20m (T10). At present, the existing building is situated within a similar orientation as the proposed building; however, this is only two storeys in height. The difference in building height will therefore alter the amount of shading that will be cast onto the trees throughout the year.
- 6.17 As there is no known research available that addresses the impact of buildings shading trees and it is not a significant consideration that is referenced within the BS5837:2012, an assessment on the potential impact it may have on the condition of the trees in question is based on professional experience and published literature from Helliwell (2008)¹ and (2013)².
- 6.18 Helliwell indicates that in Ireland the sun may be obscured by cloud for more than 70% of the time. Meaning that approximately 30% of the available light that reaches the ground is direct sunlight, while the remaining 70% is diffuse light.

¹ Helliwell, R., (2008) *Trees, Daylight, and Buildings*, Arboricultural Journal, 30:4, 279-287.

² Helliwell, R., (2013) *Daylight in relation to plant growth and illumination of buildings*, Arboricultural Journal, 35:4, 202-219.

- 6.19 Direct sunlight does have a greater impact on plant growth than diffuse light; however, it is extremely variable, as it depends on the time of day, year and weather conditions. Diffuse light comes equally from all points of the compass and as this region is generally cloudy, it is a more reliable source of light for plants to photosynthesize. The strongest source of diffuse light is from directly above, rather than from close to the horizon, which is why a plant located directly beneath the canopy of a tree would grow slower than a plant outside its canopy.
- 6.20 In relation to this proposal, direct sunlight will largely be restricted from the south for the majority of the year. However, on clear days during spring to autumn, the trees will still receive some level of direct sunlight as is shown in Image 1 & 2. They will also receive diffuse light from above and other orientations throughout the year.

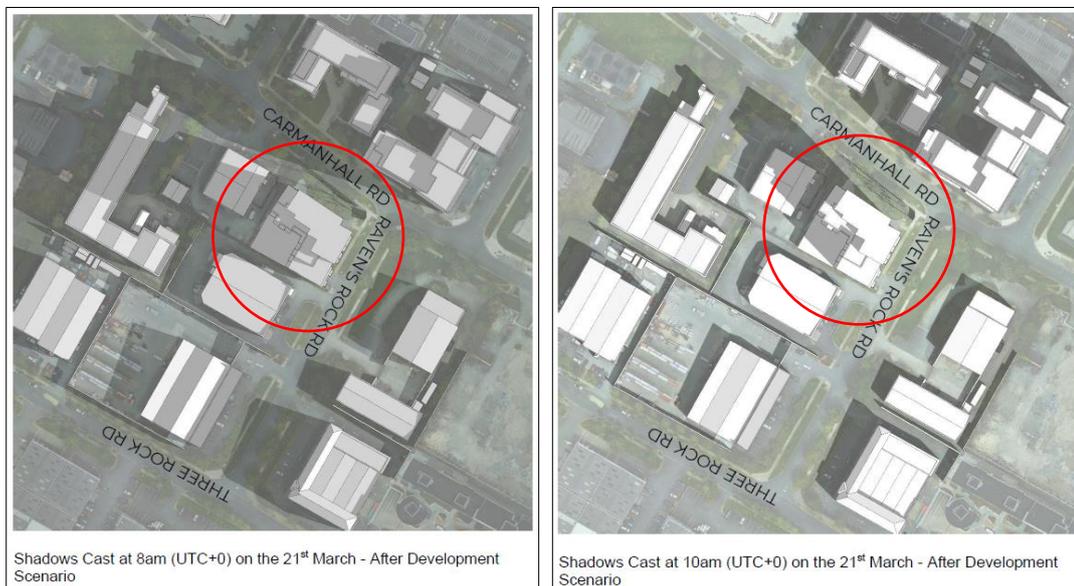


Image 1 & 2: Shadow casting images of the proposed building at 8am and 10am on 21st of March taken from the BPG3 Preliminary Assessment of Daylight Levels report. These images show that in March, the trees would still receive direct sunlight on a clear day in the morning. This would continue throughout the summer months. Building highlighted by red circle.

- 6.21 It must also be noted that major cities, such as London, often contain trees in close proximity to large buildings and that this does not result in the death or decline of the tree, as they are extremely resilient and receive adequate levels of diffuse light to maintain sufficient levels of growth.
- 6.22 Based on the above information and an assessment of the building in respect of the trees concerned, it can be concluded that the proposed building will have some impact on the amount of direct sunlight that the retain trees will receive during the year, but

that they will still receive adequate levels of diffuse light, especially from above, which will be sufficient to maintain adequate amounts of photosynthesis for plant growth.

- 6.23 **Construction of new hard standing** – Proposed footpaths and seating areas within the northern public open space are located within the RPAs of retained trees T9 to T13. This design has been altered to reduce the level of impact on the retained trees following discussions with the landscape architect.
- 6.24 The footpath located adjacent to the building, highlighted in purple on the Tree Protection Plan, will be constructed above the existing soil level using a cellular confinement system. The installation of this system will ensure that root loss is avoided. An example of a cellular confinement system is provided at Appendix D of this report.
- 6.25 Excavation works, highlighted in pink on the Tree Protection Plan, are required within the RPA of T10, T12 & T13. These works are necessary so that the proposed footpath can tie in with the existing highway and to construct the two small seating areas that are adjacent to Carmanhall Road. Both seating areas have been significantly reduced in size following discussions with the landscape architect in order to minimise the impact on the trees concern. The width of the footpath adjacent to T13 was also discussed but could not be reduced as it is required for ESB access.
- 6.26 These excavation works are required to be carried out manually with the use of hand tools and under arboricultural supervision. Where tree roots are exposed and cannot be retained, these will only be cleanly pruned following an inspection from the arboricultural consultant. The arboricultural consultant must assess the potential loss of roots to facilitate these works and if required, recommend crown pruning works to mitigate their loss and help to maintain the health and structural condition of the trees.
- 6.27 Considering the extent of incursion and the remedial works that have been recommended to improve the growing conditions for the trees, it is unlikely that the minor loss of roots would have a detrimental impact on the health of the trees.
- 6.28 **Drainage and services** – A proposed ESB run is located within the RPA of the mature beech tree T13. The location of this run has been moved to the outer extent of the tree's rooting area in order to reduce the extent of the incursion. As the run is still located within the tree's RPA, special methods of installation are required to be carried out to reduce the impact on the tree and any potential rooting that may be present.
- 6.29 The proposed excavation works for the ESB run are required to be carried out with the use of hand tools only, such as an air lance. All rooting greater than 25mm in diameter and all large clumps of fibrous roots are required to be retained and protected during

the excavation works. The arboricultural consultant will monitor the works and provide guidance on how the tree roots will be protected. Provided the works are carried out using such methods, the impact on the tree will be minimal.

- 6.30 The remaining drainage and service runs have been proposed outside the RPAs of retained trees and therefore conventional installation methods can be undertaken.
- 6.31 **Impacts on soil hydrology and nutrient availability** – The existing trees (T9 to T13) are growing within a compacted soil environment that will be restricting water infiltration and gaseous exchange. Such harsh growing environments are common within urban areas and can have a negative impact on tree growth and function, which can reduce the useful life expectancy of a tree.
- 6.32 The proposal aims to improve the growing environment of these trees by changing large areas of the rooting environment from hard standing to soft landscaping. Combining this with the proposed decompaction works and the incorporation of soil improvements, water infiltration and nutrient availability will be enhanced. These works have the potential to improve tree health and prolong the useful life expectancy of these trees within the urban environment.
- 6.33 **Tree protection measures** – Retained trees can be successfully protected during the proposed development works by using robust fencing and ground protection measures which comply with the recommendations outlined within BS5837:2012. For details of all tree protection measures required during construction operations, please refer to the Tree Protection Plan located at Appendix B. All ground protection measures must be installed in accordance with industry best practice guidance, as stated within Section 6.2.3.3 of BS 5837:2012, for further information please refer to Appendix C.

Arboricultural mitigation

- 6.34 A landscape plan has been proposed and will form part of the planning application for the development. This design focuses on enhancing the public open space surrounding the retained trees and will have a positive impact on the amenities of the site and the visual appearance of the development within the local area.
- 6.35 Soil improvement works within the rooting areas of retained trees have been recommended as part of the overall development proposal. The trees are currently growing within a seriously compacted soil which is having a direct impact on the physiological condition of the trees. By undertaking the recommended decompaction works and proposing to include a mix of nutrients and organic biochar, the health and future life expectancy of the trees can be improved.

7 Discussion & Conclusion

General Change

- 7.1 The proposed loss of trees required to facilitate the development will not have a significant impact on the character and appearance of the local surrounding landscape due to their low and poor quality and value.
- 7.2 The development proposal has been carefully designed to ensure that the better quality northern boundary trees can be successfully protected and retained as part of the development. The retention of these trees will have a positive impact on the visual appearance and amenities of the development and ensure that the character of the adjacent streetscape is maintained.

Proposal in relation to local planning policy

- 7.3 The proposed development complies with local planning policies as they relate to trees. Although tree removals are required to facilitate the development, these trees are not considered to be important in terms of the character and appearance of the property or surrounding local area.
- 7.4 The proposal has been assessed in accordance with best practice BS5837:2012 and provided the recommendations, as detailed within this report, are followed, all retained trees can be successfully protected for the duration of construction.

Conclusion

- 7.5 The proposal has been assessed in accordance with BS 5837:2012 and retained trees can be successfully protected during the course of the development by following the information provided within this report and adhering to industry best practice.
- 7.6 Provided the recommendations and methods of work, as outlined within this report, are adhered to, the proposed development can be successfully carried out without having a negative impact on the character or appearance of the surrounding landscape and local area.

8 Recommendations

- 8.1 The proposal should be carried out in accordance with the recommendations outlined within this report.

Tree Protection

- 8.2 Tree protective barriers and ground protection should be installed during the development as detailed on the Tree Protection Plan at Appendix B.
- 8.3 The protective fencing measures and ground protection to be installed must comply with the recommendations outlined within BS 5837: 2012 '*Trees in relation to design, demolition and construction – Recommendations*'. Refer to fencing detail on the Tree Protection Plan at Appendix B and ground protection measures at Appendix C.
- 8.4 No materials or equipment other than those required to install tree protection will be delivered to the site until all fencing and ground protection is in place.
- 8.5 Site supervision should be carried out by an arboricultural consultant at key stages of the project to ensure that retained trees can be successfully protected during the development.

Tree Works

- 8.6 All tree works are required to be carried out in accordance with best working practice BS3998:2010 – *Tree Work Recommendations* and by a reputable arboricultural contractor.

Section 2: Arboricultural Method Statement

Introduction

This report has been prepared in accordance with British Standard 5837: Trees in relation to design, demolition and construction – Recommendations (2012) which provides a methodology for the assessment and protection of trees and other significant vegetation on development sites.

Sequence of Operations

- Proposed tree works.
- Installation of tree protection measures.
- Enabling works, including the installation of a site compound.
- Demolition.
- Construction, including the installation of drainage and services.
- Landscaping.

Alternative sequences can be discussed and agreed with the local authority and project manager if required.

Supervision

All key / critical activities that will affect trees during construction will be inspected and monitored by the approved arboricultural consultant.

- Pre-commencement meeting with the site manager and parks department;
- Inspection of tree works and tree protection measures prior to the commencement of works;
- Monthly site visits to inspect tree protection measures;
- Supervision during the installation of hard surfaces within tree RPAs;
- Supervision during the installation of drainage and services within the RPAs of trees;
- Supervision during all working operations within tree RPAs; and
- Tree inspection upon completion.

Arboricultural Method Statement	
Scope	Methodology
Pre-commencement meeting	<p>Prior to the commencement of works, a meeting between the arboricultural consultant, site manager and local authority parks department will be held in order to discuss the tree protection measures and proposed works required in close proximity to trees.</p> <p>Contact details of all parties will be circulated to ensure all team members are able to communicate correctly.</p> <p>The site manager will be responsible for the protection of all retained trees for the duration of the project. Whenever necessary, the site manager will engage the arboricultural consultant to ensure trees are adequately protected.</p> <p>The appointed arboricultural consultant will be available for verbal advice throughout site works.</p>
Tree Works	<p>Please refer to the Tree Work Schedule at Appendix A for a list of all proposed tree works. The location of trees to be removed are highlighted on the Tree Works Plan at Appendix B.</p> <p>It is the responsibility of the Site Manager to ensure all tree works have been approved by the local planning authority.</p> <p>All tree works will be carried out by a reputable arboricultural contractor in accordance with the recommendations given in BS 3998:2010 – Tree Work Recommendations.</p> <p>All tree works should be carried out in accordance with Section 40 of the Wildlife Act 1976 and Section 46 of the Wildlife (Amendment) Act 2000.</p> <p>It is the responsibility of the arboricultural contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works.</p>
Tree Protection	<p>The position of tree protection measures are shown on the Tree Protection Plan at Appendix B.</p> <p>Protective fencing will be constructed and installed in accordance with BS5837:2012, please refer to the Tree Protection Plan for the specification. Alternatives to those shown must be agreed in advance by the arboricultural consultant.</p>

	<p>Ground protection measures are required during the construction of the development. These must be installed in accordance with industry best practice guidance as stated within Section 6.2.3.3 of BS5837:2012. They must be fit for purpose and capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.</p> <p>Any machinery located within tree RPAs must operate on the appropriate ground protection at all times, this will include the installation and removal of ground protection. Examples of ground protection measures are shown at Appendix C.</p> <p>No materials or equipment other than those required to erect protective fencing will be delivered to the site before the fencing is installed.</p> <p>Signs will be fixed to every third panel stating, <i>'Tree Protection Area Keep Out – Any incursion into the protected area must be with the agreement of the local authority or arboricultural consultant'</i>.</p> <p>The main contractor will inform the arboricultural consultant that tree protection is in place before site clearance works commence.</p> <p>No alteration, removal or repositioning of the tree protection will take place without the prior consent of the arboricultural consultant.</p>
Compound Area	<p>The proposed site compound area has not yet been designed; however, the considerations below must be followed:</p> <p>The site compound must be located outside the designated TPZs as highlighted on the Tree Protection Plan at Appendix B.</p> <p>No excavation works within tree RPAs are permitted to install temporary services for site cabins and facilities. Any temporary services within tree RPAs must be above ground and protected accordingly.</p> <p>No operating generators or toxic liquids will be stored within the RPAs of retained trees during construction.</p> <p>Overhanging tree canopies must be taken into consideration when transporting, installing and removing site cabins near tree crowns. A banksman will be present during this process to ensure that all operations are carried out in a controlled manner and no part of the cabin meets overhanging tree crowns.</p>

<p>Removal of existing hard standing with tree RPAs</p>	<p>The upper surface of existing hard standing located within the RPAs of retained trees will be fractured with a machine or using hand tools, and all loose material will be removed.</p> <p>The removal of the sub-base material must only be carried out under the supervision of the arboricultural consultant and works will not exceed beyond the depth of the sub-base layer into virgin soil.</p>
<p>Excavation within tree RPAs</p>	<p>Excavation works within the RPA of retained trees T11, T12, T13, as highlighted on the Tree Protection Plan, will be manually carried out with the use of hand tools and under arboricultural supervision.</p> <p>Root pruning will only be carried out by the arboricultural consultant, using sharp, sterile tools suitable to the size of the root to be cut. Where possible roots will be pruned cleanly back to a side branch.</p> <p>Once excavated, the edge of the trench will be lined using 1000-gauge polythene to prevent any liquid cement leaching into the surrounding soil.</p>
<p>Installation of cellular confinement system (No-Dig Construction)</p>	<p>Please refer to the Tree Protection Plan at Appendix B for areas requiring the installation new hard surfaces within tree RPAs.</p> <p>The area will be raked and, if levelling is required, this will be carried out through the spreading of lawn sand or a good quality topsoil.</p> <p>Once levelled, the area will be covered by a permeable membrane onto which the cellular system will be laid. This will then be infilled with 20-40mm angular non-fine aggregate and edged with pressure treated, pegged timber board or similar.</p> <p>The finishing surface layer will consist of a permeable hard surface material.</p> <p>The system must be installed in accordance with the manufacturer's specification. Additional information is attached to Appendix D.</p>
<p>Drainage and Service Installation</p>	<p>All methods of work for the installation of drainage runs or services within the RPAs of retained trees will follow the guidance within Table 3 of BS 5837 (2012), or National Joint Utilities Group (NJUG) <i>Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees</i>. Volume 4, issue 2, London NJUG 2007.</p> <p>Any approved works within the TPZ will be carried out using either hand tools such as an air lance and vacuum excavator or trenchless techniques as outlined within Table 3 of BS5837:2012.</p>

	<p>For excavation works, all roots greater than 25mm in diameter and large clumps of roots will be retained and will be immediately wrapped in dry hessian to prevent desiccation and temperature fluctuations. Roots will be pushed aside to allow for runs to be installed.</p> <p>In some cases, individual roots less than 25mm in diameter may be pruned, making a clean cut with a suitable sharp sterile tool (e.g. secateurs or hand saw). Prior to root pruning taking place, the contractor will consult the arboricultural consultant.</p> <p>Trenches should not remain open for more than one day. If this is unavoidable, any exposed roots should be watered and covered with hessian until the area is backfilled with soil.</p> <p>No machinery will be permitted within the TPZ at any time unless ground protection is installed and agreed with the arboricultural consultant beforehand. The requirement for temporary ground protection must be installed in accordance with Section 6.2.3.3 of BS 5837:2012, refer to Appendix C.</p> <p>Prior to drainage or service installation works commencing within RPAs, the arboricultural consultant will be contacted, and a date agreed for a site meeting to run through the proposed methods of work on site with the site manager and relevant site operatives.</p>
<p>General Principals to Avoid Damage to Trees</p>	<p>All tree works will be carried out in accordance with the recommendations given in BS 3998 (2010).</p> <p>No fires will be permitted within 20m of the crown of any tree.</p> <p>No materials, vehicles, plant or personnel will be permitted into the tree protection zones at any time without the prior consent of the arboricultural consultant.</p> <p>Any liquid materials spilled on site will be immediately cleared up and removed from the site. If liquid fuel or cement products are spilled within 2m of the tree protection zone, the contractor will report the incident to the arboricultural consultant immediately.</p> <p>The contractor will report any damage to trees or shrubs, whether caused by construction activities or from any other cause, to the arboricultural consultant immediately.</p>
<p>Landscape Operations</p>	<p>All landscape operations within the protected area will be carried out by hand, using hand tools only.</p>

	<p>No dumping of spoil or rubbish, parking of vehicles or plant, storage of materials or temporary accommodation will be undertaken within the TPZs.</p> <p>All tree roots within the RPAs greater than 25mm diameter will be retained and worked around.</p> <p>Soil levels will not be increased or reduced within the RPAs of trees without prior agreement from the arboricultural consultant.</p>
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Appendix A - Schedule

Document	Reference	Revision
Tree Schedule	210126-PD-10	-
Tree Work Schedule	210126-PD-12	A

210126 - 31 & 31a Ravens Rock Road, Sandyford Business Park, Co. Dublin

Tree ID	No. Species	Height (m)	Stem diameter (cm)	No. of Stems	CROWN SPREAD (m)								Crown clearance (m)	L.B. (m)	Life stage	Condition Notes	Survey date	RPA (m ²)	RPR (m)	Life expectancy (yrs)	BS Category
					N	NE	E	SE	S	SW	W	NW									
Tree T1	1 Acer saccharinum (Silver Maple)	8.5	17	1		3.5	3.5	3.0	3.5	2.0			Semi Mature	Structural condition Fair. Physiological condition Fair. Bark wound - Major. Strimmer damage to stem base.	05/03/2021	13.1	2.0	20-40	C2		
Tree T2	1 Acer saccharinum (Silver Maple)	7.5	11	1		3.5	3.0	2.0	3.5	2.0			Semi Mature	Structural condition Fair. Physiological condition Fair. Bark wound - Major. Strimmer damage to stem base.	05/03/2021	5.5	1.3	20-40	C2		
Tree T3	1 Acer saccharinum (Silver Maple)	7.5	14	1		4.0	3.5	3.0	3.5	2.0			Semi Mature	Structural condition Fair. Physiological condition Fair. Branch - Broken. Bark wound - Major. Strimmer damage to stem base.	05/03/2021	8.9	1.7	10-20	C2		
Tree T4	1 Acer saccharinum (Silver Maple)	9.5	14	1		4.5	2.5	2.0	4.0	2.5			Semi Mature	Structural condition Fair. Physiological condition Fair. Branch - Broken. Bark wound - Major. Deadwood - Minor. Decay / structural defect - Bole. Leaning trunk - Minor. Strimmer damage to stem base.	05/03/2021	8.9	1.7	10-20	C2		
Tree T5	1 Acer saccharinum (Silver Maple)	9.0	15	1		3.5	3.5	2.5	2.5	2.0			Semi Mature	Structural condition Fair. Physiological condition Fair. Bark wound - Minor. Leaning trunk - Minor.	05/03/2021	10.2	1.8	10-20	C2		
Tree T6	1 Acer saccharinum (Silver Maple)	7.5	13	1		3.5	3.0	3.5	2.5	2.0			Semi Mature	Structural condition Fair. Physiological condition Fair. No significant faults observed.	05/03/2021	7.6	1.6	20-40	C2		
Tree T7	1 Acer saccharinum (Silver Maple)	6.0	10	1		2.5	3.0	2.0	2.0	1.0			Semi Mature	Structural condition Poor. Physiological condition Fair. Bark wound - Minor. Leaning trunk - Minor.	05/03/2021	4.5	1.2	10-20	C2		

Stem **green** Estimated value

Stem **AVE** Average stem diameter for tree groups

Stem **COM** Combined stem diameter in accordance with BS5837

L.B. Height of lowest branch attachment (m) - where relevant

The survey information in this schedule has been gathered following a BS5837 survey for planning purposes. Where hazardous trees have been noted recommendations for works may have been made but this survey cannot be relied upon as a full health and safety assessment of the trees.

210126 - 31 & 31a Ravens Rock Road, Sandyford Business Park, Co. Dublin

Tree ID	No. Species	Height (m)	Stem diameter (cm)	No. of Stems	CROWN SPREAD (m)								Crown clearance (m)	L.B. (m)	Life stage	Condition Notes	Survey date	RPA (m ²)	RPR (m)	Life expectancy (yrs)	BS Category
					N	NE	E	SE	S	SW	W	NW									
Hedge H8	10 x Cupressocyparis leylandii (Leyland Cypress)	2.0	15 AVE	1								0.0		Early Mature	Structural condition Fair. Physiological condition Poor. Poor past pruning. Root environment - Restricted. Height and stem diameter are average for group. Quantities estimated. Hedgerow has been significantly pruned and is in poor physiological condition.	05/03/2021	10.2	1.8	0-10	U	
Tree T9	1 Quercus robur (English Oak)	20.0	55	1		5.0	7.0	6.5	4.0			1.5		Early Mature	Structural condition Fair. Physiological condition Fair. Arboricultural work - Historic. Competition - Adjacent trees. Physiological stress. Root environment - Compacted. Minor dieback evident in upper canopy, likely due to soil compaction.	05/03/2021	136.8	6.6	20-40	B2	
Tree T10	1 Quercus robur (English Oak)	20.0	70	1		7.0	5.0	7.0	7.0			2.5		Mature	Structural condition Fair. Physiological condition Fair. Access to inspect base - Not possible. Arboricultural work - Historic. Branch - Broken. Competition - Adjacent trees. Decay / structural defect in crown limb / limbs - Localised. Deadwood - Minor. Physiological stress. Root environment - Compacted. Shedding limb / limbs - Historic. Tree growing in hard standing, soil environment is significantly compacted.	05/03/2021	221.7	8.4	20-40	B2	
Tree T11	1 Quercus robur (English Oak)	10.0	45	1		2.0	5.0	5.5	5.0			4.0		Mature	Structural condition Fair. Physiological condition Fair. Access to inspect base - Not possible. Competition - Adjacent trees. Pruning wounds - Decayed. Root environment - Compacted. Suppressed crown - Major. Unbalanced crown - Major. Tree growing in hard standing, soil environment is significantly compacted.	05/03/2021	91.6	5.4	20-40	C2	
Tree T12	1 Quercus robur (English Oak)	12.0	60	1		8.0	5.0	7.0	6.0			4.0		Early Mature	Structural condition Fair. Physiological condition Fair. Access to inspect base - Not possible. Arboricultural work - Historic. Competition - Adjacent trees. Deadwood - Minor. Root environment - Compacted. Tree growing in hard standing, soil environment is significantly compacted.	05/03/2021	162.9	7.2	20-40	B2	

Stem **green** Estimated value

Stem **AVE** Average stem diameter for tree groups

Stem **COM** Combined stem diameter in accordance with BS5837

L.B. Height of lowest branch attachment (m) - where relevant

The survey information in this schedule has been gathered following a BS5837 survey for planning purposes. Where hazardous trees have been noted recommendations for works may have been made but this survey cannot be relied upon as a full health and safety assessment of the trees.

210126 - 31 & 31a Ravens Rock Road, Sandyford Business Park, Co. Dublin

Tree ID	No. Species	Height (m)	Stem diameter (cm)	No. of Stems	CROWN SPREAD (m)								Crown clearance (m)	L.B. (m)	Life stage	Condition Notes	Survey date	RPA (m ²)	RPR (m)	Life expectancy (yrs)	BS Category
					N	NE	E	SE	S	SW	W	NW									
Tree T13	1 Fagus sylvatica (Common Beech)	19.0	65	1		8.5		7.0		7.0		6.0	3.0		Mature	Structural condition Fair. Physiological condition Fair. Access to inspect base - Restricted / obscured. Arboricultural work - Historic. Competition - Adjacent trees. Decay / structural defect in crown limb / limbs - Localised. Deadwood - Minor. Decay / structural defect - Suspected. Pruning wounds - Decayed. Root environment - Compacted. Shedding limb / limbs - Historic. Localised area of decay on upper main stem. Minor dieback in upper canopy, decay suspected. Tree growing in hard standing, soil environment is significantly compacted.	05/03/2021	191.1	7.8	10-20	C2
Tree T14	1 Fagus sylvatica (Common Beech)	18.0	60	1		3.0		5.0		5.0		5.0	5.0		Mature	Structural condition Poor. Physiological condition Dead. Dead tree / trees. Ivy or climbing plant.	05/03/2021	162.9	7.2	0-10	U
Group G15	8 x Cupressocyparis leylandii (Leyland Cypress)	10.0	30 AVE	1									0.0		Early Mature	Structural condition Fair. Physiological condition Good. Access to inspect base - Not possible. Competition - Adjacent trees. Root environment - Restricted. Height and stem diameter are average for group. Quantities estimated.	05/03/2021	40.7	3.6	20-40	C2

Stem **green** Estimated value

Stem **AVE** Average stem diameter for tree groups

Stem **COM** Combined stem diameter in accordance with BS5837

L.B. Height of lowest branch attachment (m) - where relevant

The survey information in this schedule has been gathered following a BS5837 survey for planning purposes. Where hazardous trees have been noted recommendations for works may have been made but this survey cannot be relied upon as a full health and safety assessment of the trees.

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	<ul style="list-style-type: none"> * 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 health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <p>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7</p>			RED
	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	Tree 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).	GREEN
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.	BLUE
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.	GREY

210126-PD-12-A - Planning Tree Works Schedule

210126 - 31 & 31a Ravens Rock Road

CHARLES MCCORKELL
ARBORICULTURAL CONSULTANCY

ID	No. / Species	BS5837 Category	Purpose of works Recommended works	Status
H8	10 x <i>Cupressocyparis leylandii</i> Leyland Cypress	U	To facilitate development Fell - Ground level.	Proposed
T9	1 <i>Quercus robur</i> English Oak	B2	To facilitate development Reduce lateral limb / limbs. - Reduce lower lateral branches to create a 2m separation from the proposed building elevation. Good arboricultural practice Vitality - Address soil compaction. - Once the existing hard standing has been removed, the soil environment within the tree's rooting area is to be decompacted to a depth of approx. 20-30cm using an air-lance.	Proposed Proposed
T10	1 <i>Quercus robur</i> English Oak	B2	Good arboricultural practice Vitality - Address soil compaction. - Once the existing hard standing has been removed, the soil environment within the tree's rooting area is to be decompacted to a depth of approx. 20-30cm using an air-lance.	Proposed
T11	1 <i>Quercus robur</i> English Oak	C2	To facilitate development Reduce lateral limb / limbs. - Reduce lower lateral branches to create a 2m separation from the proposed building elevation. Good arboricultural practice Vitality - Address soil compaction. - Once the existing hard standing has been removed, the soil environment within the tree's rooting area is to be decompacted to a depth of approx. 20-30cm using an air-lance.	Proposed Proposed
T12	1 <i>Quercus robur</i> English Oak	B2	To facilitate development Reduce lateral limb / limbs. - Reduce lower lateral branches to create a 2m separation from the proposed building elevation. Good arboricultural practice Vitality - Address soil compaction. - Once the existing hard standing has been removed, the soil environment within the tree's rooting area is to be decompacted to a depth of approx. 20-30cm using an air-lance.	Proposed Proposed
T13	1 <i>Fagus sylvatica</i> Common Beech	C2	Good arboricultural practice Vitality - Address soil compaction. - Once the existing hard standing has been removed, the soil environment within the tree's rooting area is to be decompacted to a depth of approx. 20-30cm using an air-lance.	Proposed
T14	1 <i>Fagus sylvatica</i> Common Beech	U	Good arboricultural practice Fell - Ground level.	Proposed
G15	8 x <i>Cupressocyparis leylandii</i> Leyland Cypress	C2	To facilitate development Fell - Ground level.	Proposed

Appendix B - Plans

Document	Reference	Revision
Tree Survey Plan	210126-P-10	A
Tree Works Plan	210126-P-11	B
Tree Protection Plan	210126-P-12	B

Appendix C – Ground Protection

BS5837:2012 - Section 6.2.3.2 - Ground Protection Measures

For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane



- Scaffold Boards
- 100mm Woodchip
- Geotextile Membrane

For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;



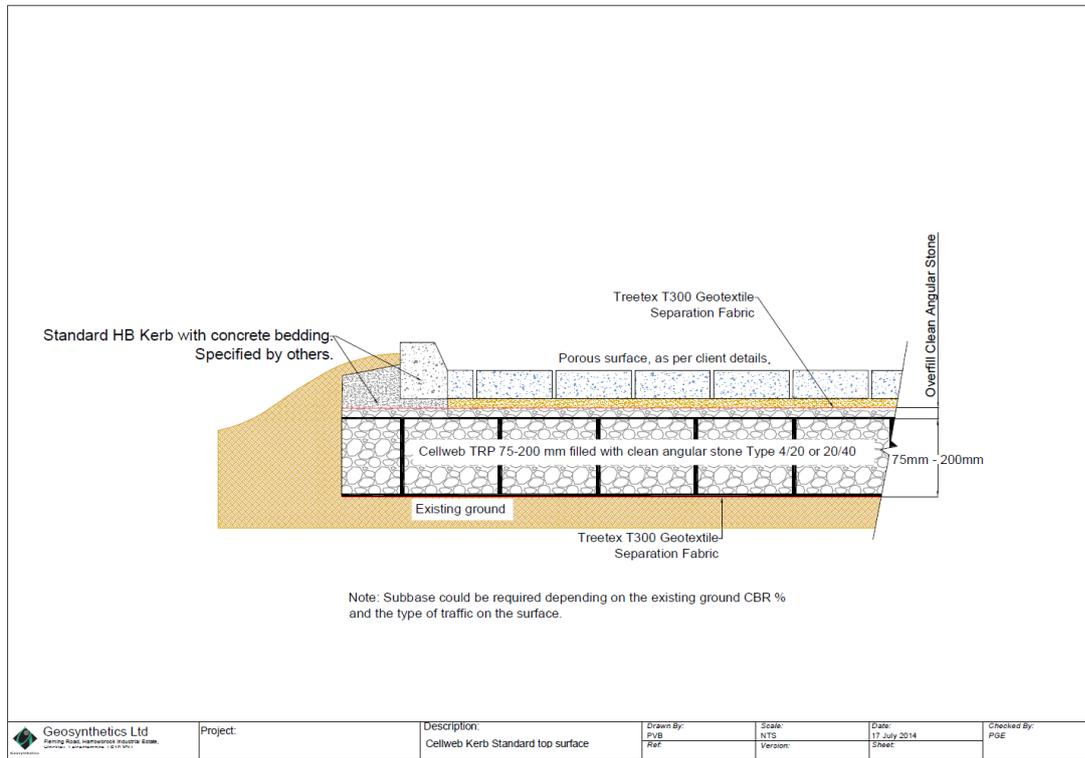
- Inter-linked Ground Protection
- 150mm Woodchip
- Pegged Timber Edge
- Geotextile Membrane

For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.



- Geotextile Membrane
- Cellular confinement system
- 20-40 Clean Angular Stone

Appendix D – Cellular Confinement System



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