

Arboricultural Impact Assessment

Prepared for:

Miele

Proposed site:

Unit 2024, Bianconi Avenue, Citywest, Dublin 24

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Table of Contents

1.	Introduction.....	3
1.1	Background.....	3
1.2	Methodology.....	3
2.	Soils.....	5
3.	Trees and Risk in the Context of Development.....	5
3.1	Trees and Wildlife.....	5
3.2	Tree Works.....	5
4.	Initial Tree Survey Overview.....	6
4.1	The Site.....	6
4.2	The Trees.....	7
5.	Statutory and Non-Statutory Designations.....	7
6.	The Proposed Development.....	8
7.	Arboricultural Impact Assessment.....	9
7.1	Trees to be Removed.....	9
7.2	Tree Works.....	9
7.3	Incursions within the RPA or Canopy Spread.....	10
7.4	The Future Impact of Retained Trees.....	11
7.5.	Tree Protection.....	11
8.0	Conclusions.....	12
	Appendix A: Tree Survey Schedule.....	13
	Key to Abbreviations Used in the Survey.....	15
	Appendix B:Tree Clearance Plans Drawing References.....	15
	Appendix C: Arboricultural Method Statement.....	16
C.1	Arboricultural Method Statement Overview.....	16
C.2	Pre commencement site meeting.....	16
C.3	Order of operations.....	16
C.4	Preliminary tree works.....	17
C.6	Site monitoring.....	18
C.7	Toolbox talk.....	Error! Bookmark not defined.
C.8	Protective fencing.....	18
C.9	Ground protection.....	20
C.10	Carriageway widening into footway or verge.....	21
C. 11	Footway or verge widening into existing carriageway.....	21
C. 12	Removal and/or replacement of an existing hard surface within an RPA.....	21
C. 13	Installation of new hard surfacing within RPAs.....	23
C. 14	Demolition.....	25
C. 15	Construction of New Boundary Walls.....	26
C. 17	Movement of Vehicles and People and the Movement and Operation of Machinery.....	26
C. 18	Site organisation, storage and mixing of materials.....	27
c. 21	Installation of new drainage within RPAs.....	28
C. 22	Installation or diversion of utilities within RPAs.....	28
C. 23	Redundant utilities.....	30
C. 24	Dismantling of tree protection measures.....	30
C. 25	Contact details.....	30
	Appendix D: Example Site Monitoring Form.....	31
	Appendix E: Tree Protection Signage (Example).....	31

1. Introduction

1.1 Background

Arbor-Care Ltd (Professional Consulting Tree Service) was retained by Miele to undertake an Arboricultural Impact Assessment, and a Tree Protection Plan identifying the trees, groups of trees that may be impacted on by the proposed development. The surveyed trees contained within this report are located within or adjacent to the proposed development (Figure 1.0 below). The objective of the impact assessment was to identify the areas that contained trees, groups of trees, and to ensure where possible that these areas would be retained and to identify the trees that are to be removed to facilitate the development.

The survey commenced on the 4th September 2021. The survey concentrated on the trees and groups of trees located within or adjacent to the proposed development site

The below impact assessment report is based on the British standard *BS 5837:2012 Trees in relation to design, demolition and construction recommendations*, this standard gives recommendations and guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees, including shrubs, hedges and hedgerows, with structures. It sets out to assist those concerned with trees in relation to construction to form balanced judgements. This impact assessment report will be accompanied by an inventory of trees and hedgerows on site and a tree protection plan. The Arboricultural Impact Assessment and a tree protection plan was prepared for the site identifying trees that may be impacted on by the proposed development based on the proposed design.

1.2 Methodology

An initial tree survey and visual condition assessment was on the 4th of September 2021. The purpose of this report and in accordance with *BS 5837: 2012 Trees in relation to design, demolition and construction. Recommendations* only trees with diameters of 75mm or greater were surveyed. Also in accordance with section 4.4.2.3 of the British standard document where trees formed obvious groups these were assessed and recorded as groups. All trees were individually tagged with a metal disc. This was placed on the northern side of the tree where practical. Where trees were located within private property or where access to the tree was not possible a virtual tag number was used this has been denoted with the letter T P* in the tree schedule and protection plan.

Section 4.4.2.3 of BS 5837: 2012 states:

Trees growing as groups or woodland should be identified and assessed as such where the arboriculturist determines that this is appropriate. However, an assessment of individuals within any group should still be undertaken if there is a need to differentiate between them, e.g. in order to highlight significant variation in attributes (including physiological or structural condition).

NOTE: The term "group" is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture), in respect of each of the three subcategories.

The survey concentrated primarily on the significant trees/ groups located within and adjacent to the proposed development area and has been based on the topographical survey plan provided. The objective of this survey was to gather information regarding the trees within or adjacent to the development area and the impact the proposed scheme may have on the trees. **Please refer to Appendix A for the tree inventory.**

Significant trees can be equated as those trees whose visual importance to the surrounding area are sufficient to justify special efforts to protect/preserve and whose loss would have an irremediable adverse impact on the local environment. Significance can also be placed depending on the trees age, another variable to imply significance can be the aesthetic merit of the tree based on its unusual size, intrinsic physical features or outstanding appearance or occurring in a unique location or context, and thus provides a special contribution as a landmark or landscape feature.

All above parts of the trees were visually examined. Tree diameters (DBH) were estimated at 1.5 meter above grade as per standard arboricultural practice. Tree height was measured with the use of a clinometer (Where practical). A generalised system was employed to describe the overall health of the trees. The system uses a five tier rating scale with the following descriptors:

Specimen condition 5-tier rating system

- Very poor-1-20%
- Poor- 21-40%
- Fair- 41-60%
- Good- 61-80%
- Very good 81-100%

2. Soils

On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations that could be influenced by trees must be installed following the recommendations of National House Building Council (NHBC) Standards *Chapter 4.2: Building Near Trees* (2021) to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

3. Trees and Risk in the Context of Development

Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

This report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on Site. However, when obvious issues have been identified recommendations have been included in the Tree Survey Schedule.

Developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition those responsible could be subject to prosecution along with the potential for further civil claims for damages.

3.1 Trees and Wildlife

Full consideration must be given to the presence of species protected under the Wildlife Act (1976 – as amended) and other relevant legislation protected wildlife and habitats, in particular the presence of bats and nesting birds. It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September. The advice of a qualified ecologist should be sought in relation to tree works with the potential to impact on protected species.

3.2 Tree Works

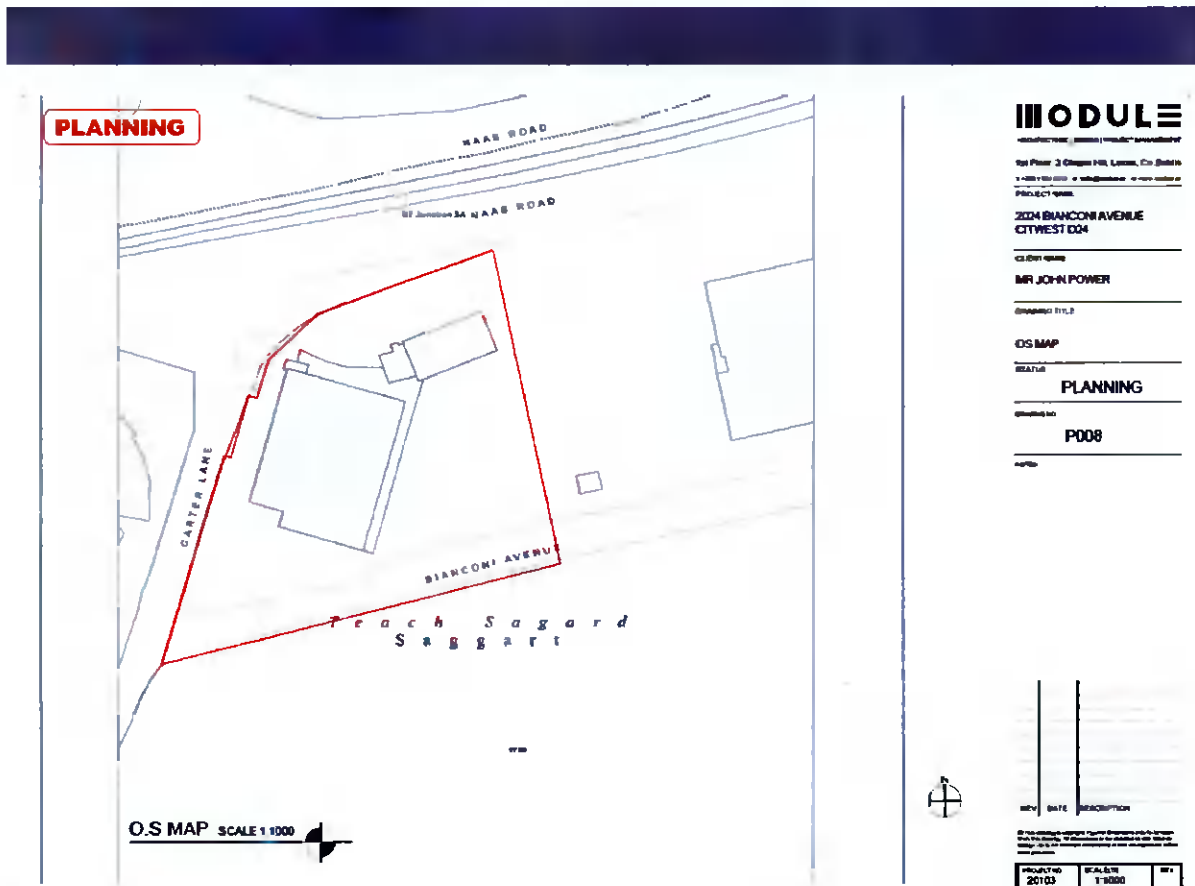
Any tree surgery recommendations contained within this report are to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors. Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general, the optimum period for works is between November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

4. Initial Tree Survey Overview

4.1 The Site

The surveyed site consists of an industrial building within a business park. The majority of the site is made up of carparking and a large industrial building

Figure 1.0 Proposed site highlighted in red.



4.2 The Trees.

A total of trees were surveyed. The surveyed trees include a mixture of semi-mature to mature trees landscaped trees. Many were planted in formal clusters as landscape features around the existing car park. Others were planted as dense groups to act as screening and noise barriers.

A breakdown of the Tree Categories on site as per BS 5837 2012 is set out in the table below:

Category	Quantity	Category %
A-Tree of high quality	2	4.3%
B-trees of good quality	3 groups + 43 individual trees	95.7%
C (Low quality or trees less than 75mm diameter)	0	0%
U (remove due to poor condition)	0	0%
Total Trees surveyed	46 including groups	100%

5.0 Statutory and Non-Statutory Designations

The National Planning Framework (NPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaption. The NPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity.

The site is located within the jurisdiction of *South Dublin County Council*. The Local Planning Authorities have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration. I have reviewed *South Dublin County Development Plan 2022-2028(draft) Tree Preservation Orders (TPO's)* . There are no TPO's identified within the development site.

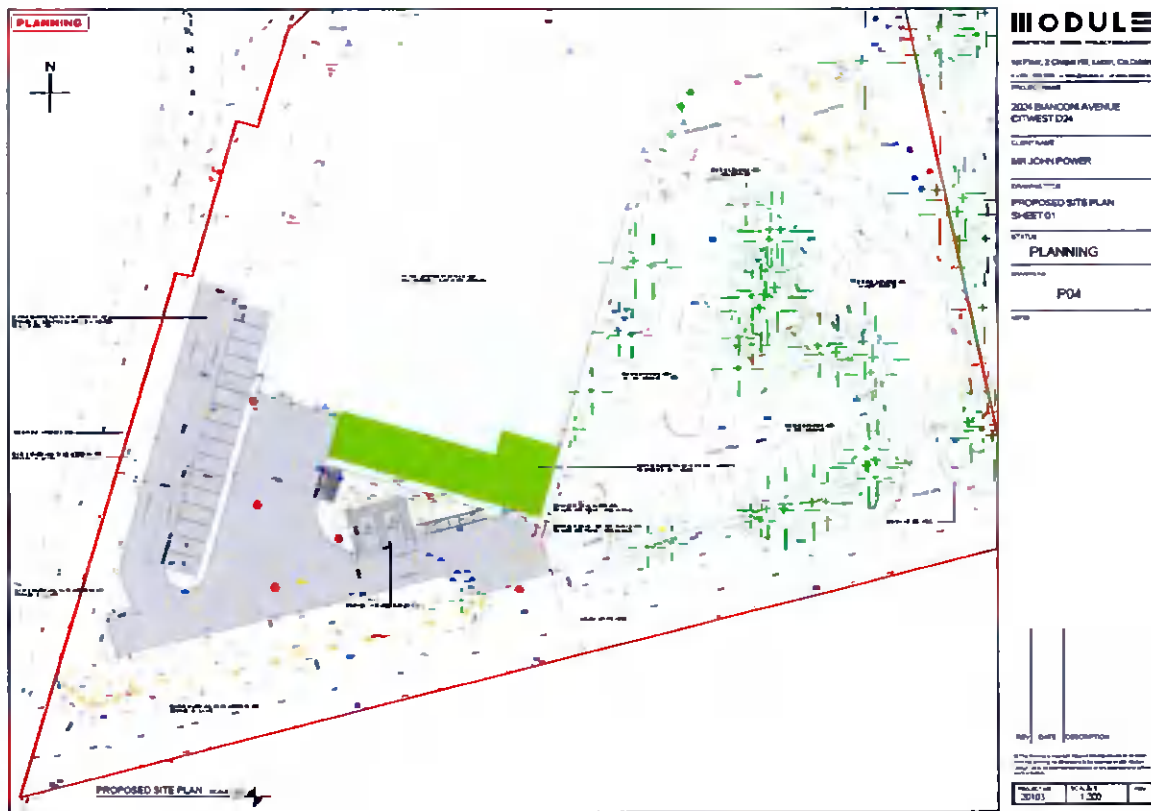
6.0 The Proposed Development (figure 2)

Development Description

Brief Summary Development Description

The development will consist of a proposed partial change of use from warehouse / storage to office use on ground and first floor level consisting of offices, canteen and toilet facilities, internal staircases, and associated facilities. Proposed 1No dock leveller located on the south west elevation to existing loading bay. New external windows & doors for office spaces to the existing south east south west and north west elevations with formation of entrance to office space to existing south east elevation. Proposed new carparking / hardstanding to provide 16 No car parking spaces inclusive of 2 No disabled spaces. Proposed external ramped / stepped to approach to office entrance to south west elevation. Alterations to existing perimeters gabion walls to the south west of existing site and realignment of kerbing and shrub line to south west elevation. Proposed car parking external LED lighting provided by way of lamp standards to car park. Proposed alterations to existing surface water drainage and associated site works.

Figure 2. The Proposed Development



7. Arboricultural Impact Assessment

This impact assessment sets out the likely principal direct and indirect impacts of the Proposed Development on the trees on or immediately adjacent to the site and suitable mitigation measures to allow for the successful retention of significant trees or to compensate for trees to be removed, where appropriate.

A brief summary of trees to be removed, tree works and incursions related to the Proposed Development are detailed within the table below.

Table 1: Summary of Removals to facilitate the Proposed Development

Impact	Category A	Category B	Category C	Category U	Un-surveyed tree features
Trees to be removed to facilitate the Proposed Development	0 individual tree,	2 Groups 1 partially removed	0 individual trees.	0 individual trees	0 individual trees
Total	0 feature	2 features	0 features	0 features	features

7.1 Trees to be Removed

The impact of the proposed development will be low it will involve the removal of 1 group of early mature trees and the partial removal of another. The majority of these trees are readily replaceable with trees of similar size and species.

7.2 Tree Works

No tree works such as pruning have been identified at this stage. The requirement for pruning should be addressed following a pre-commencement site walkover to review any trees which could form an obstruction, or which require pruning to facilitate construction works and to prevent inadvertent damage to tree crowns.

This level of pruning will generally not have a significant negative impact on the health or amenity of the trees in question.

No additional works to retained trees are likely to be required. All tree work is to follow the principles of BS3998: 2010 Treework – Recommendations and must be carried out by suitably qualified and insured contractors.

Should the requirement for additional tree works be identified, this will be discussed with an arboriculturist and no works will be undertaken without the consent of the Local Planning Authority (LPA). Where trees belong to third parties any pruned branches should be offered back to the tree owner and prior consent must be obtained for any works beyond the boundary.

7.3 Incursions within the RPA or Canopy Spread

The design has been developed to avoid the area of constraint around trees where feasible. A range of works are required within or close to the RPA of retained trees which will require specialist working methods to ensure trees are not subject to a significant negative impact. Given the constraints of the site incursions into the RPA may be unavoidable therefore the mitigation measures as set out in the method statement are to be adhered to.

The Arboricultural Method Statement included as Appendix C sets out the methodology for specific activities near retained trees. The following general principles have been applied:

This extent of resurfacing has not been fully determined at this stage. Where resurfacing of existing hard surfacing is required this will be applied over the existing wearing course or on the existing intact subbase following the careful removal of the wearing course.

Where the existing highway is to be widened requiring a section of cut into a tree RPA or where new drainage cannot feasibly be adjusted to fully avoid the RPA, tree retention will be feasible where trees are considered on balance to be of an age, condition and species which will tolerate the degree of disturbance required (generally not more than a maximum of 20% of the overall RPA) and that this is preferable to the loss of the tree. The area of excavation nearest the tree will be carried out by hand and roots will be carefully assessed by an arboriculturist and pruned as required. New kerb stones and any haunching will be the narrowest profile feasible and alternative methodologies such as reinforced bridged/lintel sections of kerb can be applied should significant roots need to be retained and worked around.

Where a new boundary wall is to be constructed within an RPA, alternative footings utilising low diameter pads or piles will be carefully located to avoid tree roots (via hand dug trial holes) and will support floating beams set at or above ground level unless trial holes (under arboricultural supervision) determine that limited careful excavation is viable to allow beams to be set into the ground.

The position of new lamp columns, signs and bus shelter footings can be locally adjusted to

avoid significant roots and tree canopies and the lowest diameter footings feasible will be employed (such as screw piles or equivalent). Footings will be hand dug within RPAs.

All new or diverted utilities will avoid the RPA of retained trees where possible. Where this is not possible, they will be installed using trenchless methods or via careful excavation in accordance with BS5837: 2012 and guidance from the National Joint Utilities Group (NJUG) Volume 4. Utilities to be removed will be cut off and left in situ where feasible to minimise disturbance or will be removed via careful excavation.

7.4 The Future Impact of Retained Trees

Retained trees will require periodic inspection to assess their structural condition and safety. Occasional removal of dead wood or other remedial works to address significant defects or obstructions may be required in areas of frequent access. This is unlikely to be overly onerous and will be the responsibility of the tree owner.

Trees within and adjacent to the Site will require ongoing maintenance and assessment by a competent person to ensure that any risks from tree failure are managed in accordance with best practice.

All tree works recommended as a result of the preliminary tree survey of the Site which considered trees in the context of the current use of the Site (these works are included as preliminary management recommendations in the Tree Schedule in Appendix A of this report) should be actioned within the recommended timescales. The retained trees are located outside of the Site boundary and will not have a significant future impact on the future use of the site.

7.5 Tree Protection

Retained trees are vulnerable to damage from construction activities which can include physical damage to stems and branches following impacts with plant. Root severance following trenching, root death or dysfunction following damage to soil structure (caused by the movement of people or machinery on unsurfaced ground) or via the spillage of materials toxic to tree health. The default position is that the RPA and canopy spread of trees to be retained will form an effective Construction Exclusion Zone, secured with robust fencing where no access will be permitted. Where access is necessary within this area special measures such as the use of ground protection (or retention of existing hard surfacing) and arboricultural

supervision are generally required. In some cases, existing boundary walls and fences can be employed as a tree protection barrier where they are robust and sufficient to prevent access or damage. Tree protection measures are considered in Appendix C of this report.

7.6 Tree Planting

Existing areas of unsurfaced ground must be protected during the demolition and construction phases if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.

Where new trees are to be planted, the minimum planting distances detailed in Annex A, Table A.1 of BS5837:2012 must be adhered to, to prevent direct damage to services and structures from future tree growth.

New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations.

8.0 Conclusions

The arboricultural impact of the proposed development on the site will be low any tree removal will be replaced with compensatory plantings

Appendix A: Tree Survey Schedule-Miele City West, Dublin

Tree	Species	Size (mm)	Height (M)	Crown Sp. (M)	Crown Cl.(M)	Age class	Condition	Structural/Physiological Observations	Impact of the development	PMR	Category	RPA
Group 1	Mixed deciduous	200 circa	8	N=3 S=3 E=3 W=3	2	EM	Good	A mixed deciduous planting of oak, cherry, silver birch and Laurel. Planted on a raised mound. They provide good screening	Section to be removed	Remove impacted section	B2	
Group 2	Mixed deciduous/conifer group	220	12	N=3 S=3 E=3 W=3	1	EM	Good	A mixed deciduous group with some scot pines, this group will be removed to accommodate the proposed disabled car parking	Remove entire group	Remove	B2	
Group 3	Mixed deciduous	220	10	N=3 S=3 E=3 W=3	2	EM	Good	A mixed deciduous planting of oak, cherry, silver birch and Laurel. Planted on a raised mound. They provide good screening	No impact	Retain	B2	3.2m
2208-2209 x 16	Silver birch	200	10	N=2 S=2 E=2 W=2	2	EM	Good	A staggered row of silver birch in good condition, they provide good screening	No impact	Retain	B2	3m
2210 x 7	Silver birch	200	10	N=2 S=2 E=2 W=2	2	EM	Good	A cluster of 7 birch in good condition	No impact	Retain	B2	3m
2211 x 5	Silver birch	200	10	N=2 S=2 E=2 W=2	2	EM	Good	A cluster of 5 birch in good condition	No impact	Retain	B2	3m
2212 x 9	Silver birch	200	10	N=2 S=2 E=2 W=2	2	EM	Good	A cluster of 9 birch in good condition	No impact	Retain	B2	3m

Appendix A: Tree Survey Schedule-Miele City West, Dublin

Tree	Species	Size (mm)	Height (M)	Crown Sp. (M)	Crown Cl.(M)	Age class	Condition	Structural/Physiological Observations	Impact of the development	PMR	Category	RPA radius
2213 x 2	Alder	110	6	N=1 S=1 E=1 W=1	2	SM	Good	Two semi-mature alder in good condition	No impact	Retain	B2	2.1m
2214 x 2	Silver birch	110	8	N=1.5 S=1.5 E=1.5 W=1.5	2	SM	Good	Two semi-mature alder in good condition	No impact	Retain	B2	2.1m
2215 x 2	Silver birch	160	8	N=1.5 S=1.5 E=1.5 W=1.5	2	SM	Good	Two semi-mature alder in good condition	No impact	Retain	B2	2.6m
2216 x 2	Weeping willow	340	14	N=4 S=4 E=4 W=4	2	M	Good	Two large willows either side of the dried pond	No impact	Retain	A2	4.4m

Key to Abbreviations Used in the Survey

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedge/G=Group/W=Woodland/S=Shrub.	
Tag No.	Tree marked with individual tree tag of this reference number on site.	
Species	Common name followed by botanical name shown in <i>italics</i>	
RPA	Root Protection Area (As defined by BS5837)	
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C)	Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.	
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.	
#	Estimated dimensions	
*	Indicates estimated position of tree (not indicated on topographical survey).	
P	Privately owned tree (e.g. tree not located in the public highway or adjacent public land).	
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation) A=High quality/value 40yrs+ (light green) B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).	
Life stage	Young (Y): Newly planted tree 0-10 years. Semi-Mature (SM): Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size). Early Mature (EM): Tree in the second third of its normal life expectancy for the species (some potential for future growth in size) Mature (M): Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size). Over Mature (OM): Tree beyond the normal life expectancy for the species. Veteran (V): Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.	
Structural condition	Good: No significant structural defects Fair: Structural defects which can be resolved via remedial works. Poor: Structural defects which cannot be resolved via remedial works. Dead: Dead.	
Physiological condition	Good: Normal vitality including leaf size, bud growth, density of crown and wound wood development. Fair: Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds. Poor: Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species. Dead: Dead Fair/Good = Indicates an intermediate condition Fair – Good = Indicates a range of conditions (e.g. within a group)	
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).	
Works to facilitate the development	Tree works identified as necessary to facilitate the Proposed Development following a desk top analysis of the proposals in relation to tree constraints.	

Appendix C: Arboricultural Method Statement

C.1 Arboricultural Method Statement Overview

This Arboricultural Method Statement details the specification for tree protection measures and how sensitive operations are to be achieved in proximity to trees to be retained. It also addresses the general management of Site activities to ensure that retained trees are not inadvertently damaged.

This document may need to be amended to reflect more detailed or updated information as it becomes available. The final agreed version must be read in conjunction with the final Tree Protection Plan (to be developed) and copies of both documents must be permanently available on Site for reference throughout the development. All Site personnel must be made fully aware of its contents and the implications for work they may be involved in. All elements of the agreed Method Statement must be adhered to in full, failure to do so could result in a failure to discharge planning conditions, damage to significant trees and enforcement action by the Local Planning Authority (LPA). No changes may take place to the content or application of the Method Statement without the prior written approval of the LPA.

When planning permission is in place, some details (including changes in layout, services, materials, tree protection measures and the order of works) may be subject to change. No changes should be enacted without the prior written approval of the LPA. The Method Statement must be reviewed in advance of the commencement.

C.2 Pre commencement site meeting

Prior to the commencement of works on Site a meeting must take place including the Site Manager, Project Arboriculturist and Local Authority Tree Officer. This meeting will allow a further discussion of the programme of works, tree protection measures, the locations of the areas for storage/site organisation and the agreement of any changes to the Method Statement which will then be formally updated and approved as required.

C.3 Order of operations

1 Pre commencement Site meeting;

2 Preliminary tree works;

- 3 Site briefing for Site personnel;
- 4 Installation of protective fencing and ground protection as required;
- 5 Demolition and enabling works including utility diversions;
- 6 Re adjustment of protective fencing and ground protection as required;
- 7 Construction operations;
- 8 Re adjustment of protective fencing and ground protection as required;
- 9 Installation of new hard surfaces and hard landscaping;
- 10 Site signed off on agreed completion of significant development works;
- 11 Dismantling of tree protection measures;
- 12 Soft landscaping works within the Root Protection Area (RPA) of retained trees;

C.4 Preliminary tree works

All approved tree works are to be completed by suitably qualified and insured contractors and must take place before protective fencing is installed and any Site works begin. A list of contractors approved by the Arboricultural Association is available at www.trees.org.uk.

All tree works must be carried out in line with the principles of BS3998: 2010 Tree work – recommendations and be conducted in such a way that no damage is caused to any tree to be retained. The tree works contractor must avoid the production of ruts on unmade ground.

A tree works specification which identifies trees to be felled or pruned is included in the schedule in Appendix A.

Due to the nature of the site and the potential for tree growth in the period between planning and construction, prior to the commencement of works on a given area of the site a walkover must be undertaken by the site team including the Project Arboriculturist to determine if any additional tree works are likely to be required to facilitate the development. Any additional approval must be secured in advance from the Local Planning Authority (LPA).

If further additional tree works are deemed to be required during the development the advice of the Project Arboriculturist is to be obtained. No works are to take place without the consent of the tree owner (and the LPA).

Prior to the commencement of any tree works a thorough check for protected species (including nesting

birds, bats and badgers) is to be undertaken. If evidence of any protected species is discovered the advice of a suitably qualified ecologist must be obtained. Tree works are to be undertaken outside of the typical nesting bird season (March to September) outside of this period any individual trees will be inspected for evidence of nesting birds by a suitably qualified person prior to works being carried out.

C.5 Site briefing

The Site Manager is responsible for ensuring that all personnel are made fully aware of the constraints posed by retained trees on site and the measures in place to ensure they are protected, including having full on-site access to the Arboricultural Method Statement and Tree Protection Plan (TPP). It is good practice for the Project Arboriculturist to be involved in the site briefing to ensure all constraints and tree protection measures are clearly understood.

C.6 Site monitoring

An auditable system of Site monitoring shall be established to guide contractors on Site, ensure that tree protection measures are implemented and adhered to and to demonstrate to the LPA that any Planning Conditions have been met satisfactorily.

This includes Site visits by the Project Arboriculturist to confirm the correct installation of protective fencing, to oversee sensitive elements of works within the RPA of retained trees and to sign off the Site when works are complete before fencing can be dismantled.

The frequency of Site monitoring will be discussed with the Local Authority Tree Officer and agreed in writing before works begin on Site (but is recommended to be at least every four weeks in addition to ad hoc monitoring of particularly sensitive operations near retained trees as required). An example Site monitoring form is included as Appendix E.

C.8 Protective fencing

In many areas of the Site the works are contained within the existing highway boundary bordered by existing walls or fencing and surrounded by hard surfacing. In such cases no additional tree protection fencing is likely to be required.

Where retained trees are at risk of damage, the default position as set out by BS 5837:2012 is that retained trees must be protected from construction operations with the erection of robust protective fencing positioned on the outer edge of the RPA or crown spread (whichever is greatest). All site operations will be restricted to the area outside of tree protection fencing and this area will form a Construction Exclusion Zone (CEZ) unless agreed otherwise. Protection measures will be installed as set out in the Tree Protection Plan.

The area inside the fence and any additional tree protection measures will be sacrosanct and must not be removed or altered without the prior approval of the LPA Tree Officer. Any damage to tree protection measures must be reported immediately.

Default Specification:

Fencing shall be constructed with robust vertical and horizontal scaffold framework with weldmesh panels firmly attached in accordance with BS 5837:2012 Figure 2. Vertical support poles and bracing poles must be located with care to avoid underground utility services and will be sited to avoid the structural roots of retained trees. Where driven supports are not feasible due to the presence of roots or underground utilities block trays, counterweights or equivalent can be utilised.

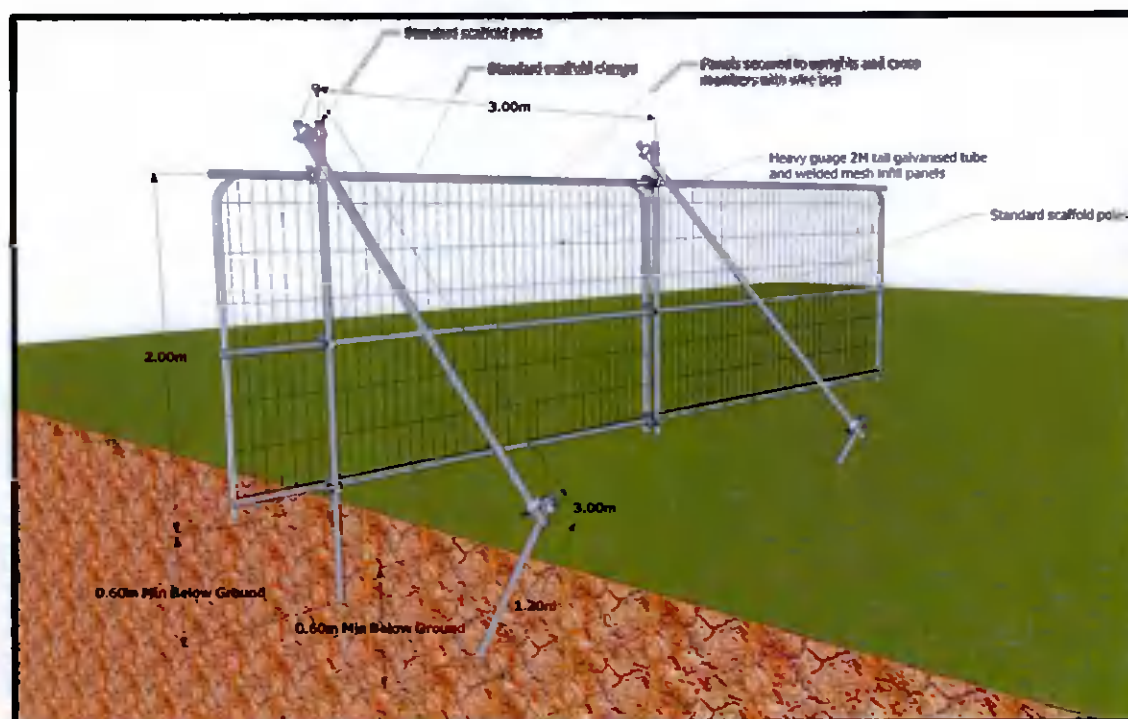


Figure 2 Default specification for tree protection barrier in accordance with BS5837:2012 figure 2.

Alternative equivalent robust and immovable fencing specification including site hoarding will also be appropriate.

Suitable all-weather signage will be fixed to fencing to notify site staff and visitors of the construction exclusion zone and its purpose (example included as Appendix D).

Failure to fully respect the positioning of barriers and tree protection measures may result in the LPA imposing a temporary stop notice or other enforcement action and is likely to require the use of a more

onerous barrier specification and potentially expensive remedial works.

When entering and exiting the Site the fencing contractor must avoid the production of ruts on the unprotected surface of the ground.

Protective fencing and ground protection shall stay in place until all construction operations are completed and removal is agreed with the Project Arboriculturist and/or the LPA.

Chestnut Paling Stem/Limb Wrapping:

Where tree stem or the limbs of trees are at risk of damage (e.g. where plant is unavoidably operating in proximity) they will be protected with a double layer of hessian, carpet felt or equivalent cushioning material and a double layer of chestnut paling fencing or equivalent hardwood batons secured with wire which is to be wrapped around the stem or branch and must not be pinned or attached to the tree itself. Measures must be removed following completion of works.

C.9 Ground protection

Existing hard surfacing will act as fit for purpose ground protection where it is to be retained within the RPA of retained trees. For existing areas of unsurfaced ground within RPAs where construction access is unavoidable ground protection will be required to protect the structure of the soil from compaction. This should also apply to areas for new tree planting.

As set out in section 6.2.3.3 of BS5837:2012 the following ground protection measures will be appropriate:

- Suitable ground protection for pedestrian only access will comprise a single thickness of scaffold boards set on a compressible layer of 100mm of woodchip on a geotextile separation layer.
- Pedestrian operated plant up to two tonnes in weight would require the use of a proprietary ground protection system (such as Ground Guards, Eki mats, Eve Trakway or equivalent) set on a minimum depth of 150mm woodchip or sharp sand.
- Heavier loads will require ground protection to an engineering specification in conjunction with arboricultural advice.

As a guide the threshold beyond which root development is significantly affected is a bulk density ranging from 1.4g per cm³ for clay soils, to 1.75g per cm³ for sandy soils.

C.10 Carriageway widening into footway or verge

Where the carriageway is to be widened into the existing footway or verge within the RPA of a retained tree this must be supervised by the Project Arboriculturist. The outer extent of the required excavation (nearest to the tree) should be carefully excavated by hand to allow roots to be assessed and pruned as necessary. Exposed roots must be covered with hessian sacking or equivalent. The existing kerb edging and haunching can then be very carefully removed with an excavator working from the existing carriageway, reaching towards the tree and working backwards, reverting to working using hand tools in areas close to retained tree roots as required.

New edging must have the thinnest profile and extent of haunching possible and pinned alternatives will be applied where feasible. Backfill is to utilise the excavated parent material to replicate the original soil profile.

The sub base for replacement hard surfacing (where required) must be hand tamped only to prevent significant compaction of the underlying soil.

C. 11 Footway or verge widening into existing carriageway

Where the footway is to be widened into the existing carriageway the existing kerb will need to be carefully removed under arboricultural supervision. Kerb stones must be removed using hand tools including pneumatic breakers. Plant positioned on the carriageway can lift out kerb sections using slings. Haunching must be carefully broken out by hand. Any exposed roots must then be covered with soil or hessian to prevent drying out. There will be no constraint on new edging or haunching as it will sit within or above the existing build-up of the carriageway where no roots are present. Backfill must utilise good quality topsoil where the verge is being widened. Where the footway is being widened the new section of the footway can be constructed using a standard methodology providing that the sub base of the existing footway is retained intact and undisturbed.

C. 12 Removal and/or replacement of an existing hard surface within an RPA

At the time of writing the full extent of resurfacing has not been fully determined but there is a potential for extensive areas of resurfacing across the Scheme. Where resurfacing is required within the RPA of a retained tree the following principles will apply:

Replacement hard surfacing on top of existing surface:

Where possible the new hard surface is to be installed on top of the existing surface and the existing edging is to be retained intact.

Removal of existing surface (wearing course):

Before work commences, the Project Arboriculturist will assess the potential for significant roots immediately below the wearing course and in such areas all works must be achieved by hand. The wearing course must be removed with hand tools (including a handheld pneumatic breaker where required). The existing surface must be 'rolled back' with contractors working from the existing hard surface and with pedestrian only access on the exposed sub base. With the prior agreement of the Project Arboriculturist it will be acceptable to use light tracked machinery such as a mini excavator with an untoothed bucket to assist with the removal of the existing surfacing where this can be achieved without damage to any significant roots beneath.

Machinery must work from existing hard standing only. Where surface roots are obviously present (and at the junction between hard and soft ground) surfacing is to be removed by hand only.

Restoring hard surfacing to soft ground:

Following the removal of the wearing course the sub base is to be broken up using hand tools via pedestrian access only. Materials must be removed using wheel barrows or via hand loading of long reach machinery positioned on adjacent hard surfacing or ground protection. The sub base is to be rolled back. Following removal any low points or hollows are to be filled with sharp sand or gravel and topsoil be applied to the required level which can then be seeded or turfed as required. This area must then be completely fenced off for the remainder of the development works or be otherwise protected with ground protection.

Installing replacement pedestrian or light vehicular hard surfacing on an existing sub base.

The sub base must be retained intact, ameliorated as required and utilised for the new surface. Levels are to be increased using inert granular fill by a maximum of 100mm. The sub base must be hand tamped only to prevent significant compaction of the underlying soil.

Exposed roots must be treated in accordance with the guidelines in Section C19 of this Method Statement.

Following the removal of existing hard surfacing the unprotected ground within RPAs must be immediately protected with protective fencing and or ground protection (where access is required) as set out in Section C9 to ensure that the structure of the soil and tree roots are protected.

Pedestrian only access onto the exposed and retained sub base will be acceptable to allow the installation of replacement hard surfacing. The new surface should be laid as quickly as possible.

Any exposed roots greater than 25mm in diameter must be assessed by the Project Arboriculturist. If roots which are to be retained are exposed at ground level these should be covered with a thin layer of sharp sand and adjacent levels built up around it. This layer must not be significantly compacted and hand tamped only.

Installing replacement heavy vehicular hard surfacing on an existing sub base:

The sub base must be retained intact, ameliorated as required and utilised for the new surface. Exposed roots are unlikely to be encountered due to the heavily engineered sub base of the existing surface. Where encountered any roots must be treated in accordance with the guidelines in Section C19 of this Method Statement. The new surface must be rolled out working from the existing sub base only.

Surfacing operations are to be conducted solely from the existing footprint of the road. Access beyond the footprint will be restricted with Tree Protection Barriers as necessary.

Edging:

Existing edging within the RPA of a retained tree will be retained intact and used as the edging for the new surface.

Where the removal of existing edging is unavoidable within an RPA this will be removed carefully by hand under the supervision of the Project Arboriculturist.

Plant positioned outside of the RPA or on existing hard surfacing within the RPA may reach in to assist in lifting edging out of its position using slings but must not be used to excavate around the edging unless otherwise agreed in advance with the Project Arboriculturist.

Where possible new edging must be installed without excavation using pinned alternatives. Where an excavated edge is unavoidable both the edging and any footing must have the narrowest profile possible. Where significant roots are present which cannot be pruned, reinforced sections of kerb acting as lintels to bridge important roots will be applied where possible.

C. 13 Installation of new hard surfacing within RPAs

Very small areas of new hard surfacing in the outer RPA of a retained tree can be constructed using hand excavation supervised by the Project Arboriculturist. Due to the very small incursion within an RPA no specialist construction measures will be required. No roots greater than 25mm in diameter will be severed without the consent of the Project Arboriculturist. Where significant roots are encountered the methodology set out below will be applied to avoid root severance. The approach below will apply where any significant area of new surfacing is required within the RPA of a retained tree.

Three-Dimensional Load Bearing Raft:

Construction of the significant areas of new footway or cycleway hard surfacing within the RPA of retained trees shall follow 'no dig' principles. The surface shall be engineer designed to meet the highest expected loads, including those used for the construction of the route.

A proprietary 3D cellular confinement system will be used to allow the hard surface to be installed without excavation within RPAs.

Work will preferably be carried out in dry conditions within the period of May to October when the ground is less liable to compaction.

Existing ground vegetation shall be treated with an approved herbicide such as glyphosate 2-3 weeks before construction takes place. Killed vegetation can then be subject to a maximum 50 mm vegetative scrape which must take place by hand. Any arisings shall be removed (if left in situ they could cause anaerobic conditions as they break down which could be detrimental to tree roots).

Any hollows must be filled with inert granular material such as sharp sand or washed no fines gravel. Builder's sand must not be used as this contains salts which are toxic to tree roots.

Any rocks, stumps (if present) or other protruding objects within the footprint of the load bearing surface must be removed. Stumps must be ground out below ground level. All other objects must be removed by hand.

A robust geotextile membrane must be laid out across the proposed area for the load bearing surface within the RPA. Joints must overlap by approx. 300 mm and be stapled together. This must be capable of resisting puncture by the angular stone fill, and also able to filter pollutants to prevent or reduce contamination of the soil. The load bearing surface is only required within the RPAs.

It is essential to consider the final levels of the load bearing surface which will typically be 75mm-100 mm in thickness for footway or cycleway applications plus the final wearing course (dependent on its application).

The final surface must be resistant to future growth of tree roots and also must be positioned to give a minimum clearance of 500mm from the base of a retained tree. The resulting gap can be filled with inert granular fill if required. A three-dimensional load bearing surface which allows the lateral and horizontal movement of air and water (e.g. Cellweb or equivalent), must be fully expanded and stapled together. This is to be laid on top of the geotextile layer. This surface must be able to support the greatest expected load the surface is likely to experience (including any construction traffic).

The load bearing surface shall be 'rolled out', with construction operations beginning from outside the

RPA or from existing hard standing and progressing forwards using the new load bearing surface. The load bearing surface must be filled with 4/20, 20/20 or 20/40 washed angular stone.

Edging is not typically required to stabilise the load bearing surface and the edge of the surface. If edging is required, this must be installed without excavation within RPAs. Appropriate methods would include the use of treated wooden peg and boards.

Concrete kerb stones can be cast directly onto the web if required, however all uncured concrete must be fully contained with impermeable plastic sheeting and sandbags to prevent run off into the RPA of retained trees. The use, storage and mixing of concrete must comply with the provisions set out in section C19.

Where a road edge kerb must be installed by excavation this must be of the thinnest profile possible with the minimum extent of haunching feasible and all excavation work must be undertaken by hand with any roots managed under the guidance of the Project Arboriculturist. Alternative kerb construction may be required where significant roots are identified (such as using lintels or equivalent to bridge important roots).

The load bearing surface must have an even transition with adjacent hard surfacing or structures. This must be achieved outside of the RPA of all retained trees. Where this is not possible, structural soil or a mixture of top soil and sharp sand can be employed to raise levels by up to 100mm. Where levels are to be raised in excess of this height the advice of the Project Arboriculturist must be obtained.

C. 14 Demolition

Existing boundary walls, noise barriers, footbridges, lamp columns and other structures are to be demolished within or close to the RPA of retained trees. All demolition must be inward into the existing footprint of the structure or away from tree positions and be achieved by working backwards away from retained trees no arisings are to fall or be stored in unsurfaced or protected areas of tree RPAs.

All plant and machinery associated with the demolition process will be positioned outside of the RPA of retained trees or on existing hard surfacing or ground protection and must operate under the guidance of a banksman where they must operate within 5m of any part of a retained tree.

Existing footings are to be retained in situ where possible to minimise disturbance, where removal is unavoidable footings within RPAs must be broken out carefully by hand or where feasible via the careful use of plant positioned outside of RPAs or on ground protection/existing hard surfacing under the supervision of the Project Arboriculturist.

C. 15 Construction of New Boundary Walls

New boundary walls are to be constructed within the RPA of retained trees. Where a new wall cannot avoid an RPA, specialist construction methods must be employed to prevent extensive root severance. Footings must utilise carefully located pads or narrow diameter piles with floating beams (at or above ground level) unless the presence of significant roots has been otherwise discounted following trial excavations under the supervision of the Project Arboriculturist.

Footings must be carefully positioned with hand dug (potentially using compressed air/soil vacuum) trial holes or trenches to identify optimal positioning to avoid significant roots.

Ground protection must be in place where repeated access is required over unsurfaced ground within an RPA.

C. 16 Installation of Piles

Where new piles are to be installed within or close to the RPA or retained trees the canopy of the tree is to be pruned back before any construction work commences on Site to provide a clearance of the pile head to facilitate this work. For smaller piles, smaller plant or pedestrian installation only should be applied.

Piling rigs to be sited outside of the RPA or on ground protection within an RPA and protective fencing is to be installed to maintain an exclusion zone within as much of the RPA as possible.

The piling rig is to be positioned as far from the canopy and RPA of the tree as possible and reach inwards.

Piles will be the lowest diameter feasible. Where piles are to be installed within the RPA of a retained tree an initial trial hole will be excavated by hand to allow for the assessment and management of any exposed roots under the supervision of the Project Arboriculturist. Pile locations will be adjusted to avoid significant tree roots where feasible.

Pile caps within the RPA must be located above the existing ground level to minimise the level of disturbance. Beams must not bear on the existing ground level unless the presence of significant tree roots can be discounted following careful trial excavation.

C. 17 Movement of Vehicles and People and the Movement and Operation of Machinery

Due to the spatial constraints on site, construction works and in particular the use of machinery must be carefully co-ordinated to avoid damage to retained trees. A banksman must be in place for any operations which occur within 5m of any part of a retained tree. Long reach machinery with jibs, booms or counterweights will require particular care.

Where trees are at risk of impact damage from plant that cannot be controlled with fencing or a careful working methodology, consideration must be given to any requirement for access facilitation pruning which must be agreed in advance with the Project Arboriculturist and local authority tree officer and tree owner where appropriate.

C. 18 Site organisation, storage and mixing of materials

The final locations for temporary site organisation and compounds will be agreed at the pre commencement site meeting with the LPA and will be confirmed in writing. A Site compound is proposed at a single location as shown on the Tree Protection Plan. The area of constraint associated with retained trees within or surrounding compounds will be fenced off as an exclusion zone at the outset.

The storage and mixing of materials and any re-fuelling shall take place at least 5m from the RPA of any retained trees and also take into account any potential for run off. Where this is an issue measures such as bunding with robust impermeable polythene sheeting and sandbags must be put in place to prevent accidental run off reaching the rooting zone of retained trees.

No changes in ground level are permitted within the RPA of a retained tree.

No fires shall take place within an RPA or within 5m of any part of a retained tree. No signs, cables or other items are to be attached to any part of a retained tree.

C. 19 General principles for the management of tree roots

Where agreed excavation by hand tools or compressed air takes place within an RPA the following principles will apply:

- Individual or small groups of roots less than 25 mm in diameter will be retained where possible but can be severed with a sharp tool such as secateurs or pruning saws to leave a clean cut end (ideally 100mm back from the face of the excavation to account for future regrowth) where they pose an obstruction.
- Where roots are encountered which are larger than 25 mm in diameter or where significant groups of smaller roots are found, the advice of the Project Arboriculturist must be sought to decide an appropriate course of action (following consultation with the LPA where appropriate).
- Roots must only be exposed for the minimum period possible. In the interim period any exposed roots (including the face of any excavation within an RPA) must be completely covered with dampened hessian sacking (which may require ongoing re wetting) to avoid drying out and exposure to light. Backfill for excavations should ideally utilise the parent material and must not be significantly compacted.

C. 20 Installation of new lamp columns, road signs

Where new features such as lamp columns, road signs are to be installed within the RPA of a retained tree the final position of the feature must be adjusted to give the greatest clearance of adjacent tree stems possible and to reduce any conflict with tree branches or any requirement for pruning.

Footings must be excavated by hand or compressed air (e.g. air spade/soil vacuum) for at least the upper 0.5-1m and be adjusted to avoid significant tree roots. Footings must be the smallest dimensions feasible and utilise screw piles or equivalent where necessary. Any uncured concrete required must use the driest mix feasible and excavations must be lined with an impermeable liner to prevent uncured concrete leaching into the surrounding soil. Any cabling must be installed in accordance with the principles set out in C22.

c. 21 Installation of new drainage within RPAs

Drainage has been designed to avoid the RPA of retained trees as fully as possible. Solutions such as surface channels, off set chambers positioned to avoid RPAs as fully as possible and hand excavated sections of piped filter drain positioned to avoid trees roots will be utilised to further reduce impacts on adjacent trees as appropriate. Where excavation for new drainage must take place within an RPA, the method of installation will be agreed in advance with the Project Arboriculturist and will typically involve the nearest area of excavation to the tree being completed by hand or equivalent to allow significant roots to be carefully exposed and pruned. Roots will be managed in accordance with the principles set out in Section C19.

C. 22 Installation or diversion of utilities within RPAs

Utility diversion and new utilities have not been fully defined at this stage. The default position is that all services be located outside of the RPA of retained trees. In the context of this Site it is not feasible to fully avoid the RPA of retained trees and therefore either trenchless installation below tree root systems or hand dug/compressed air excavation through RPAs where significant roots can be retained and worked around will be required.

Use of trenchless techniques:

Where services can't avoid the RPA of retained trees the primary consideration must be to install them using trenchless insertion techniques such as impact moling, direct drilling or equivalent

Insertion and retrieval pits must be located outside of the RPA of retained trees. The depth of the run must be at least 2m below ground level and should be located as far from the tree as possible.

The mole must be lubricated with water only.

Installation must follow the principles set out in the National Joint Utilities Group (NJUG) Vol 4: Guidelines for the planning, installation, and maintenance of utility apparatus in proximity to trees (issue 2) and BS5837 Section 7.7 and Table 3.

Replacement pipes must be installed via pipe bursting, re lining or equivalent trenchless techniques where they are located within the RPA of a retained tree. Pipe bursting or relining equipment must be positioned outside of the RPA at all times.

Hand digging:

Where trenchless installation isn't feasible shallow utility runs can be installed via hand or compressed air/soil vacuum excavation. The excavation will be located as far from the stem of the tree as possible and must be carried out by hand (ideally using compressed air such as an Air Spade and soil vacuum) under the supervision of the Project Arboriculturist.

Pedestrian only access will be permitted, and ground protection measures as set out in Section C10 will be employed where no hard surfacing is in place with fencing positioned immediately adjacent to restrict any further access into RPAs.

Excavation will be supervised by the Project Arboriculturist who will be on hand to advise on the management of any roots encountered and to ensure the approved tree protection methodology is fully adhered to. Roots smaller than 25mm in diameter can be cut with a clean sharp tool where they pose an obstruction.

Should significant roots (larger than 25mm diameter or large clumps of smaller roots) be encountered these will be retained and wrapped in dampened hessian to prevent drying out and pipes will be routed around them where ever possible. If significant roots are encountered which cannot be feasibly worked around and retained the Project Arboriculturist will liaise with the LPA to agree appropriate action.

Pipes must be constructed to resist future incursion by tree roots.

All spoil/ arisings from excavation will be placed onto ground protection boards to prevent compaction, ground level changes and to assist in removal or reinstatement. Backfill is to utilise the excavated parent material where feasible, applied to restore the soil profile to its original structure (i.e. top soil will be installed last) and must be lightly hand tamped only

Services shall be installed following the principles set out in the National Joint Utilities Group (NJUG) Vol 4: Guidelines for the planning, installation, and maintenance of utility apparatus in proximity to trees (issue 2).

C. 23 Redundant utilities

Where existing services are to be removed these must be winched out from an access/inspection chamber located outside of an RPA or left in situ.

Redundant pipe work will be sealed off and will not be removed via excavation within the RPA of a retained tree. Redundant pipe work can be filled with an inert material or if confirmed to be fully water tight may be filled with foamed concrete applied from an access point located outside the RPA of all retained trees. Concrete must be managed in accordance with section C18 of this Method Statement.

C. 24 Dismantling of tree protection measures

All protective fencing and ground protection must remain in place until all significant site works for a given location have been completed and approval has been obtained from the Project Arboriculturist and/or LPA.

C. 25 Contact details

(To be confirmed).

Site Manager: To be confirmed

Project Arboriculturist: To be confirmed

Local Authority Tree Officer: To be confirmed

Appendix D: Example Site Monitoring Form

Appointed Site Arboricultural Consultant: Company: Consultant's name: Tel: Mob:	
Development site address:	Local Planning Authority (LPA):
Developer's details: Company: Developer's name: Tel:	

Stage of Development (x)

Pre-construction works

- Tree works
- Protective fencing/tape
- Fencing signage
- Ground protection
- Temporary haul road

Construction works

- Demolition
- Grading/muck away
- Placing portacabin
- Excavation/services
- Construction work

Post-construction works

- Rectifying tree damage/pruning
- Hard landscaping/walls/drives
- Removal of protective fencing etc
- Soft landscaping
- Special surfacing Tree planting

Comments:

Appendix E: Tree Protection Signage (Example)



PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.



**TREE PROTECTION AREA
KEEP OUT !**
(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION
ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY



This report was prepared by:

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Yours in Conservation,
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