



THE ARBORICULTURAL
CONSULTANCY LTD

Arboricultural Method Statement

Ashworth Mansions, Elgin Avenue, W9 1JP

Report Reference Number: AMS.AM.0885.V1

Version: One

Date: 24 March 2024

Site address:
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Qualifications			
Foundation degree in Arboriculture (level 5), Lantra Professional Tree Inspection.			

Details:

Purpose of the report:

The report is designed to fulfil the recommended criteria for the provision of arboricultural information, with the primary objective being minimal impact to trees maybe affected by the proposed retaining dwarf wall and walkway slab replacement.

Client: Collins (Contractors) Ltd

Date: 24 March 2024

Report prepared by: Mr B Tidey FdSc (arb) of The Arboricultural Consultancy Ltd

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Site Address:

Ashworth Mansions
Elgin Avenue
W9 1JP

Use of Report:

This report is to give information on tree stock and is to be used in conjunction with;

- Tree protection Plan TPP.AM.0885.V1
- Arboricultural Impact Assessment AIA.AM.0885.V1

Proposal:

The proposed development is for the demolition and rebuild the dwarf wall due to it bowing as well as replacement of deformed concrete slab. The area is a walkway with retaining wall that leads to steps that head down to basement dwellings.

Use of Report:

This report is to be used at the development and operational stage, not all the information is applicable to every reader. The summary highlights which areas are more applicable to specific users of the report to help target the relevant information to those implementing the necessary instruction.

Report Outline Information

All tree inspections, unless specified, have been undertaken from ground level and using non-invasive techniques. Comments contained within the report on the condition and risk associated with any tree relate to the condition of the tree at the date and time of survey. Please note that the condition of trees is subject to change. This change may occur but is not limited to biological and non-biological factors as well as mechanical/physical changes to conditions in the proximity of the tree. Trees should be inspected at intervals relative to identified site risks and in accordance with relevant HSE and Central Government guidance. The Arboricultural Consultancy can provide further information on this matter if required. Where tree surgery works have been identified these should only be undertaken after checks with the relevant authority have been made, it is necessary to ensure that works may lawfully be undertaken. Up to date checks should be made as to the possible protection status of trees/vegetation or land they are located within, these checks should cover, but are not limited to; Tree Preservation Orders (TPOs), Conservation Area, planning conditions, Areas of Outstanding Natural Beauty (AONBs), Ramsar, Special Protection Areas (SPA), Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI). Locations of designation can be found at <http://magic.defra.gov.uk/MagicMap.aspx> and further advice on designations can be found at <http://jncc.defra.gov.uk>. Further advice on TPOs, Conservation Areas or planning condition can be found with the local governing organisation. All works should be undertaken in accordance with the appropriate Duty of Care. This should include, for example, site specific risk assessments and due diligence inspections for the presence of protected species. Any comment relating to 3rd party trees has been made without full access to the tree(s). Should these trees have any impact on the site we would advise you to instruct us to contact the third party and undertake further inspection work.

This survey and report have been undertaken and produced by The Arboricultural Consultancy Ltd. All information within this report was correct at time of assessment.



Ben Tidey FdSc
Consultant Arboriculturist
Sunday, 24 March 2024

Report Caveats:

The trees have been surveyed in accordance with the criteria set in the *BS 5837: Trees in Relation to Design, Demolition and Construction 2012*. A full hazard assessment of the trees (including assessment of decay or their defects and their implications) has not been undertaken as this is considered beyond the scope of this report. Any obvious hazards and defects have been identified where relevant in the Tree Survey Schedule and appropriate relating works have been recommended. Where relevant, trees not located within the legal property of the owner have been included and any works would be subject (where relevant by law, Statute and Common) to the owner's permission. Where appropriate further investigative works to be undertaken have been detailed and recommended. This may include climbing inspections, below ground exploratory investigations and the use of specialist decay detection equipment. Detailed ecological considerations are also beyond the scope of this report. UK and European Wildlife Legislation may affect the timing and even prohibit the enhancement of works and operations described in this report. Most of the information regarding wildlife can be found in the Wildlife and Countryside Act 1981 & updated 1994. This includes information of wild birds, bats, badgers and some insects. Bats in particular are afforded particular protection and a specialist is required to determine if bats are present or may be affected when carrying out tree works. Further information is available from Natural England.

It is accepted that this document may need to be updated and more detailed information added throughout the planning and development process. However this document will be the main documentation for reference in the event of disputes.

1.0 Introduction

- 1.1. The Arboricultural Consultancy have been appointed to provide advice on the arboricultural issues relating to the development at Ashworth Mansions, Elgin Avenue.
- 1.2. This report has been compiled using the information gathered during the tree assessment and constraints plan undertaken in December 2023. The trees were assessed to standards set out in *BS 5837:2012: Trees in relation to design, demolition and construction – Recommendations*.
- 1.3. Following preparation of our Tree Schedule and Tree Constraints Plan, these documents have been used to produce a method of works that;
 - Is appropriate to the scale of the works
 - Has the minimal impact on the overall treescape
 - Is practical and can be undertaken
 - Is agreed by, and is suitable for all parties
 - Is compliant where necessary with *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations*.
- 1.4. The tree numbers used in this report refer to the tree numbers used in our Tree Protection Plan (TPP).

2.0 Executive Summary

- 2.1. The proposed development is for the demolition and rebuild the dwarf wall due to it bowing as well as replacement of deformed concrete slab. The area is a walkway with retaining wall that leads to steps that head down to basement dwellings.
- 2.2. The primary impact to trees will be from the replacement of the dwarf wall and concrete slab, it is likely that tree roots to have grown in proximity to this area and the project design accounts for this.
- 2.3. There is a potential for damage to above tree parts, with the tree T3 being close to the operational area, this shall have its trunk protected with boxing to stop inadvertent damage, further to this T2 and T4 are to be protected with barrier fencing during development operations.
- 2.4. The area that will be used for development operations will be within the area of the pavement and from on the slab that is to be replaced, this will mean there is no further impact to trees.
- 2.5. There will be a requirement to ensure that trees are suitably protected with barrier fencing, that the tree close to the operations area has its trunk protected, and that where there is demolition within RPAs these this is undertaken in a way to minimise damage to rooting and where there is a requirement to install the new retaining dwarf wall and slab this shall be done in such a way as to mitigate tree damage and to account for the roots and there growth.
- 2.6. Where there are any roots exposed during excavations these shall be delt with in such a way as to minimise the impact to trees, this will include pruning of tree roots 25mm diameter and under where they are intergrown with the structures, this pruning is to be undertaken to a suitable site branch union using sharp secateurs or saw, where roots are over 25mm diameter these shall be wrapped in hessian to stop

desiccation and reduces the impacts from rapid temperature change. These roots shall be retained and protected during the rest of the development, all operations to roots shall be under the instruction of the project arboriculturist.

- 2.7. Methods to reduce or stop tree damage are applicable for this project and all parties involved should take responsibility to ensure there working method is appropriate.
- 2.8. With the implementation of protective barrier fencing and protective boxing, as well as management of discovered tree roots, the impact to trees from the project can be greatly reduced.

3.0 Arboricultural Protection Methods and Specifications

3.1. The below tables outline the criteria that is required to achieve suitable tree.

3.2. Tree Protection Plan

Table 1 - Tree protection plan criteria

SCOPE OF WORKS	CRITERIA
Tree Protection Plan	<ul style="list-style-type: none"> • Includes details and location of the tree protection fencing of the Root Protection Areas (RPA) to define the Construction Exclusion Zones (CEZ) • To indicate areas of 'hand-dig under supervision' within RPAs • To show the location of temporary ground protection where required • To show what trees/hedging is to be removed • To indicate what trees will most likely need pruning • A copy of the tree protection specifications are indicated on the Tree Protection Plan.

3.2.1. This can be found within document, Tree Protection Plan TPP.AM.0885.V1. This will provide a plan with locations of specific protection requirements.

3.3. Protective Fencing

Table 2 - Protective fencing criteria

SCOPE OF WORKS	CRITERIA
Protective fencing	<ul style="list-style-type: none"> • Location of fencing shall be as detailed in the Tree Protection Plan TPP.AM.0885.V1 • Protective fencing must be in place prior to any site activities, it is recommended that this fencing is installed at the time site hoarding is erected • To be effective the tree protective fencing must remain in place for the duration of the development • Protective fencing for all trees shall consist of Heras style fencing panels installed as recommended in the <i>BS5837:2012</i> • <i>Tree boxing to be installed where there is a potential for contact with tree stems.</i>

3.3.1. The site barrier fencing is located to suitably protect trees and shall remain in situ for the duration of the project.

3.3.2. Tree T3 shall have boxing of the lower trunk to stop inadvertent trunk damage. The boxing shall be full sheet height (2.4m) and protects all sides of the tree built over a 2x4 frame, this shall be screwed together and have a protective layer inside formed of

something compressible such as an insulation board or polystyrene. No part of this shall be in contact with or connected to the trees.



Figure 1 - Plyboard protecting tree trunk

3.4. Site Inspection, Monitoring and Supervision

Table 3 - Site inspection, monitoring and supervision criteria

SCOPE OF WORKS	CRITERIA
Site Inspections and Supervision	<ul style="list-style-type: none"> • Arrange details of communication between the inspecting arboriculturist, and client / client appointed ground worker, demolition contractor etc. • Details, instructions and authority for inspections should be provided and retained on site at all times. • To ensure that the construction process is undertaken with minimal disturbance to the retained tree stock, we recommend that the experienced arboricultural consultant from The Arboricultural Consultancy Ltd is appointed to undertake supervision at key points that may present an opportunity for tree damage site inspection / supervision schedule below. • During the site visit any changes to the proposed works will be discussed, their impact assessed and recommendations for best practice will be outlined. After the visit a copy of a report should be sent to the Site Manager, Local Authority Tree Officer and Client. • Any damage or incidents regarding the retained trees should be reported to the consultant arboriculturist at The Arboricultural Consultancy Ltd. Any incidents requiring a planning variation will only be completed after prior approval and consultation with the LPA. • Where excavations are necessary within RPAs then this should be under the supervision of an arboricultural watching brief/ supervision. • Full list of proposed supervision/ inspections to be found in the Appendix.

3.4.1. Site supervision from the project arboricultural consultant from The Arboricultural Consultancy Ltd shall be provided at key points this will be where there are times where there is an increased risk to the trees this will be: demolition of/ removal of wall and slab and installation of new dwarf wall and slab.

3.4.2. Reports from site inspections/ supervisions will be provided, these should be shared with the LPA tree officer and kept on file.

3.5. Removal of Existing Hard Surfacing Within or Close to the RPA of Retained Trees

Table 4 - Removal of existing hard surfacing within or close to the RPA of retained trees criteria

SCOPE OF WORKS	CRITERIA
Removal of existing hard surfaces within RPA of retained trees	<ul style="list-style-type: none"> • Remove the hard surfacing with a mechanical hand held tool, working in small sections making the shallowest possible excavations. • Remove arisings away from the tree area immediately. • There may be shallow adventitious / feeding roots immediately below the surface of the tarmac / hard surfacing, therefore great care should be taken. • Cover the area with a shallow layer of sharp sand / damp hessian sacking immediately to prevent desiccation of surface roots. • If any roots over 25mm are accidentally scuffed by machinery, the advice of The Arboricultural Consultancy Arboricultural consultant, should be sought. It is likely such small roots can be cleanly cut with a sharp hand saw or secateurs. • The depth of the sub base below the existing surfacing is unlikely to be known at this stage. It may be that once the top surfaced is removed the depth of existing sub-base will be sufficient for the loading to be applied to it with the new surface finish ie. new tarmac or block paver (The structural engineer will need to make this assessment). In this instance a cellular confinement sub-base will not need to be laid.

3.5.1. The area of the walkway concrete slab is close to protected trees and there is likely to be tree roots present.

3.5.2. All operations within the precautionary zone (area within the RPA where operations are required) shall be undertaken by hand using hand tools, however a small excavator may be used if this excavator can sit outside of the precautionary zone and reach in. there will be no excavation/digging with this machine of any type, the machine is only for the braking up of the slab and removal of arisings.

3.5.3. All arisings shall be removed from the area as they arise, this shall be done by hand or where possible by manually loading the excavator bucket. The excavator bucket must not come in to contact with the ground as there is very high possibility of root damage.

3.5.4. All operations within the precautionary zone are to be under strict arboricultural supervision by The Arboricultural Consultancy arboricultural consultant.

3.6. Demolition in proximity to retained trees

Table 5 - Demolition in proximity to retained trees criteria

SCOPE OF WORKS	CRITERIA
Demolition and removal of existing structures in proximity to trees	<ul style="list-style-type: none"> • Where there is a potential for a conflict between tree branching and operations then branching shall be pruned back or tied back to allow adequate operational space • Remove arisings away from within the tree RPA area immediately • Where removal of structures within the RPA there shall be barriers erected and ground protection installed up to the base of the structure • All plant and machinery shall operate from outside of the RPA or from on top of suitable ground protection • Where trees stand adjacent to structures a “top down pull back” method of operations shall be used • Where possible underground structures shall be left in place to minimise root disturbance, advice for the project arboricultural consultant shall be sought • Where there may be a build up of dust on the tree foliage this will need to be hosed off to keep trees fully functioning.

3.6.1. There will be a need to use a modified method of demolition in proximity to T3. All operations shall be undertaken working away from the tree.

3.6.2. All tree protection must be installed and remain unmoved and undamaged throughout the process. If the operation is not possible because of tree protection the project arboriculturalist shall be consulted.

3.6.3. All operations within the precautionary zone (area withing the RPA where operations area required) shall be undertaken by hand using hand tools, however a small excavator may be used if this excavator can sit outside of the precautionary zone and reach in. there will be no excavation/digging with this machine of any type, the machine is only removal of arisings.

3.6.4. All arisings shall be removed from the area as they arise, this shall be done by hand or where possible by manually loading the excavator bucket. The excavator bucket must not come in to contact with the ground as there is very high possibility of root damage.

3.7. Installation of New Hard Surfacing and construction of the new dwarf wall

Table 6 - Installation of New Hard Surfacing

SCOPE OF WORKS	CRITERIA
Installation of New Hard Surfacing	<ul style="list-style-type: none"> • Shall be as prescribed is the development plans • Shall be located on areas of previous hard surfacing • The design shall not require any excavation into the soil within RPA.

3.7.1. There will be a requirement for replacement hard surfacing and the installation of a replacement dwarf wall within the RPA of T2, T3 and T4.

3.7.2. The new surfacing will be formed of a 50mm binding layer that is to be compacted by hand only ensuring there is no damage to tree roots, on top of this a 200mm clay board will be layer that will have cutouts to allow space for tree roots, tree roots will be

surrounded with uncompacted topsoil or sharp sand (builders’ sand should not be used because of its high salt content, which is toxic to tree roots), on top of this will be a non-permeable membrane that will stop cement leachate from contaminating tree roots, a 125mm reinforced slab will then be layer over this.

- 3.7.3. The dwarf wall will sit on the existing wall footings and will allow for tree roots with space crate that will be bridge over with a steel lintel, this must allow sufficient space for the roots and root growth the tree roots will be surrounded with uncompacted topsoil or sharp sand (builders’ sand should not be used because of its high salt content, which is toxic to tree roots).
- 3.7.4. Full specification to be found in [appendix](#).
- 3.7.5. All operations withing the precautionary zones shall be under the supervision of the project arboricultural consultant.

3.8. Excavation Within RPA of Retained Trees

Table 7 - Excavation within the retained tree RPAs criteria

SCOPE OF WORKS	CRITERIA
Excavation within the retained tree RPAs	<ul style="list-style-type: none"> • Excavations with the trees’ Root Protection Area will likely require the severing/pruning of roots. • If necessary a full specification on remove existing hard surfacing is found in the Appendix. • If roots with a diameter of less than 25mm are found, then they are to be pruned to a side root, or suitable point, with secateurs. • If a major root with a diameter of over 25mm, clusters, or mases of fibrous roots are discovered then where possible they are to be protected, they shall be wrapped in hessian and hand dug around the roots and tunnel underneath (this may cause a confined space for which a Risk Assessment will need to be undertaken).

- 3.8.1. There is no proposed excavation within the RPA of retained trees, however if specific situations arise there may be a requirement to modify the soils.
- 3.8.2. All operations must only be undertaken by hand using unpowered hand tools and under close supervision.

3.9. Site Compound and Material Storage

- 3.9.1. The site compound(s) will be planned to provide adequate space for operations required and will be outside of all RPA and construction exclusion zones.
- 3.9.2. All storage of materials will be outside of RPA and construction exclusion zones and be located to prevent soil contamination within RPAs.

4.0 Responsibilities and Delegate Powers

- 4.1. The project management will be responsible for contacting the local planning authority or project arboriculturalist should any issue be raised relating to the trees effected by the project.
- 4.2. It will be the responsibility of the project manager to ensure that all planning conditions attached to the planning consent are adhered to and that an auditable regime in regards to tree protection is adopted on site.
- 4.3. The contracts manger will be responsible to the project arboriculturalist on all tree related matters, in the first instance where construction is halted for tree protection. Should there be no line of communication then the Local Authority tree officer will be contacted. In the absence of any advice or supervision, all work must cease until relevant permissions are gained.
- 4.4. If further pruning works are required at any time then the contracts manager will request permission from the Local Planning Authority through their project arboriculturalist and all works must be carried out to the relevant specification.
- 4.5. The contracts manger will ensure the project is sequenced is appropriately to ensure that no damage occurs to trees during any phase of the project, all protection measures will remain in position until completion of all construction work.
- 4.6. All tree protection measures will remain in position and will have regular monitoring by a responsible and designated person on site. An auditable system of management of tree protection measures must be made available for scrutiny by the Local Planning Authority should they request it.

5.0 Terms of Reference

5.1. Reference Documents:

BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*

BS3998:2010 *Tree work – Recommendations*

5.2. Documents supplied by the client:

- 39023-SK20 - Retaining Wall Setting Out Plan

6.0 Statutory Protection

- 6.1.1. All trees include within this report are subject to a Tree Preservation Order or within a conservation area.

7.0 Conclusion

- 7.1. Tree protection measures in this Arboricultural Method Statement and the accompanying Tree Protection Plans are deemed appropriate and will offer the best solution with minimal arboricultural impact.
- 7.2. The recommended protection and working methods should be adhered to by all persons at all times and if there is need to deviate from this specification then advice from the project arboriculturalist shall be sought and an amended method statement may need to be issued.
- 7.3. If all the above measures are undertaken then the necessary work at will have the minimal effect on the retained local treescape, and with the proposed tree planting there will be an enhanced tree cover as trees mature.

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Appendix 1: Tree Schedule

Tree ID	Common Name/ Latin Name	Category/ Subcategory	Life Expectancy	Maturity	Height (m)	Stem(s) diameter (DBH)	Root Protection Area (m ²) / Circle Radius (m)	Spread (m) N:E:S;W	Height and Direction of first significant branch (m)	Crown Height (m) N:E:S;W	Physiological Condition	Physical Condition	General Observations	Management Recommendations
T1	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Mature	13	670	203.1/8.0	4.5;4.5;5;4. 5	W3.5	6;6;7;7	Good	Good	Located within pavement, tree managed as a pollard with recent pruning, tree in proximity to excavations, with roots exposed from excavations	Protect roots that are exposed
T2	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Early- mature	10	370	61.9/4.4	3.5;3.5;2;3. 5	E2	5;5;5;5	Good	Good	Located c.150mm from wall, tree managed as a pollard with recent pruning, tree in proximity to excavations	No management required
T3	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Early- mature	10	450	91.6/5.4	3;4.5;3;2.5	W2	5;4;5;5	Good	Fair	Located c.150mm from wall, tree managed as a pollard with recent pruning, tree in proximity to excavations, longitudinal damage to trunk from base to crown break, damage to northern stem at 2.5m on upper side with wound cavity and decay	Remove compromised branch
T4	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Early- mature	8	320	46.3/3.8	1;2;3;1	S2	5;5;5;5	Fair	Fair	Located c.150mm from wall and 30mm from wall pillar, tree managed as a pollard with recent pruning, decay cavity on lower southern branch over pavement	Remove compromised branch
T5	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Mature	10	440	87.6/5.3	3;2;4;3	E2	5;3;5;4	Fair	Fair	Tree managed as a pollard with recent pruning, tree in proximity to development operations	Protect trunk during development operation.

Tree ID	Common Name/ Latin Name	Category/ Subcategory	Life Expectancy	Maturity	Height (m)	Stem(s) diameter (DBH)	Root Protection Area (m ²) / Circle Radius (m)	Spread (m) N;E;S;W	Height and Direction of first significant branch (m)	Crown Height (m) N;E;S;W	Physiological Condition	Physical Condition	General Observations	Management Recommendations
T6	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Mature	10	430	83.7/5.2	3;2;3;2	E2	5;5;5;5	Fair	Fair	Located c.150mm from wall, tree managed as a pollard with recent pruning.	No management required
T7	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	40+	Mature	10	380	65.3/4.6	3;1;3;1	E2.5	5;5;6;5	Fair	Fair	Located c.200mm from wall, tree managed as a pollard with recent pruning.	No management required

= Dimensions estimated

* = Tree covered by a Tree Preservation order (TPO) or within a conservation area

T = Tree

TG = Tree Group/ Hedgerow

Appendix 2: Impact schedule

Tree ID	Common Name/ Latin Name	Category/ Subcategory	Impact from the development	Mitigation Required
T1	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Replacement of retaining wall within RPA • Excavations within RPA 	<ul style="list-style-type: none"> • Outside of development area
T2	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Replacement of retaining wall within RPA • Excavations within RPA 	<ul style="list-style-type: none"> • Arboricultural supervision when working within RPA • Protection of roots during operations • Modified build method to protect tree roots
T3	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Replacement of retaining wall within RPA • Excavations within RPA 	<ul style="list-style-type: none"> • Arboricultural supervision when working within RPA • Protection of roots during operations • Modified build method to protect tree roots • Trunk boxing around trunk to stope inadvertent damage
T4	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • No impact from the development 	<ul style="list-style-type: none"> • Arboricultural supervision when working within RPA • Protection of roots during operations • Modified build method to protect tree roots
T5	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Tree in proximity to development operations 	<ul style="list-style-type: none"> • Outside of development area
T6	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Tree in proximity to development operations 	<ul style="list-style-type: none"> • Outside of development area
T7	London Plane/ <i>Platanus × acerifolia</i>	A / 1,2	<ul style="list-style-type: none"> • Tree in proximity to development operations 	<ul style="list-style-type: none"> • Outside of development area

Appendix 3: Key terms and abbreviations

Arboricultural Implication Assessment (AIA):

An assessment of the arboricultural impact of a development.

Arboricultural Method Statement (AMS):

Contains references to tree protection information.

Arboriculturalist:

Person who has relevant education and training, gained expertise in the field of trees.

British Standard 5837: 2012 Trees in Relation to Design, Demolition, and Construction - Recommendations (BS 5837):

British Standard document outlining best practice and guidelines for the impact of arboriculture on the construction industry.

British Standard 3998 2012 Tree Work Recommendations (BS 3998):

British Standard document outlining best practice for Tree Works.

Competent Person:

Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

Construction:

Site based operations with the potential to affect existing trees.

Construction Exclusion Zone:

Area based on the root protection area from which access is prohibited for the extent of the project.

Root Protection Area (RPA):

Layout design tool indicating the minimum area around a tree deemed sufficient to protect roots in order to maintain the trees health and viability.

Service(s):

Any above or belowground structure or apparatus required for utility provision e.g. drainage, gas supply, water, ground source heat pumps, soak-a-ways, CCTV, telecommunications.

Stem:

Principle above ground structural component(s) of a tree that supports the branches/crown.

Tree Protection Plan:

Scale drawing, informed by descriptive text where necessary, based upon the finalised proposals, showing the trees for retention and illustrating the tree and landscape protection measures.

Appendix 4: Tree Protection

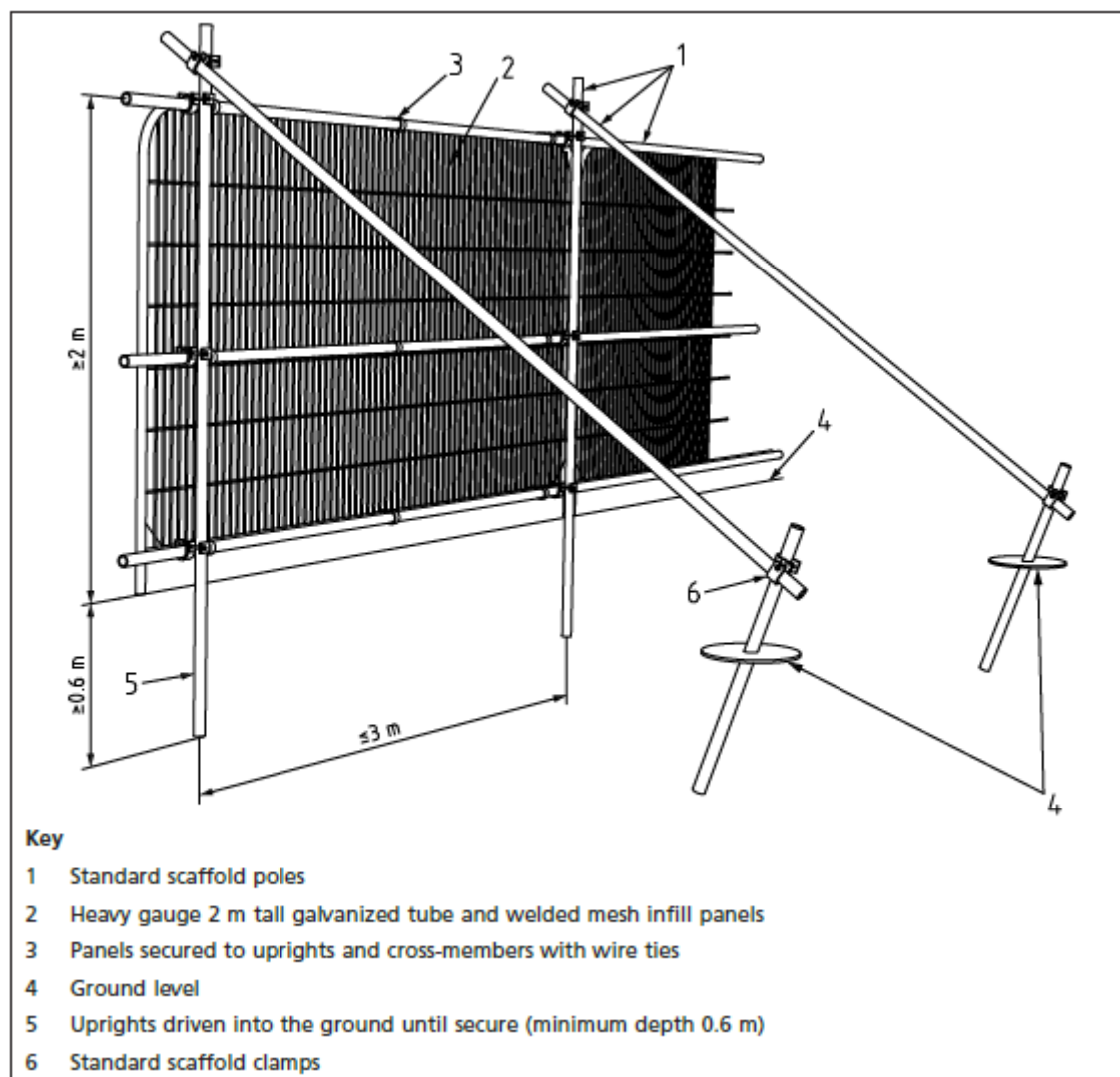
BARRIERS/FENCING

All barriers/fencing agreed for the development must be installed prior to any works starting on site and ideally in conjunction with the erection of the site security measures. All barriers/fencing must stay in place until the all works on site are finished or as agreed by the consultant arboriculturalist and/or planning authority.

Default Specification:

The default specification consists of a vertical and horizontal scaffold framework that is well braced to resist impacts from vehicles and construction site operations. The specification recommended in the current BS 5837 states the vertical tube should be spaced at maximum intervals of 3m and should be driven securely into the ground. Once in place welded mesh or similar (Heras panels) will need to be securely fixed to the scaffold framework.

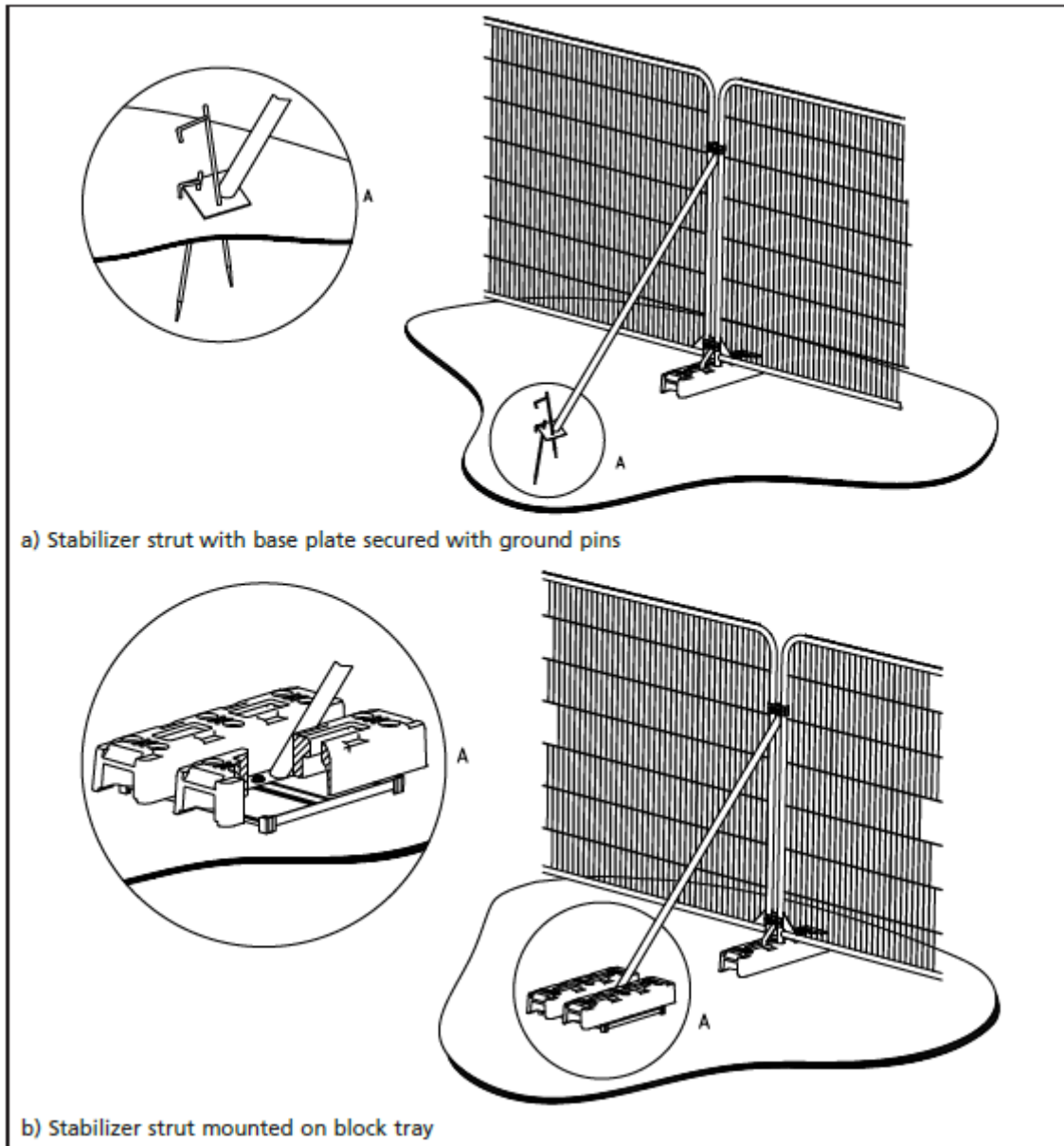
Figure 2 Default specification for protective barrier

**Alternative Specification:**

Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturalist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated

plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

Figure 3 Examples of above-ground stabilizing systems



Signage:

All tree protection fencing is required to have signs attached at 4-6m intervals. Below are examples of the required signage to be attached to the tree protection barrier.



Above: Three examples of tree protection fencing signage ranging from a simple sign (*left*) attached with zip ties to more in-depth signs (*middle & right*) explaining the limitations and legal protection status of the trees being protected.

Ground Protection

Ground protection is required during the development process to protect the retained trees.

Root Protection Areas from construction operations.

This can be where permanent working space is needed or temporary access is justified within the RPA, which would involve setting back the tree protection barrier. Where possible existing hard surfaces within RPAs need to be utilised or retained for ground protection rather than being removed during demolition operations. Where tree protection barriers are set back from the perimeter of the RPA exclusion zone exposing unmade ground to construction damage, new temporary ground protection will be installed prior to construction starting. Below are some general specifications for ground protection based on the type and weight of traffic.

Pedestrian Access

For pedestrian traffic ONLY a single thickness of scaffold board (40mm) or wooden boarding is to be laid on a minimum of 100mm deep woodchip, which is laid upon a geotextile membrane.

Small Plant Up To 2 Tonne (2000kg)

For small plant machinery with a gross weight of up to 2 tonne (2000kg), interlinking polyethylene or aluminium track way needs to be laid on a minimum of 150mm deep woodchip which is laid upon a geotextile membrane.

Regular Traffic and Plant Up To 3.5 Tonne (3500kg)

Where heavy traffic is expected from pedestrian to vehicular with a gross weight of up to 3.5tonne, interlinking aluminium or metal track way must be used over a minimum layer of 200mm deep woodchip, which is laid upon a geotextile membrane.

Appendix 5: Working in root protection areas

Prevention of detrimental impact to RPAs: In most instances the RPA will need to be completely isolated from construction and development operations using tree protection barriers and ground protection. This is the most reliable way to ensure the preservation of the RPA and retain it completely undisturbed. The RPAs of the trees to be retained have been shown diagrammatically on the Tree Protection Plan along with accurate location of any tree protection measures.

However some operations will require specific works to be carried out in the RPA and anyone entering the RPA must follow the guidelines below to ensure the minimal amount of disturbance is afforded at all times. Any operations in the RPA needs to accord to the principle that the tree and soil structure takes priority. This will help retain and preserve healthy, valuable trees in the landscape and development but also prevent costly and potentially dangerous situations from occurring during and after the works has been completed.

The two main instances where these guidelines for entering and working must be followed are:

1. Removal of existing surfaces/structures and replacing those with new surfaces, structures, landscaping.
2. Preparation and installation of new surfacing, structures, landscapes.

Most of the other operations can utilise some form of ground protection to prevent or reduce the impact on the RPA.

Excavations within the RPA and root retention: Any excavations carried out within the RPA must be done so by hand using spades, forks and trowels, taking care to limit the amount of damage caused to the outer bark and woody structure of the roots. The fork should be used to loosen the soil in the excavation area and help locate any substantial roots (25mm- 100mm diameter). A trowel can then be used to remove the soil from around the roots taking care as to not damage the bark.

Once the roots have been exposed, those that are to be removed (any roots up to 25mm in diameter) can be done using sharp secateurs or a handsaw. Any roots above 25mm in diameter, where possible, need to be retained and protected from drying out and temperature extremes by wrapping or covering them in a suitable material e.g. hessian, spare membrane material, plastic. This wrapping needs to be removed before any back filling takes place. Some roots over larger areas of excavation can be displaced where possible to bend round any new structures or pipework whilst remaining intact. Roots with a diameter of 25-100mm should only be cut in exceptional circumstances and after consultation. Roots above 100mm should only be cut after consultation with the appointed arboriculturalist. Alternatively using compressed to displace the soil is always preferable and more affective especially over larger areas or to remove soil quicker while keeping roots intact. This may be part of the specification and would be included within the Arboricultural Method Statement.

Arboricultural Supervision: All works being carried out within the RPA must be carried out with great care and be supervised by a qualified arboriculturalist to ensure that the contractors understand the need to minimize any detrimental impact on the retained root system. This is done through properly briefing before the work commences along with regular site inspections and signing the work off when completed.

Removal and Demolition of Structures and Surfaces: As with all operations carried out within the RPA exceptional care must be taken to ensure any detrimental impact on the roots and soil structure is kept to an absolute minimum. Where any structure is being demolished (above or below ground) within the RPA additional barriers is recommended to protect the remaining RPA, above ground stem and branch structures. Where there are no hard surfaces or they are due to be removed from within the RPA, plant machinery should operate from outside the RPA providing there is a long enough reach. Where this is unfeasible ground protection must be used to prevent soil compaction from plant machinery conducting the demolition operations. Where possible any suitable load bearing hard surface already existing within the RPA should be retained during demolition. This prevents any additional damage to the underlying soil structure by allowing the surface to support the plant machinery and falling material. Where the hard surface in the RPA is due to be removed, where possible it should remain in-situ for as long as possible. Before any demolition process takes place it should be determined whether any access facilitation pruning is required to provide clearance and prevent physical damage between the plant machinery and tree structures. In some situations working space can be provided by temporarily tying back tree branches. Both tying and pruning need to be specified by a qualified arboriculturalist and ideally follow the guidelines set out in BS 3998 2012 Tree Work Recommendations.

Debris to be removed from within the RPA must be done so across existing hard surface or temporary ground protection so as to prevent compaction of the soil structure. If possible the material can also be lifted out of the RPA using suitable machinery preferable with a long reach.

Where trees are standing adjacent to structures that need to be removed, the demolition should be undertaken inwards within the footprint of the existing building, often referred to as 'top down, pull back'. Where underground structures are present within RPAs and will become redundant it is preferable to leave the structures in situ rather than remove them, which could cause considerable root damage. Where hard surface is scheduled for removal within RPAs care must be taken to not disturb the root structure that could be present underneath. Hand held tools or carefully supervised machine work could be utilised to remove the surface. This should be working backwards away from the retained trees and not moving over the newly exposed ground.

New Structure Guidelines: All new structures being proposed in the RPA have the potential to cause damage to root structures and alter the ground conditions. The age and maturity of the trees will affect the viability and type of incursion into the RPA available. Younger trees are more robust and adaptable to changes in their environment where as mature and Veteran trees tolerate very little disturbance to their soil and root structures. When constructing inside RPAs the goal is to minimise the amount of soil disturbance/compaction and retain a good level of gaseous and water exchange.

Constructing above ground using pile and beam construction limits the amount of disturbance to the soil and root structure which reduces the adverse effect on physiological processes. Most solutions need to be well thought out and are a combined effort and communication of ideas between the engineer, architect and arboriculturalist.

Light Weight Structures e.g. Sheds, Small Storage: Small structures with relatively small foundations that spread load bearing can be constructed straight onto the surface without the need for any excavations. A certain amount of ground levelling is permitted but only to the top 50mm of the soil to fill in any undulations and provide a level surface. Anything above the 50mm will need to be raised up above the existing ground level to achieve the desired surface. Any ground works required must be carried out with great care so as not to damage retained tree roots. Small roots below 25mm can be severed with a sharp saw or secateurs. A membrane will be required between the ground and the bottom of the foundation to prevent leeching of potentially harmful chemicals materials e.g. cement into the soil. Frames can be constructed and fixed onto the ground using stakes from which the foundation can be produced. But there are recommendations for the amount of RPA that can be covered.

New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

Fencing, Posts, and Small Piers: Generally, the construction of fencing that doesn't require a strip or wall foundation can be installed with having very little impact on the soil and root structure. It is acceptable to dig small holes up to 300mm x 300mm for the installations of posts or piers so long as the digging is carried out carefully and by hand as directed in Appendix. 5.4 Or preferably by compressed air. Any roots up to 25mm in diameter may be severed using a sharp saw or secateurs, if possible the hole being dug could be widened or moved to enable retaining the root(s) whole. Any roots 25mm+ should be retained where possible but may be severed after consulting the appointed arborist; further guidelines have been explained above. Ideally holes should be dug as far away from the main stem as possible where larger diameter roots are less likely to be encountered and less damage will occur. When installing posts or piers in the RPA the smallest feasible hole possible must be used when excavating for the foundations of the posts to reduce the impact to the RPA.

Buildings, Walls, Bridges on New Foundations: Most conventional foundations are done by producing a strip of concrete dug into a trench in the ground. This is not acceptable practice in RPA's with the potential to cause large amounts of damage to root systems causing decline in the trees health, making the tree structurally unsound. Small diameter piles supporting beams or cast flooring are permitted within the RPA's as they will reduce the potential damage to root structure. But before any piling is carried out suitable ground protection must be put down to prevent soil compaction from the piling rig leaving gaps in the ground protection for the pile locations. Hand excavations need to be carried out in the location for each pile down to a depth of 700mm to establish whether there are any substantial roots in the pile location. If substantial roots are discovered (25mm+) the appointed arborist will make a decision whether the root can be severed or if the pile location has to be moved. The supporting beams connecting to the piles cannot be lower than the existing ground level resulting in the need for further excavations. The beams should be constructed off site allowing them to be lowered in to position without the need to be casted in the RPA.

Services: New services and service runs should where possible be sited outside the RPA of retained trees to prevent unnecessary damage to root structures. Sometimes there is the need to upgrade existing services, which requires excavation, this can cause extensive damage and render the trees structurally unsound. This should be a last resort and all decisions need to be in conjunction with the consulting arborist.

New Surfaces Guidelines: The installation of new surfaces within the RPA can be very damaging to the root structure and soil conditions. Excavations required for the laying of new sub bases and level grading could both cause extensive root damage to retained trees.

Excessive soil level alterations and new surfaces can change the condition of the soil and the environment the roots survive in, altering moisture content and the ability for gaseous exchange. Ideally any new surface needs to be permeable to allow moisture transfer and allow the continuation of gaseous exchange, be constructed above existing ground levels and load bearing where the load is spread evenly over the surface to help prevent compaction of the soil. Having these qualities helps enable structures and surfaces to be constructed in RPA while having continued successful retention of valuable trees. Younger trees are more adaptable to changes and construction of new surfaces within the RPA. They are able to cope with the pressures whereas mature, and veteran trees often severely decline. Mature and veteran trees should not have any new surfaces installed in their RPAs, as their ability to cope with the change is poor.

Providing Sufficient Grading for New Surfaces: Determining the depth of roots within any soil and RPA is difficult and can only be achieved by careful excavation of the topsoil. All surfaces proposed inside the RPA need to ideally be of a no dig construction which prohibits excavation, but this is often unfeasible as the ground is usually undulating. Limited ground movement and excavations are permitted if they are carried out with care to prevent any damage to the retained root systems. Ideally the ground should be raised up to provide a suitable level surface using a granular aggregate like angular stone or sharp sand. If done under supervision it is acceptable to allow the removal of the topsoil and turf to a depth of no more than 50mm, which normally doesn't, damage the roots. However if there are a large number of surface roots already showing prior to any soil removal there can be no excavation and the ground level must alternatively be raised. If during the grading of the soil roots at a diameter greater than 25mm are encountered the consultant arborist will need to make an evaluation as to whether the damage is preventable and or acceptable before proceeding. At no point can the graded surface be compacted to provide a finish as this will disrupt the soil structure and cause a damaging effect of the roots within it. The final level of the proposed surface must also be considered and discussed prior to starting any works to establish whether the proposal is practical and useable once completed.

Installing Base and Top Layers: Once a suitably level base has been created without damaging the retained roots, a load spreading construction is required to prevent the compaction of the soil structure beneath. Normally this can be achieved by installing a cellular confinement system that is filled with an angular no fines aggregate to help support and distribute the calculated load over a wider area and limiting soil compaction. This enables a finishing layer of permeable tarmac, block pavers, grasscrete, or gravel to be laid on top depending on the desired usage of the surface. Alternative options are to use preformed concrete slabs that can be laid directly onto the surface but they cannot be laid on top of any form of strip foundation which has a high potential for root damage.

Retention of Existing Surfaces: Where possible it is preferable to install new surfaces over those already existing, limiting the potential damage to any underlying root system. This can provide a suitable sub base without the need for excavation and without the need for special supervision and precautions. Care will only be needed if roots are lifting or protruding through the existing surface.

Appendix 6: Temporary ground protection

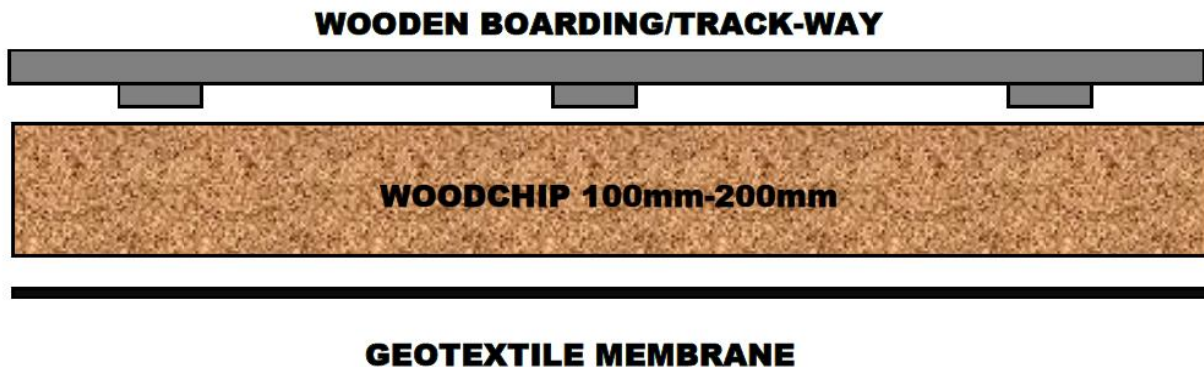
BS5837 recognizes that incursions in to the construction inclusion zones will be required at times during some developments.

The objective is to minimize soil compaction

Example 1 - *for pedestrian movements only, a single thickness of scaffold boards places 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.) 100mm depth of woodchip), laid on to a geotextile membrane.*

Example 2 - *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. 150mm depth of woodchip), laid onto a geotextile membrane;*

Example 3 - *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 conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.*



The Ground Guards temporary road system can be used on construction sites to protect virgin ground from erosion and damage by construction vehicles. Ground-Guards are usually installed as a construction 'haul' roadway consisting of a parallel track of 2.4m x 1.2m panels with a 1.2m space in between. Where a temporary 'haul' roadway must pass near to trees, the following extra precautions must be taken in order to spread the loading applied to the track way. If Ground Guards are unavailable then a twin overlapping surface of 12mm plyboard may be used instead, this will be needed for both layers within the make up.

Edge rails of 200 x 50mm sawn timber or un-treated sleepers should be installed where the track way will pass over exposed retained tree RPA's. These should be installed on either side of the track way using either 50x50x500mm timber stakes of 500mm steel pins at 1.5m spacings.

A layer of geotextile membrane should then be laid over the area of ground to have the track way installed upon it.

A base layer of Ground Guards/twin sheets of 12mm ply should be laid over the top of the geotextile membrane at least three boards wide between the installed timber edging.

A minimum layer of at least 150mm deep coarse, preferably green wood chippings should be laid as a compressible layer over the top of the Ground Guards.

The second layer of Ground Guard/twin sheets of 12mm ply track way can then be laid over the top of the wood chippings.



Cellular confinement system for temporary site access (preferred method)- Use of Core TRP System (Core Tree Root Protection System).

The use of a product such as Core TRP System is used for areas that require temporary ground protection and then later may be used as a subbase for a porous wearing course. This reduces the likelihood of soil damage during removal and reinstallation. The temporary ground solution "provides guaranteed protection for the roots of mature trees from pedestrian and vehicular traffic". Further information available at - <https://www.corelp.co.uk/core-tree-root-protection/>

The system shall be installed in accordance with the manufacturers guidelines.

The installation of this ground covering shall use a method that ensures that no plant or equipment comes in direct contact with the soil of RPA. This shall be undertaken by installing the trackway starting at the front of the property and laying small sections advancing along the completed ground covering as it is installed. This method will ensure that no operations need to be undertaken within unprotected RPAs, the trackway will go no closer than 500mm from any trunk buttress root.

The system shall be installed as per the manufacturers recommendations, and as outlined below and installed as per section *Installation of 'no-dig' special surfacing within or close to the RPA of retained trees* of this report but with a sacrificial temporary wearing course that will on completion of the project be removed and the final top surfacing installed.

Appendix 7: Monitoring

Visit	Date	Status
Pre-commencement Inspections Attend site to inspect type and location of tree protection and any temporary ground protection prior to development commencing and discuss any issues associated with demolition/ enabling works	TBC	Incomplete
Final Site Inspection Final site visit to confirm that no damage has been done to retained trees/ identify any remedial actions in the event damage has occurred. Assess any required tree surgery following construction	TBC	Incomplete
Watching brief / Arboricultural supervision Where any operations within RPA are undertaken	TBC	Incomplete

End of Report



The Arboricultural Consultancy is based in Sussex, covering the South East of England. We specialise in comprehensive tree management surveys, reports, and advice. Our expertise is invaluable in ensuring compliance with health and safety regulations, meeting development requirements, and fulfilling Tree Preservation Order (TPO) and Conservation Area obligations.

We take pride in offering professional and reliable services that prioritise the health and longevity of trees. Our team is dedicated to providing expert guidance and recommendations that align with your objectives and environmental stewardship.

With our extensive knowledge in arboricultural science, we deliver accurate and detailed assessments that inform sound decision-making. Trust us to be your trusted partner in responsible tree management.

Visit our website at www.thearboriculturalconsultancy.co.uk