

Land at Parkfield House, Manchester Old Road, Middleton

Arboricultural Impact Assessment & Method Statement

March 2023

**Land at Parkfield House
Manchester Old Road
Middleton**

Muller Property Group

**ARBORICULTURAL IMPACT ASSESSMENT
AND
METHOD STATEMENT
(Revision C)**



tba
landscape architects

Landscape Architecture
Arboriculture

Ashton Old Baths
Stamford Street West
Ashton-under-Lyne
Lancashire
OL6 7FW

Tel: 0161 8042099

Email: info@trevorbridge.co.uk
www.trevorbridge.co.uk

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1.0 Introduction

- 1.1 This document has been prepared by Trevor Bridge Associates on the behalf of Muller Property Group. It provides an Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) in regard to the following proposed development.
- Demolition of existing structures and construction of nursery home and 20 dwellings with related infrastructure.
- 1.2 This document follows, and should be read in conjunction with, a pre-development tree survey that was undertaken by TBA Ltd in December 2022 (ref: *PD/7082/TSR/DEC22*).
- 1.3 For the purposes of preparing this document the following material was referenced:
- Archi-scape drawing: ***Detailed Site Layout. Drawing. No. MPG.PH.DSL.01. Date: 13.03.2023.***
- 1.4 This report assesses the potential impacts to trees as a consequence of the development proposals, as well as specifying the necessary methodologies required during construction to ensure that trees being retained are afforded adequate protection from harm.
- 1.5 Accompanying this report is the following drawing which must be read in conjunction with this report:
- ***TBA Drawings: Tree Protection Plans. Drawing Nos. 7082.04 & 7082.05 Revision C. Date started: December 2022.***

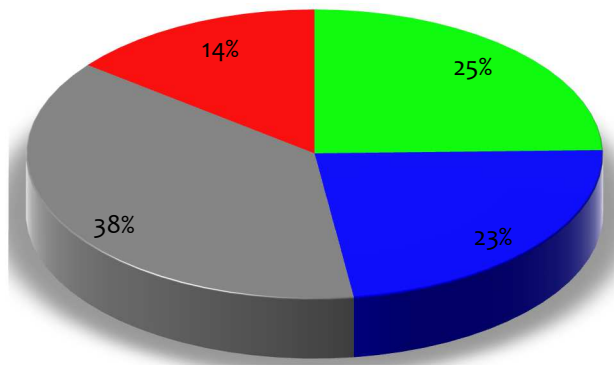
2.0 Arboricultural Impact Assessment

2.1 The consequences on existing trees situated within and adjacent the proposed development site are considered.

2.2 The value of the trees and vegetation surveyed

In the initial tree survey report a total of 69 items were surveyed within and adjacent the development site. These items comprised 53 individual trees and 16 groups. The chart and table below show the ratio of tree retention categories on the site and number of items (be it groups or individuals etc that were surveyed).

Tree/hedge retention category ratios



■ A
■ B
■ C
■ U

Retention Category	No.
A (High Value)	17
B (Moderate value)	16
C (Low value)	26
U (Remove)	10

3.0 Arboricultural Impact Table - Key

- 3.1 The Arboricultural Impact Table (section 3.3) lists all items surveyed within the site. The tree data is taken from the initial tree survey report. The table is colour coded for ease of reference, particularly in relation to the value of trees and the potential impact that may occur to them:

Tree Values

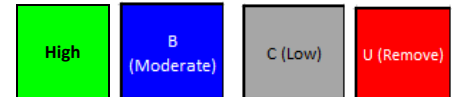
High	High value tree / group / hedge as included within the initial tree survey
B (Moderate)	Moderate value tree / group / hedge as included within the initial tree survey
C (Low)	Low value tree / group / hedge as included within the initial tree survey
U (Remove)	Tree / group / hedge in poor condition. Retention unsustainable within context of development

Impacts on Tree's / Groups

Removal	Tree / Group / Hedge will require removal in order to facilitate the development proposals
Partial Removal	Group or hedge will require partial removal to facilitate the development proposals
High	The development proposals will have a high impact the on the tree /group / hedge
Moderate	The development proposals will have a moderate impact on the tree / group /hedge
Low	The development proposals will have a low impact on the tree / group / hedge
None	The development proposals will have no impacts on the tree / group / hedge

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3.2 Arboricultural Impact Table - Cascade Chart:

3.2.1 Tree **Values** are taken from BS: 5837 and comprise of the following:3.2.2 The **Impacts** comprise of 6 elements:3.2.3 Causes of impacts comprise of 6 factors: '**None**', '**To facilitate development**', '**Due to poor condition**', '**Direct disturbance to roots**', '**Pruning required**' and '**Possible future pruning pressure due to shade and other factors**'.

3.2.4 Comments are also included providing more information where necessary.

	REMOVAL	PARTIAL REMOVAL	HIGH	MODERATE	LOW
TO FACILITATE DEVELOPMENT	Tree / group requires removal.	Partial removal of group is required. i.e., 'a section of hedge may require removal to allow a new access road'.	N/A	N/A	N/A
DUE TO POOR CONDITION	Tree or group require removal due to poor structural and / or physiological condition.	Part of group require removal due to poor structural and / or physiological condition.	N/A	N/A	N/A
DIRECT DISTURBANCE TO ROOTS	N/A	N/A	In many case this will result in the loss of tree/s - refer to ' TO FACILITATE DEVELOPMENT '. In rare cases a Tree/s may be retained but damage will occur to the roots.	Disturbance will be caused to roots of a tree/s that are likely to result in some physiological and structural dysfunction. The extent of damage does not require trees to be felled. Remedial actions may be taken in some cases that would help mitigate against damage but site topography, tree age, condition and species condition may result in disturbance being considered MODERATE as opposed to LOW .	Activity will occur within the root protection area of trees which will have a low impact, or can be mitigated by special measures.
PRUNING REQUIRED	N/A	N/A	Pruning that may retain a tree but will have a potential impact on the tree condition and visual appearance	Pruning is required that is acceptable within recommendations within BS3008:2010, but would require a material alteration to the tree/group affected.	Pruning is required that will have little impact to the structural, physiological and visual amenity of a tree or group.
POSSIBLE FUTURE PRUNING PRESSURE DUE TO SHADE OR OTHER FACTORS	Removal of tree/s required as retention is unsustainable and/or undesirable within the context of development. i.e. fast growing tree in small garden.	Partial removal of tree/s required as retention is unsustainable and/or undesirable within the context of development. i.e. fast growing tree in small garden.	Tree/s likely to cause significant shading. i.e. small garden areas with dense mature trees to south.	Some level of shade or other inconvenience will occur. Not highly oppressive, but some residents may seek management of trees in long term.	Some level of shading / overhang will occur.

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3.3 ARBORICULTURAL IMPACT TABLE - RESULTS

Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
1T	Dead cherry	U	Removal	To facilitate development		
2T	False Acacia	C2	Moderate	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	Possible impact from regrading to accommodate new gradients leading to the new access.
3T	False Acacia	C2	Removal	To facilitate development	Regrading is anticipated to accommodate new gradients leading to the new access.	
4T	Horse Chestnut	C1	Removal	To facilitate development	Regrading is anticipated to accommodate new gradients leading to the new access.	
5T	Variegated Holly	C2	Removal	To facilitate development	Regrading is anticipated to accommodate new gradients leading to the new access.	
6T	Deodar Cedar	C1	Removal	To facilitate development	Regrading is anticipated to accommodate new gradients leading to the new access.	
7T	Dead Hawthorn	U	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
8T	Horse Chestnut	B2	Removal	To facilitate development		
9T	Beech	B1	Removal	To facilitate development		
10T	Beech	A1	Moderate	Direct disturbance to roots	Outer root protection area to the east of the tree will be regraded for new access.	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist. This is to be re-instated as a path using a cellular confinement non-dig system for replacement path.
11T	Beech	A2	None	N/a		
12T	Hornbeam	U	Removal	Due to poor condition	The stump of this tree must remain in situ, or be ground out using a self powered stump grinder.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
13T	Lime	B2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist. This is to be re-instated as a path using a cellular confinement non-dig system for replacement path.	
14G	Young Cherry, Semi-mature Sycamore, Semi-mature Beech, Lawson cypress	C1	None	N/a		
15G	5x Hornbeam and 1x Beech	B2	None	N/a	Proposed path within the vicinity of the tree to be constructed using a non-dig methodology.	
16T	Whitebeam	C1	Removal	To facilitate development		
17T	Cypress	C1	Removal	To facilitate development		
18T	Rowan	C1	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
19T	Horse Chestnut	A2	High	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	A wall is proposed within the root protection area of this tree. Ground protection required either side of the wall during its access to minimise ground disturbance.
20T	Lime	A2	Moderate	Direct disturbance to roots	The tree is to be retained within a plot garden. For the viable retention of the tree ground levels will require to be retained at existing levels, with minimal disturbance. This may require segregation of the rear garden using a retainer should ground levels around the tree differ from the final floor levels of adjacent houses.	A wall is proposed within the root protection area of this tree. Ground protection required either side of the wall during its access to minimise ground disturbance.
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 2. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
21T	Sycamore	B2	Low	Direct disturbance to roots	The tree is to be retained within a plot garden. For the viable retention of the tree ground levels will require to be retained at existing levels, with minimal disturbance. This may require segregation of the rear garden using a retainer should ground levels around the tree differ from the final floor levels of adjacent houses.	
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 2. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
22T	Horse Chestnut	A2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	The tree is to be retained within a plot garden. For the viable retention of the tree ground levels will require to be retained at existing levels, with minimal disturbance. This may require segregation of the rear garden using a retainer should ground levels around the tree differ from the final floor levels of adjacent houses.
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 3. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	
23G	2x Holly and 1X Cherry	C1	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
24T	Sycamore	A2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	The tree is to be retained within a plot garden. For the viable retention of the tree ground levels will require to be retained at existing levels, with minimal disturbance. This may require segregation of the rear garden using a retainer should ground levels around the tree differ from the final floor levels of adjacent houses.
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 4. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	
25T	Bay	C2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
26T	Lime	A2	Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 6. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot. In addition, remove major deadwood.	
			Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	The tree is to be retained within a plot garden. For the viable retention of the tree ground levels will require to be retained at existing levels, with minimal disturbance. This may require segregation of the rear garden using a retainer should ground levels around the tree differ from the final floor levels of adjacent houses.

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
27T	Lime	A2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	Minor ingress within the outer root protection area for construction space for plot 7.
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 7. Future pressure for pruning of the tree is foreseeable.	
			Moderate	Pruning required	Undertake a 20% overall canopy reduction due to the tree's location within garden plot. In addition, remove major deadwood.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
28T	Lime	A2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	Minor ingress within the outer root protection area for construction space for plot 7.
			Moderate	Possible future pruning pressure due to shading and/or other factors	The tree will dominate much of the garden area of plot 9. Future pressure for pruning of the tree is foreseeable.	
			Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	Minor ingress within the outer root protection area for construction space for plot 7.
29G	Common Oak, Goat Willow and Silver Birch	C3	Removal	To facilitate development		
30G	6x Goat Willow	C3	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
31G	4x Ash, 2x Hawthorn, 1x Oak, 1x Elm	U	Removal	Due to poor condition		
32T	Ash	C1	Removal	To facilitate development	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	
33G	4x Silver Birch	C1	None	N/a		
34T	Beech	B2	Removal	To facilitate development		
35T	Hornbeam	A2	Removal	To facilitate development		
36T	Beech	A1	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
37G	3x Holly & 1x Silver Birch	C1	Removal	To facilitate development		
38T	Whitebeam	C2	Removal	To facilitate development		
39T	Holly	B2	Removal	To facilitate development		
40T	Whitebeam	C2	Removal	To facilitate development		
41T	Silver Birch	C1	Removal	To facilitate development		
42G	Juniper, Lawson's Cypress, 2x Whitebeam, Common Oak	C3	Removal	To facilitate development		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
43T	Wild Cherry	C2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.	
44G	9x Cherry & 1x Ash	C1	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the trees requires removal in a controlled manner under direct supervision of the project arboriculturist.	
45G	2x Ash	U	Removal	Due to poor condition	Trees are in advanced stages of Ash dieback. Removal of the trees is recommended.	Group 2G are off-site trees and the consent and co-operation of the tree owners is required to facilitate their removal.
46T	Ash	U	Removal	Due to poor condition		
47T	Ash	U	Removal	Due to poor condition		
48T	Sycamore	B2	Low	Direct disturbance to roots	Possible minor disturbance to roots.	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturist.

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
49T	Lombardy Poplar	B2	Low	Direct disturbance to roots	Possible minor disturbance to roots.	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturalist.
50T	Sycamore	B2	Low	Direct disturbance to roots	Possible minor disturbance to roots.	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturalist.
51T	Ash	C3	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturalist.	
52G	2x Ash, 1x Horse Chestnut and 1x Dead Tree	U	Removal	Due to poor condition		
53T	Ash	U	Removal	Due to poor condition		

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
54T	Lawson's Cypress	A2	Low	Direct disturbance to roots	Possible minor disturbance to roots.	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturalist.
55T	Scots Pine	A2	None	N/a		
56T	Scots Pine	A2	None	N/a		
57T	Sycamore	B1	Removal	To facilitate development		
58T	Sycamore	B2	Low	Direct disturbance to roots	Existing hard surface within the vicinity of the tree requires removal in a controlled manner under direct supervision of the project arboriculturalist.	A section of the nominal root protection area will be impacted by new path.
			Low	Pruning required	Reduce the lateral canopy spread to the west by approximately 2m to provide clearance for construction.	Strip ivy from the base of the tree to allow for future visual assessment of the tree's structure and condition.

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
59G	2x Flowering Cherry	C3	Removal	To facilitate development		
60G	Hawthorn and Holly	U	Removal	Due to poor condition		
61G	Mixed Species Group	C1	Partial Removal	To facilitate development	Some sections that are removed must have roots either ground out using a self powered stump-grinder, or be grubbed out using hand tools.	
62G	Beech and Hawthorn	B2	None	N/a		
63T	Beech	B2	Low	Direct disturbance to roots	The tree is situated on the other side of a retaining wall. It is unlikely that roots extend beyond this wall, which is likely acting as a root barrier.	There is a lack of clarity within the development proposals. A section of the existing retaining wall would require demolition, however the remaining section adjacent to 20T can remain undisturbed. Full engineering details of the access are required prior to a full appraisal of impacts.

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
64T	Beech	A2	Low	Direct disturbance to roots	Areas of existing hard surface will require removal in a controlled manner. Existing hard surface area to be re-utilised. Subbase material to remain in situ.	A zone of soil amelioration may be carried out within a section of the tree.
65T	Beech	A2	Low	Direct disturbance to roots	Areas of existing hard surface will require removal in a controlled manner. Existing hard surface area to be re-utilised. Subbase material to remain in situ.	A zone of soil amelioration may be carried out within a section of the tree.
66T	Lime	B2	None	Pruning required	Remove major deadwood.	
67T	Sycamore	C1	None	Pruning required	Remove major deadwood.	
68T	Sycamore	B2	Low	Direct disturbance to roots	Areas of existing hard surface will require removal in a controlled manner. Existing hard surface area to be re-utilised. Subbase material to remain in situ.	A zone of soil amelioration may be carried out within a section of the tree.
			None	Pruning required	Remove major deadwood.	

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Ref No.	Species	Value	Impact	Impact Cause	Management Options / Comments	Other
69T	London Plane	A2	Low	Direct disturbance to roots	Areas of existing hard surface will require removal in a controlled manner. Existing hard surface area to be re-utilised. Subbase material to remain in situ.	A zone of soil amelioration may be carried out within a section of the tree.

4.0 General Issues

4.1 Installation of underground services

At the time of considering the layout design, no information was available relating to the proposed location of underground services. By default no services shall be placed within the identified Root Protection Areas of trees being retained. While it is possible in some cases that underground services may be placed within Root Protection Areas, this is best done under arboricultural supervision (at least initially). Where special installation methods are necessary (such as pipe jacking) supplementary method statements must be provided. The proposed location of underground infrastructures must be made available to the local planning authority prior to installation.

4.2 Storage of materials, contractor parking and site logistics

Logistically the site has adequate space for the placement of site huts and material storage. By default all compounds and storage areas are to be outside root protection areas/construction exclusion zones.

4.3 Level changes on site

At the time of undertaking this report, no information was available relating to potential external works. Full details of external work requirements are required to fully assess potential impacts to retained trees. Details of cut and fill, retainers and similar engineering alterations within the vicinity of trees is required to fully assess potential impacts. This is particularly relevant in relation to potential impacts to trees 20T to 28T situated within the rear gardens of proposed plots. It is anticipated that final floor levels of plots will differ from that of existing levels and soil differentials that could result in major root damage must be addressed via embanking or retainers.

4.4 Installation of 'non dig' hard surfaces

It is proposed that non-dig surfaces (access path) are constructed using a product called Cellweb; a three dimensional cellular confinement system. The company that supplies Cellweb (Geosynthetics Ltd) will need to supply specifications based on the soil conditions and existing ground topography. Further details are included within the Arboricultural Method Statement Schedule (section 6.0).

- 4.4.1 The successful installation of Cellweb requires that existing ground levels, where the product is being installed, are not excavated. The installation of Cellweb will result in final raised levels, as the product itself is three dimensional. Additionally, use of a final layer, such as porous tarmac, will also raise the final levels.

4.5 Amelioration measures within root zones

- 4.5.1 It is proposed to provide amelioration of the rooting zones of trees. The works are to be undertaken by qualified landscapers/arboriculturalists only.

- 4.5.2 The following steps are to be taken:

1. Where turf is present it is to be carefully removed around both of the trees to a maximum radius of 3.5m (where space allows). The turf is to be removed using hand tools/ hand operated tools only. Removed turf is to be removed from site.

2. The exposed section of soil is to be lightly spiked with a fine spoke fork. This should comprise some 5 insertions per M². The intention is not to tiller soil but improve aeration and allow some penetration of soil improver. No insertions are to be made within 1m of the tree trunk to avoid larger structural roots.

3. A soil improver is to be applied over the exposed soil are. This is to comprise an enhanced biochar powder at a rate of some 500g per M².
4. Once biochar has been applied, the treated area is to be covered in a woodchip mulch to a thickness no less than 100mm. Care must be taken to ensure clearance of the root-collar of the trees.
5. A knee high rail fence may be hand installed around the area of mulch.

5.0 Arboricultural Method Statement

- 5.1 The Arboricultural Method Statement (AMS) specifies all measures to be undertaken to ensure the ongoing health and viability of trees to be retained within the proposed development.
- 5.2 This AMS is in compliance with British Standard 5837: 2012. **Accompanying this document is a plan that shows the position of protective fencing and any additional special measures that are required. This plan is referred to as the Tree Protection Plan.**
- 5.3 The AMS must be considered a 'working document'. It must be made available to the developer, site manager, and LPA. A copy of this document and the Tree Protection Plan must be kept on the development site at all times. All site operatives must be briefed on the main contents of this document.
- 5.4 It is the Site/Project Manager's responsibility to ensure that the detail of this AMS and the TPP and any agreed amendments are known and understood by all site personnel. A copy of this AMS and the TPP will be available for reference on site by the Project and Site Managers, and will form the basis of the management of all works relating to the trees on the site following commencement of the project. The Site Manager shall induct all personnel who could have an impact on trees on the content of this document.

5.5 Tree Works –General Issues

- 5.5.1 All tree works (tree felling and pruning) are to take place prior to any site operations and immediately before the installation of protective fencing.
- 5.5.2 All works to the existing trees are to be carried out by a fully qualified tree surgeon and in accordance with BS 3998 (2010) *Recommendations for Tree Work*.
- 5.5.3 The necessary tree surgery works should be carried out **before** any construction work starts and immediately before erection of protective fencing. Any works will include any trees that require removal in order to facilitate construction and access. No tree works must be carried out unless permission is provided by the local planning authority. Tree works to any protected trees (trees within a Conservation Area or subject to a Tree Preservation Order) that do not require works to directly enable the development to proceed will require a notification/application to be made to the Local Planning Authority. Any tree works required in order to directly facilitate the development to proceed (such as tree felling) must not proceed unless full planning consent and written consent is given by the local planning authority.
- 5.5.4 Wildlife issues and timing of operations. The following must be observed:
- Bats. Under current legislation it is an offence to 'intentionally or recklessly disturb a bat' or 'damage, destroy or block access to the resting place of any bat'. For further details consultation must be made with the Statutory Nature Conservancy Organisation (Natural England, 0300 060 1842 www.naturalengland.org.uk). Where relevant any current ecological surveys for the site will take precedence in this matter.
- 5.5.5 Birds. It is an offence to kill, injure or take any wild bird; or take, damage or destroy the nest of any wild bird while it is in use or being built. Therefore work likely to disturb nesting birds should be avoided from late March to August.

5.6 Tree Protective Barrier Fencing

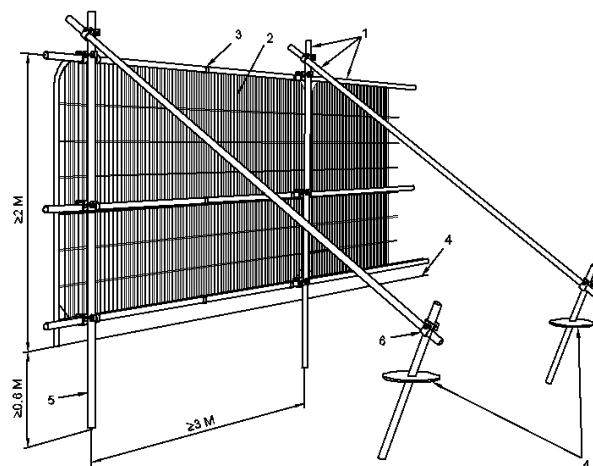
5.6.1 Protective barriers must be erected prior to any site operations. The protective barriers are essential to prevent root severance or compaction of the soil in the Root Protection Areas, and so give the best chance of continued good health of the retained trees.

5.6.2 Tree protective barriers are to comprise a vertical and horizontal scaffold framework which is braced to withstand impacts, and not easily moved or relocated by site operatives (to prevent opportunistic moving of the barrier fences). The vertical tubes should be spaced at intervals of no more than 3m and driven securely into the ground. Onto this framework welded mesh panels should be securely fixed (such as Heras). The fencing is to be placed accurately as shown within the Tree Protection Plan. A scale copy of the tree protection plan shall be referenced and scale measurements taken to indicate the necessary fencing positions.

BS 5837 (2012) Tree Protection Fencing

NOTES

- | | | |
|--|---|--|
| 1. STANDARD SCAFFOLD POLES. | 3. PANELS SECURED TO UPRIGHTS AND CROSS-MEMBERS WITH WIRE TIES. | 5. UPRIGHTS DRIVEN INTO THE GROUND UNTIL SECURE (MINIMUM DEPTH 0.6 M). |
| 2. HEAVY GAUGE 2 M TALL GALVANIZED TUBE AND WELDED MESH INFILL PANELS. | 4. GROUND LEVEL. | 6. STANDARD SCAFFOLD CLAMPS. |



Care must be taken when locating vertical poles to avoid underground services and, in the case of bracing poles, also to avoid contact with structural roots. If the presence of underground services prevents the use of driven poles, an alternative specification should be prepared; such alternatives could include the attachment of the panels to a free standing scaffold support framework.

Where fencing is required adjacent the site boundaries it is acceptable to use Hoarding to double as protective fencing but only where the exact location of the protective fencing is adhered to (as per the Tree Protection Plan) and where it is hand installed only.

5.6.3 Examples of the correct erection of tree protective barrier fencing



Above: Full specification barrier fencing.

Below: Barrier fencing accurately placed adjacent variable and complex working zones.



5.7 General Requirements

- 5.7.1 Developers must enforce the methods of protection identified within the statement. All contractors must also agree to them. Any failure to comply with them must be dealt with by the developer. Any damage that may occur to trees due to failure to observe the method statement must be reported to the Local Planning Authority and arboricultural advice must be sought.
- 5.7.2 No pruning, lopping, felling or severance of roots is to take place without prior consent of the local authority or unless in compliance with specifications included within the Method Statement.
- 5.7.3 **The ground levels within the protected areas, be they fenced or special working areas, must neither be raised nor excavated unless specifically in compliance with requirements within this method statement.**
- 5.7.4 No ropes, cables, services, or notice boards shall be fixed to existing trees.
- 5.7.5 Fires should not be permitted, or else not lit where flames could extend to within 10m of the foliage, branches or trunk of any trees (it should be noted that local environmental health authorities may have specific restrictions on fires),
- 5.7.6 Should temporary access within the Root Protection Area be required that is not included within the method statement, an agreement, in advance, with the consultant and the LPA must be made. The fence may need to be re-aligned and the ground surface protected. For vehicular access this protection will need to be specifically detailed and agreed.
- 5.7.7 Care must be taken in regard to tall or wide loads, or use of plant with booms, jibs and counterweights. Where machinery may be required to operate in the vicinity of trees a banksman must ensure that no direct physical damage is caused to trees. It must be checked that any materials or vehicles entering the site are able to do so without causing damage to adjacent trees.
- 5.7.8 Any material that will contaminate soil (e.g. concrete mixings, and vehicle washings) must not be discharged within 10m of any Root Protection Area. In addition it is essential that allowance be made for the slope of the ground so that damaging materials cannot run towards trees, or Root Protection Areas. If diesel and fuel containers are used or stored on site they must be kept within a plastic container bund to prevent any ground contamination and spill kits must be kept available to remediate any spillage.

5.8 Arboricultural monitoring

- (i) The arboricultural consultant (or local authority Tree Officer) shall be consulted whenever an unexpected issue occurs that involves any retained tree on site including access within the Protection Area.

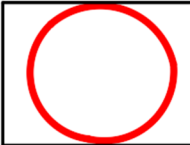
Mike Gregory (Arboricultural Consultant) 07515827944.

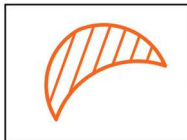
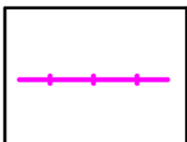
- (ii) No amendments shall be made to the methods detailed in this Arboricultural Method Statement without the agreement of the consultant or local planning authority Tree Officer.
- (ii) If the site agent is at all unclear about exact compliance with any of the above requirements, or if requested by any other party, then a pre-start meeting shall be arranged with the architect, site agent, local authority tree officer and arboricultural consultant in attendance as necessary.

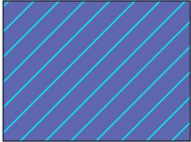
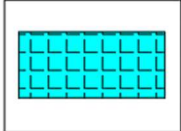
5.9 Health and Safety Issues

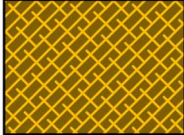
All operations must be carried out with full regard to Health and Safety requirements. Due to the diverse nature of recommendations included (e.g. tree surgery works, construction etc) it is necessary that supervisors of those undertaking recommended operations undertake risk assessments prior to starting the relevant works. It should be the Site Managers/developers responsibility to ensure that risk assessments are submitted prior to undertaking relevant works.

6.0 Method Statement Schedule

Phase	Requirements	Method																																																																										
1 Prior to erection of protective fencing.	Undertake tree and vegetation removal Trees/vegetation to be removed: 	Refer to section 5.5 of AIA/MS report. All tree works to be carried out to BS3998: 2010: by suitably qualified and insured professional tree surgeons. The following tree felling must be undertaken at this Phase: <table><tr><th colspan="2">Items requiring removal:</th></tr><tr><td>1T</td><td>Dead Cherry*</td></tr><tr><td>2T</td><td>False Acacia</td></tr><tr><td>3T</td><td>False Acacia</td></tr><tr><td>4T</td><td>Horse Chestnut</td></tr><tr><td>5T</td><td>Variegated Holly</td></tr><tr><td>6T</td><td>Deodar Cedar</td></tr><tr><td>7T</td><td>Dead Hawthorn</td></tr><tr><td>8T</td><td>Horse Chestnut</td></tr><tr><td>9T</td><td>Beech</td></tr><tr><td>12T</td><td>Hornbeam*</td></tr><tr><td>16T</td><td>Whitebeam</td></tr><tr><td>17T</td><td>Cypress</td></tr><tr><td>18T</td><td>Rowan</td></tr><tr><td>23G</td><td>2x Holly and 1X Cherry*</td></tr><tr><td>29G</td><td>Common Oak, Goat Willow and Silver Birch</td></tr><tr><td>30G</td><td>6x Goat Willow</td></tr><tr><td>31G</td><td>4x Ash, 2x Hawthorn, 1x Oak, 1x Elm</td></tr><tr><td>32T</td><td>Ash</td></tr><tr><td>34T</td><td>Beech</td></tr><tr><td>35T</td><td>Hornbeam</td></tr><tr><td>36T</td><td>Beech</td></tr><tr><td>37G</td><td>3x Holly & 1x Silver Birch</td></tr><tr><td>38T</td><td>Whitebeam</td></tr><tr><td>39T</td><td>Holly</td></tr><tr><td>40T</td><td>Whitebeam</td></tr><tr><td>41T</td><td>Silver Birch</td></tr><tr><td>42G</td><td>Juniper, Lawson's Cypress, 2x Whitebeam, Common Oak</td></tr><tr><td>45G</td><td>2x Ash</td></tr><tr><td>46T</td><td>Ash</td></tr><tr><td>47T</td><td>Ash</td></tr><tr><td>52G</td><td>2x Ash, 1x Horse Chestnut and 1x Dead Tree</td></tr><tr><td>53T</td><td>Ash</td></tr><tr><td>57T</td><td>Sycamore</td></tr><tr><td>59G</td><td>2x Flowering Cherry</td></tr><tr><td>60G</td><td>Hawthorn and Holly</td></tr><tr><td>61G</td><td>Mixed Species Group (Partial removal only)</td></tr></table> *Stumps of trees/groups much be removed using a self powered stump-grinder	Items requiring removal:		1T	Dead Cherry*	2T	False Acacia	3T	False Acacia	4T	Horse Chestnut	5T	Variegated Holly	6T	Deodar Cedar	7T	Dead Hawthorn	8T	Horse Chestnut	9T	Beech	12T	Hornbeam*	16T	Whitebeam	17T	Cypress	18T	Rowan	23G	2x Holly and 1X Cherry*	29G	Common Oak, Goat Willow and Silver Birch	30G	6x Goat Willow	31G	4x Ash, 2x Hawthorn, 1x Oak, 1x Elm	32T	Ash	34T	Beech	35T	Hornbeam	36T	Beech	37G	3x Holly & 1x Silver Birch	38T	Whitebeam	39T	Holly	40T	Whitebeam	41T	Silver Birch	42G	Juniper, Lawson's Cypress, 2x Whitebeam, Common Oak	45G	2x Ash	46T	Ash	47T	Ash	52G	2x Ash, 1x Horse Chestnut and 1x Dead Tree	53T	Ash	57T	Sycamore	59G	2x Flowering Cherry	60G	Hawthorn and Holly	61G	Mixed Species Group (Partial removal only)
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Phase	Requirements	Method																		
1 Cont. Prior to erection of protective fencing.	Undertake tree pruning Tree pruning: 	Refer to section 5.5 of AIA/MS report. All tree works to be carried out to BS3998: 2010: by suitably qualified and insured professional tree surgeons. The following tree pruning must be undertaken at this Phase: <table><thead><tr><th colspan="2">Items requiring pruning:</th></tr></thead><tbody><tr><td>20T</td><td>Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.</td></tr><tr><td>21T</td><td>Sycamore. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.</td></tr><tr><td>22T</td><td>Horse Chestnut. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.</td></tr><tr><td>24T</td><td>Sycamore. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.</td></tr><tr><td>26T</td><td>Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.</td></tr><tr><td>27T</td><td>Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.</td></tr><tr><td>28T</td><td>Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.</td></tr><tr><td>58T</td><td>Sycamore. Reduce the lateral canopy spread to the west by approximately 2m to provide clearance for construction.</td></tr></tbody></table>	Items requiring pruning:		20T	Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	21T	Sycamore. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	22T	Horse Chestnut. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	24T	Sycamore. Undertake a 20% overall canopy reduction due to the tree's location within garden plot.	26T	Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.	27T	Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.	28T	Lime. Undertake a 20% overall canopy reduction due to the tree's location within garden plot. Also remove major deadwood.	58T	Sycamore. Reduce the lateral canopy spread to the west by approximately 2m to provide clearance for construction.
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2 Prior to any construction works on site	Erection of protective fencing: To retain throughout the duration of the development: 	Protective fencing is to be erected in accordance with 5.6 of AIA/MS report. The fencing must comply with the positions shown in the Tree Protection Plan. A scale copy of the Tree Protection Plan must be used as reference and fencing positions measured from the Plan using a scale rule and/or using the provided distances where shown. No works, no storage of materials, no access, or any ground disturbance is to take place within the Tree Protection Barrier Fencing other than works specified within the Arboricultural Method Statement. Fenced areas are to be treated as Construction Exclusion Zones. Warning signs to be placed on all protective fencing. For large sections of fencing the signs must be placed at 20m intervals. Signs must be laminated and securely attached at all corners. Two signs are to be placed side by side; copies of which are attached within Appendix A.																		
3 Verifying quality of protective barriers	Verify that the location and quality of tree protection barriers is adequate prior to onset of main site works.	Site visit with Arboricultural Consultant and Site Manager. Tree Officer to be pre-informed of visit. In order for set works to proceed the pro-forma in Appendix B. of the AIA/AMS report is to be completed and passed on to the local planning authority: If the protective barriers are not adequately, work is not to proceed until rectified.																		
4 Ongoing	Maintain protective fencing	The tree protective barrier fencing is to remain in situ during all demolition & construction works.																		

Phase	Requirements	Method
5 Removal of hard surface areas	Controlled removal of existing road surfaces situated adjacent trees to be retained. 	1, Present during the work must be the project arboriculturalist, site manager and site operatives. 2. A panel from the protective fencing is to be removed in order to access the works area. 3. Prybars and/or jackhammer to be used to break edges of surface nearest the tree/s. 4. A mechanical digger to be used to 'peel' away surface of existing road. 5. Mechanical plant is to operate from the intact surfaces of the road, working back. 5. The sub-base of exposed sections of road to be regularly checked by the project arboriculturalist for the presence of roots. If roots are encountered, the project arboriculturalist will advise on whether further excavation shall take place, or how further excavation shall occur. A layer of no-more than 150mm depth good quality top soil to be placed over the removed hard surface to allow for subsequent laying of turf.
6 Construction of wall within root protection areas	Ground protection required: 	A layer of Terram 1000 geotextile to be laid down, with ground protection boards (see appendix C) to be laid on-top. Only mini-plant can operate in this location, and must operate on the ground protection boards only.
7 Installation of geotextile cellular confinement systems	Installation of three dimensional cellular confinement system. 	Installation of non-dig pavement surfaces: A three dimensional cellular confinement system is to be utilised (Cellweb). Guidance for the installation of the Cellweb is attached within Appendix D. Cross section details are to be provided (in conjunction with engineer and Cellweb recommendations). Technical specifications required, as well as cross section details relevant to the site can be provided by Cellweb suppliers, Geosynthetic (01455 617139). Email Sales@geosyn.co.uk. Tree barrier protective fencing is to be moved only <u>immediately prior</u> to the installation of the Cellweb. The installation is to be carried out <u>under Arboricultural Supervision</u>. The ground layer in which Cellweb is to be installed is to be subject only to removal of exiting turf layer. Adjoining levels <u>must</u> marry with the required depth of the Cellweb, not vice versa. Once Cellweb is installed the protective fencing is to be relocated immediately adjacent the intalled areas of Cellweb.

Phase	Requirements	Method
8 Improvement of rooting zones	Removal of turf and addition of improved biochar topped with mulch. 	The following steps are to be taken: 1. An area of existing turf is to be carefully removed around both of the trees to a maximum radius of 3.5m (where space allows). The turf is to be removed using hand tools/ hand operated tools only. Removed turf is to be removed from site. 2. The exposed section of soil is to be lightly spiked with a fine spoke fork. This should comprise some 5 insertions per M². The intention is not to tiller soil but improve aeration and allow some penetration of soil improver. No insertions are to be made within 1m of the tree trunk to avoid larger structural roots. 3. A soil improver is to be applied over the exposed soil area. This is to comprise an enhanced biochar powder at a rate of some 1kg per M². 4. Once biochar has been applied, the treated area is to be covered in a woodchip mulch to a thickness no less than 75mm. Care must be taken to ensure clearance of the root-collar of the trees. 5. A knee high rail fence is to be hand installed around the area of mulch.
9 Completion of main construction and undertaking of landscaping	Landscaping and Dismantling of tree barrier protective fencing.	It is essential that ground levels within the root protection areas are not altered, either by raising or lowering soil levels; even at the landscaping stage. Landscaping operations must be undertaken in a manner that will not impact trees. Landscaping within the root protection area of trees must be undertaken in the following manner: 1. Any existing ground flora (grass/weeds/scrub) is to be sprayed with a systemic herbicide and left to die-off. 2. Dead flora is to be strimmed as hard as possible with a brush cutter or similar. The bulk of the strimmed material is to be removed by raking. 3. A good quality organic topsoil layer may be placed down. Small depressions may be filled (and lightly compacted underfoot). Placed topsoil soil layers must not exceed 100mm depth. 4. No plant machinery operating within the root protection areas to exceed 1 tonne gross weight and must only operate from propriety ground protection boards such as DuraMatt Access Matts (see Appendix C). 5. Turf and other planting to proceed thereafter.

APPENDIX A - SIGNS TO ATTACH TO PROTECTIVE FENCING



Construction and Trees



Why Is Fencing Erected Around Trees?

1. The major cause of damage to trees on construction sites is due to **soil compaction**.
2. Roots use the spaces between soil particles to obtain Oxygen, Water and Nutrients.
3. Heavy plant and machinery compresses (compacts) the soil, squashing out the air spaces and preventing root function.
4. A compacted soil structure will stay compacted.
5. Consequently the tree suffers and will show signs of branch die-back.
6. Symptoms such as die-back may take several years to appear.
7. Soil compaction over roots can be prevented by maintaining a fenced exclusion zone over the tree roots.
8. The exclusion zone distance is calculated using British Standard 5837.
9. Protective Fencing is installed at the calculated distance.
10. Protective Fencing is a condition of planning approval, if it is removed or repositioned the construction firm is in breach of a condition and may be subjected to legal action.

APPENDIX B – Site Inspection pro-forma

**SITE INSPECTION - ARBORICULTURAL METHOD STATEMENT
(Ref: MG/7082/AIA&AMS/REV C/MAR23)**

Site Address : Land at Parkfield House, Manchester Old Road

Name of Arboricultural Inspector:

Date of Inspection:

The purpose of this site inspection is to confirm with requirements within the above referenced Arboricultural Method Statement.

The site is to be visited and the placement of tree protection barrier fencing checked for compliance with specifications within the method statement.

Further works on the site shall not proceed until the tree protective fencing is installed in compliance with the method statement and in submitting this document to the Local Planning Authority the inspector is verifying that the necessary specifications have been met.

Notes (continue on separate attachments as necessary):

Photographs: (attach below):

APPENDIX C – GROUND PROTECTION BOARDS

(to be used for light plant access when undertaking temporary operations within the root protection areas of trees- such as fencing and landscaping)

DuraMatt Single Sided Access Mat - 2400mm x 600mm x 10mm - 17kg

Product Code: DURA-2400600175S



MultiMatts are the market leading provider of temporary access and ground protection solutions. Temporary Access and Ground Protection Mats are now an essential requirement for the construction, civil engineering and groundwork industries, although they're also used extensively within the festival and outdoor event sectors.

Our DuraMatt - Light/Medium Duty Access Mat is manufactured from 100% recycled Low Density Polyethylene (LDPE) and weigh just 17kg. DuraMatt is ideal for both short and long term projects and can be used in a variety of applications.

DuraMatt is capable of taking weights of 15-20 tonnes* depending on the ground conditions, they've also been designed with a connection hole in each corner should the mats need to be connected together.

DuraMatt has a unique diamond pattern "non-slip" surface on one side, the other side has been left smooth for working on hard standing areas and sensitive grass, it also allows contractors to use the mat as a spoil board for construction materials. It's flexible nature allows the mats to follow the contours of the ground to deliver highly effective access over undulating or sloping terrain.

Standard colour option is Grey – Please contact us for other colours or customisation.

Key Applications

- Ground Work Spoil Boards
- Temporary Roadways and Car Parks
- Pedestrian Walkways
- Heritage sites; Eco-Sensitive areas
- Sports and Leisure Events
- Golf Course and Sports Field Maintenance
- Ground Protection
- Emergency Access Routes
- Utilities
- Infrastructure Maintenance

Key Features and Benefits

- 2.4m x 0.6m x 10mm - Weight 17kg
- Maximum Weight loading approx. 15-20 tonnes*
- Unique diamond pattern "non-slip" surface for optimal grip
- Avoids health and safety issues
- Avoids property, heritage and environmental damage and reinstatement
- Avoids vehicles becoming bogged down
- Low transportation and handling costs
- Various connection options for different ground conditions and equipment
- Premium 100% recycled (LD) polyethylene which is 100% recyclable

APPENDIX D – OUTLINE SPECIFICATION FOR INSTALLATION OF CELLWEB

PRODUCT DATA SHEET Geosynthetics Limited Tel: 01455 617 139 Fax: 01455 617 140 Email: sales@geosyn.co.uk

Cellweb® TRP Installation Guide



Step 1: Prepare Surface



Step 2: Lay Treetex® T-300



Step 3: Layout Cellweb® TRP

- Cellweb® TRP is a NO DIG tree root protection measure and it is recommended that no excavation be performed without prior approval and guidance from the Local Authority Arboricultural Officer.
- Soil compaction from vehicles, machinery and materials is to be strictly prohibited during construction within Root Protection Areas (RPAs).
- Approval must be obtained from the Local Authority that the design and the method of construction is acceptable.
- Further information is available from the following two documents;
 - British Standard BS5837: 'Trees in Relation to Design, Demolition and Construction' (2012).
 - Arboricultural Advisory and Information Service: Practice note 12 – 'Through the Trees to Development' (APN12).

Installation Method

- 1. Prepare the Surface**
 - Remove the surface vegetation using appropriate hand held tools or herbicide (see Note 1).
 - Remove any surface rocks, debris and organic material.
 - Create a level surface by filling any hollows with clean angular stone or sharp sand.
 - Do not level off high spots or compact the soil through rolling.
- 2. Lay the Treetex® T-300 Non-Woven Geotextile**
 - Lay the Treetex® T-300 over the prepared area, overlaying the edges of the required area by 300mm.
 - Overlap any joins by 300mm minimum or more, depending on soil structure (see Note 2).
- 3. Lay the Cellweb® TRP Cellular Confinement System**
 - Lay the collapsed Cellweb® TRP on-top of the Treetex® T-300.
 - Place one of the supplied J pins into the centre cell at the end of the panel and secure into the ground.





DE:85/V17/02.01.14 (Page 1 of 3)

Cellweb® TRP - Installation Guide



Step 3: Pinning Cellweb® TRP



Step 3: Stapling Cellweb® TRP

- Pull out the Cellweb® TRP to its full 8.1m length and secure its length with another J pin.



- Now measure its width to 2.56m and secure in each of the corners with the J pins.



- Use 10 pins per panel to create a panel measuring 8.1m x 2.56m.
(3 pins at each end of the panel and 2 pins on each side)



- This will produce a cell size of 259mm x 224mm which is the required cell diameter. Each cell must be fully extended and under tension.
- Staple adjacent panels together at each cell (see Note 3).
- If a curved path or shape is required, this should be cut when the Cellweb® TRP panel is pinned out to 8.1 x 2.56m, ensuring complete cells remain. Do not try to curve or bend the Cellweb® TRP panels into place.
- All cells must be fully opened to the required diameter.



DB: 8/1/16 08:14 (Page 2 of 3)

Cellweb® TRP - Installation Guide



Step 4: Clean Angular Stone



Step 5: Edge Restraints



Step 6: Surface Options

4. Infill the Clean Angular Stone

- The infill material must be a clean angular stone, Type 4/20mm or Type 20/40mm (see Note 4).
- Do not use M.O.T type 1 or crushed stone with fines for tree root protection.
- Infill the Cellweb® TRP cells with the clean angular stone, working towards the tree and using the infilled panels as a platform.
- No compaction is required of the infill. Do not use a whacker plate or other means of compaction.

5. Edge restraints

- Excavations for kerbs and edgings should be avoided within the RPAs.
- Where edging is required for footpath and light structures, a peg and treated timber board edging is acceptable.
- Other options include wooden sleepers, kerb edging constructed on-top of the Cellweb® TRP system, plastic and metal edging etc.

6. Surface options

- Surfaces can include block paving, asphalt, loose gravel, grass and gravel retention systems (eg Golpla), resin bound gravel, concrete etc.
- For Root Protection Areas this surface must be porous.

NOTES

1. **Herbicide:** According to BS5837:2012 "The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from the manufacturers should be strictly observed and followed. Care should be taken to avoid any damaging effects upon existing plants and trees to be retained, species to be introduced, and existing sensitive habitats, particularly those associated with aquatic or drainage features."
2. **Geotextile:** We recommend the installation of a Non-Woven Geotextile **300gsm** over the sub-base, if installed. The overlapping between adjacent rolls of Geotextile should be: CBR > 3%: 300mm minimum, CBR between 1% and 3%: 500mm minimum. CBR ≤ 1%: 750mm minimum.
3. **Staples:** Number of staples per joint: 200mm: 5 staples. 150mm: 4 staples. 100mm: 3 staples. 75mm: 3 staples.
4. **Granular Fill:** Open graded sub-base, clean angular stone Type 4/20 or Type 20/40. Please refer to BS7533-13:2009 and to the Design Manual for Roads and Bridges (DMRB), Volume 4 Geotechnics and Drainage, Section 1 Earthworks, HA44/91, Volume 7 – IAN 73/06 Design Guidance for road pavement foundations and Manual of Contract Documents for Highway Works (MCHW), Volume 1 Specification for Highway Works for the construction and maintenance of the fill material.

This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentation. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge becomes available. Since we cannot anticipate all variations in actual and use conditions, Geosynthetics Limited makes no warranties and assumes no liabilities in connection with this information. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent right.
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