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Arboricultural Impact Assessment

“BS5837 2012: Trees in Relation to Design, Demolition and Construction”

Refence: 26AWR-BS-001
Revision: Revision A
Date: June 2024
Project: 26A Wilberham Road
Site Address: 26 Wilbraham Rd, Fallowfield, Manchester M14 6JX

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1 Introduction

1.1 Instruction

Christians Environmental have been instructed by the client to inspect applicable trees within the site boundary and trees in adjacent land that may be affected by the proposed developments, the aim of which is to prepare the following information to accompany a planning submission for the site:

- Schedule of the relevant trees to include basic data and a condition assessment collected on site during a preliminary survey of the site prior to consideration to proposed development works.
- Appraisal of the impact of the proposed development on the trees and any resulting impact that it has on local amenity.
- An Arboricultural Method Statement setting out any agreed tree removal and/or pruning works, appropriate protection measures or retained trees, construction methods and any post development management required for trees to be retained.
- The Tree Constraints Plan which identifies any arboricultural constraints on site.
- The Tree Retention Plan which identifies trees, groups and hedges that may require pruning or removal to facilitate the proposed development. Those trees, groups and hedges which can be retained alongside the proposed development will also be identified.
- The tree protection plan which demonstrates the appropriate protection measures to be implemented for retained trees during the development.

1.2 Purpose of the Report

This report provides an analysis of the impact of any proposed development on trees, groups and/or hedges and local amenity value they provide. Its primary purpose is for the Local Authority to review any tree related issues associated with the applicable outline planning application, and use as a basis for issuing a planning consent or engaging in further discussions towards that end. During the planning process, this document and accompanying data will be available for inspection by people including the general public; we aim to present the information in a format that is easily understandable to people without a general knowledge of the subject area.

1.3 Documents provided by Client

The following plans have been provided:

- Topographical Land Survey: provided in drawing file (.dwg) format.
- Development Proposal Plans: provided in drawing file (.dwg) format.

2 Site Context

2.1 Site Overview and Surrounding Area

The development site currently comprises of an unoccupied building with adjacent land comprising of disused landscaped areas. The surrounding area can be characterised as urban with intermittent pockets of green space from parks and gardens.

2.1 Proposals

The planning proposals seek redevelopment of the former school and exterior landscaping.

3 Arboricultural Impact Assessment

3.1 Summary of the Impact on Trees, Groups and Hedges

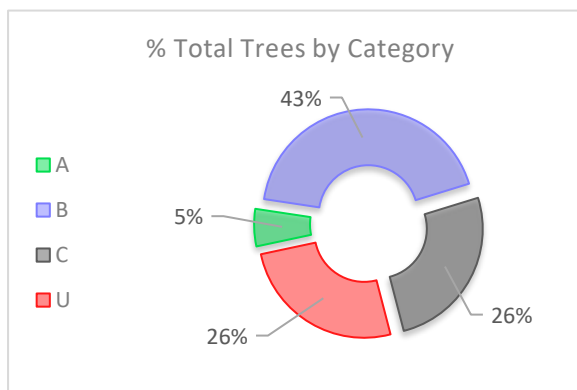


Chart 1: Individual trees by retention category.

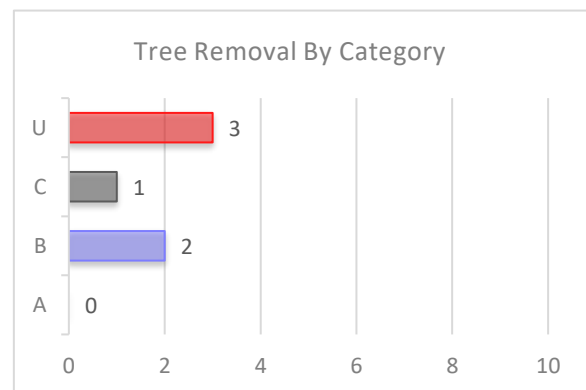


Chart 2: Quantity of tree removals by retention category.

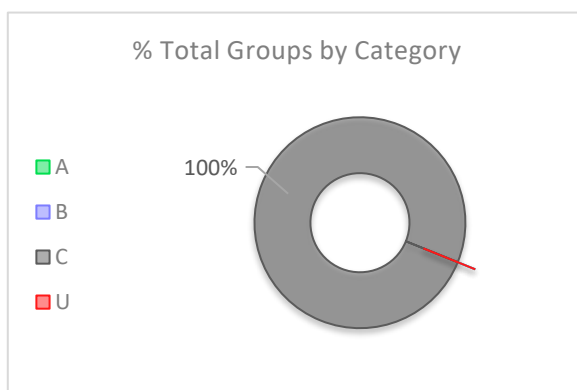


Chart 3: Individual Groups by retention category.

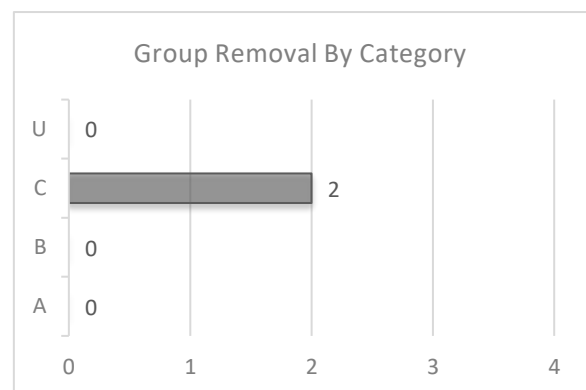


Chart 4: Quantity of Group removals by retention category.

Table 1: Tree removal by number.

Retention Category	Total	Tree Number
A	0	-
B	2	T15 and T16
C	1	T26
U	3	T18, T22, T24

Table 2: Group removal by number.

Retention Category	Total	Group Number
A	0	-
B	0	-
C	2	G2 (partial removal), G3 (partial removal)
U	0	-

3.2 Preliminary Impact Assessment

(Please refer to the Tree Constraints and Tree Data Section when reading the below information).

Category A trees, groups and hedges. (Trees of high quality)		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
-	T17, T28	-
T17 Due to the close proximity of the proposed build to Tree T17, it is the intention of the project management to relocate the tree to the north of the site thus retaining the tree onsite rather than loss through removal. T28 A large root protection area of T28 has potential for damage from the proposed additional hardscape area, refuse and cycle store. It is the intention to use specialist construction techniques here so as not to excavate into and disturb the RPA. Please refer to the Arboricultural Method Statement and Tree Protection Plans for further information.		

Category B trees, groups, and hedges. (Trees of moderate quality)		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
T15, T16	T12, T13, T19, T20, T27, T30-T34	T12
T15 and T16 Trees T15 and T16 will require removal in order to facilitate the proposed building. Onsite BNG will account for the loss of these trees.		

Category B trees, groups, and hedges. (Trees of moderate quality)		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
T15, T16	T12, T13, T19, T20, T27, T30-T34	T12
T12 It is proposed that T12 can be retained with a reduction in canopy to the following approximate dimensions: N = 3m, E = 3m, S = 3m, W = 3m. It is also expected that T12 will see a 4% area incursion of the rooting due to the proximity of the proposed building. In line with the proposed reduction and adjacent land available for compensatory root offset, this should be viable. As the tree will require a complete canopy reduction rather than just site side to create a uniformed spread, neighbouring land owner permission should be sought to undertake the full works. T13 It is proposed that T13 will have an 8.5% RPA incursion due to the proximity of the building. However, there should be suitable adjacent land available for compensatory root offset to occur. T19 and T20 It is proposed that the RPAs of T19 and T20 have the potential for damage due to the new access pathway from the development to Wilberham Road. However, it is the intention to use specialist construction techniques here so as not to excavate into and disturb the RPA. Please refer to the Arboricultural Method Statement and Tree Protection Plans for further information. T27 and T30 It is proposed that trees T27 and T30 have the potential of RPAs to be incurred and damaged during any resurfacing works of the existing hardstanding along with the additional proposed hardstanding extension works for the refuse, cycle area and footways. Construction techniques are further discussed within the Arboricultural Method Statement to prevent any adverse effects to rooting. Please also see the Tree Protection Plan for measures to be adopted. T31-T34 It is proposed that trees T31-34 have the potential of RPAs to be incurred and damaged during any resurfacing works of the existing hardstanding. Construction techniques are further discussed within the Arboricultural Method Statement to prevent any adverse effects to rooting. Please also see the Tree Protection Plan for measures to be adopted.		

Category C trees, groups and hedges. (Trees of low quality)		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
G2 (partial removal), G3 (partial removal)	T26 and T29	T21
G2 and G3 It is the intention to undertake partial removal and pruning back vegetation of groups G2 and G3 to reduce conflicts during development and after works have completed with the proposed infrastructure of the site. This is preferable to complete removal. T26 Due to the close proximity of the proposed build to Tree T26, it is the intention of the project management to relocate the tree to the south of the site thus retaining the tree onsite rather than loss through removal.		

Category C trees, groups and hedges. (Trees of low quality)		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
G2 (partial removal), G3 (partial removal)	T26 and T29	T21
T21 and T29 A large root protection area of T21 and T29 has potential for damage from the proposed additional hardscape area, refuse and cycle store. It is the intention to use specialist construction techniques here so as not to excavate into and disturb the RPA. Please refer to the Arboricultural Method Statement and Tree Protection Plans for further information. It is also proposed that T21 can be retained with a reduction in canopy to the following approximate dimensions: N = 2m, E = 2m, S = 2m, W = 2m.		

Trees of quality and/or health and safety requirements		
Removal due to the proposals	Potential affects to rooting by the proposals	Pruning due to the proposals
T18, T22 and T24	T14	T14
T14 It is proposed that T14 can be retained with a reduction in canopy to the following approximate dimensions: N = 2.5m, E = 2.5m, S = 2.5m, W = 2.5m. It is proposed that T14 will have a 15% RPA incursion due to the proximity of the building. However, in line with the proposed reduction and adjacent land available for compensatory root offset, this should be viable. As the tree will require a complete canopy reduction rather than just site side to create a uniformed spread, neighbouring land owner permission should be sought to undertake the full works. T18 Tree T18 will require a risk of harm removing due to dying condition with tree exhibiting large deadwood and reduced structural integrity within close proximity of the highway. In order to retain this feature, a standing dead stem will be left whilst removing the dead branches and dysfunctional canopy with arisings habit piled around base. T22 and T24 The above trees will require removal in order to facilitate the proposed development however, it is the intention to replace the trees as close to the original positions without adversely conflicting with the proposed development layout. Like for like trees have been proposed for replacement. In light of ash dieback, native ash will not be possible however, native <i>Betula pubescens</i> should be sought instead.		

3.3 Impact on Local Amenities

1. The developments have been designed to accommodate as much as possible the tree stock on site, with tree losses incurred being offset by replacement planting and proposed relocation of trees on site also. The project has also carefully worked and plotted out the BNG requirements in response to tree losses and works that best meet the demands of the site.

2. The tree works proposed will not adversely affect the overall amenity of the surrounding area due to the majority of the tree stock being set back from Wilberham Road thus away from high trafficked areas and public view.
3. As a large number of moderate to high quality trees have been identified as having the potential for root impact from building works, it is advised that specialist construction measures and no-dig techniques are implemented within the areas highlighted on the Tree Protection Plan to preserve the roots and their environment.
4. In accordance with the advice and principles as discussed within this report, the development proposals should be considered for acceptable delivery from an arboricultural perspective.

4 Arboricultural Method Statement

This Method Statement has been drawn up to assist the Planning Authority and the developer in overseeing the construction of the proposed development. This document seeks to discuss any tree constraints and implications. It describes the proposals for ensuring any retained trees will survive the development process and thrive thereafter. Development and timing of operations are described, with materials and techniques discussed to maximize tree protection. This statement will be included as part of the specification and schedule of works issued to the building contractor and will form part of the contract. The accompanying arboricultural statement plans will be available on site for inspection along with this method statement.

4.1 Programme and Phasing of Tree Management

Stage	Requirement
1	Carry out agreed tree removal, pruning and relocation works
2	Implement tree protection
3	Carry out demolition works
4	Carry out construction works
5	Remove tree protection
6	Undertake tree replacement planting

4.1.1 Stage 1. Carry out agreed tree removals, pruning and relocation works

1. All arboricultural operations on site including tree removal must be carried out by an arboricultural contractor that is able to comply with British Standards 3998: 2010 – Tree Work Recommendations.
2. All arboricultural contractors should be insured to a minimum of £5 million and able to show competency by means of relevant certification and health and safety policy.
3. All tree works should be undertaken before development begins. Trees should be removed as detailed on the Tree Retention Plan. All further works specifications for canopy reductions and dimensions should be carried out in accordance with those discussed within the Arboricultural Impact Assessment section of this report.
4. It is the intention of the project management to have trees T17 and T26 relocated elsewhere on site to more suitable locations away from the proposed development works. Due to the large size of tree T17 and existing location and rooting area, possibility of removal and relocation should be backed by a full preliminary assessment and subsequent method statement by a specialist company. Christians are not acting as specialists in this field and cannot provide any further assessment on possibility or success or provide any advice on suitability of this operation. The phasing of this operation for T17 may dictate that demolition of the existing adjacent structure are carried out first.

4.1.2 Stage 2. Implement tree protection

1. Tree protection fencing should then be installed in accordance with the Tree Protection Plan contained within Appendix D of this report and the specification contained within Appendix E of this report. Signage should also be affixed to the fencing at intervals of 9-meters explaining the purpose of the fencing; an example of this can be seen in Appendix F of this report.
2. It will also be required that stem protection fitted to trees T31-T34. A schematic example of this has been included within appendix G.
3. It will also be required that ground protection matting is installed in accordance with Tree Protection Plan for trees T12-T14 for the duration of developments to allow for a working area during construction whilst protecting the retained RPAs from damage and compaction; and example of this has been detailed within appendix H. This should be underlaid with a geotextile permeable membrane to act as a pollution capture layer.

4.1.3 Stage 3. Carry out demolition works

1. In accordance with sub-section 7.3.4 of BS5837:2012 Trees in Relation to Design, Demolition and construction – Recommendations, demolition of existing structures should be undertaken inwards within the footprint of the existing building.
2. Large amounts of dust may coat tree leaves and reduce photosynthetic capability and create contamination to the leaf surface and damage. If it is expected that a large amount of dust is to be created from demolition works, then it may be required that a water suppression unit is present on site to reduce this to an acceptable level.

4.1.4 Stage 4. Carry out construction works

1. During the construction phase, it is important that all staff are aware of the tree protection measures and the importance of tree protection. This should be made clear during a site and pre-commencement of works induction. If any breach in the tree protection occurs, it is the site manager's responsibility to report this urgently to the Projects Consultant Arboriculturist (Christians) so the appropriate measures can be taken.
2. Due to the proposed new hardscaping from pathways, parking cycle and refuse storage areas being located within a significant portion of the RPAs for trees T19; T20; T21; T25; T27; T28; T29 and T30, specialist materials and construction methods will need to be adopted to preserve these areas and tree health. It is therefore advised that a cellular confinement system (such as the Geosynthetics product – Cellweb TRP) is used to act as an above ground construction method for foundations and paving as opposed to traditional excavations that could severely damage roots and cause the decline of retained trees. The sub-base infill and wearing course will need to be of permeable materials to ensure water percolation and gaseous exchange of the rooting environment. Areas where this will be required have been hatched on the Tree Protection Plan for further information. It is advised that a specialist provider such as Geosynthetics is contacted to provide further engineer design specifications of materials and depths for these areas.
3. Areas where the RPAs of retained trees extend underneath the existing areas of hardstanding that will be surfaced must not be excavated deeper than the existing sub-base and or wearing course depths. Existing sub-bases should be utilised where possible with new surface materials laid a top of this. Should it be deemed that additional depths are required, then this should be accounted for by building up with amendment of finished levels.

4.1.5 *Stage 5. Remove tree protection*

Upon successful completion of the developments, all tree protection shall be removed from site in reverse order of implementation.

4.1.6 *Stage 6. Undertake tree replacement planting*

1. Tree planting locations should be undertaken in accordance with the Landscape Plan (7252.01B LP 1.200).
2. These trees should be planted within the accepted planting season within the United Kingdom between the months of November – March.
3. Trees should be adequately supported until establishment with any posts and tree ties removed once deemed they are no longer required.
4. During establishment, should any subsequent and prolonged drought during spring and summer months be experienced, it may be necessary to undertake routine watering of the trees to ensure that they do not succumb to dieback during these conditions.

4.2 Design and Construction Guidance

4.2.1 *Construction Compound and Site Office*

No storage of materials, mixing or washing will be carried out within the Root Protection/Ground Protection Area. If there is a risk of run off leaching into the soil area from such operations, these areas should be bordered by sandbags and a non-permeable membrane to prevent contamination. It is proposed that a material storage area should be established in the existing adjacent car park if a designated area is required.

4.2.2 *Services*

All work to services on site should be guided by the principles discussed within the NJUG “Guidelines for Planning, Installation and Maintenance of Utility Services in Proximity to Trees”.

4.2.3 *Trees in Close Proximity to Structures*

When building new structures of any kind within close proximity to trees, it is recommended that a civil engineer should be appointed to specify the correct foundations and any further measures which may be required.

5 Appendices

APPENDIX A: TREE AND GROUP DATA

APPENDIX B: TREE CONSTRAINTS PLAN

APPENDIX C: TREE RETENTION PLAN

APPENDIX D: TREE PROTECTION PLAN

APPENDIX E: TREE PROTECTION FENCING SPECIFICATION

APPENDIX F: TREE PROTECTION SIGNAGE

APPENDIX G: TREE STEM PROTECTION

APPENDIX H: GROUND PROTECTION MATTING

APPENDIX I: CELL WEB TREE ROOT PROTECTION EXAMPLE

APPENDIX J: GLOSSARY OF ARBORICULTURAL TERMS

Within this section is the tree and group survey data. Also included is a chart explaining how trees are classed when carrying out a BS 5837:2012 Trees in Relation to Design demolition and Construction – Recommendations report. Within the appendix is also a glossary of arboricultural terms. **N.b.** Where group survey data is discussed, measurement variables of height, crown clearance and canopy spread are discussed as an average.

Category A	Those of high quality and value: in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested, unless site characteristics dictate otherwise)
Category B	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested, unless site characteristics dictate otherwise)
Category C	Those trees of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested, unless site characteristics dictate otherwise)
Category U	Those in such a condition that any existing value would be lost within 10 years, and which should, in the current context, be removed for reasons of sound arboricultural management

KEY:

Tree Numbers/Tags	Individual tree = T + number Group of trees = G + number
Species	Common and or scientific names where appropriate
Height	Overall tree height
Crown Clearance	Distance between lowest point of canopy and ground level
Diameter at breast height	Measurement of tree stem
Canopy spread	Extents of tree branches taken in compass points
Age Class	(Y=Young) (SM= Semi Mature) (M=Mature) (OM=Over Mature) (V=Veteran)
Tree Condition	Comments on trees overall health etc...
Comments	Any further details that may be of importance
Management recs	List of urgent works or further investigation that may be needed
Life Expectancy (years)	How long the tree will offer a contribution
Category Rating	See opposite table

Tree No.	Species	Height (m)	Crown Clearance (m)	No. of Stems	DBH (cm)	North Canopy Spread (m)	East Canopy Spread (m)	South Canopy Spread (m)	West Canopy Spread (m)	Age Class	Physiological Condition	Structural Condition	Conditional Comments	Preliminary Management Recommendations	Life Expectancy (years)	Retention Category
1	Prunus cerasifera	5	2	1	16	3	3	3	3	SM	Good	Moderate	Minor deadwood. Suppressed.	>Null<	11-20	C.2
2	Sorbus aucuparia	5	2	1	12	2	2	2	2	SM	Good	Moderate	Minor deadwood. Pruning wounds. Suppressed.	>Null<	11-20	C.2
3	Fraxinus excelsior	6	2	1	35	3	3	3	3	SM	Moderate	Moderate	Rooted on adjacent land [cannot access or inspect fully]. Minor deadwood. Ash dieback.	>Null<	<10	U
4	Fraxinus excelsior	13	4	1	60	5	6	4	7	M	Moderate	Poor	Rooted on adjacent land [cannot access or inspect fully]. Deadwood. Over hanging site.	>Null<	<10	U
5	Fraxinus excelsior	10	3	1	42	4	3	5	3	M	Moderate	Poor	Rooted on adjacent land [cannot access or inspect fully]. Deadwood.	>Null<	<10	U
6	Prunus serrulata	3	1	1	8	1	1	2	1	M	Moderate	Moderate	Suppressed. Stem damage.	>Null<	11-20	C.2
7	Prunus serrulata	3	1	1	11	1	1	2	1	M	Moderate	Moderate	Suppressed. Stem damage.	>Null<	11-20	C.2

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8	Fraxinus excelsior	8	4	1	25	3	3	3	3	SM	Moderate	Poor	Rooted on adjacent land [cannot access or inspect fully]. Deadwood. Overhanging site.	>Null<	<10	U
9	Tilia cordata	7	2	1	33	4	3	4	3	SM	Good	Moderate	Rooted on adjacent land [cannot access or inspect fully]. Deadwood.	>Null<	21-30	B.2
10	Cupressus x leylandii 'aurea'	9	1	3	13; 18; 21; 25	1	2	2	2	M	Good	Good	Rooted on adjacent land [cannot access or inspect fully]. Companion tree. Multi-stemmed. Overhanging site.	>Null<	21-30	B.2
11	Cupressus x leylandii 'glauca'	10	2	1	48	2	2	1	2	M	Good	Good	Rooted on adjacent land [cannot access or inspect fully]. Companion tree. Overhanging site.	>Null<	21-30	B.2
12	Tilia cordata	11	4	1	58	4	5	4	4	M	Good	Good	Rooted on adjacent land [cannot access or inspect fully]. Minor deadwood. Overhanging site.	>Null<	21-30	B.2
13	Pinus nigra	12	7	1	58	2	2	3	4	M	Good	Good	Rooted on adjacent land [cannot access or inspect fully].	>Null<	21-30	B.2
14	Fraxinus excelsior	13	4	1	45	4	5	4	4	M	Moderate	Moderate	Rooted on adjacent land [cannot access or inspect fully]. Minor deadwood. Overhanging site.	>Null<	<10	U
15	Fagus sylvatica 'purpurea'	11	4	1	56	5	6	4	4	M	Good	Good	Overhanging site. Minor deadwood. Unbalanced canopy. Dense vegetation inhibiting inspection. Stem deformity.	>Null<	21-30	B.2
16	Aesculus hippocastanum	8	3	1	58	5	4	3	4	M	Good	Good	Overhanging site. Minor deadwood. Unbalanced canopy. Dense vegetation inhibiting inspection.	>Null<	21-30	B.2
17	Tilia cordata	16	3	1	70	7.5	7.5	8.5	5.5	M	Good	Good	Overhanging site. Minor deadwood. Dense vegetation inhibiting basal inspection.	>Null<	21-30	A.2
18	Acer pseudoplatanus	8	5	1	55	2.5	4	5	6	M	Dead	Dead	Ded tree. Access prevented by dense vegetation.	Remove.	<10	U
19	Betula pubescens	12	4	1	25	2	2	3	2	M	Good	Good	Overhanging site. Minor deadwood. Access prevented by dense vegetation.	>Null<	21-30	B.2
20	Betula pubescens	10	4	1	30	1	2	3	2	M	Good	Good	Overhanging site. Minor deadwood. Access prevented by dense vegetation.	>Null<	21-30	B.2
21	Prunus avium	8	2	1	23	4	3	2	2	M	Good	Good	Overhanging site. Minor deadwood. Access prevented by dense vegetation.	>Null<	11-20	C.2

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22	Fraxinus excelsior	9	5	1	25	4	4	2	2	M	Moderate	Moderate	Overhanging site. Minor deadwood. Access prevented by dense vegetation.	Remove.	<10	U
23	Picea abies	4	1	1	13	2	1	2	1	SM	Good	Good	Overhanging carpark marginally.	>Null<	11-20	C.2
24	Fraxinus excelsior	6	2	2	13; 26	4	3	1	3	SM	Moderate	Moderate	Overhanging carpark. Suppressed. Minor deadwood.	Remove.	<10	U
25	Acer pseudoplatanus	12	2	1	85	6	7	6	5	OM	Moderate	Moderate	Overhanging carpark. Suppressed and in decline. Minor deadwood.	Remove.	<10	U
26	Ilex aquifolium 'argentea marginata'	4	2	1	29	3	2	2	2	M	Moderate	Moderate	Overhanging carpark. Suppressed. Close proximity to BT line.	>Null<	11-20	C.2
27	Aesculus hippocastanum	10	3	1	50	6	6	6	6	M	Moderate	Moderate	Overhanging carpark. Suppressed. Close proximity to BT pole. Minor deadwood. Restricted rooting area.	>Null<	21-30	B.2
28	Platanus x acerifolia	14	5	1	78	7	4	6	5	M	Good	Good	Overhanging carpark. Minor deadwood. Restricted rooting area.	>Null<	40>	A.2
29	Ilex aquifolium	6	1	2	27; 29	2	3	2	3	M	Good	Good	Restricted rooting area. Suppressed.	>Null<	11-20	C.2
30	Aesculus hippocastanum	10	3	1	80	5	5	4	3	M	Moderate	Good	Restricted rooting area. Suppressed. Minor deadwood. Dense ivy inhibiting inspection.	>Null<	21-30	B.2
31	Chamaecyparis lawsoniana	9	3	2	29; 34	2	2	2	2	M	Good	Good	Restricted rooting area. Suppressed. Minor deadwood. Codominant. Close proximity to BT pole..	>Null<	21-30	B.2
32	Taxus baccata	7	2	1	42	2	3	3	3	M	Good	Good	Restricted rooting area. Suppressed. Minor deadwood. Codominant. Close proximity to BT line.	>Null<	21-30	B.2
33	Acer pseudoplatanus/Prunus avium	8	2	3	15; 21; 27	2	4	3	3	SM	Moderate	Good	Restricted rooting area. Suppressed. Minor deadwood. Codominant. Close proximity to BT line. Companion trees.	>Null<	11-20	B.2

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34	Taxus baccata	6	2	1	45	3	2	3	2	M	Moderate	Good	Restricted rooting area. Suppressed. Minor deadwood. Dense ivy inhibiting inspection.	>Null<	21-30	B.2
35	Ilex aquifolium	6	3	1	34	3	2	3	3	M	Moderate	Good	Restricted rooting area. Suppressed. Minor deadwood.	>Null<	11-20	C.2

Group No.	Species	Av. Height (m)	Av. Canopy Clearance (m)	Approx. No. of Trees	Av. DBH (cm)	Av. Canopy Spread (N)	Av. Canopy Spread (E)	Av. Canopy Spread (S)	Av. Canopy Spread (W)	Av. Age Class	Physiological Condition	Structural Condition	Condition comments	Preliminary management recommendations	Retention Category	Remaining Contribution
1	Eleagnus × submacrophylla	3	1	10	12	3	2	3	2	M	Good	Good	Rooted on adjacent land. Overhanging site.	>Null<	11-20	C.2
2	Mixed broadleaf	4	1	20	15	1	1	1	1	SM	Moderate	Moderate	Semi mature trees acting as screening hedge. Moderate to poor health. Suppressed growth. Rooted on thin boarder strip of soil at edge of car park.	>Null<	11-20	C.2
3	Mixed broadleaf	4	1	20	12	1	1	1	1	SM	Moderate	Moderate	Juvenile to semi mature trees forming dense understory to woodland compartment. Overhanging car park marginally.	>Null<	11-20	C.2

Project:	4355 – 26A Wilberham Road
Site Address:	26 Wilbraham Rd, Fallowfield, Manchester M14 6JX
Survey Date:	17/08/2023



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KEY:

- Surveyed tree - category **A**
- Surveyed tree - category **B**
- Surveyed tree - category **C**
- Surveyed tree - category **U**
- Surveyed tree - extents of root protection area (RPA)
- Surveyed group of trees - Category **A**
- Surveyed group of trees - Category **B**
- Surveyed group of trees - Category **C**
- Surveyed group of trees - Category **U**
- Existing building and/or topographical feature

BESSEY 2012 Trees in relation to construction - Categories and definitions

Trees for removal

A Identification on Plan - **RED** - Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound Arboricultural management.

Criteria

Trees that have a serious, immediate, structural defect, such that their early loss is expected due to collapse, including those that will become unstable after removal of other U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)

Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline

Trees affected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease) or very low quality trees suppressing adjacent trees of better quality

NOTE: Natural replacement may be appropriate (e.g. U category tree used as a bar root; installation of bat box in nearby tree)

Trees to be considered for retention

A Identification on Plan - **LIGHT GREEN** - Those of high quality and value in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

B Identification on Plan - **MID BLUE** - Those of moderate quality and value; those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).

C Identification on Plan - **GREY** - Those of low quality and value, currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 50mm

Category C trees will usually not be retained where they would impose a significant constraint on development. Young trees with a stem diameter of less than 50mm should be considered for relocation. Category A and B trees will normally be retained.

Criteria - Subcategories

The following subcategories are applied. Trees may be allocated more than one subcategory, but this will not increase their overall value

1. Merely Arboricultural value

A1. Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups or formal or semi-formal Arboricultural features (e.g. the dominant and/or principal trees within an avenue)

B1. Trees that might be included in the high category, but are downgraded because of imposed condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage)

C1. Trees not qualifying in higher categories

2. Merely Landscape value

A2. Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other Arboricultural features assessed as groups)

B2. Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal Arboricultural features (e.g. trees of moderate quality within an avenue that includes better A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality

C2. Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit

3. Merely cultural values, including conservation

A3. Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. where trees or wood plant)

B3. Trees with clearly identifiable conservation or other cultural benefits

C3. Trees with very limited conservation or other cultural benefits

A	Jun 24	Tree Constraints Plan	CEL-RC
rev	date	description	by
1	Jun 24	Tree Constraints Plan	CEL-RC

CHRISTIANS Environmental Ltd

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client

Site Owner

project

264 Wilbraham Road

drawing title

Tree Constraints Plan

scale

1:200 @ A1

drawing number

26AWR-TCP-001

drawn

CEL-RC

date

Jun 2024

rev

A



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KEY:

- Retained Tree
- Tree to be Removed Due to the Proposal
- Tree to be Removed Due to Overall Poor Condition
- Retained Group
- Group to be Removed Due to the Proposal
- Group to be Removed Due to Poor Overall Condition
- Building and/or Topographical Feature
- Retained tree - extents of root protection area (RPA)
- Proposed Relocated Tree Canopy
- Proposed Replacement Tree Canopy
- RPA Incursion

A	Jun 2024	Tree Retention Plan	CEL-RC
rev	date	description	by
CHRISTIANS Environmental Ltd 1 +44 (0) 1254 790810 info@christianseltd.com www.christianseltd.com 2 +44 (0) 1539 234022 info@christianseltd.com www.christianseltd.com Christians Ltd (Lancashire) Minor Court Salembury Hall Road Haslingburn Preston PR6 3AR CA10 3JZ Christians Ltd (Cumbria) The Stable Coe Farm Hall Tatner Parrish CA10 3JZ			

client

Site Owner

project

26A Wilbraham Road

drawing title

Tree Retention Plan

scale

1:200 @ A1

drawing number

26AWR-TRP-001

drawn

CEL-RC

date

Jun 2024

rev

A



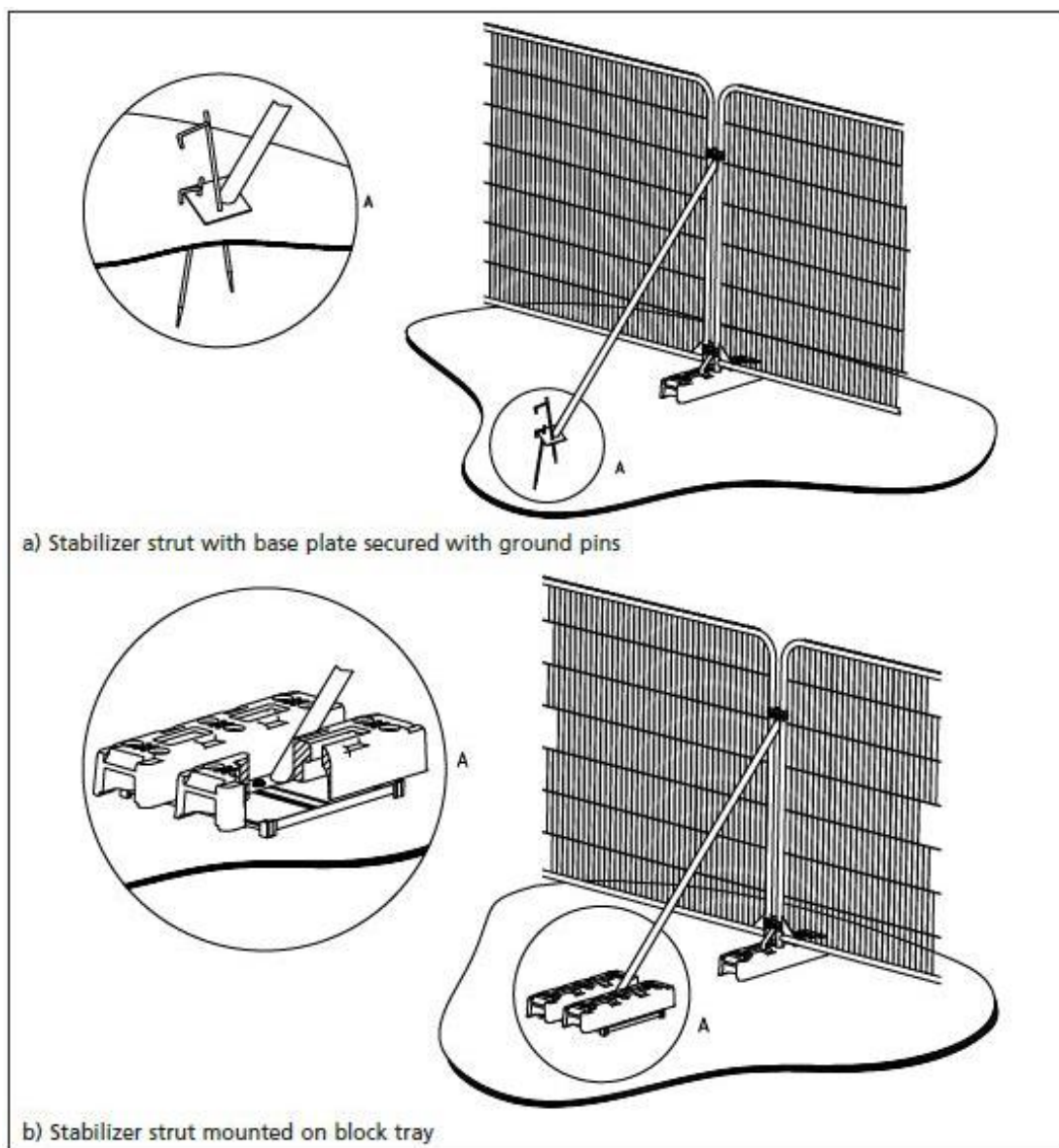
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- KEY:
- Proposed Tree Protection Fencing
 - Proposed Stem Protection Fencing
 - Proposed Cell Web No Dig
 - Retained Tree Canopy
 - Retained Tree Root Protection Area
 - Proposed Ground Protection Matting

A	Jun 2024	Tree Protection Plan	CEL-RC
rev	date	description	by
1		Christians Ltd (Lancashire)	Christians Ltd (Lancashire)
2		Minor Court Sawbury Hall Road Haslemere Surrey GU27 3JZ	The Stable Coal Farm Hall Tisbury Wiltshire BA13 3JZ
3		+44 (0) 1254 790810 info@christiansltd.com www.christiansltd.com	+44 (0) 1539 234022 info@christiansltd.com www.christiansltd.com

client
Site Owner
project
264 Wilbraham Road
drawing title
Tree Protection Plan
scale
1:200 @ A1
drawing number
26AWR-TPP-001
drawn
CEL-RC
date
Jun 2024
rev
A

TREE PROTECTION FENCING EXAMPLES



TREE PROTECTION SIGN

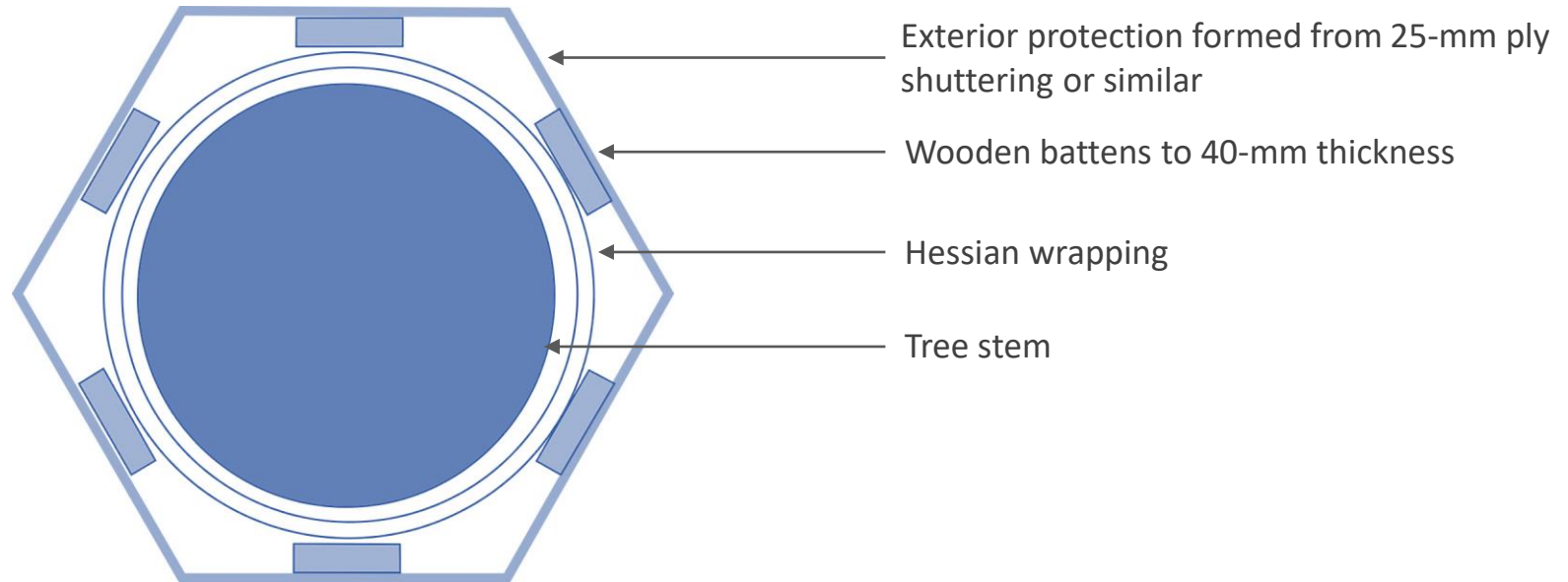


**TREE PROTECTION
FENCING. THIS FENCING
MUST BE MAINTAINED IN
ACCORDANCE WITH THE
APPROVED PLANS AND
SPECIFICATIONS FOR THIS
DEVELOPMENT.**



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

Inset Sketch 1: Schematic of stem boxes viewed in section



TEMPORARY PATHWAYS, PEDESTRIAN & FOOTWAY BOARDS

Walkovers



TPPF-WALK

Client demands for 'clean working' and Health & Safety considerations on jobsites means that every effort must be made to keep any mess and muck to an absolute minimum. Even the events and festival arenas that used to glory in the depth of their mud have long ago realised that where there is a mess, there's a hazard, plus a bill to clean it up.

So whether you are doing a house extension next to your customers prize Begonias, foot trafficking a grass verge whilst you overhaul a gas line or turning a quiet meadow into a temporary Cathedral to Rock & Roll, we'll provide something decent for you to walk on.

TECHNICAL SPECIFICATION

TYPICAL APPLICATIONS:

Heavy duty rubber Walkovers are ideal for foot traffic over grass and unmade ground.

Panel dimensions 1,200 x 700

Textured surface means that they stay where they are put, even on slopes and embankments

A 'clean feet' solution for parties, events and sensitive job sites.

Our installation service is available if required.

They have a link up function on all 4 sides so can be formed in pads of any dimension.

Approved for use by National Grid and most of the major utility companies

At just 20 kgs each they are easily transportable and can be installed with no special skills or tools

Not suitable for loads over open excavations

As with all roadplates/crossing plates, the loadings for whatever passes over them will be transferred to the areas bearing the edges of the plate. Adequate measures to shore the underlying excavations should be taken

Individually serial numbered for tracking purposes

MASS: 20 kgs

ANTI SKID: Textured moulded surface

SECURING METHOD: Rebated edges for interlinking



Case Study

Cellweb® TRP

Location:

116 Roehampton lane
Roehampton
London
SW15 4HT

Client:

Downshire House
Roehampton University

Project:

Downshire House



Contractor:

Morgan Sindall



Geosynthetics Limited

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Hinckley
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Tel. 01455 617 139
sales@geosyn.co.uk
www.geosyn.co.uk

Morgan Sindall approached Geosynthetics requiring correction work for their high trafficked roadway at Downshire House Roehampton University. The original road used a Geogrid with a 200mm surcharge of stone which wasn't suitable for such a high traffic area.

Geosynthetics Limited was able to visit the site and offer our 200mm deep Cellweb® TRP as a suitable solution to this problem. As the site was used for construction traffic it was extremely important to ensure that the product supplied could withstand the pressure of construction machinery passing over it on a daily basis. The original product was causing the vehicles to sink into the ground disabling any work to continue on site.

Cellweb® TRP is a 3D Cellular Confinement System that was originally created for use by the U.S army corp engineers to transport large vehicles across unstable terrain. Cellweb® TRP is available in a variety of depths. The 200mm deep is capable of supporting up to 60 tons of gross weight distributed.

Within 4 working days of the haulage road failing, Geosynthetics Limited provided a

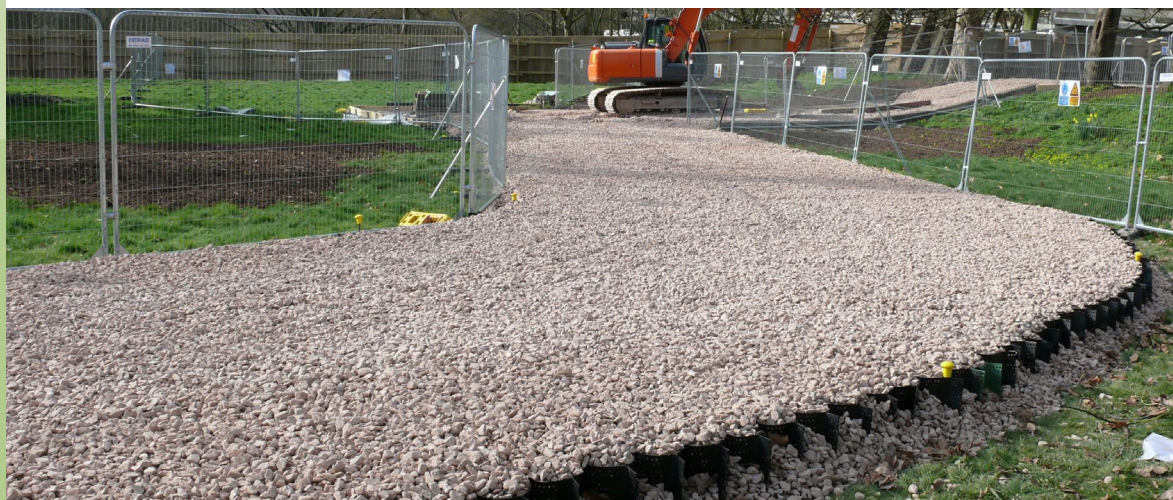


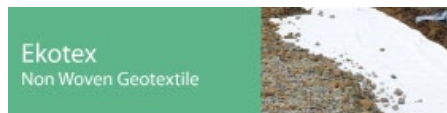
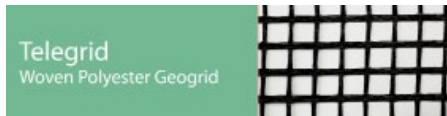
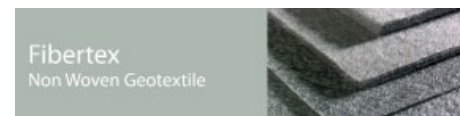
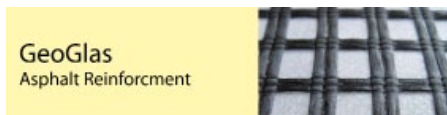
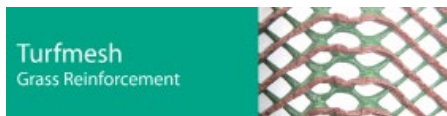
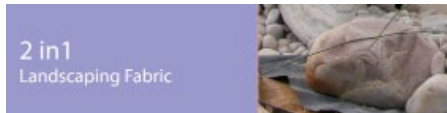
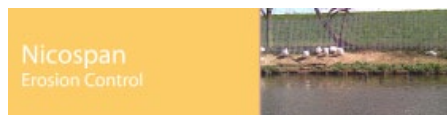
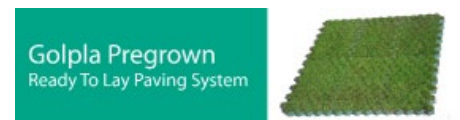
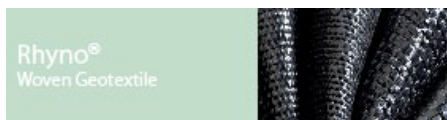
full technical recommendation including calculations for the rebuilding of the road. As Cellweb® TRP is kept in stock at Geosynthetics delivery was processed and dispatched the same day.

This project was designed, supplied, installed and operational within 7 days. Geosynthetics Limited Engineering capabilities combined with stock availability made Geosynthetics Limited the perfect solution for the project.

"Our designed haul road was failing to perform due to the angular stone not binding. We needed an instant solution to provide a stable road where the construction traffic's wheels didn't spin or dig-in. Using Cellweb® TRP, and Geosynthetics range of services, we were able to utilise the existing stone to quickly provide a suitable haulage road."

Nigel Coleman - Site Manager





Geosynthetics Limited | Fleming Road | Harrowbrook Ind Est | Hinckley | Leicestershire | LE10 3DU

Abscission. The shedding of a leaf or other short-lived part of a woody plant, involving the formation of a corky layer across its base; in some tree species twigs can be shed in this way

Abiotic. Pertaining to non-living agents; e.g. environmental factors

Absorptive roots. Non-woody, short-lived roots, generally having a diameter of less than one millimetre, the primary function of which is uptake of water and nutrients

Adaptive growth. In tree biomechanics, the process whereby the rate of wood formation in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium. This helps to maintain a uniform distribution of mechanical stress

Adaptive roots. The adaptive growth of existing roots; or the production of new roots in response to damage, decay or altered mechanical loading

Adventitious shoots. Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage. The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Architecture. In a tree, a term describing the pattern of branching of the crown or root system

Ascomycota (Ascomycetes). One of the major taxonomic groups of fungi; their spores are borne on microscopic structures called asci, which in many types are in turn borne upon the fruit body of the fungus usually taking the form of a crust or cup. These fungi have particular importance in arboriculture, as some can cause significant decay and dysfunction in the live tissue of trees.

Axil. The place where a bud is borne between a leaf and its parent shoot

Bacteria. Microscopic single-celled organisms, many species of which break down dead organic matter, and some of which cause diseases in other organisms

Bark. A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Bark included union [BI]. When two or more branches or stems are held static or where normal movement is inhibited causing a weak branch attachment. This is usually caused by a 'natural-brace' or artificial structure above the point to where the branch attach to the stem.

Basidiomycota (Basidiomycetes). One of the major taxonomic groups of fungi; their spores are borne on microscopic peg-like structures (basidia), which in many types are in turn borne on or within conspicuous fruit bodies, such as brackets or toadstools. Most of the principal decay fungi in standing trees are basidiomycetes

Bolling. A term sometimes used to describe pollard heads

Bottle-butt. A broadening of the stem base and buttresses of a tree, in excess of normal and sometimes denoting a growth response to weakening in that region, especially due to decay involving selective delignification

Bracing. The use of rods or cables to restrain the movement between parts of a tree

Branch:

- **Primary.** A first order branch arising from a stem
- **Lateral.** A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral.** A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch bark ridge. The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem

Branch collar. A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot. A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling. An irreversible deformation of a structure subjected to a bending load

Buttress zone. The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium. Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker. A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Canopy species. Tree species that mature to form a closed woodland canopy

Cleaning out. The removal of dead, crossing, weak, and damaged branches, where this will not damage or spoil the overall appearance of the tree

Compartmentalization. The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compression strength. The ability of a material or structure to resist failure when subjected to compressive loading; measurable in trees with special drilling devices

Compressive loading. Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition. An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Construction exclusion zone. Area based on the Root Protection Area (in square metres) to be protected during development, by the use of barriers and/or ground protection

Crown/Canopy. The main foliage bearing section of the tree

Crown lifting. The removal of limbs and small branches to a specified height above ground level

Crown thinning. The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping. A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

Crown reduction/thinning. Reduction of the canopy volume by thinning to remove dominant branches whilst preserving, as far as possible the natural tree shape

Deadwood. Dead branch wood

Decurrent. In trees, a system of branching in which there is a well-defined central main stem, bearing branches which are limited in their length, diameter and secondary branching (cf. excurrent). In fungi with toadstools as fruit bodies, the description of gills which run some distance down the stem, rather than terminating abruptly

Defect. In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment

Delamination. The separation of wood layers along their length, visible as longitudinal splitting

Dieback. The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease. A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Distal. In the direction away from the main body of a tree or subject organism (cf. proximal)

Dominance. In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also, the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud. An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction. In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DBH (Diameter at Breast Height). Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified

Deadwood. Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Endophytes. Micro-organisms which live inside plant tissues without causing overt disease, but in some cases capable of causing disease if the tissues become physiologically stressed, for example by lack of moisture

Epicormic shoot. A shoot having developed from a dormant or adventitious bud and not having developed from a first-year shoot

Excrecence. Any abnormal outgrowth on the surface of tree or other organism

Excurrent. In trees, a system of branching in which the crown is borne on a number of major widely-spreading and secondarily branched limbs (cf. excurrent)

Felling licence. In the UK, a permit to fell trees in excess of a stipulated number of stems or volume of timber

Flush-cut. A pruning cut which removes part of the branch bark ridge and or branch-collar

Girdling root. A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Guying a form of artificial support with cables for trees with a temporarily inadequate anchorage

Habit. The overall growth characteristics, shape of the tree and branch structure

Hazard beam. An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Heartwood/false-heartwood/ripe wood. Sapwood that has become dysfunctional as part of the natural aging processes

Heave. A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also, the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

High canopy tree species. Tree species having potential to contribute to the closed canopy of a mature woodland or forest

Incipient failure. In wood tissues, a mechanical failure which results only in deformation or cracking, and not in the fall or detachment of the affected part

Increment borer. A hollow auger, which can be used for the extraction of wood cores for counting or measuring wood increments or for inspecting the condition of the wood

Infection. The establishment of a parasitic micro-organism in the tissues of a tree or other organism

Internode. The part of a stem between two nodes; not to be confused with a length of stem which bear nodes but no branches

Lever arm. A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin. The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed Lignification

Lions tailing. A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end loading

Loading. A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Longitudinal. Along the length (of a stem, root or branch)

Lopping. A term often used to describe the removal of large branches from a tree, but also used to describe other forms of cutting

Mature Heights (approximate):

- **Low maturing** – less than 8 metres high
- **Moderately high maturing** – 8 – 12 metres high
- **High maturing** – greater than 12 metres high

Micro drill. An electronic rotating steel probe, which when inserted into woody tissue provides a measure of tissue density

Minor deadwood. Deadwood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree

Mulch. Material laid down over the rooting area of a tree or other plant to help conserve moisture; a mulch may consist of organic matter or a sheet of plastic or other artificial material

Mycelium. The body of a fungus, consisting of branched filaments (hyphae)

Natural brace. This feature can be defined as where two or more branches or stems connect, join, rub, fuse or entwine in the canopy of the tree. This can restrict normal movement lower down the branch which inhibits movement at the point of where the branch attaches to the stem of the tree; this is commonly known as the union, but also the junction or fork. As the tree grows and thickens, this will cause a bark included union due to the branch being tied up. If the rubbing branches are removed or die-back, this can open the union up to excessive stress and possibly cause the branch to fail. This is because the union has not been able to produce the necessary adaptive (or strengthening) growth through natural movement.

Occluding tissues. A general term for the roll of wood, cambium and bark that forms around a wound on a woody plant (cf. wound wood)

Occlusion. The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen. A micro-organism which causes disease in another organism

Photosynthesis. The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products.

Phytotoxic. Toxic to plants

Pollarding. The removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years. The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.

Primary branch. A major branch, generally having a basal diameter greater than 0.25 x stem diameter

Primary root zone. The soil volume most likely to contain roots that are critical to the health and stability of the tree and normally defined by reference to Table 1 of BS5837 (1991) Guide for Trees in Relation to Construction.

Priority. Works may be prioritised, 1. = high, 5. = low

Probability. A statistical measure of the likelihood that a particular event might occur.

Proximal. In the direction towards from the main body of a tree or other living organism (cf. distal)

Pruning. The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial. In the plane or direction of the radius of a circular object such as a tree stem

Rams-horn. In connection with wounds on trees, a roll of occluding tissues which has a spiral structure as seen in cross-section

Rays. Strips of radially elongated parenchyma cells within wood and bark. The functions of rays include food storage, radial translocation and contributing to the strength of wood

Red-rot. A form of decay in which reddish pigments are present but which is biochemically a white-rot; not to be confused with brown-rots which sometimes also have a reddish-brown colour

Reactive Growth/Reaction Wood. Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Removal of dead wood. Unless otherwise specified, this refers to the removal of all accessible dead, dying and diseased branch wood and broken snags

Removal of major dead wood. The removal of, dead, dying and diseased branch wood above a specified size

Respacing. Selective removal of trees from a group or woodland to provide space and resources for the development of retained trees.

Residual wall. The wall of non-decayed wood remaining following decay of internal stem, branch or root tissues

Root-collar. The transitional area between the stem/s and roots

Root-collar examination. Excavation of surfacing and soils around the root-collar to assess the structural integrity of roots and/or stem

Root protection area. An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival. Calculated with reference to Table 2 of BS5837 (2005) and shown in plan form in square metres

Root zone. Area of soils containing absorptive roots of the tree/s described microscopic and dispersed in air or water. The **Primary** root zone is that which we consider of primary importance to the physiological well-being of the tree

Sapwood. Living xylem tissues

Secondary branch. A branch, generally having a basal diameter of less than 0.25 x stem diameter

Selective delignification. A kind of wood decay (white-rot) in which lignin is degraded faster than cellulose

Shedding. In woody plants, the normal abscission, rotting off or sloughing of leaves, floral parts, twigs, fine roots and bark scales

Silvicultural thinning. Removal of selected trees to favour the development of retained specimens to achieve a management objective

Simultaneous white-rot. A kind of wood decay in which lignin and cellulose are degraded at about the same rate

Snag. In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing-point or dormant bud; a snag usually tends to die back to the nearest growing point

Soft-rot. A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Spores. Propagules of fungi and many other life-forms; most spores are

Shrub species. Woody perennial species forming the lowest level of woody plants in a woodland and not normally considered to be trees **Sporophore.** The spore bearing structure of fungi

Sprouts. Adventitious shoot growth erupting from beneath the bark

Stem/s. The main supporting structure/s, from ground level up to the first major division into branches

Stress. In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

Stress. In mechanics, the application of a force to an object

Stringy white-rot. The kind of wood decay produced by selective delignification

Storm. A layer of tissue which supports the fruit bodies of some types of fungi, mainly ascomycetes

Structural roots. Roots, generally having a diameter greater than ten millimetres, and contributing significantly to the structural support and stability of the tree

Subsidence. In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots

Subsidence. In relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight

Taper. In stems and branches, the degree of change in girth along a given length

Target canker. A kind of perennial canker, containing concentric rings of dead occluding tissues

Targets. In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping. In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Torsional stress. Mechanical stress applied by a twisting force

Translocation. In plant physiology, the movement of water and dissolved materials through the body of the plant

Transpiration. The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

Understory. A layer of vegetation beneath the main canopy of woodland or forest or plants forming this

Understory tree species. Tree species not having potential to attain a size at which they can contribute to the closed high canopy of a woodland **Vascular wilt.** A type of plant disease in which water-conducting cells become dysfunctional

Vessels. Water-conducting cells in plants, usually wide and long for hydraulic efficiency; generally, not present in coniferous trees

Veteran tree. A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned

White-rot. A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

Wind exposure. The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure. The force exerted by a wind on a particular object

Wind throw. The blowing over of a tree at its roots

Wound dressing. A general term for sealants and other materials used to cover wounds in the hope of protecting them against desiccation and infection; only of proven value against fresh wound parasites

Wound wood. Wood with atypical anatomical features, formed in the vicinity of a wound'