



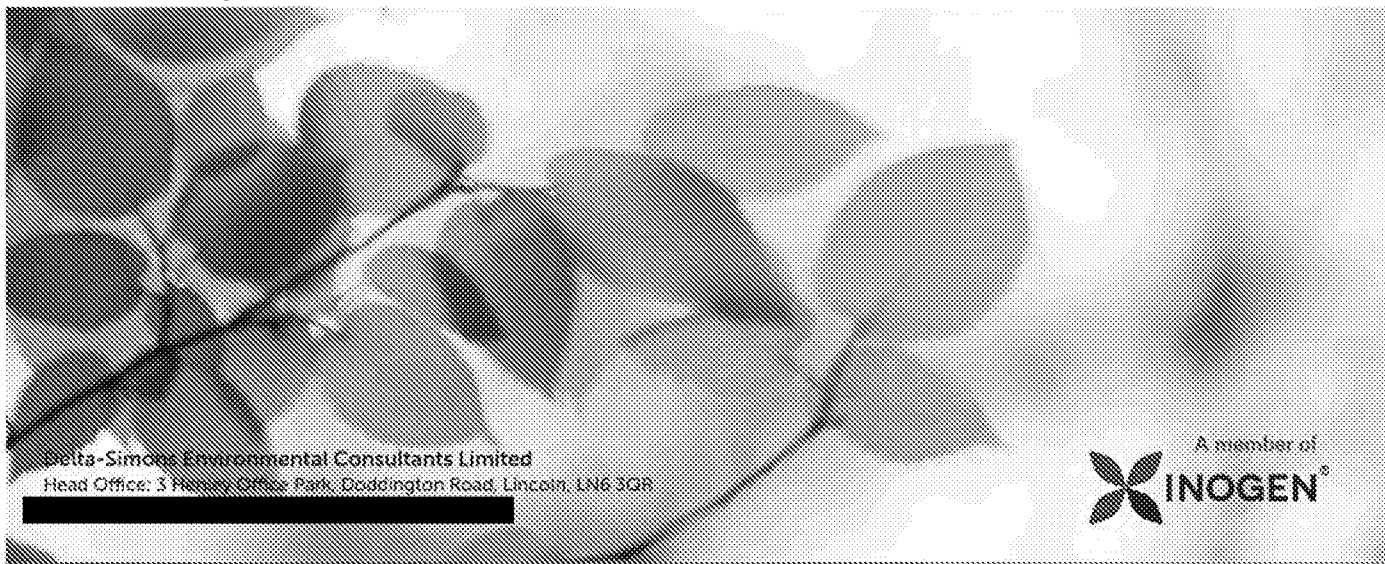
Arboricultural Method Statement for Enabling and Construction Phases of Work

DBN3 Norway Lane, Littlehampton

Presented to Gleave Partnership Ltd.

Issued: March 2019

Delta-Simons Project No. 19-0138.05



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Report Details

Client	Gleave Partnership Ltd.
Report Title	Arboricultural Method Statement for Enabling and Construction Phases of Work
Site Address	DBN3 Norway Lane, Littlehampton
Project No.	19-0138.05
Delta-Simons Contact	Pete Morrell [REDACTED]

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1.	Final	20 th March 2019	[REDACTED]	Catherine Bywood Arboriculturalist	Peter Morrell Principal Arboriculturalist	Charlotte Sanderson-Lewis Associate and Ecology Team Leader

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1.0 Introduction

1.1 Purpose and Scope of the Method Statement

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Gleave Partnership Ltd. (the "Client") to produce an Arboricultural Method Statement (AMS) to British Standard BS5837:2012. This AMS has been prepared for trees within and immediately beyond the boundary of the Amazon Warehouse off Norway Lane in the north-east of Littlehampton in West Sussex (hereafter referred to as 'the Site'). The Delta-Simons Arboricultural Survey (March 2019, report reference 19-0138.02) has been referenced to inform this Statement.

This AMS covers the Enabling and Construction Phases of Works for the alterations to the internal access routes at the Site, including the widening of the road in the north. The Site location is shown in Figure 1. The proposed development plan is included as Figure 2.

The purpose of this AMS is to assist with the preservation of trees shown to be retained at, and adjacent to, the Site. Trees can readily be retained and protected during the proposed development by ensuring that the tree protection methods, construction techniques and working practices are adhered to. This document provides this information; principles that are approved and enforced by the Local Planning Authority (LPA), Arun District Council.

1.2 AMS Summary

The following points are explained and qualified in more detail within this Report, and this summary is intended for reference only. Any actions consequent to this summary should be discussed with the Arboriculturalist at Delta-Simons before being undertaken in order to prevent a potential breach of tree protection legislation, whether by planning condition, area planning designation or specific tree preservation order (which may apply to individual trees or groups).

This document will give Site-specific instructions on the methods required to protect the existing tree stock agreed to be retained. These methods are set out in a logical sequence of operations and include:

- ▲ Pre-construction meeting: To review the AMS and ensure all relevant parties are familiar with its content, show the trees concerned and where protection will be required;
- ▲ Tree protection fencing and exclusion signage: To BS 5837:2012 or other agreed approach if required;
- ▲ Ground protection: Techniques to avoid compaction, disturbance or contamination of the tree root environment;
- ▲ Groundworks, foundations and services: Methods to allow building operations including service routing and special measures where Root Protection Areas (RPA) are unavoidably breached. To include specialist construction methods such as piling for foundations, no-dig solutions for footpaths and paved areas, where permissible, in proximity to trees without damage to the tree, from root damage, or to the buildings, either from roots or from ground desiccation and heave;
- ▲ Erection of scaffolding for construction;
- ▲ General tree care measures and awareness; and
- ▲ Site monitoring to be undertaken by the Arboriculturalist at agreed intervals through the Site preparation and construction process.

The British Standard recommendations are made for appropriate barriers to exclude construction from RPA: The RPA for each tree is provided in the Tree Survey Schedule (Appendix A).

It should be noted that this is a Site-specific AMS produced solely for the physical protection of those trees identified within the Tree Survey and is not relevant to any other site or situation. This Report has been compiled from data achieved during the Tree Survey by Delta-Simons on 4th February 2019.

2.0 Root Protection Areas

As the majority of tree roots are found in the upper metre of soil, development works, including for example even shallow excavation and soil compaction can adversely affect the health of trees in close proximity. Trees differ in their tolerance to root loss or disturbance, according to their age, species and/ or condition. All protection works within this document are in accordance with BS5837:2012 *'Trees in Relation to Design, Demolition and Construction – Recommendations'*

Based on the tree survey data, RPAs have been determined for every retained tree as shown in the Tree Survey (Appendix A). The RPAs are designed to protect at least a functional minimum of tree root mass in order to ensure that the trees survive the construction process. The RPA has been used to inform the Construction Exclusion Zone (CEZ), the area to be protected during development by the use of ground protection and specialised construction techniques, outlined below.

A total of eight individual trees T12, T14, T15, T18, T19, T20, T24 and T30, three trees within TG13 and three trees within TG21, totalling 15 trees, are to be removed to facilitate the works.

From the assessment undertaken, the following tree needs specific consideration in this AMS:

- ▲ **T29** - This tree is located on the eastern Site boundary and is a memorial tree.

3.0 Methodology

The following sequences are governed by operational constraints and subject to change. The Site Arboriculturalist must be noted of any changes to this schedule.

3.1 Sequenced Methods of Construction and Tree Protection

Pre-Development Stage

3.1.1 Pre-Commencement

An on-Site meeting will be held if required, with all relevant parties; including the developer, Site Arboriculturalist, Architect and LPA representative. The purpose of this meeting is to record Site features including tree condition, to agree tree works (detailed below), the location of permanent and temporary access, location of Site storage, the location of ground protection barriers and the timing of Site operations.

3.1.2 Completion of Agreed Tree Works

All tree work is to conform to BS3998:2010 'Tree Work' and to current arboricultural best practice. Tree works are to be undertaken by a professional and specialist arboricultural contractor, who carries the appropriate experience and insurance cover and following formal approval from the LPA.

A total of eight individual trees T12, T14, T15, T18, T19, T20, T24 and T30, three trees within TG13 and three trees within TG21, totalling 15 trees, are to be removed to facilitate the works.

3.1.3 Tree Protection Barriers

Tree protection barriers will be erected in order to exclude the CEZ from significant construction activity. All construction work will be undertaken from the existing hard surfaces. It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

Inside the exclusion area of the development, the following shall apply:

- ⚡ No mechanical excavation without approval from the LPA;
- ⚡ No excavation by any other means without Arboricultural Site supervision;
- ⚡ No hand digging without a written Method Statement having first been approved by the Site Arboriculturalist;
- ⚡ No ground level changes whatsoever;
- ⚡ No storage of plant or materials;
- ⚡ No storage or handling of any chemicals;
- ⚡ If 360-degree excavators are to be used during construction, at no time is the excavating arm to encroach over the position of the protection barriers;
- ⚡ No vehicular access;
- ⚡ No fires should be lit within 10 metres of the nearest point of the canopy of any retained tree;
- ⚡ No equipment, signage, fencing, tree protection barriers, materials, components, vehicles or structures shall be attached to or supported by a retained tree; and
- ⚡ No mixing of cement or use of other materials or substances shall take place within tree RPA or tree CEZ, nor in proximity to tree RPA or tree CEZ, since leakage or displacement of those materials or substances could cause them to enter tree RPA or tree CEZ.

Following the authorised tree works, TPF will be erected in accordance with BS5837:2012 that comprises 2 m tall welded mesh panels on rubber feet. The fence panels should be joined together using a minimum of two anti-tamper couplers, installed so they can only be removed from inside the fence.

The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabiliser struts mounted on a block tray. (See Appendix C).

T29 lies adjacent to the proposed working area in the east of the Site, and will be individually fenced to protect it, whilst a single line of fence will be sufficient for trees in the north of the Site.

Once the barriers have been properly erected in position, they are to be considered fixed, and are not to be removed or altered in any way without prior approval from the Site Arboriculturist and the LPA.

Weather-proof signs shall be fixed to the outside of the walls with words such as 'CONSTRUCTION EXCLUSION ZONE – NO ACCESS AND NO STORAGE OR WORKING WITHIN THIS AREA'. (See Appendix D).

All operatives and other relevant personnel are to be informed of the role of the exclusion barriers and their importance. A copy of the TPP will be displayed on-Site at all times during the construction process.

The location of the protection barriers is indicated on Figure 3. The position of the barriers is to be marked out with biodegradable marker paint on-Site and agreed with appropriate representatives from the LPA and the Site Contractor.

The barriers will be erected prior to any works on-Site in the vicinity of retained trees, including enabling works, removal of curbing or the delivery of machinery, materials, plant or equipment to the Site or any adjacent land. The barriers will remain in situ until final completion or until a time agreed by the LPA and Contractor.

Construction of hardstanding, paths and parking bays will be undertaken as part of the Construction Stage.

3.1.4 Temporary Ground Protection Method and Specification

In the unlikely event that it is required, the Contractor, Site Arboriculturist, and the LPA will liaise over measures for vehicular or pedestrian access for construction operations to be located within a tree's RPA. In such a case, a combination of barriers and ground protection should be adopted to form the CEZ. The objective is to minimise soil compaction.

- ❖ Example 1 - For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid on to a geotextile membrane (see Appendix E);
- ❖ Example 2 - For pedestrian-operated plant up to a gross weight of two tonnes, proprietary inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane; and
- ❖ Example 3 - For wheeled or tracked construction traffic exceeding two tonnes gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

The Ground Guards temporary road system can be used on construction sites to protect virgin ground from erosion and damage by construction vehicles. Ground Guards are usually installed as a construction 'haul' roadway consisting of a parallel track of 2.4 m x 1.2 m panels with a 1.2 m space in between. Where a temporary 'haul' roadway must pass near to trees, the following extra precautions must be taken in order to spread the loading applied to the track way:

- ❖ Edge rails of 200 x 50 mm sawn timber or un-treated sleepers should be installed where the track way will pass over exposed retained tree RPA's. These should be installed on either side of the track way using either 50 x 50 x 500 mm timber stakes or 500 mm steel pins spaced at 1.5 m intervals;
- ❖ A layer of geotextile membrane should then be laid over the area of ground to have the track way installed upon it;
- ❖ A base layer of Ground Guards should be laid over the top of the geotextile membrane at least three boards wide between the installed timber edging;

- ▲ A minimum layer of at least 150 mm deep coarse, preferably green wood chippings should be laid as a compressible layer over the top of the Ground Guards; and
- ▲ The twin surface Ground Guard track way can then be laid over the top of the wood chippings.

3.1.5 Underground and above-ground utility apparatus

Mechanical trenching for the installation of underground apparatus and drainage severs any roots present and can change the local soil hydrology in a way that adversely affects the health of the tree. For this reason, particular care should be taken in the routeing and methods of installation of all underground apparatus. Wherever possible, apparatus should be routed outside RPAs. Where this is not possible, it is preferable to keep apparatus together in common ducts. Inspection chambers should be sited outside the RPA.

Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routeing should be drawn up in conjunction with the project arboriculturist. In such cases, trenchless insertion methods should be used, with entry and retrieval pits being sited outside the RPA. Provided that roots can be retained and protected in accordance with the National Joint Utilities Guide, Volume 4, (see Appendix F).

3.1.6 Removal of Existing Hard Surfaces

Reasonable notice will be given to the LPA as to the date of commencement of any removal of hard standing surfaces adjacent to the retained trees as part of the enabling works, noting that there is very limited above ground removal to be undertaken mainly consisting of existing curbs. This will provide the LPA with the opportunity to visit the Site and ensure that all tree protection methods are in place.

3.1.7 Groundworks

- ▲ Spoil, including soil and rubble will be removed from the Site and not stored against any protection barriers or over any ground protection;
- ▲ Only predetermined access routes with appropriate ground protection will be used to during this process; and
- ▲ The enabling programme is to be undertaken across the Site. The works are not considered to impact upon any RPA.

3.1.8 Dismantling Protection Barriers and Landscaping Works

- ▲ It is anticipated that the barriers will remain in place until the landscaping stage of works;
- ▲ A minimum of seven days' notice will be given to the LPA prior to the dismantling of the protection barriers;
- ▲ Prior to any landscaping works taking place on-Site, the Site Arboriculturist will inspect the RPA for signs of ground compaction and brief the landscaping contractors to working practices to be employed within RPAs; and
- ▲ Once the barriers have been removed all landscaping works undertaken will avoid soil re-grading and disturbance within the CEZ, and no soil levels will be altered after the protection barriers have been removed.

3.1.9 Soft Landscaping within the RPA

- ▲ All works will conform to BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces);
- ▲ Sensitive ground preparation must be carried out in the RPA's to ensure root damage is avoided;
- ▲ Heavy machinery i.e. a rotovator, is not permitted and only clearance of vegetation or turf by hand (or a light mechanical turf stripper), is acceptable;
- ▲ Soil levelling must be carried out by hand;
- ▲ Should soil become compacted or have poor structure, which may hinder the development of newly planted flora, advice can be sought from the Arboriculturist in regard to de-compaction works using 'air-spade' technology and 'vertimulching' techniques; and
- ▲ Trench planting should be avoided in the RPA to avoid damage to roots. Plants must be bedded individually.

4.0 Communications/Monitoring

In order to ensure that the principles of tree protection set out in the statement are adhered to, the contact details of the key individuals involved with these works, and the tasks that require monitoring should be set out. These details should be retained by all relevant parties and available on-Site at all times. Relevant parties will be advised of any changes in personnel or contractor during the development process.

Before construction begins written confirmation that the Site contractor or its agents agree to comply in full with the principles set out within this Method Statement will be lodged with the LPA.

Specific Contacts are identified as follows:

▲ **Developers Arboriculturalist:** Pete Morrell, Delta-Simons

Pete.Morrell@deltasimons.com 07824 445051

▲ **Developer:** Martin O'Connor

Martin.oconnor@gleavegs.co.uk 07713 416194

4.1 Monitoring

Monitoring of all trees on-Site and immediately adjacent to the Site will be undertaken by the developer's arboriculturalist. This will take the form of Arboricultural Protection Site Inspections:

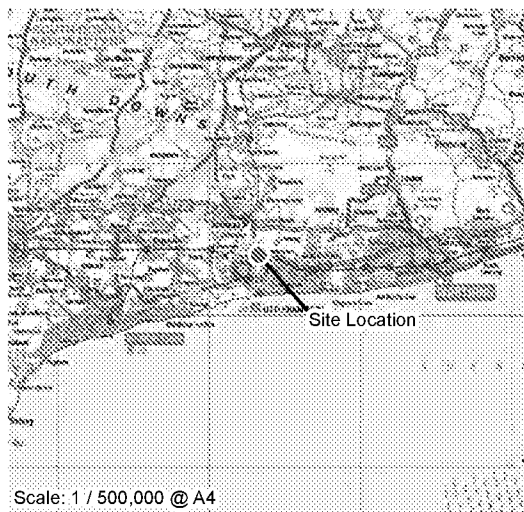
- ▲ Site inspections will be completed at regular intervals for the entire duration of on-Site external operations;
- ▲ Adherence to the approved Arboricultural Method Statement and any incidents will be monitored and recorded; and
- ▲ A Reporting Form (Appendix V) will be produced following each visit by the Developers Arboriculturalist and distributed to the LPA and Site contractor.

5.0 Limitations of the Arboricultural Method Statement

The recommendations contained in this Method Statement represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.0 of this Method Statement, exercising the duty of care required of an experienced Environmental Consultant.

This Method Statement was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Method Statement. Nothing contained in this Method Statement shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Method Statement to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Method Statement by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Method Statement, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

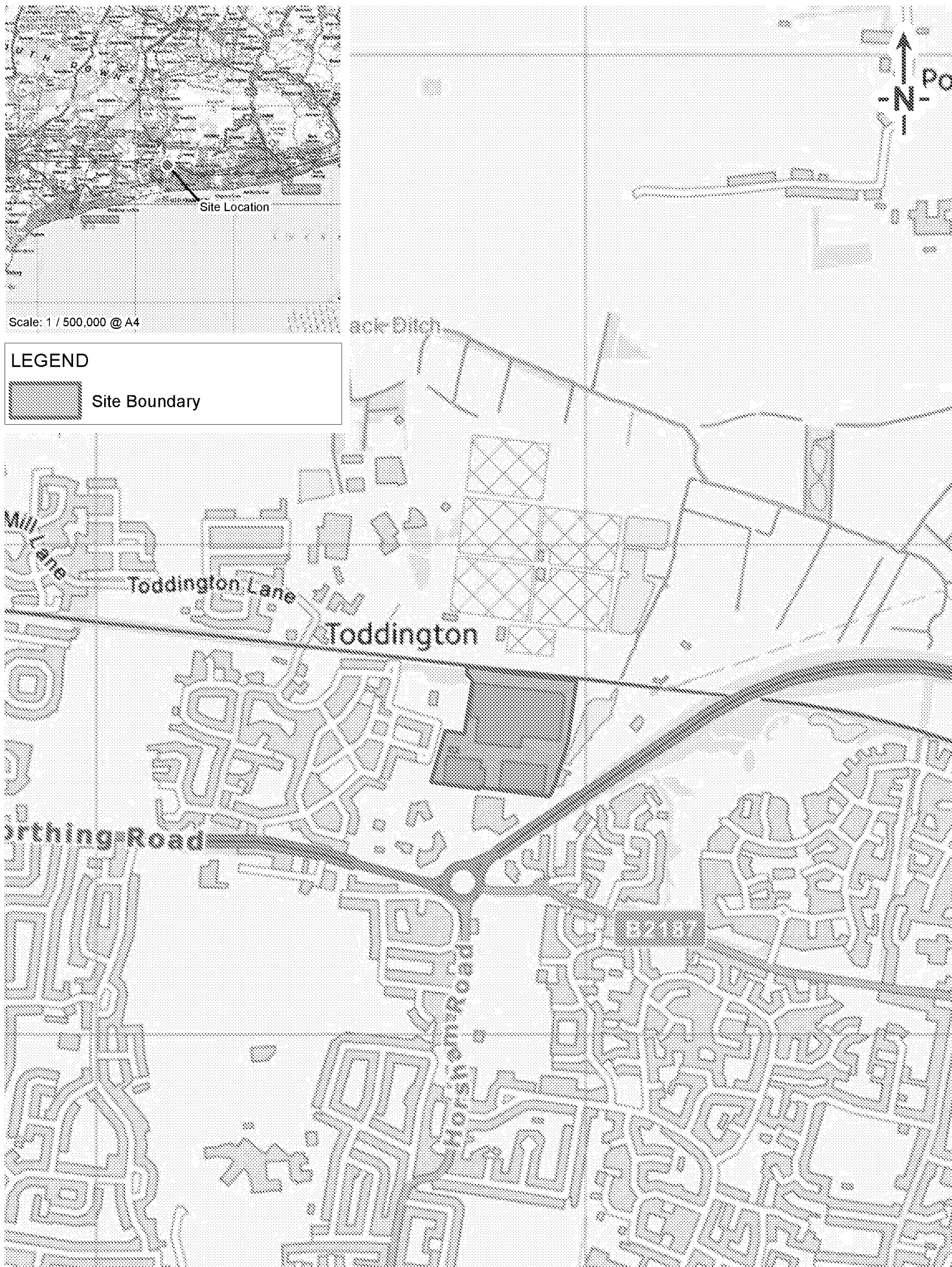
Figure 1 – Site Location Map



Scale: 1 / 500,000 @ A4

LEGEND

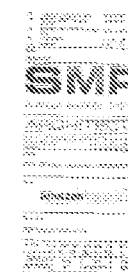
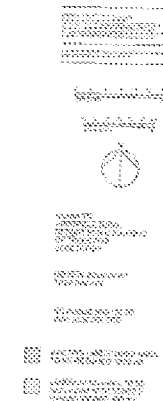
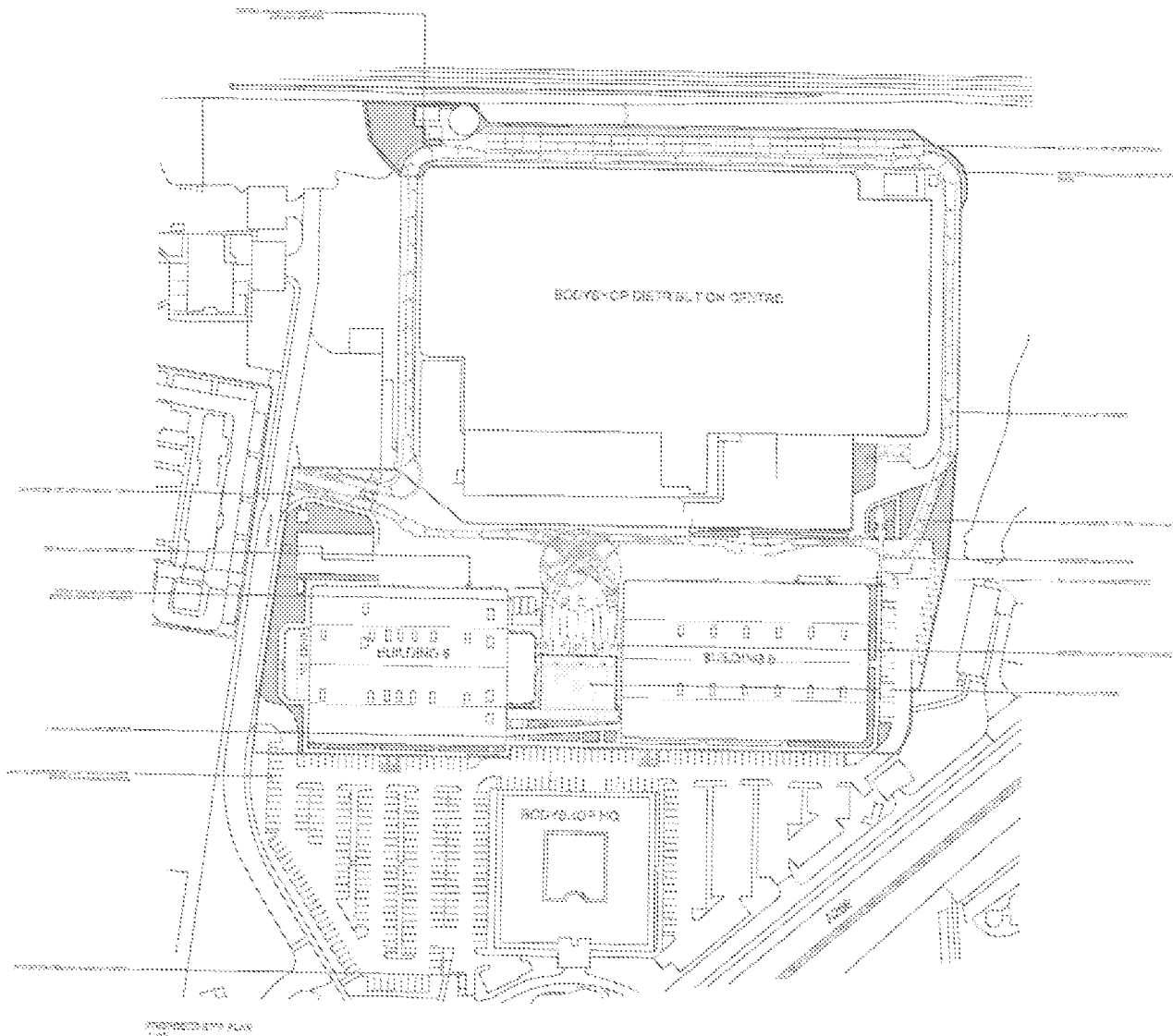
 Site Boundary



Scale: 1 / 10,000 @ A4

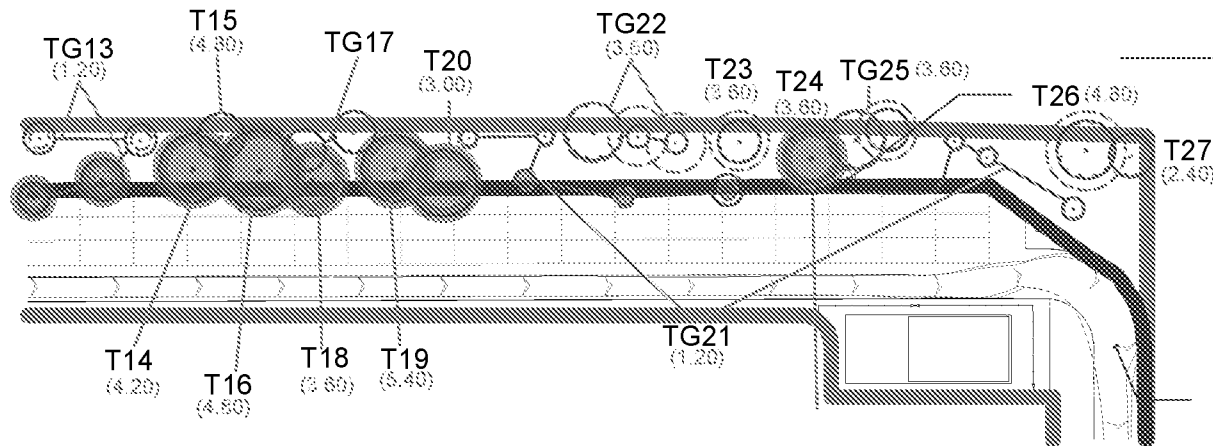
Service Layer Credits: Contains OS data © Crown Copyright and database right 2018

Figure 2 – Proposed Development Plan



Site Plan Provided by Client

Figure 3 – Tree Protection Plan



TREE LIKELY TO REQUIRE ROOT PROTECTION - REFER TO ARBORICULTURIST REPORT

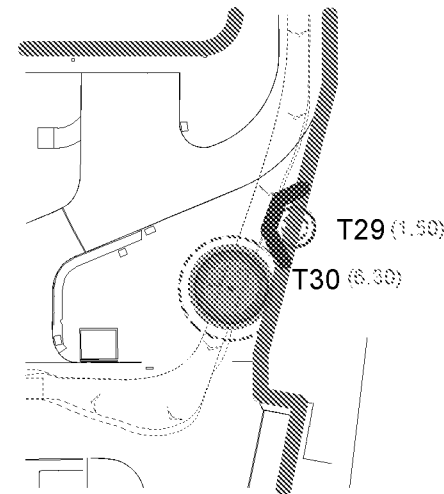
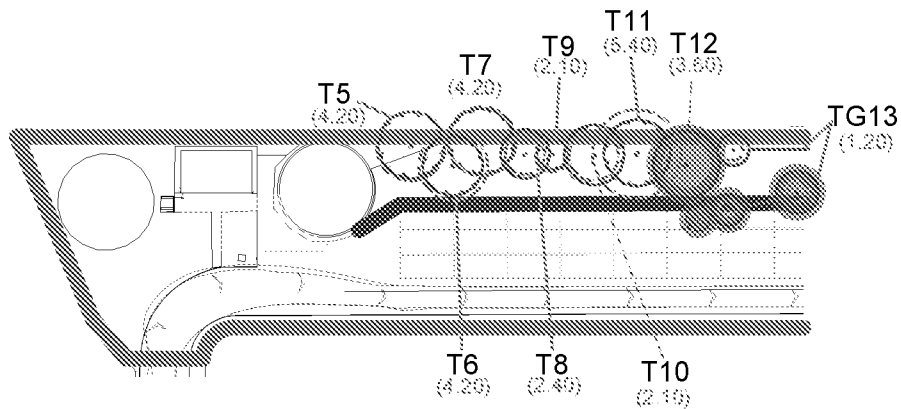
TREE TO BE FELLED, SUBJECT TO ARBORICULTURIST CONFIRMATION

EXISTING TARMAC PARKING AREA RETAINED FOR VAN STAGING

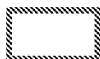
EXISTING SOFT LANDSCAPING TO BE REPLACED WITH HGV GRADE TARMAC SURFACE - 750m²

EXISTING KERB LINE CUT BACK TO BE REPLACED WITH HGV GRADE TARMAC - 25m²

ROAD BUILDUP, KERBING, HAUNCH AND DRAINAGE DETAILS TO STRUCTURAL ENGINEER'S DESIGN

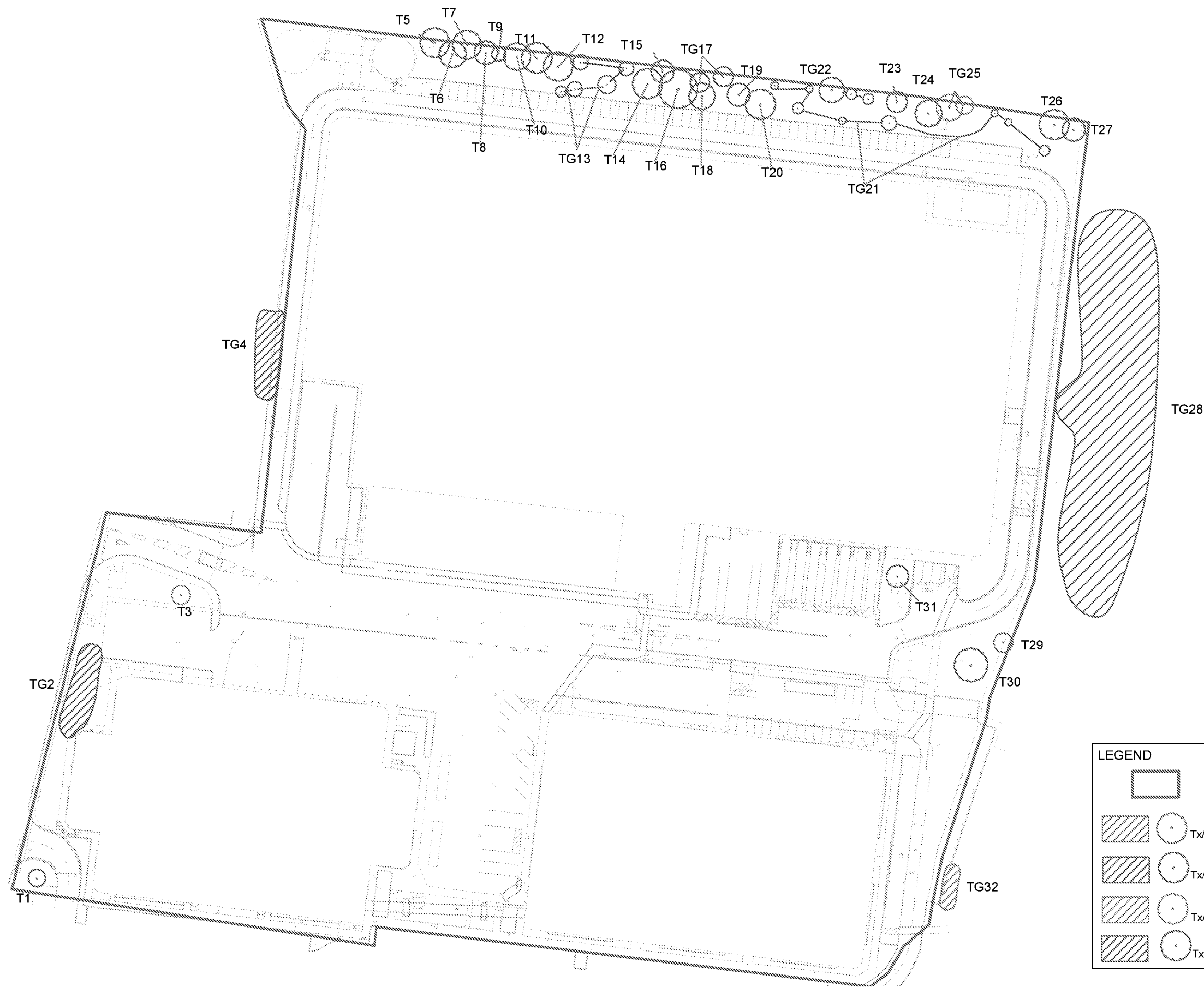


LEGEND

-  Site Boundary
-  Tx/TGx Category A: High value retention most desirable
-  Tx/TGx Category B: Moderate value retention desirable
-  Tx/TGx Category C: Lower value could be retained
-  Tx/TGx Category U: For removal
-  RPA: Root Protection Area
-  Trees to be Removed
-  Tree Protection Barriers

Site Plan Provided by Client

Appendix A – Tree Survey



LEGEND	
	Site Boundary
	Category A: High value retention most desirable Tx/TGx
	Category B: Moderate value retention desirable Tx/TGx
	Category C: Lower value could be retained Tx/TGx
	Category U: For removal Tx/TGx

Site Plan Provided by Client

Appendix B – Tree Schedule

Table 1 - BS5837:2012 Tree Schedule for Arboricultural Method Statement

	Tree Species		Measurements				Crown (m)					Tree Condition										Management
Tree Number	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter	Average	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works		
T1	Silver birch	<i>Betula pendula</i>	SM	7	1	275	2	3	3	3	3	No obvious visual damage	Single stem. Vertical.	Balanced.		G	20-40	B	3.3			
TG2	Hawthorn	<i>Crataegus monogyna</i>	SM	6	1	AV 225	1	3	5	3	3	No obvious visual damage	Single stem. Vertical	Balanced. Read as one.		F	20-40	B	2.7			
T3	Apple	<i>Malus sp.</i>	SM	5	1	150	2	3	3	3	2	No obvious visual damage	Single stem. Vertical	Spreading. Scattered deadwood.	Bark damage on stem	F	20-40	C	1.8			
TG4	Leyland cypress	<i>X Cupressocyparis leylandii</i>	SM	8	1	Av 300	0	3	3	3	3	No obvious visual damage	Single stems. Vertical	Balanced. Reads as one.		G	20-40	B	3.6			
T5	Horse chestnut	<i>Aesculus hippocastanum</i>	SM	9	1	350	3	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.		G	20-40	B	4.2			
T6	Horse chestnut	<i>Aesculus hippocastanum</i>	SM	8	M S	350	0	3	5	5	5	No obvious visual damage	Multi-stemmed from base. Vertical	Balanced.		F	>40	B	4.2			
T7	Horse chestnut	<i>Aesculus hippocastanum</i>	SM	9	1	350	2	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.		G	>40	B	4.2			
T8	Norway maple	<i>Acer platanoides</i>	Y	9	1	200	1	3	3	3	1	No obvious visual damage	Single stem. Vertical	Slightly unbalanced		F	>40	B	2.4			
T9	Norway maple	<i>Acer platanoides</i>	Y	8	3	3 x 100	0	1	1	1	1	No obvious visual damage	Trifurcated at 0.5 m. Vertical	Balanced.		F	20-40	B	2.1			

T10	Horse chestnut <i>Aesculus hippocastanum</i>	Y	8	3	150 100 175	1	4	4	4	4	No obvious visual damage	Single stem. Vertical	Balanced.		F	20-40	B	3.0	
T11	Horse chestnut <i>Aesculus hippocastanum</i>	Y	9	4	150 300 250 150	1	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.		G	>40	B	5.4	
T12	Horse chestnut <i>Aesculus hippocastanum</i>	Y	9	1	300	2	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.		F	>40	B	3.6	
TG13	Horse chestnut Pedunculate oak <i>Aesculus hippocastanum</i> <i>Quercus robur</i>	Y	5	1	Av 100	1	1	1	1	1	No obvious visual damage	Single stems. Vertical	Balanced.	Tree guards present	F	>40	B	1.2	
T14	Horse chestnut <i>Aesculus hippocastanum</i>	Y	5	1	300	0	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.	Trifurcated at 2 m	F	>40	B	4.2	
T15	Horse chestnut <i>Aesculus hippocastanum</i>	Y	5	4	175 125 275 150	2	1	5	1	1	No obvious visual damage	Single stem. Vertical	Unbalanced.	Stubs present	F	>40	B	4.8	
T16	Horse chestnut <i>Aesculus hippocastanum</i>	Y	5	1	400	1	3	3	6	3	No obvious visual damage	Single stem. Vertical	Spreading		G	>40	B	4.8	
TG17	Leyland cypress <i>X Cupressocyparis leylandii</i>	Y	11	1	Est 375	0	3	3	3	3	No obvious visual damage	Single stem. Vertical	Balanced.		F	20-40	B	4.5	
T18	Horse chestnut <i>Aesculus hippocastanum</i>	Y	9	1	300	1	4	4	4	4	No obvious visual damage	Single stem. Vertical	Balanced.		F	20-40	B	3.6	

T19	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	8	1	450	0	6	6	6	6	No obvious visual damage	Single stem. Vertical	Spreading. Balanced.		G	>40	B	5.4	
T20	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	6	1	250	0	3	3	3	3	No obvious visual damage	Single stem. Vertical	Balanced.		F	20-40	B	3.0	
TG21	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	2	1	100	0	1	1	1	1	No obvious visual damage	Single stem. Vertical.	Balanced		G	>40	B	1.2	
TG22	Leyland cypress Beech Hazel	<i>X Cupressocyparis leylandii</i> <i>Fagus sylvatica</i> <i>Corylus avellana</i>	Y	8	1	Est 300	0	3	3	3	3	No obvious visual damage	Single stem. Vertical	Balanced.		F	20-40	B	3.6	
T23	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	7	1	300	1	5	5	5	5	No obvious visual damage	Single stem. Vertical	Balanced.		F	>40	B	3.6	
T24	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	8	1	300	1	5	3	5	3	No obvious visual damage	Single stem. Vertical	Slightly unbalanced		F	20-40	B	3.6	
TG25	Leyland cypress	<i>X Cupressocyparis leylandii</i>	Y	9	1	Av 300	1	1	2	1	1	No obvious visual damage	Single stems. Vertical	Suppressed by adjacent tree.		F	20-40	C	3.6	
T26	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	8	3	250 325 250	0	5	5	5	5	No obvious visual damage	Trifurcated at 1.5 m. Vertical	Balanced		F	>40	B	4.8	
T27	Horse chestnut	<i>Aesculus hippocastanum</i>	Y	6	3	150 150 250	0	3	5	3	3	No obvious visual damage	Trifurcated at 1 m. Vertical	Balanced		F	>40	B	2.4	
TG28	London plane	<i>Platanus x acerifolia</i>	SM	11	1	Av 450	3	6	6	6	6	No obvious visual damage	Single stem. Vertical	Spreading, Scattered deadwood	Canopies read as one.	F	>40	B	5.4	

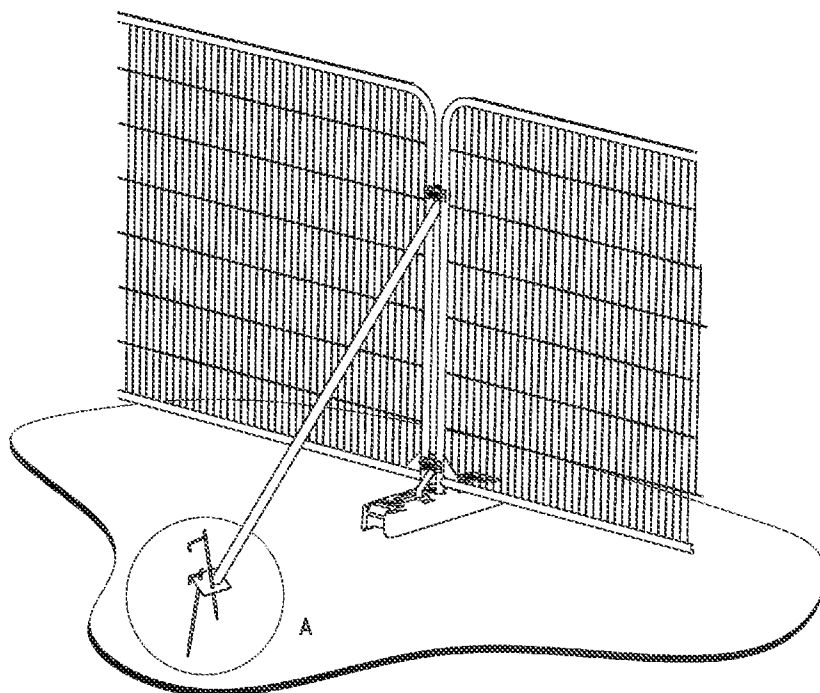
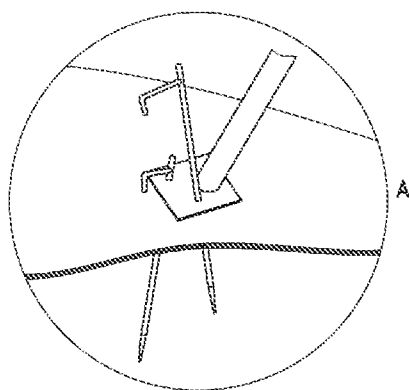
T29	Indian bean tree <i>Catalpa bignonioides</i>	Y	7	1	125	2	3	3	3	3	No obvious visual damage	Single stem. Vertical	Spreading. Well balanced.	Memorial tree	F	>40	A	1.5	
T30	Cherry <i>Prunus sp.</i>	SM	8	5	150 175 250 225 250	2	6	6	6	6	No obvious visual damage	Multi-stemmed from base	Spreading. Minor deadwood	Several branches removed. Stubs present	F	20-40	B	6.3	
T31	Plum <i>Prunus Sp.</i>	SM	4	1	150	2	3	3	3	3	No obvious visual damage	Single stem. Vertical	Spreading. Well balanced.		F	>40	B	1.8	
TG32	Crack willow <i>Salix fragilis</i>	M	12	M S	10 x 300	2	7	7	7	7	No obvious visual damage	Multi-stemmed from base Vertical	Crown lifted to 6 m, stubs present. Spreading. Occasional deadwood	Hazard beam present Low BRP	F	>40	C	6.6	

Table 2 – Key to Tree Schedule

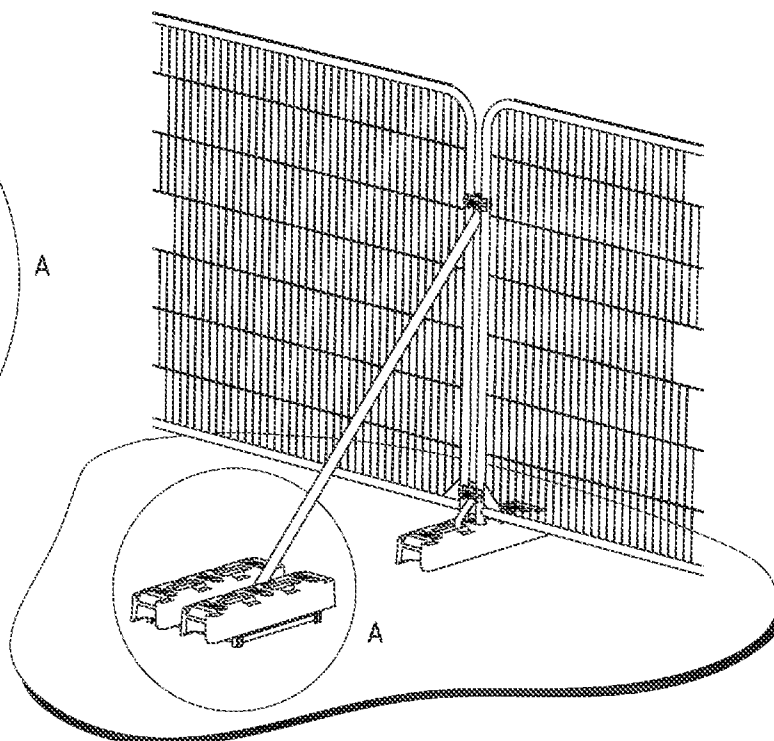
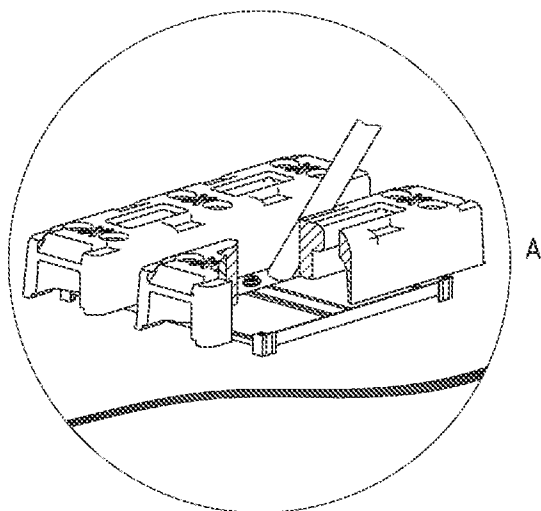
Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols
MS – Multi-stemmed	Y - Young	G – Good	A – High	< = less than
Ht - Height in metres	EM – Early-mature	F – Fair	B – Moderate	~ = approximately
Stem – Stem Diameter at 1.5m in mm	SM – Semi-Mature	P – Poor	C – Low	> = greater than
Crown – Crown spread in metres	M – Mature	D – Dead	R – Trees for Removal	
TD - Trunk Division (height in metres)	V - Veteran Est Yrs – estimate of years remaining (>40 years; 20 –40 years; <20 years)		Sub-categories: 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	

Appendix C – Tree Protection Barriers

Tree Protection Barriers



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Appendix D – CEZ Warning Sign

CEZ Warning Sign

– TREE PROTECTION AREA – KEEP OUT!

(TOWN & COUNTRY PLANNING ACT 1990)

**THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING
CONDITIONS, THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION.
THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:**

- △ THE PROTECTIVE FENCING MUST NOT BE MOVED**
- △ NO PERSON SHALL ENTER THE CONSTRUCTION EXCLUSION ZONE**
- △ NO MACHINE, PLANT OR VEHICLES SHALL ENTER THE EXCLUSION ZONE**
- △ NO MATERIALS SHALL BE STORED IN THE EXCLUSION ZONE**
- △ NO SPOIL SHALL BE DEPOSITED IN THE EXCLUSION ZONE**
- △ NO EXCAVATION SHALL OCCUR IN THE EXCLUSION ZONE**
- △ NO FIRES SHALL BE LIT IN THE EXCLUSION ZONE**

**ANY INCURSION INTO THE EXCLUSION ZONE MUST BE WITH THE
WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY**

Appendix E – Example of Ground Protection

Example of Ground Protection

Using TERRAM GEODELL for tree root protection ensures the roots beneath are protected from vehicle loads by confining the sub-base and stabilising the ground. When the permeable TERRAM GEODELL is filled with a porous, no fines, free-flowing aggregate the system allows essential passage of air and water providing essential nutrients to the roots. TERRAM GEODELL is ideal for "lay-Dig" situations.

Typical Applications

- Permanent Woodland Trails
- Paths & Cycleways
- Driveways*
- Roads
- Access Routes*
- Parking Areas

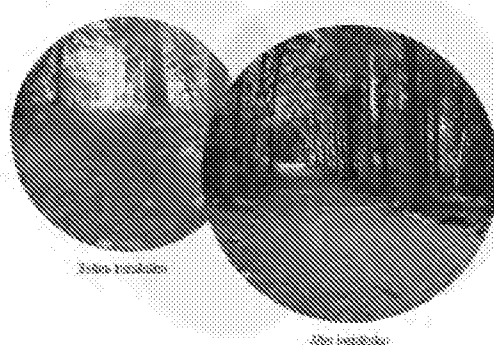
*See Architectural Details and Information Section
APR12: Driveways close to trees

TERRAM GEODELL is supplied as flat packed panels which are opened to form the honeycomb-like structure. These are positioned and pinned to the ground using fixing pins and filled with a suitable, permeable infill.

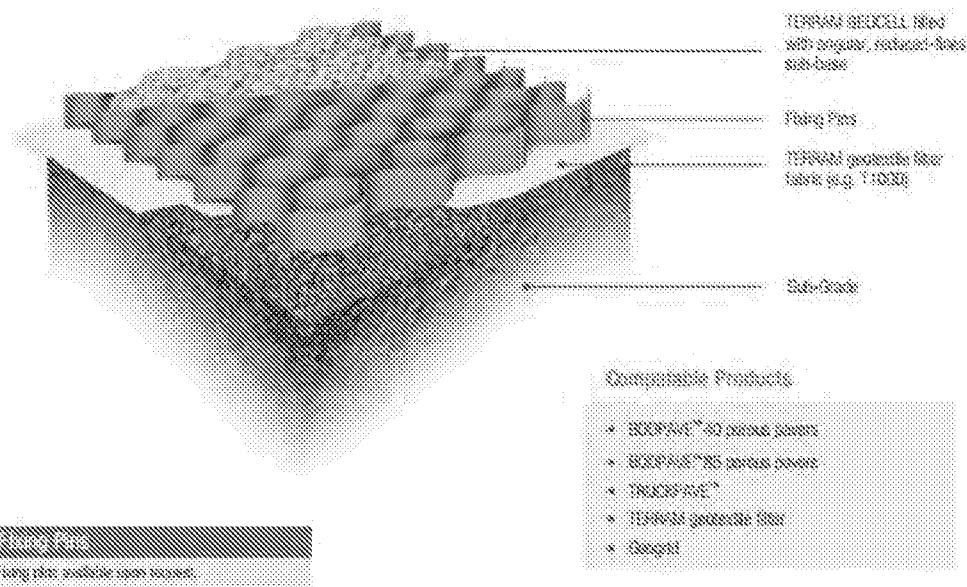
TERRAM GEODELL confines the fill and ensures that downward forces are spread laterally, reducing pressure on the sub-base. Without this cellular system, the surface would become rutted and compressed with the traffic loads, damaging the tree roots and potentially resulting in the death of the tree.

WHY TERRAM GEODELL?

- Lightweight and easy to handle reducing installation costs.
- Permeable geotextile allows free flow of water, essential in tree root applications.
- The flexible TERRAM geotextile material allows TERRAM GEODELL to effectively adapt to any variations in the terrain.
- TERRAM GEODELL are easily cut to size without damage, therefore reducing cost.



Typical Profile



Product Details

Product	Panel Size (mm)	Panel Size (ft/inch)	Panel Weight	Panel Features
GEODELL 25/10	5 x 7	2500 mm x 1900	17kg	"medium cycle"
GEODELL 25/15	5 x 7	2500 mm x 1900	25kg	"light vehicle"
GEODELL 20/20	5 x 5	2000 mm x 2000	20kg	"Optimum for heavier vehicles or more frequent traffic"

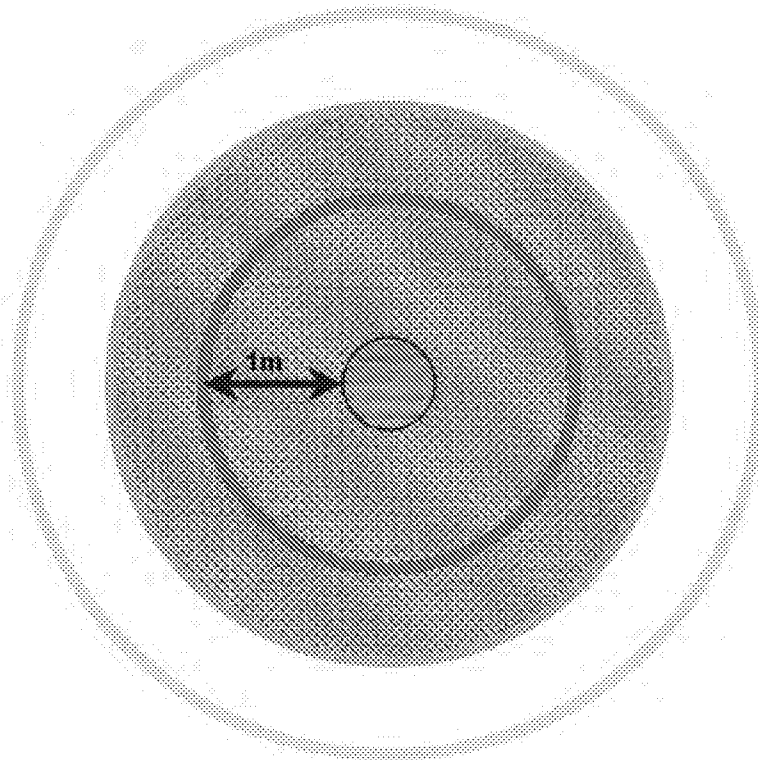
** These are typical profiles only.

Appendix F – NJUG Volume 4



NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

FIGURE 1 – Tree Protection Zone



Key



Trunk of tree



Canopy or branch spread



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with the local authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with the local authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of the precautionary zone. Excavation works may be undertaken within this zone, however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

DAMAGE TO TREES

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

- Don't excavate within this zone.
- Don't use any form of mechanical plant within this zone.
- Don't store materials, plant or equipment within this zone.
- Don't move plant or vehicles within this zone.
- Don't lean materials against, or chain plant to, the trunk.
- Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.
- Do protect any exposed roots uncovered within this zone with dry sacking.
- Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.
- Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

- Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.
- Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.
- Don't repeatedly move / use heavy mechanical plant except on hard standing.
- Don't store spoil or building material, including chemicals and fuels, within this zone.
- Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.
- Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.
- Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.
- Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

- Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.
- Do use caution if it is absolutely necessary to operate mechanical plant within this zone.
- Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.
- Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.
- Do notify the local authority tree officer or the tree's owner of any damage.

Appendix G – AMS Reporting Form

Project: DBN3 Norway Lane, Littlehampton
Subject: Arboricultural Inspection Visit
Author: Pete Morrell

Job No: 19-0138.05
Report Date:
Inspection:

Date of Inspection

1.0 Results

2.0...Actions to be taken

3.0 Photographs

Date of next visit –

Distribution

Tree Officer	
Site Engineer	
Site Manager	
Job File	19-0138.05