



Arboricultural Method Statement

for development at

181-183 York Way & 282a Camden Road, London,

N7 9LN _ NW1 9AB

on behalf of

Mr Demetri Tsangari

Pursuant to discharge planning conditions



13th October 2017

Our reference DFCEP 4123

Robert Ellis 1st Dip Countryside and Forestry, NC/ND in

Arboriculture; TechArborA

Summary

This report is to provide information in connection with planning consent for development of 181-183 York Way & 282a Camden Road, London and is pursuant to discharge planning conditions relating to one Birch tree.

An Arboricultural Method Statement has been prepared subsequent to a site visit carried out and in relation to protection measures for the ornamental Birch tree at the above address.

This report seeks to provide information on the appropriate works and method for carrying out proposed construction works without significant detriment to the tree being retained on site. This report seeks to provide information in accordance with British Standard BS 5837:2012, Trees in relation to design, demolition and construction.

This report contains details for protecting the retained tree during construction and methods for working within root protection areas whilst, minimising damage to tree roots and retaining a suitable rooting environment for retained trees.

A pre-commencement meeting is required with the site manager, arboricultural consultant and LPA tree officer prior to demolition to ensure tree protection and demolition/construction requirements are agreed.

Any excavation within the RPA should be carried out under the supervision of the project Arboriculturalist, so that any root pruning requirements can be carried out at that time, using a sharp cutting implement, wrapped with damp hessian, water retaining gel and back filled with sharp sand.

Tree protection measures should be placed under the supervision of the project Arboriculturalist.

The existing surfacing should remain in place as a form of ground protection until the latter stages of the project when landscaping works are being carried out.

The tree is currently surrounded by hard surfacing and the proposal will in fact be of benefit to the tree as the area within the Root Protection Area (RPA) will be turned from hard standing/ parking area to a soft landscaped area.

There will be no digging required within the RPA of T1, the only works to be carried out are removal of existing hard standing and soft landscaping.

Provided tree protection and methods of work close to trees outlined in this report are followed, the development will be acceptable from an arboricultural perspective.

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1.0 Introduction

1.1 Instruction

1.1.1 DF Clark Bionomique Ltd were instructed by Demetri Tsangari to carry out an Arboricultural Method Statement and to alleviate concerns raised over the protection of the retained tree during construction so it was ensured that the retained tree may continue to thrive and give amenity value for years to come.

1.1.2 It has been produced in accordance with the principles of British Standard *BS 5837:2012, Trees in relation to design, demolition and construction - Recommendations* (BS 5837) and includes the following information:

- an analysis of the proposed scheme and the impact on trees to be retained;
- a tree protection plan, showing the location and specification of protective fencing and ground protection if required, in accordance with BS 5837;
- proposed methods of work to minimise the impact on retained trees;
- a schedule of site monitoring and/or supervision of construction activity with the ability to damage retained trees.

1.2 Scope and purpose of this report

1.2.1 This report covers one tree at the site of the proposed development, it is deemed that this tree could be affected by the development. It is concerned with the impact the development may have on this tree and the effect the retained tree may have on the development. Its purpose is to enable the retained tree to survive the construction process and continue to thrive and give amenity value for years to come. It also allows the Local Planning Authority (LPA) to assess the tree protection information and audit compliance with planning conditions.

1.2.2 This AMS will cover the lifetime of the development and will be subject to an appropriate regime of monitoring and review of all operations within this report at suitable intervals.

1.2.3 It is intended to be a working document to be used by the building contractor.

1.3 Planning consent and legal considerations

1.3.1 Refer to Inhouse Architects Reports

1.4 Other information included in this report

1.4.1 The following information is included in Appendix 1:

- Documents and information provided
- Legal constraints and liabilities
- Survey methodology
- Contacts
- Reference documents

2.0 Appraisal

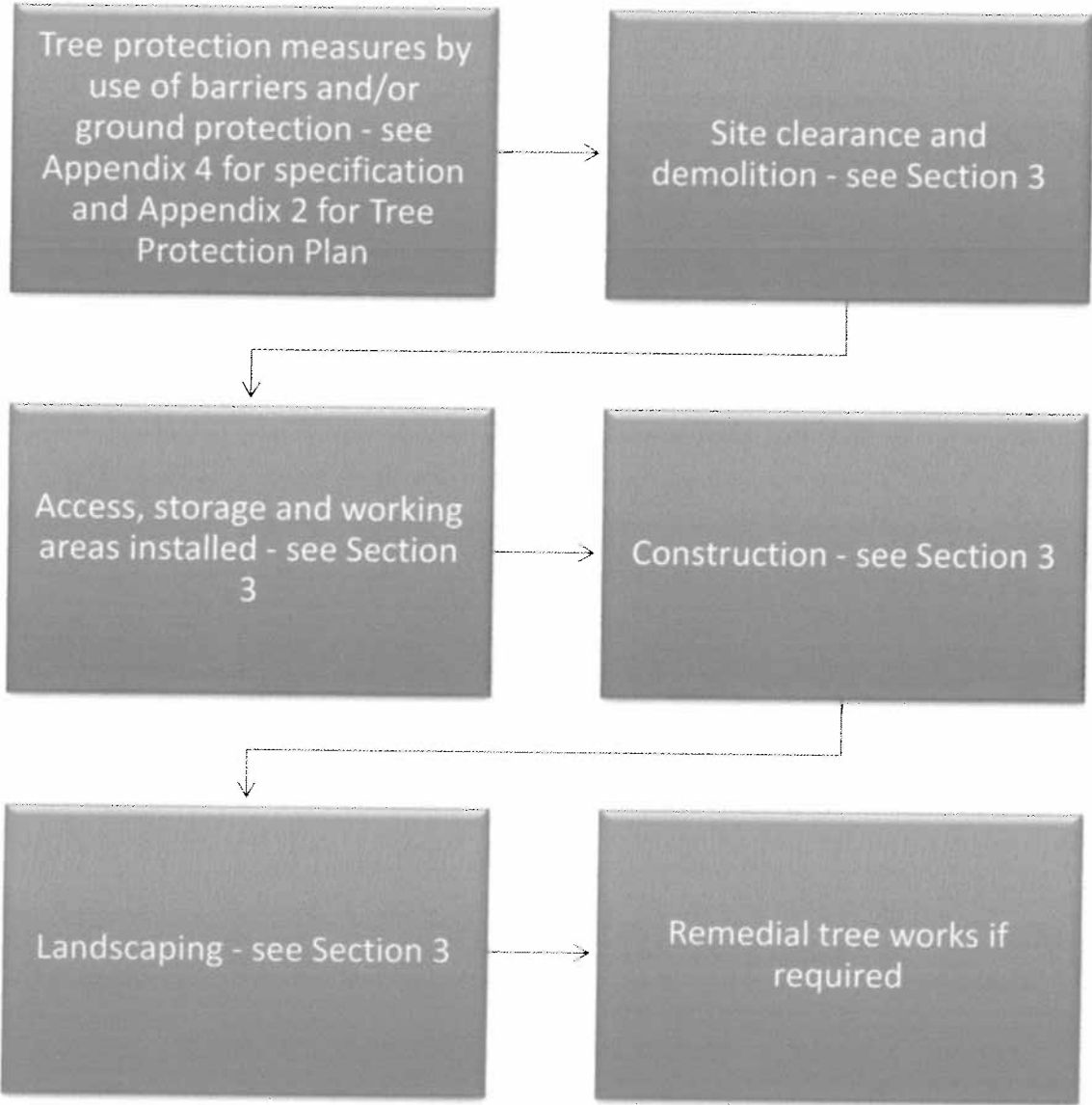
2.1 Areas considered

- tree surgery works;
- protection of tree for site clearance, demolition and construction activities, in the form of protective barriers and/or ground protection;
- specialist methods of work employed for demolition;
- specialist methods of work employed for construction;
- monitoring and supervision; and
- options for mitigation and remediation.

2.2 Site construction timeline

2.2.1 Damage to trees on development sites can easily occur before construction starts through compaction of soil structure even with the passage of light vehicles.

2.2.2 In addition, damage to the branches and trunks of trees can occur if site clearance/demolition occurs before trees are protected. Therefore it is important that all works with the potential to affect trees follows a process to ensure their protection. Below is a flowchart showing the sequence of works to follow.



2.3 The site

- 2.3.1 The site is located on the boundary of North and North West London next to the busy junction of York Way and Camden Road, the site is accessible from Camden Road and is located between retail units and flats of 181-183 York Way and 282a Camden Road. The surrounding areas comprise of densely populated housing with retail units along the York Way.
- 2.3.2 Currently the only vegetation on site is the tree being retained which is in a small planting border along the existing driveway.
- 2.3.3 The ornamental Birch tree to be retained would have been planted as a specimen tree to break the hard/ urban environment. The tree has had little if any maintenance and is currently in a poor growing medium.
- 2.3.4 The soil texture is thought to be loamy and clayey soils with slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (The British Geological Society). The presence of clay indicates that the soil is liable to compaction which is very damaging to trees by restricting air-flow and also that there is the potential for tree root related soil movement which must be considered in relation to building foundations.

2.4 Subject trees and impact of proposal

- 2.4.1 The ornamental Birch to be retained will have no impact on the existing proposal as long as all protection measures are adhered too. There is no construction proposed within the RPA and the only concerns would be during the removal of the existing hard standing, which is being converted into soft landscaping which will be of significant benefit to the tree.

- 2.4.2 The works removing the existing hard standing should be carried out with the use of hand held tools and no use of diggers for this purpose within the RPA although the existing surface shall be retained during construction to protect the Roots of T1. Works should be supervised by the project arboriculturalist to ensure any roots exposed during works within the RPA are pruned and wrapped with damp hessian and water retaining gel to avoid desiccation of roots, they will then be back filled with sharp sand. It is unlikely any significant rooting structures are likely to be found in the soil horizon being excavated.
- 2.4.3 As long as the recommendations with this Arboricultural Method Statement are adhered to, the trees will continue to give amenity value on the site.

3.0 Arboricultural method statement

3.1 Tree protection plan (TPP)

3.1.1 The plan found at Appendix 2 is based on provided information and all measurements and site boundaries must be checked against the submitted plans. This plan should only be used for dealing with the tree issues. Trees to be retained have black centres and green outlines whilst trees to be removed have red centres and a red, dashed, outline. Tree protection is shown as barriers and/or ground protection defining the tree protection zone (TPZ)¹ and any areas requiring specialist methods of demolition or construction are shown.

3.2 Site clearance and pre-construction works

3.2.1 Site clearance, demolition and pre-construction works such as soil investigations, are often undertaken before trees for retention are protected and this can result in irreparable damage being caused to the trees or their soil environment.

3.2.2 It is important therefore that trees are protected before any works are carried out. The only exception to this is tree felling and tree surgery works, which may be necessary before barriers are erected. Clearance of other site vegetation to enable access to erect the protective barriers should be factored in at this stage if necessary. This must be carried out with the use of hand tools only (including chainsaws, brush cutters etc.) but without the use of tracked or wheeled plant and machinery.

¹*Tree Protection Zone. An area based on the RPA in m² identified by an arboriculturist, to be protected during development, including demolition and construction work, by the use of barriers and/or ground protection fit for purpose to ensure the successful long-term retention of a tree.*

3.3 Tree protection barriers

- 3.3.1 Appendix 4 includes guidance for protective barriers based on BS 5837. The approximate location of the barriers and the TPZs is shown on the TPP. The precise location of the barriers and other protective measures should be confirmed at the pre-commencement meeting before any demolition or construction activities, including site clearance, start.
- 3.3.2 This tree will be protected with a 3mx3mx3m secured box to a height of 2m which will need supervising to ensure that branches are gently placed behind the boxing to protect the tree whilst still retaining the required site access.

3.4 Ground protection

- 3.4.1 The ground protection will be the existing surfacing until the soft landscaping stages of the project when the existing hard standing can be removed.
- 3.4.2 The existing hard surfacing at the front of the property will remain in place until the latter stages of the project when paving and softscaping is being implemented.
- 3.4.3 The proposed area of softscape within the RPA of T1 will require the removal of existing surfacing by hand and no excavation within this area during the soft landscaping stage
- 3.4.4 There will be no digging within the root protection zone.

3.5 Tree removals and tree surgery works

- 3.5.1 None required at present.

3.6 Site set-up

- 3.6.1 Space must be allowed outside of RPAs for site cabins, machinery and materials storage, fuel storage, cement mixing and washing points etc
- 3.6.2 All Welfare facilities will be located outside of the RPA of T1.
- 3.6.3 Temporary buildings and storage areas can sometimes be placed within RPAs if agreed with the LPA, and if site conditions allow, although this is not required on this site. If required they would need to be installed on appropriate ground protection with no excavation taking place. All temporary services must be installed above ground level.

3.7 Removal of existing surfaces

- 3.7.1 Existing surfacing within RPZ will be removed at the latter stages of the development once the construction of the building has been completed. This area will be removed by hand to avoid damage to any high roots that could be unsurfaced.
- 3.7.2 All areas of hard surfacing requiring removal within a TPZ will be broken up using a hand held pneumatic drill or mounted hydraulic breaker attached to a digger located outside the TPZ.
- 3.7.3 We recommend the surface be peeled back by hand or mini-digger with toothless bucket.
- 3.7.4 The mini-digger will work from the existing hard surface pulling the debris away from T1.
- 3.7.5 No excavation of existing soil beneath the hard surface will take place.
- 3.7.6 Immediately after removal of the hard surface, topsoil or sharp sand must be used to cover the soil surface and any roots to prevent drying out.

3.8 Demolition of buildings and structures close to trees

- 3.8.1 All structures including buildings, hard surfaces, walls and fences within or adjacent to a TPZ must be removed following the methods detailed below to minimise damage to tree roots and upper parts of the tree.
- 3.8.2 The demolition of the existing structure will be not affect the retained tree.

3.8.3 Ground protection **MUST remain** throughout demolition and construction.

3.8.4 Any Debris fallen within TPZs must be removed by hand..

3.9 Foundations

3.9.1 All foundations are outside of the RPA of T1.

3.10 Site hoarding, signs & fencing

3.10.1 If site hoarding is to be placed it will be of no dig construction in the area of T1.

3.11 Services

3.11.1 The location and direction of new services should be designed to allow for services to be routed avoiding the RPAs of retained trees in this case T1.

3.11.2 If any services need to run through a TPZ the main contractor must contact the arboricultural consultant before any works are undertaken. Agreement will then be sought from the LPA tree officer on methodology. Works will only begin with the agreement of the LPA. Methodology used must comply with NJUG Volume 4: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees, which can be summarised as:

- Hand excavate only.
- Work carefully around roots only cutting as a last resort.
- Do not cut roots over 30 mm in diameter without referring to the project arboriculturist.
- For roots less than 30 mm in diameter use a sharp tool to make a clean cut leaving as small a wound as possible.

3.12 Landscaping

3.12.1 Landscape operations within root protection areas have the potential to damage trees if not carried out with care; in addition the removal of protective barriers to carry out landscape operations may allow other contractors in previously protected areas.

3.12.2 If protective fencing is taken down to facilitate landscaping operations, the area of the TPZ must be delineated by pins and marker tape, spray paint, or some other method that clearly show the extent of the TPZ.

3.13 Other site works with the ability to affect trees

Site and fuel storage, cement mixing and washing points

3.13.1 All site storage areas, cement mixing and washing points for equipment and vehicles and fuel storage areas should be outside RPAs unless otherwise agreed with the LPA.

Use of piling rigs, cranes and other tall plant and vehicles

3.13.2 Any of the above will be operated or used if required from within the new building footprint and be located away from T1.

4.0 Site management and supervision

4.1 Pre-commencement site meeting

4.1.1 Before any site works including site clearance begin, a site meeting between the site manager and arboricultural consultant should be held and to which the LPA tree officer will be invited. The purpose of the meeting will be to discuss tree protection measures detailed in this document and to agree the sequence of events where they can impact on trees. At this meeting a programme of tree protection will be agreed by all parties to form the basis of any monitoring and/or supervision arrangements between the arboricultural consultant and the developer.

4.1.2 At the pre-commencement meeting, the contact details of the following should be agreed:

- The site manager or other person on site responsible for ensuring tree protection is in accordance with that agreed.
- The LPA tree officer and/or case officer.
- The project arboriculturist.
- Any other relevant party.

4.2 Site management

4.2.1 It is the responsibility of the main contractor to ensure that the details of this report are known, understood and followed by all site personnel. As part of the site induction, all site personnel who could have an impact on trees should be briefed on specific tree protection requirements. Copies of the report and plans should be available on site at all times.

4.3 Site monitoring and supervision

4.3.1 Once work begins on site, the project arboricultural consultant should visit site at an interval agreed at the pre-commencement site meeting usually approximately 1 visit per 12 weeks or should specific works require supervision. The interval should be sufficiently flexible to allow the supervision of key works as they occur. These are likely to include the following although the list is not exclusive:

- tree pruning and felling and site clearance close to trees;
- installation of tree protection barriers;

- installation of ground protection;
- any agreed works in root protection areas.

4.3.2 The arboricultural consultant's role is to monitor compliance with arboricultural conditions and advise on any tree problems that arise or modifications that become necessary. Following every site visit, a short report will be sent to the local authority tree officer and the client/developer. Tree site supervision reports are useful not only as an audit trail for the client and local planning authority, showing compliance to tree protection conditions, but also to provide evidence of retention and protection of 'ecological features of value' which is required under Code for Sustainable Homes section Eco 3.

4.3.3 Should any issues or compromises occur during the development that have an impact on any retained tree it is the responsibility of the site manager to inform the project arboriculturist who will notify the LPA tree officer of the issue and any proposed remedial works.

4.3.4 Overleaf is a schedule to be completed at the pre-commencement site meeting listing key stages requiring monitoring and/or supervision. It may be necessary to add to the schedule according to site specific issues or planning conditions.

Site monitoring & supervision schedule - to be completed at the pre-commencement meeting

Constraints item	Supervision/monitoring required?	Number or frequency of visits expected	Timing of site visits
Tree works	Yes/No		Prior to construction
Establishment of Tree Protection Zones with barriers and/or ground protection	Yes/No		Prior to site clearance and throughout development
Site access for construction and avoidance of compaction damage to soil within TPZs	Yes/No		During site clearance and construction phase
Changes in soil levels within TPZs	Yes/No		During site clearance and construction phase
Excavation for foundations within TPZs	Yes/No		During construction phase
Excavation for services within TPZs	Yes/No		During construction phase
Construction of hard surfaces within TPZs	Yes/No		During construction phase
Protection and prevention of damage to retained tree canopies	Yes/No		During construction phase
Generic construction site constraints: <ul style="list-style-type: none"> • site set-up location • location of contaminant storage and washout areas • siting of bonfires • location of spoil and materials 	Yes/No		During construction phase
Replacement tree planting conforms with planning conditions and NHBC guidance	Yes/No		Post construction
Additional at initial site meeting...			
Additional at initial site meeting...			

5.0 Conclusions

- 5.1** A pre-commencement meeting is required with the site manager, arboricultural consultant and LPA tree officer prior to demolition to ensure tree protection and demolition/construction requirements are agreed.
- 5.2** The Existing hard surfacing/ pavement area at the front of the property will remain in place until the latter stages of the project when paving and softscaping are being implemented.
- 5.3** There will be no excavation within the RPA of T1.
- 5.4** There will be no heavy machinery or storage of materials within the root protection zone.
- 5.5** The ground protection will be placed prior to demolition and remain until completion of site works or for required soft landscaping works.
- 5.9** Site storage should not be within the RPA of any trees.
- 5.10** Supervised excavation within RPA for any required root pruning.
- 5.11** Planned Arboricultural site visits will be required for an auditable trail to ensure the protection of the retained trees onsite.

6.0 Recommendations

- 6.1 Tree protection box must be in place before any works begin including site clearance and site set-up and installed under the supervision of the project arboriculturalist.
- 6.2 The arboricultural method statement should be observed by all site personnel and supervised at key stages by the project arboriculturist. Supervision/monitoring reports to be issued after each inspection as a record of compliance and audit trail for the local authority.
- 6.3 A copy of this report and associated plans should be kept on site and be part of the site induction where applicable.

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Tel: 01621 740876

Appendix

1

Survey and background information

1. **Methodology**

The trees were surveyed from ground level without detailed investigations. All trees with a trunk diameter of 75 mm or above² were surveyed. All dimensions were estimated unless otherwise indicated. Obvious hedges and shrub masses were identified where appropriate. Information collected is in accordance with recommendations in subsection 4.4.2.5 of BS 5837 and includes species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition and remaining contribution. Each tree was then allocated one of four categories (U, A, B or C) to reflect its suitability as a material constraint on development.

2. **Background information**

Documents and information received

- INHOUSE Drawings 1532-TP02
1532-TP10

3. **Contacts**

<i>Table 4</i>		
Name	Company/organisation & position	Tel.No.
Demetri Tsangari	Client - Owner	N/A
Diane Israel	INHOUSE ARCHITECTS - Architects	0207 359 5044
Robert Ellis	DF CLARK BIONOMIQUE LTD - Senior Arboricultural Consultant	01621 745443

1. The information contained in this report is the property of the author and is not to be used for any other purpose without the author's written consent.

4. Reference documents

- *British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction – Recommendations*
- *British Standards Institution (2010) BS 3998: Tree work – Recommendations*
- *DETR Tree Preservation Orders – A Guide to the Law and Good Practice*
- *National Joint Utilities Group (2007) Volume 4, Issue 2: Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees*
- *DTLR (2001) Principles of Tree Hazard Assessment and Management - David Lonsdale*

5. Legal constraints and liabilities

Tree preservation orders: A phonecall made to LB Camden confirms there are no tree preservation orders affecting the above site

The tree protection status is correct at the time of report production but can be subject to change. It is therefore the responsibility of any persons undertaking tree works operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory tree protection checks with the local planning authority, to include TPO, conservation area (CA) and planning conditions prior to works commencing.

Conservation Areas: The site is within a conservation area, Camden Square.

Occupiers Liability 1957 and 1984: The Occupiers Liability Act places a duty of care to ensure that no reasonably foreseeable harm takes place due to tree defects. Therefore this report includes recommendations within the tree tables for work required for safety reasons. 'Common sense risk management of trees (National Tree Safety Group 2012)' states that *'the owner of the land on which a tree stands, together with any party who has control over the tree's management, owes a duty of care at common law to all people who might be injured by the tree. The duty of care is to take reasonable care to avoid acts or omissions that cause a reasonably foreseeable risk of injury to persons or property.'*

Common Law: This enables pruning back of the crown and roots of trees on adjacent land where they overhang neighbouring property, providing the work is reasonable and does not cause harm. This right does not override TPO and CA legislation.

Ecological constraints: The Wildlife and Countryside Act 1981, as amended, The Conservation of Habitats and Species Regulations 2010 and the Countryside and Rights of Way Act 2000, provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees. These could impose significant constraints on the use and timing of access to the site. It is the responsibility of the main contractor and tree surgery contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works. Unless competent to do so, the advice of an ecologist must be sought.

Tree protection barriers & ground protection Plan

Tree surgery schedule

Tree surgery recommendations

All tree works to be undertaken in accordance with *BS 3998:2010 Recommendations for tree works*, or industry best practice.

Tree no.	Species	Proposed works	Reason
T1	Ornamental Birch Spp.	None required at present	None required at present

Tree protection barriers & ground protection

Design of welded mesh, Heras type tree protection barrier

Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place. The default specification should be in accordance with 6.2.2.2 of BS 5837, as set out below.

Specifications: Barrier shall be a minimum 2 m high. It shall consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated below. The vertical tubes should be spaced at a minimum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. See Figure 2 overleaf.

Where site circumstances and associated risk of damaging incursions into the RPA do not necessitate the default level of protection, an alternative specification may be used if agreed with the local authority. An example would be 'Heras' type welded mesh panels on rubber or concrete feet. The panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The panels should be supported on the inner side by stabiliser struts. See Figure 3 overleaf. All-weather notices should be attached to the barrier with words such as 'TREE PROTECTION ZONE - NO ACCESS'.

Location: Barriers shall be positioned on the perimeter of the Root Protection Area to define the Tree Protection Zone or as specified in the Tree Protection Plan.

Shown on the Tree Protection Plan by a dashed black line

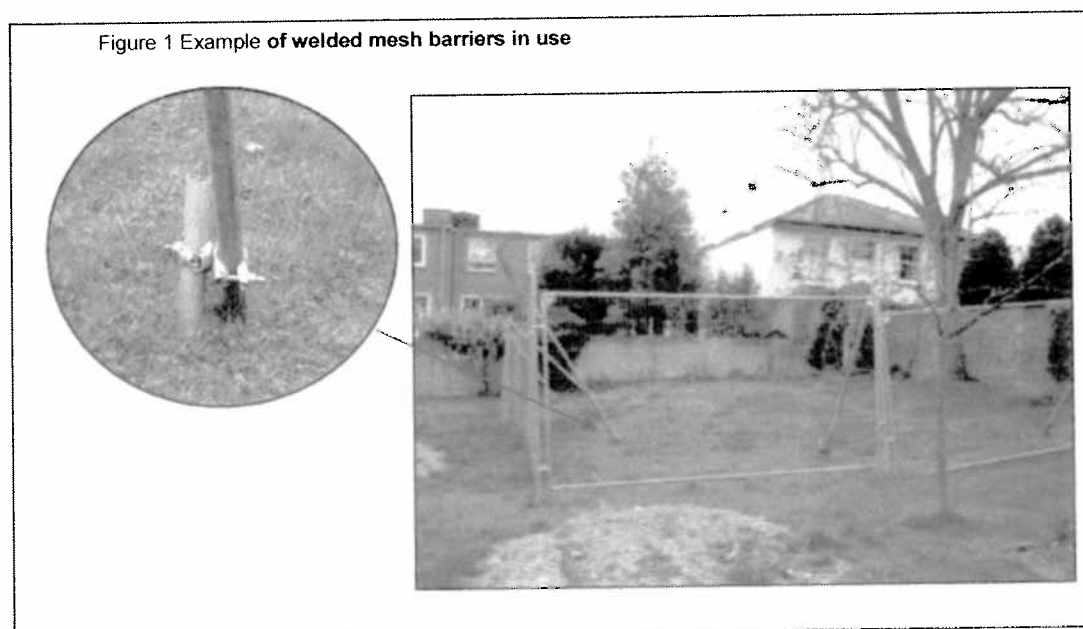


Figure 2 Default specification for protective barrier

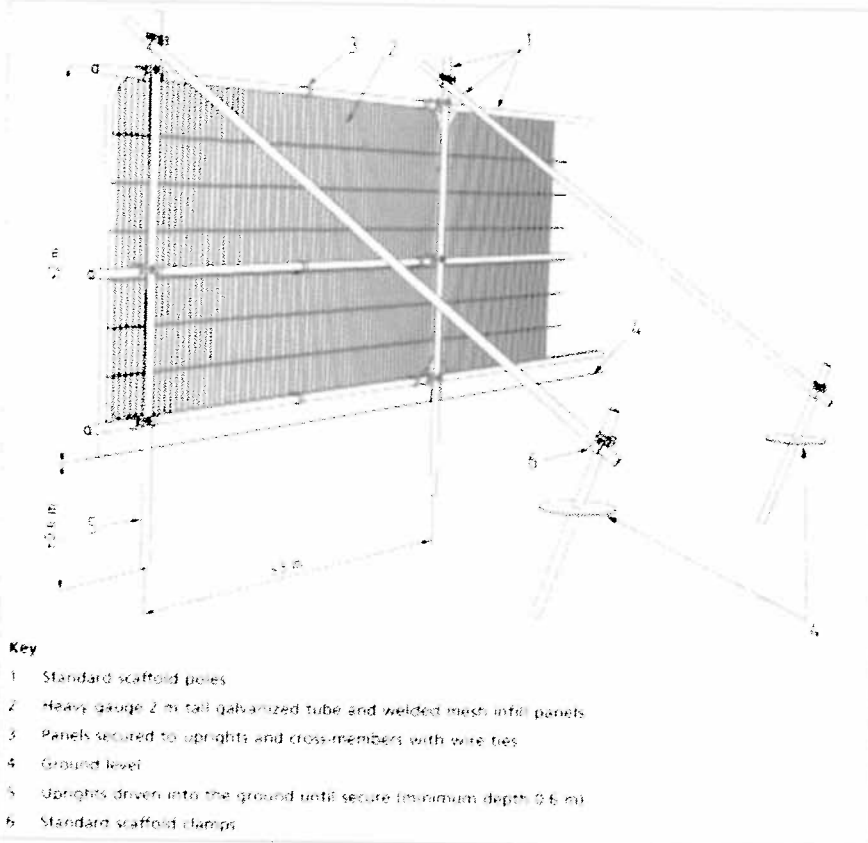
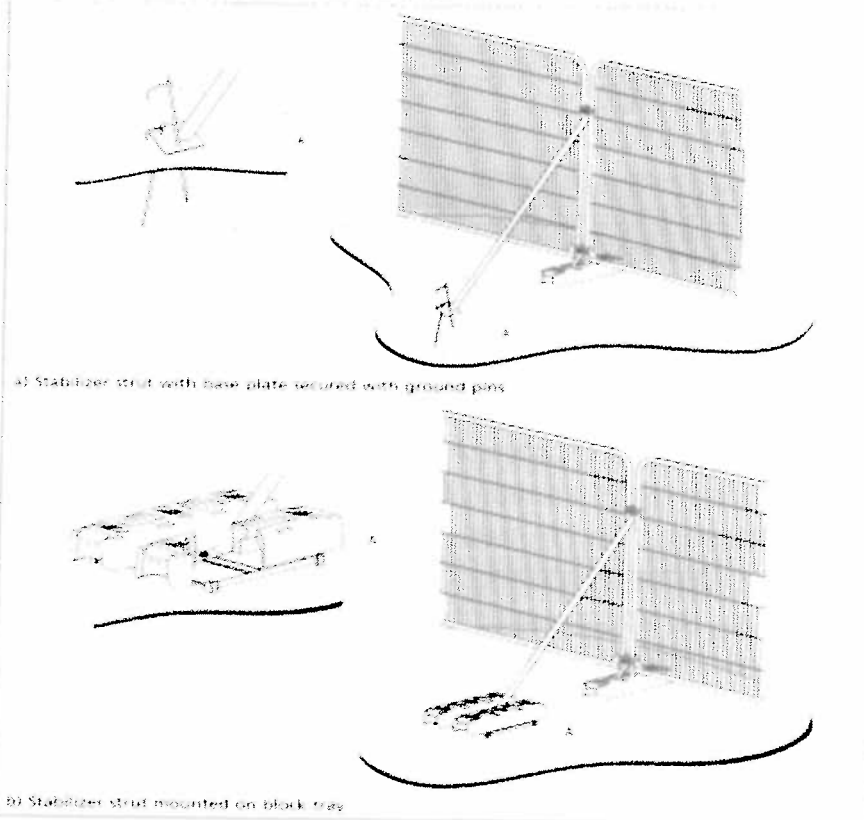


Figure 3 Examples of above-ground stabilizing systems



Figures above are reproduced with the permission of the British Standards Institute

Suggested protective fencing warning sign format



Ground protection

In areas where it is not possible to erect protective fencing, ground protection must be used to protect the TPZ of trees. Where it has been agreed during the design stage, and as shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the TPZ, the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be within the TPZ at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the TPZ should be protected with ground protection. **This must be installed before any site activity takes place to protect soil structure and tree roots.**

Ground protection must be fit for the purpose of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil. It might comprise one of the following:

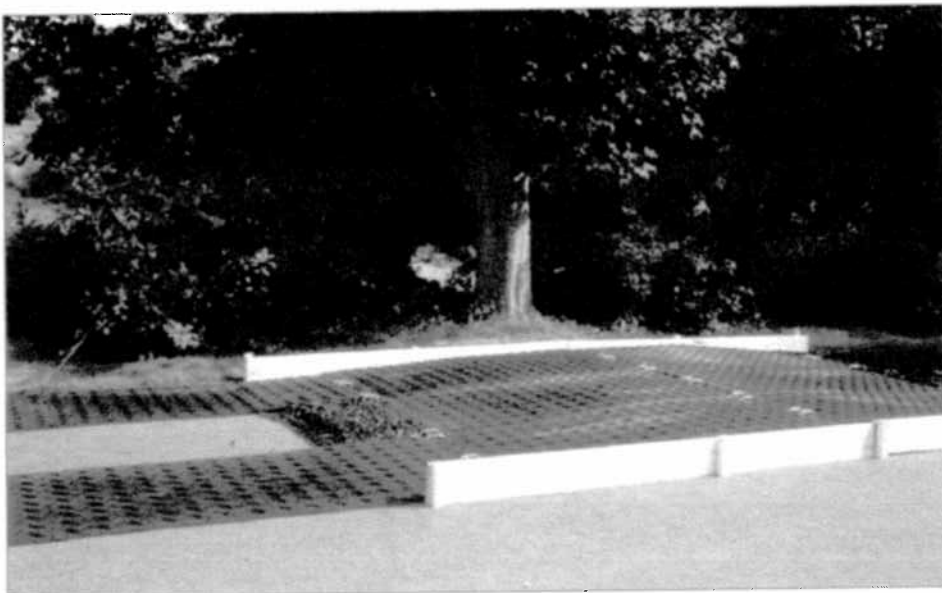
- For pedestrian movements or the erection of scaffolding within the RPA the installation of ground protection in the form of a single thickness of scaffold boards either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth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

The following is a list of suppliers of temporary ground protection including polymer, metal or wooden panels. Other companies supply similar products and the following are given only as an example.

- www.ground-guards.co.uk
- www.evetrakway.co.uk
- www.trakmatseurope.com
- www.centriforce.com
- www.marwoodgroup.co.uk

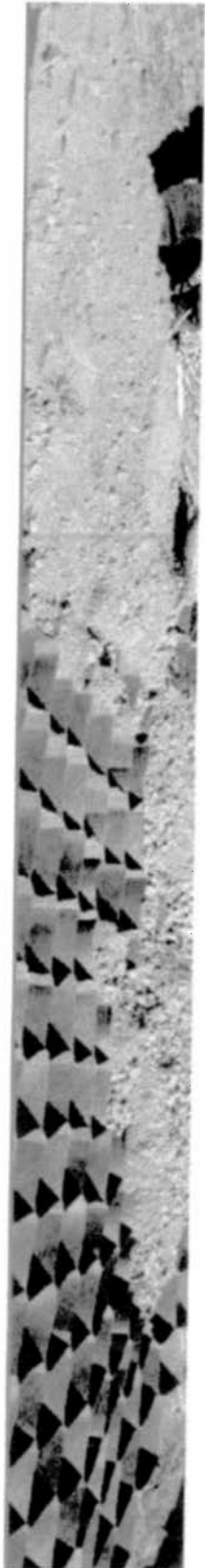
Cellular confinement no-dig systems can also be used.

Examples of proprietary ground protection panels



Green-Tek Ground Guards showing geotextile membrane, 100 mm of woodchip with panels above to

Tree Roots Protection



Protect tree roots from vehicle traffic, whilst maintaining water and nutrient absorption using TERRAM GEOCELL.

Using TERRAM GEOCELL to protect tree roots from the soil's weight and pressure from ground water is an effective way to ensure the ground around the tree trunk remains healthy. It will allow the ground to settle and the soil to settle around the roots, ensuring the tree trunk remains healthy. It will also prevent the roots from being crushed by the soil's weight and pressure.

Types of Applications

- Protection around trees
- Sports & grounds
- Footpaths
- Roads
- Access roads
- Driveways
- Parking areas
- Areas around buildings

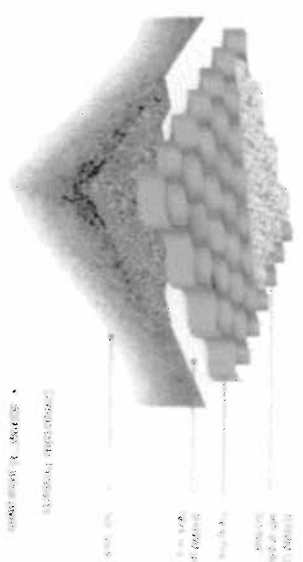
TERRAM GEOCELL is installed in the ground around the tree trunk to protect it from the soil's weight and pressure. It will also prevent the roots from being crushed by the soil's weight and pressure. It will also prevent the roots from being crushed by the soil's weight and pressure. It will also prevent the roots from being crushed by the soil's weight and pressure.

WHY TERRAM GEOCELL?

- It protects the tree roots from the soil's weight and pressure.
- It prevents the roots from being crushed by the soil's weight and pressure.
- It allows the roots to breathe and absorb water and nutrients.
- It prevents the roots from being crushed by the soil's weight and pressure.
- It allows the roots to breathe and absorb water and nutrients.



Typical Profile



Product Details

Product Name	Material	Weight	Dimensions	Installation
TERRAM GEOCELL	High Density Polyethylene (HDPE)	1.2kg	1000mm x 1000mm x 100mm	See installation instructions

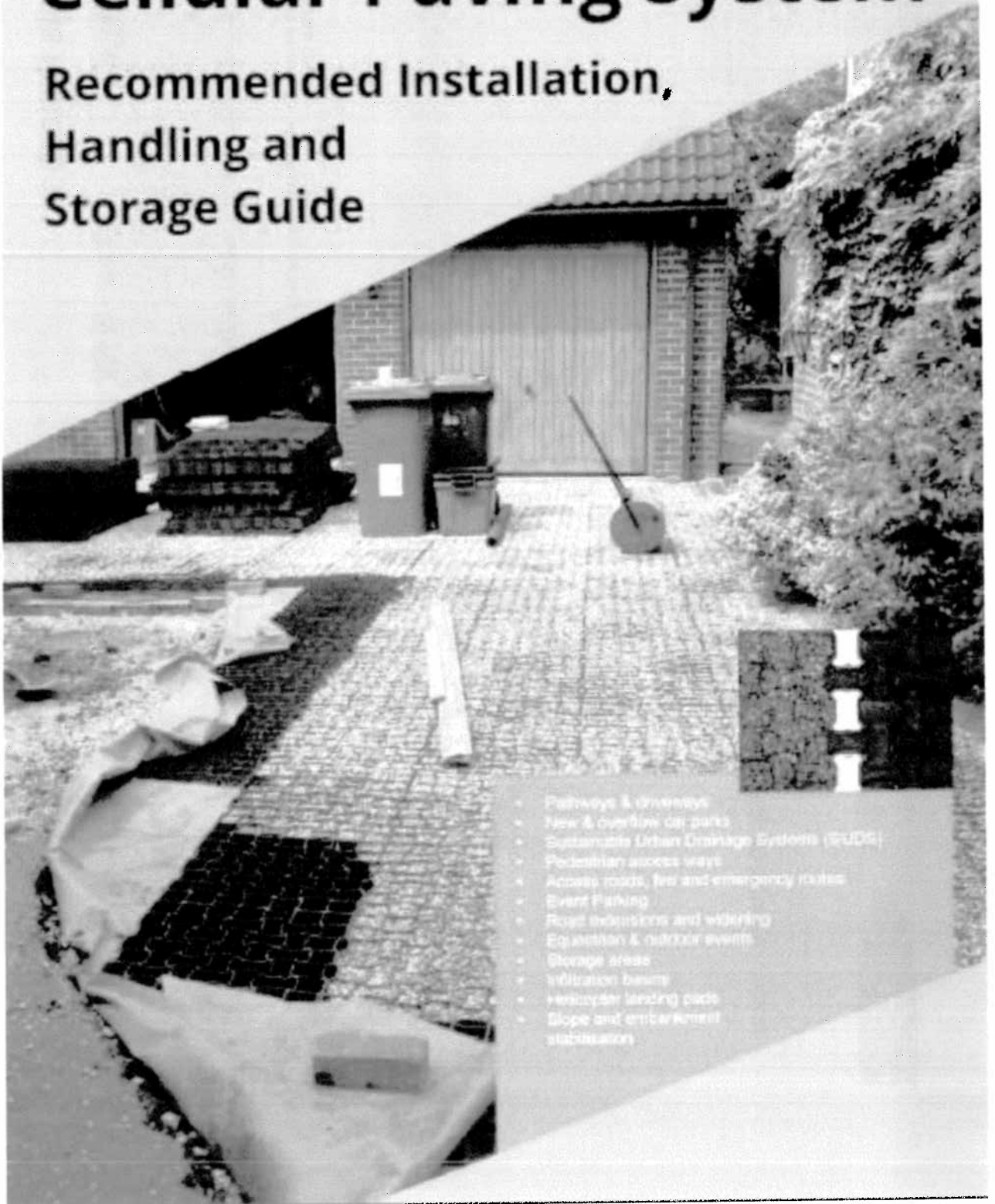
TERRAM Data Sheets, Installation & Design Guidelines and Case Studies can be downloaded from www.terram.com



GeoGrid Cellular Paving System

Ground-Guards

Recommended Installation,
Handling and
Storage Guide



- Pathways & driveways
- New & overflow car parks
- Sustainable Urban Drainage Systems (SUDS)
- Pedestrian access ways
- Access roads, fire and emergency routes
- Event Parking
- Road indentations and widening
- Equestrian & outdoor events
- Storage areas
- Infiltration basins
- Helicopter landing pads
- Slope and embankment stabilisation

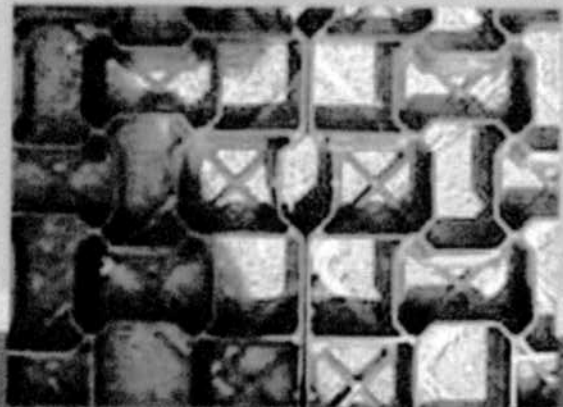
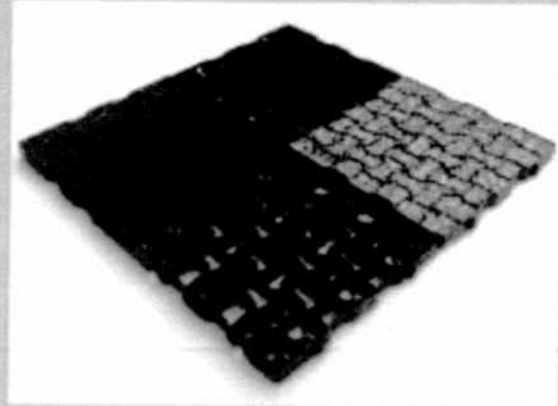
Installation

GeoGrid is a new innovative ground reinforcement and stabilization product for use in the permanent reinforcing of soft ground for the improvement or parking of vehicles and for stabilizing soft earth banks. GeoGrid is a modular, open design grid tile, manufactured in recycled low-density polyethylene. It is tough, flexible, easy to install and allows natural drainage.

The method of installation is determined by existing ground conditions as well as the end use and weight loading requirements. The methods described below provide general guidance only and do not form part of any contract with the user. We advise that the method of installation should be undertaken in accordance with your designers specification and drawings and the relevant Health and Safety requirements.

Prior to use the GeoGrid Pavers should be stored to prevent excessive mud, wet concrete or other damaging materials from coming into contact with and affixing to the GeoGrid.

The grid structure can be filled with different materials such as soils (to support plant or grass establishment) or gravel / aggregates. We recommend that detailed design, specification and installation advice is sought from appropriately qualified civil and structural engineers.



Key Product Details

Material:	<ul style="list-style-type: none"> • 100% Recycled High Density Polyethylene (HDPE) • Withstands foot and UV radiation
Natural stability:	Temperatures -30 to +100°C
Axis weight load:	Standard - 25 tonnes* / Premium - 35 tonnes*
Max load per m ² :	Standard - 350 tonnes* / Premium - 500 tonnes*
Grid dimensions:	495mm x 495mm x 40mm
Wall thickness:	Standard - 3mm / Premium - 5mm
Weight Per Grid:	Standard - 1.1kg / Premium - 1.8kg
Weight Per 1m ² :	Standard - 4.4kg / Premium - 6.9kg
Packaging:	<ul style="list-style-type: none"> • Pre-connected 1m² sections - 4 grids • 60 layers of 4 grids per pallet • 240 grids per pallet • Pallet size and area required per pallet 105cm x 120cm (1200mm (90m²)) • 26 pallets per standard articulated lorry

Country of Manufacture: Made in the UK and EU

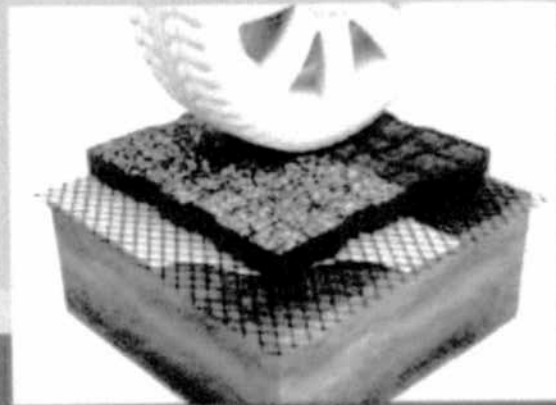
* Tested at the National Physical Laboratory UK, under BS EN 124-1:1994
Dimensions may be subject to nominal variation



90mm on pallet

Installing GeoGrid® with grass infill

1. Existing turf and soil should be removed to a depth of $\geq 75\text{mm}$ over the area where GeoGrid® is required (with allowance made for edge retaining boards or kerbs as required). This formation layer should be levelled and lightly consolidated.
2. Edge retaining boards or kerbs should then be installed as required.
3. Place 4-14mm diameter gravel or aggregate (BS EN 12620) to a depth of 35mm spreading evenly over the prepared area.
4. Place the GeoGrid® on top of the gravel / aggregate and connect using the interlocking system and progressing over the area in both directions. As an option to ensure a greater degree of stability of the GeoGrid®, pins or hoops can be used to pin the GeoGrid® into the formation layer. GeoGrid® can be cut to shape using a hand or power saw to follow curves or fit around obstacles as required.
5. GeoGrid® can then be firmed in place using a light vibrating compaction plate.
6. The GeoGrid® cells should then be filled with an appropriate proprietary soil mix material to about 5mm below the top of the cells. The soil mix material should be suitable to encourage and maintain healthy grass growth. Against light compaction is recommended to settle the soil mix.
7. Undertake a seeding, fertilising and watering programme to establish the grass sward, with top dressing as necessary to cover the seed and encourage germination. The GeoGrid® cells should not be over-filled.
8. Although the surface may be trafficked straight away, it is advisable to first allow the grass to become established before use.
9. It should be noted that instead of seeding, a thin-cut turf layer can be rolled into the GeoGrid® as an alternative method of grass establishment.



Installing GeoGrid® with gravel infill

1. Existing turf and soil should be removed to a depth of $\geq 75\text{mm}$ over the area where GeoGrid® is required (with allowance made for edge retaining boards or kerbs as required). This formation layer should be levelled and lightly consolidated.
2. Edge retaining boards or kerbs should then be installed as required.
3. Place a layer of stabilisation mesh flat on top of the formation layer using pins to hold in place as necessary. In circumstances where it is necessary to prevent ingress and migration of contaminants a layer of geo textile fabric (of the required specification) can be placed above the formation layer before installation of the stabilisation mesh.
4. Place 4-14mm diameter gravel or aggregate to a depth of 35mm spreading evenly over the stabilisation mesh ensuring that the mesh is not left exposed.
5. Place the GeoGrid® on top of the gravel / aggregate and connect using the interlocking system and progressing over the area in both directions. As an option to ensure a greater degree of stability of the GeoGrid®, pins or hoops can be used to pin the GeoGrid® into the formation layer. GeoGrid® can be cut to shape using a hand or power saw to follow curves or fit around obstacles as required.
6. GeoGrid® can then be firmed in place using a light vibrating compaction plate.
7. The GeoGrid® cells should then be filled with the specified gravel or aggregate, for example, clean, well-graded angular material within the range 6-14mm diameter.
8. Use a light vibrating compaction plate to consolidate the surface.
9. Any low spots can be refilled and compaction repeated until satisfied with final compaction.
10. The surface can be trafficked straight away.

Specific report caveats**Specific report caveats**

- The survey was based on a drawing provided by the client.
- No internal diagnostic equipment was used other than a sounding mallet and probe.
- The survey is concerned solely with arboricultural issues.
- Any work with trees will discharge the due diligence requirements of all relevant wildlife and countryside legislation.
- Trees are dynamic living organisms whose health and condition can change rapidly. Any changes to the tree or conditions close to the tree may change the stability and condition of the tree and a further examination would be required and may affect the validity of this report.
- This report is valid for 12 months.

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Arboricultural Method Statement

for development at

181-183 York Way & 282a Camden Road, London,

N7 9LN _ NW1 9AB

on behalf of

Mr Demetri Tsangari

Pursuant to discharge planning conditions

13th October 2017

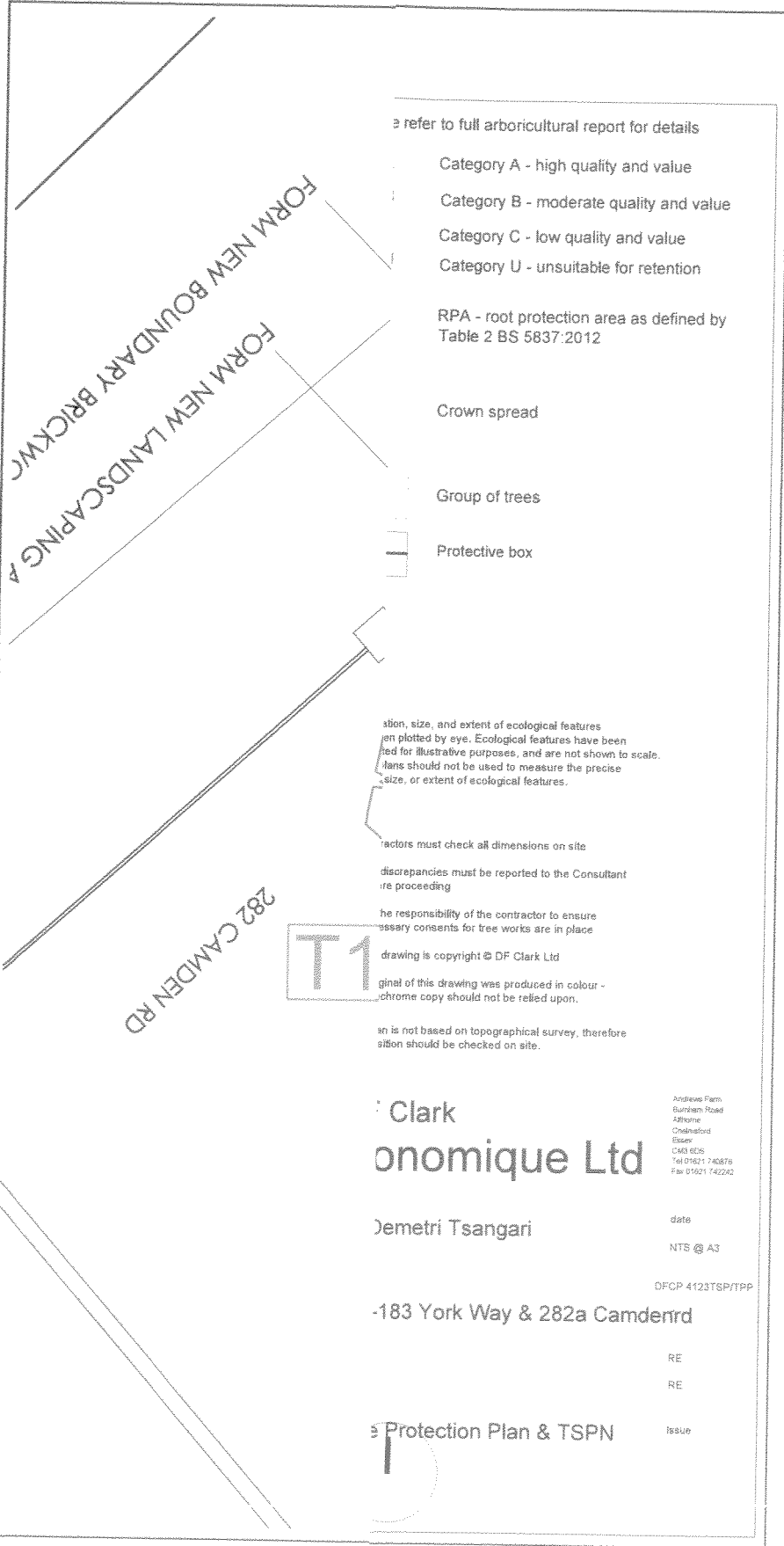
Our reference DFCEP 4123

Robert Ellis 1st Dip Countryside and Forestry, NC/ND in

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refer to full arboricultural report for details

- Category A - high quality and value
- Category B - moderate quality and value
- Category C - low quality and value
- Category U - unsuitable for retention

RPA - root protection area as defined by Table 2 BS 5837:2012

Crown spread

Group of trees

Protective box

ation, size, and extent of ecological features
 en plotted by eye. Ecological features have been
 ed for illustrative purposes, and are not shown to scale.
 Plans should not be used to measure the precise
 size, or extent of ecological features.

actors must check all dimensions on site

discrepancies must be reported to the Consultant
 ire proceeding

he responsibility of the contractor to ensure
 ssary consents for tree works are in place



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an is not based on topographical survey, therefore
 sition should be checked on site.

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RE
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Protection Plan & TSPN

Issue

