John Booth Arboricultural Consultants Ltd
***John A Booth** MBA, MSc, FICFor, CEnv, FArborA, RCArborA, DipArb(RFS), CUEW, LCGI(Hort), NDArb.*
Director & Principal Consultant
Chartered Arboriculturist, Chartered Environmentalist
& Certificated Expert Witness,
Arboricultural Association
& Institute of Chartered Foresters Registered Consultant

Arboricultural Survey Report & Method Statement

(Preliminary)

at

15 Minver Crescent
Nottingham

for and on behalf of

Alex Malik

October 2023

242 Highfields Park Drive
Broadway
Derby
DE22 1JY

Mobile: 07783 968714
Email: info@jabooth.co.uk
Web: www.jabooth.co.uk

AA Registered CONSULTANT trees.org.uk

Arboricultural ASSOCIATION Fellow Member

CARDIFF UNIVERSITY LAW SCHOOL BOND SOLON CIVIL Expert Certificate

Institute of Chartered Foresters Registered Consultant

SUMMARY

This report is concerned with a tree located on land adjacent to 15 Minver Crescent, Nottingham.

The report and accompanying tree survey schedule is produced in accordance with the guiding principles of British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'.*

The Root Protection Area (RPA) of the tree surveyed is calculated and recorded in the Tree Survey Schedule where it is expressed both in linear and square metres. Where construction is proposed within this area special techniques should be employed and guidance is contained herein.

Contents

1 INTRODUCTION

***1.1 Author's Qualifications and Experience*:** I am a Chartered Arboriculturist and a Chartered Environmentalist, a Fellow and Registered Consultant of the Arboricultural Association; I am also a past national chairman of the Arboricultural Association. I am also a Fellow and registered consultant of the Institute of Chartered Foresters. I have over forty years experience of arboriculture and amenity tree management and have written papers published in respected journals such as the International Journal of Urban Forestry. I am trained in the use of the Quantified Tree Risk Assessment (QTRA) methodology and am a Bond Solon/Cardiff University certificated Expert Witness. A full CV can be found at Appendix 1.

For your assurance I carry £1,000,000.00 Professional Indemnity insurance.

This report is based on my site observations and any information provided.

1.2 Instructions and Brief: Alex Malik (the client) sought advice regarding the condition of a tree which might be implicated in a proposal to develop land at 15 Minver Crescent, Nottingham (the site). Guidance was sought as to what arboricultural constraints might be associated with any proposal and how any such might be overcome/minimised. A Tree Survey Schedule compliant with the guiding principles of British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'* is contained in this report and all survey data is recorded in this Schedule.

1.3 Documents & Information Provided: No plans were provided. It is understood that the tree is the subject of a Tree Preservation Order (TPO).

1.4 Scope:

1.4.1 This report has been prepared for the sole use of the client. Any third party referring to this report or relying on the information contained herein does

so entirely at his or her own risk.

1.4.2 Whilst every effort has been made to detect defects within the subject tree, no guarantee can be given as to the absolute safety or otherwise of any individual tree. This report represents a survey and should not be construed to be a detailed tree inspection report; trees comprising groups were assessed as such and individuals within were not subject to inspection. Any recommendations given are intended to reduce the likelihood of tree collapse and are intended to reduce the likelihood of tree collapse but absolute safety is not a realistic goal; even apparently sound trees can fail particularly during inclement weather eg Gale force winds of 8 (39 - 46 mph) may result in the shedding of small twigs and branches whereas Gale force 10 winds (55 – 63 mph) may result in trees being uprooted. All recommendations are given in the context of the site's current usage; any change will dictate a further survey.

1.4.3 The findings and recommendations contained within this report are, assuming its recommendations are observed, valid for a period of twelve months from the date of survey. Trees are living organisms subject to change – best practice dictates they are inspected on a regular basis for reasons of safety.

1.4.4 My expertise is ARBORICULTURE, any non-arboricultural references made within this report are made as a lay person.

2 SITE VISIT AND OBSERVATIONS

2.1 ***Site Visit*****:** I undertook a site visit on 18 October 2023. The tree was surveyed visually from the ground. No drilling or excavation was carried out on this occasion. The weather at the time of the visit was dry and still, visibility was adequate for the purposes of the visit.

2.2 ***Tree Survey Methodology:*** The survey was undertaken in accordance with the guiding principles of British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'* and the tree was assessed objectively and without reference or influence being given to any proposed site layout. Using 'Visual Tree Assessment' (VTA) techniques the trees were surveyed from the ground. VTA is a methodology, employed by arboriculturists, to evaluate the structural integrity of a tree, relying on observation of a trees biomechanical and physiological features; this is the method generally adopted and is appropriate in this instance.

Further explanatory details regarding the survey methodology can be found at Appendix 2.

3 TREE RETENTION – GENERAL

3.1 ***Below Ground Constraints:*** to achieve any development various construction activities are required and great care and consideration needs to be given as to how such activity can proceed whilst avoiding damage to retained trees.

3.1.2 Generally, and contrary to common belief, in the UK, the majority of a trees roots can be found in the upper 600mm of a soil (See Figures 1 & 2). In order to avoid damage to these roots, trees should be protected using protective barriers as are detailed in British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction – Recommendations'* and as illustrated in Figure 3. Such barriers should usually be erected around the RPA prior to the commencement of the demolition/construction activity; it must remain in situ and intact until completion. The area within these barriers should, with some exceptions (see Section 4) be considered sacrosanct and no work should be permitted within them. In an effort to ensure any tree protective barriers remain during construction, it is further advised that they carry signage as per Figure 5 and that the Site Agent is briefed accordingly.

Tree Protective Barriers should also be erected, prior to the commencement of construction, around those areas identified for soft landscaping/tree planting so as to protect the soil from compaction and denaturing.

Correct setting out of the barriers and ground protection should be confirmed on site by the project arboriculturist prior to the commencement of any other operations on site.

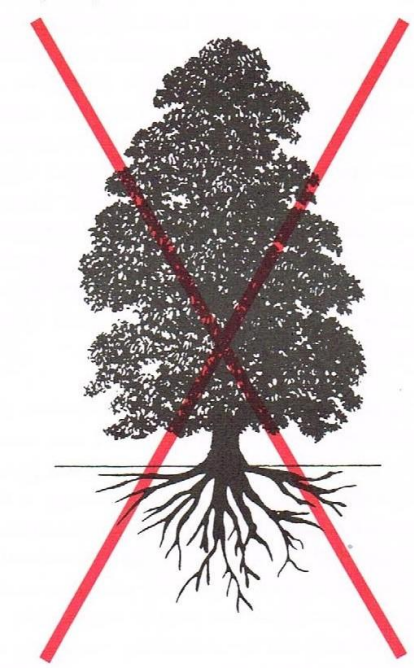

Figure 1. This is the commonly held idea of what a tree's root system is like. In fact it is quite wrong.

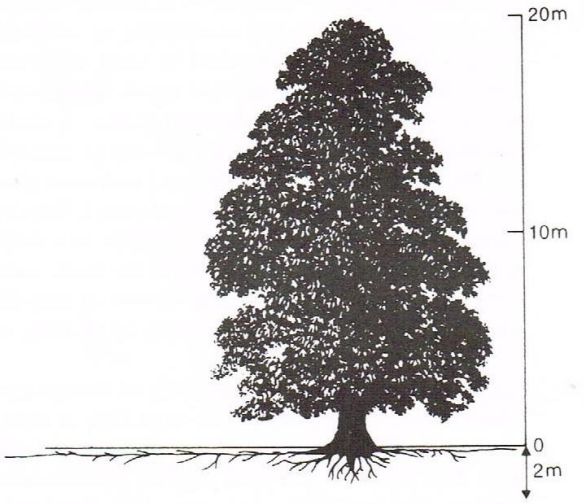

Figure 2. A tree's root system is typically fairly shallow (frequently no deeper than 2 m), but is widespreading, with the majority of roots found in the upper 60cm of soil.

Figures 1 & 2
AAIS (1995) '*Tree Root Systems*'.

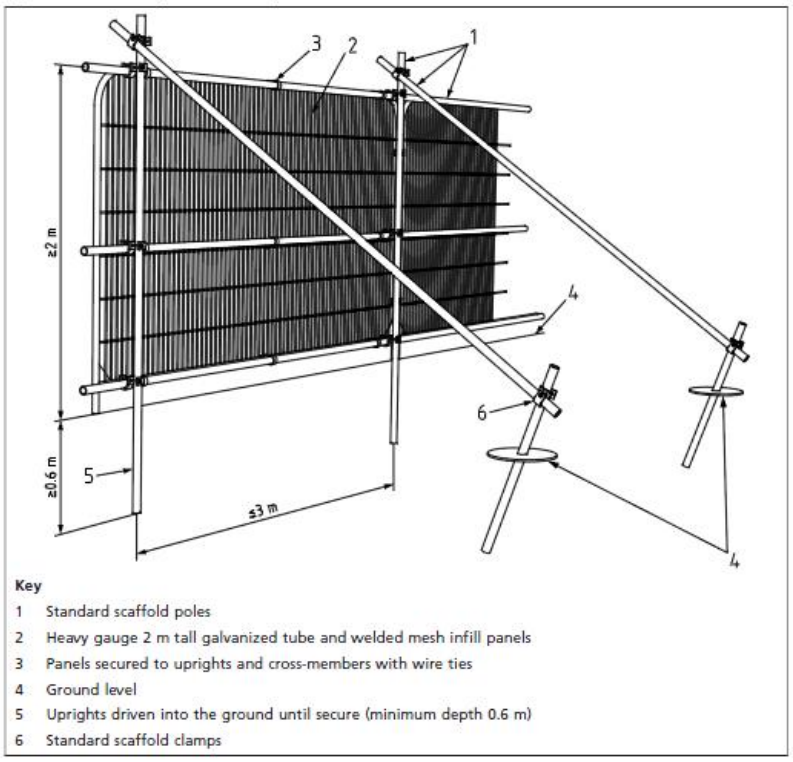

Figure 3 - Tree Protection Barrier

British Standard 5837, (2012), '*Trees in Relation to Construction: Recommendations'*, *Page 20.*

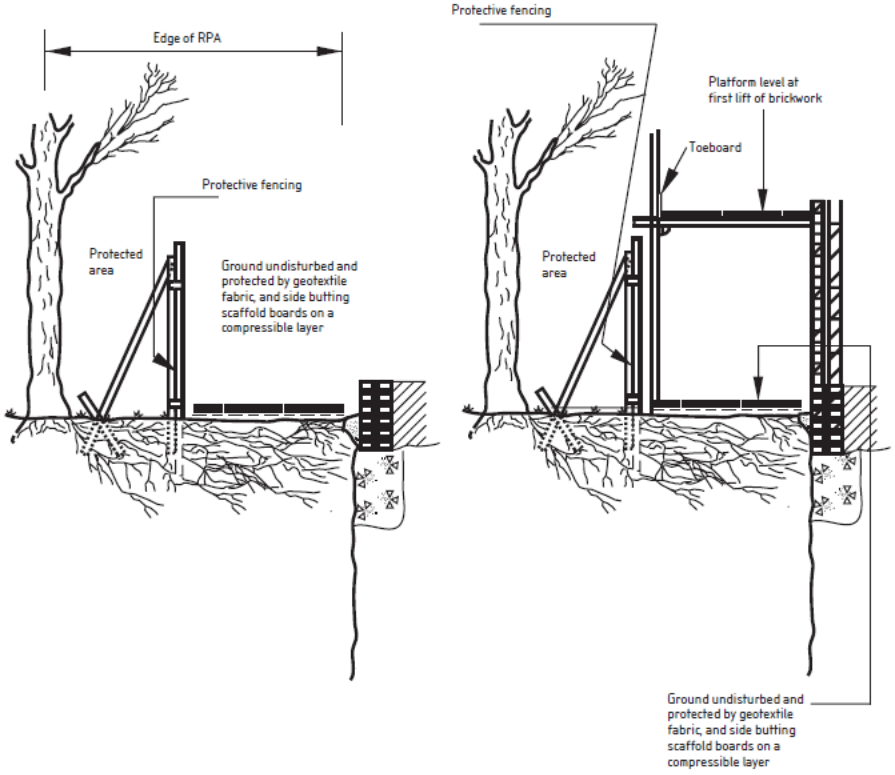

Figure 4
Adapted Barrier Incorporating Temporary Ground Protection

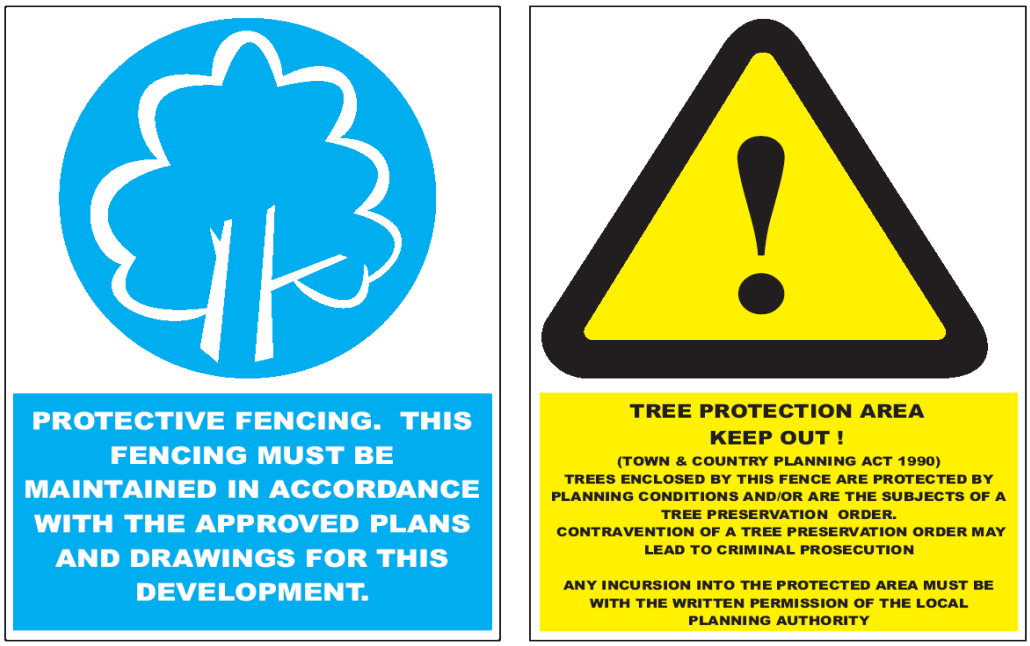

Figure 5 - Barrier Notice

3.1.3 Where space is required within the RPA to facilitate the erection of scaffold this may be satisfactorily achieved incorporating ground protection within the scaffold structure as illustrated in Figure 4 above.

3.2 ***Above Ground Constraints*****:** Consideration must also be given to the aerial parts of the tree in relation to any construction; particularly residential buildings. Conflict frequently arises where dwellings are placed close to trees giving rise to concerns relating to shade, falling debris such as leaves and twigs and from apprehension arising from a perceived threat of tree failure. These concerns can often be overcome, in part at least, by carefully ensuring adequate useable garden space is provided and is not dominated by trees and that principal windows face away from trees; in some instances it may be appropriate to locate glazed panels into the roof structure. The LPA are likely to resist any proposal that results in built structures close to trees or that makes inadequate provision for their future growth. Usually, and particularly in the case of immature trees, the distances required to avoid conflict will be greater than those expressed as the RPA. It is however, equally important to note that

issues arising from shade are often overstated and that some shade is not only tolerable but may be beneficial. It is also important to bear in mind that different tree species cast different shade patterns depending upon juxtaposition, size, habit, canopy density, evergreen/deciduous.

The following guidance is given by the Building Research Establishment (BRE): "*Tree locations are … important; deciduous species are best because they are leafless when solar gains are most valuable, while providing some shade in summer.*" (BR380 Page 69)

"*Deciduous trees give shade in summer but allow access to sunlight in winter*." (BR 209 page 22).

"*The question of whether trees … should be included in the* (solar gain*) *calculation depends upon the type of shade they produce. Normally, trees and shrubs need not be included, partly because their shapes are impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building. This applies especially to deciduous trees*." (BR209 page 13) (* - Authors edit).

4 ARBORICULTURALLY ACCEPTABLE CONSTRUCTION METHODS WITHIN RPA

4.1 ***Foundations:*** in order to maximise a sites' development potential, it may be possible to employ special foundation design such as mini/micro pile and suspended beam or a cantilevered foundation or 'Ground Screws' (See Appendix 3). These designs enable construction within the RPA as they limit excavation to a minimum. The location of any mini piles would need to be flexible so as to avoid damage to major roots and the necessary excavation for the piles may need to be carried out by hand. In these circumstances a suspended floor slab will need to be incorporated and the void beneath should

be externally vented so as not to inhibit gaseous exchange, in some instances ie where more than 20% of the RPA is to be covered, there will need to be provision for the redistribution of rainwater beneath the slab. Where pile foundations are to be employed, consideration needs to be given to the selection of the type of piling rig so as to avoid conflict with low, overhanging tree branches. A structural engineer must be appointed to design any foundation.

4.2 Hard Surfacing:

***4.2.1 New*:** It is permissible to construct hard surfacing for drives and paths within the RPA; however, it can have implications for tree roots. These implications can often be overcome and/or minimised by employing a 'No-dig' construction (see Appendix 4) methods. These techniques result in structures which are load bearing and negate the need for deep excavation. Any final surface must be porous so as to permit gaseous exchange and moisture percolation. Further advice of a structural engineer must be sought to design the final specification in accordance with these parameters, with the final design being agreed with a Chartered Arboriculturist.

4.2.2 Existing: Where hard surfacing exists within the area defined as the RPA, it is acceptable to erect protective barriers at the extent of that hard surface, since the surface itself will afford protection to any tree roots beneath. However, where is proposed to remove/regrade existing hard surfacing care must be taken to avoid collision between overhanging tree branches and passing construction traffic. It is advised that to minimise root disturbance the existing surface is broken and gathered for disposal using hand operated tools, any backfilling must utilise top quality top soil laid at approximately 50mm deep with a composted bark mulch laid over that to a maximum depth of 75mm; in the long term this approach brings a positive arboricultural impact.

4.3 Services – Details regarding the siting of underground services have not been made available, the following is given as general advice: Careful consideration must be given to the siting of underground services eg drains, electricity, gas

etc. They should ideally not be sited within the RPA; where such is unavoidable; the trench must be hand dug and all roots greater than 25mm diameter must be carefully dug around and left intact. Any roots below this size, where they cannot be retained, must be cut cleanly with pruning tools. If the trench is to remain open for prolonged periods, especially in hot, dry weather, roots must be wrapped in damp hessian sacking to prevent desiccation. In order that they can assess any impact upon trees it is likely that the LPA will require the submission of details regarding service location and installation methodology prior to the granting of any planning consent.

Where drains are to be installed within the rooting zone, particular consideration must be given to their construction; compression joints are not wholly reliable and can allow root ingress.

4.4 ***Temporary Site Accommodation*** – Note 2 Page 20 of BS 5837 (2012) advises that in some circumstances it is appropriate to use site cabins as components of the tree protective barriers where they can serve as an effective means of protecting the soil from many of the construction related activities. Further advice of a Chartered Arboriculturist should be sought should this matter be of relevance or advantageous.

4.5 ***Temporary Ground Protection*** - In some instances it may be advantageous to work within the RPA eg access a site, either for pedestrians or machinery. BS5837 (2012) acknowledges this as a possibility and systems which dissipate any load applied, thus avoiding soil compaction and denaturing, are to be used (See Appendix 5), also new temporary ground protection could comprise one of the following:

a) For pedestrian movements only, a single thickness of scaffold boards should be 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 onto a geotextile.

b) For pedestrian operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards could be placed on top of a compression resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile.

c) For wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. pre-cast reinforced concrete slabs) could be employed.

An engineer should be consulted regarding the design of a temporary access with the final specification being agreed with a Chartered Arboriculturist.

5 OTHER CONSIDERATIONS

5.1 ***Trees Subject to Statutory Controls:*** No attempt has been made to establish the existence of any statutory controls, it is, however, understood that the tree is subject to a Tree Preservation Order (TPO); the following is given as guidance.

Trees and hedgerows can be subject to statutory control and severe penalties can result from unauthorised works or damage. It is recommended that prior to commencement of any tree works the Local Planning Authority (LPA) are contacted. When proposing to do works to trees within a Conservation Area, with some exceptions, eg the implementation of works directly necessary to implement a full planning permission, six weeks written notice must be given to the LPA, this notice need not take any form other than a written specification of what is proposed and a plan illustrating the position of the tree(s). This notice is often referred to as a Section 211 Notice. Many LPA's prefer that their standard pro-forma is submitted to ensure the necessary detail is included in the notice; whilst such cannot be strictly required it can assist in a speedy outcome.

Having received the notice the LPA has essentially only one of two options at its disposal ie:

- **Impose a TPO** in respect of those trees/some of those trees subject to the notice. This prevents any works being carried out without the express, written consent of the LPA,

  Or

- **Do nothing** It is considered best practice for an LPA to acknowledge receipt of the notice but there is no obligation for it to do so. After six weeks of serving the notice the tree owner may proceed with the works detailed in the Section 211 Notice.

The LPA cannot, in response to a Section 211 Notice, issue a conditional consent.

TPO's are made in the interests of preserving amenity, usually taken to mean public visual amenity. Trees largely removed from public view and which have little visual impact are not usually made the subject of a TPO. The written consent of the LPA must be obtained prior to undertaking works to trees subject to TPO unless, as with trees in Conservation Areas, certain exemptions apply. With regard to trees subject to TPO's it is a requirement that a standardized application form is used; this form is available from the LPA.

Where trees are protected John Booth Ltd is happy to act as the client's agent, liaising as necessary with the LPA and producing the written submissions/notices/applications as required.

5.2 ***Trees and Wildlife*****:** Trees play host to nesting birds many of which are protected by law. All British bat species are also protected and can be found in trees. Great care needs to be taken to avoid disturbance and consideration should be given to the timing of tree works in order to avoid disturbance. Where the presence of protected species is suspected, Natural England should

be contacted for advice.

5.3 ***Implementation of Tree Works*****:** Guidance on hiring an Arborist is available the Arboricultural Association's Register of Contractors which is available free from Ullenwood Court, Ullenwood, Cheltenham, Gloucestershire, GL53 9QS (Telephone 01242 522152 , www.trees.org.uk). Any appointed contractor should carry out all tree works to BS 3998 (2010) '*Recommendations for Tree Work*.'

5.4 ***New Planting:*** It is possible that any planning permission issued will carry a condition requiring new tree planting, particularly in instances where a proposal involves the removal of trees. Further advice is available upon request.

6 RECOMMENDATIONS

6.1 This report provides guidance for the design team and sets out the constraints relating to the tree. Tree survey and RPA detail can be found in the Tree Survey Schedule.

6.2 In an effort to ensure any issues are resolved from the outset it is recommended that a site visit is undertaken with the Local Authority's Planning Case Officer and Tree Officer to ensure that the approach for development and tree retention is suitable. I would be happy to represent the client at any such meeting.

6.3 Once a layout has been designed further arboricultural input should be sought and an impact assessment should be undertaken.

6.4 An auditable system of arboricultural site monitoring should be factored in to the process wherever trees on or adjacent to a site have been identified for retention; this should extend to supervision by a chartered arboriculturist

whenever construction and development activity is to take place within any RPA.

7 BIBLIOGRAPHY

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- Building Research Establishment, (1998), BR209, '*Site layout planning for daylight and sunlight: a guide to good practice'*.
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- Strouts R. G., Winter T. G. (1994), '*Diagnosis of Ill Health in Trees'*, 2nd Ed., DETR.

- Lonsdale D., (1999), '*Principles of Tree Hazard Assessment and Management'*, DETR.

John A Booth ***MBA, MSc, FICFor, CEnv, FArborA, RCArborA, DipArb(RFS), CUEW, LCGI(Hort), NDArb.***
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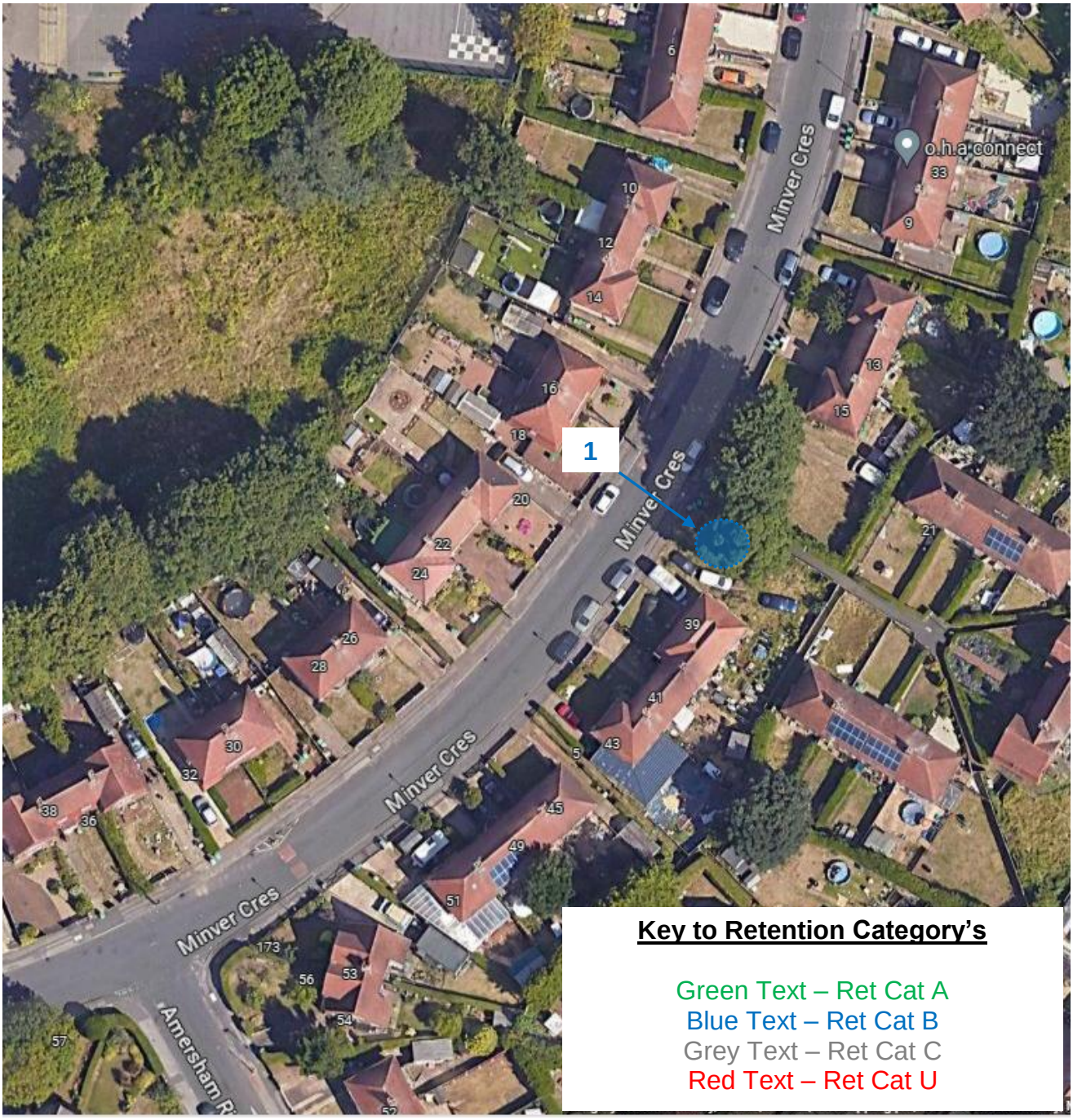
8 Tree Survey Schedule (Explanatory Notes Found at Appendix 2)

Tree No	Species	Ht (m)	Stem Dia (mm)	Branch Spread (m)				Crown Ht. (m)	Age Class	Cond	Comments/ Preliminary Recs.	Life Exp (yrs)	Ret Cat	RPA* (Lin M)	RPA** (M^2)
				N	E	S	W								
1#	Sycamore	17 (20)	770	8	8	8	8	6	Mat	B	No work required at this moment in time.	>40	B	9.5	268

* RPA = The minimum distance, measured from the trees trunk, at which tree protective barriers should usually be erected.
** RPA = The minimum area in M^2 around which tree protective barriers should usually be erected.
# = Tree in third party ownership, inspection limited, dimensions limited.

8.1 Tree Survey Plan



9 APPENDICES

Appendix 1: Curriculum Vitae

John Booth **MBA, MSc, FICFor, CEnv, FArborA, RCArborA, DipArb(RFS), CUEW, LCGI(Hort), NDArb**

PROFESSIONAL QUALIFICATIONS
Sheffield/Hallam University, MSc in Environmental Management (Distinction), 2005-2006
Nottingham Trent/Derby Universities, Masters in Business Administration (MBA) 2002-2005
Merrist Wood College, RFS Professional Diploma in Arboriculture, 1992-1993
Merrist Wood College, National Diploma in Arboriculture (Distinction) (B Tec), 1987-1990
Cardiff University/Bond Solon, Expert Witness Certificate, 2007
Lantra Certificate – Professional Tree Inspection, 2007

CAREER
2007 - Director of John Booth Arboricultural Consultants Ltd. (www.jabooth.co.uk)
1994 – 2007 - Arboricultural Manager for Derby City Council.
1990 – 1994 - Tree & Landscape Officer for Wycombe DC
1988 – 1989 - Assistant Arboricultural Officer for Bolton MBC
1981 – 1987 - Arborist for Bolton MBC

MEMBERSHIP OF PROFESSIONAL BODIES
Chartered Forester, Registered Consultant and Fellow of the Institute Chartered Foresters.
Fellow, past National Chair and Registered Consultant of the Arboricultural Association.
Chartered Environmentalist.
Bond Solon/Cardiff University Certificated Expert Witness.
Licentiate of City & Guilds Institute.

PUBLICATIONS
Numerous articles and papers in academic journals and trade literature.

Appendix 2: Tree Survey Methodology

The survey was undertaken in accordance with the guiding principles of British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations.*' Information recorded in the survey includes:

Species – the species identification is based on visual observations and the common English name of what the tree appeared to be is listed.

Tree Heights – are estimated in metres. Estimated mature heights are given in brackets.

Crown Height – the height to the lowest branch is estimated in metres.

Trunk Diameters – measured at 1.5 metres above ground and recorded in millimetres to the nearest 10mm.

Crown Radius – was recorded in metres along each of the cardinal points.

Crown Height – height from ground level to lowest principal limb.

Age Class – recorded as follows:

Yng	-	Young tree; <1/3 of normal life expectancy
Mid	-	Middle aged tree; between 1/3 & 2/3 normal life expectancy
Mat	-	Mature tree; has attained optimum stature
OM	-	Over Mature tree; declining
Vet	-	Veteran tree; tree of great age which is of exceptional value culturally, in the landscape or for nature conservation.

The ***Condition*** of the tree is based upon a preliminary assessment categorised thus:

A - Good

B - Fair

C - Poor

D - Very Poor/Dead

Preliminary Recommendations – works required regardless of development proposals.

Life Expectancy – estimated; ie less than 10 years, 10-20 years, 20-40 years, more than 40 years.

A ***Retention Category*** is given as follows which corresponds with Table 1 of British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations.*' ie:

- **A** - Trees of a high quality and value, including public visual amenity value. It is usual for such trees to be retained unless the planning merits of a particular scheme or layout over-ride.

- **B** - Trees of moderate quality and value, including public visual amenity value. Such trees should be considered for retention.

- **C** - Trees with a stem diameter of less than 150mm or which are of low quality/value, including public visual amenity value and/or have and life expectancy of less than 10 years value. ***The retention of Category C trees should not be allowed to impose a constraint on development.*** Trees with a stem diameter of less than 150mm are classified as Retention Category C, they should be considered for transplanting.

- **U** - Trees in such a condition that they are unsuitable for retention. Where category U trees have identifiable conservation, heritage or landscape value, even though only for the short term (less than 10 years), they may be retained where they are (or can be) sited such that concerns over safety are at (or can be reduced to) acceptable levels.

It must be noted that Retention Categories are awarded purely on arboricultural/amenity grounds and that in some instances the planning merits of a particular scheme may well over-ride the retention of even those trees qualifying for Retention Category 'A'.

Root Protection Area (RPA) – In respect of all trees surveyed the RPA has been calculated and is given in the Tree Survey Schedule. The figures given represents both the radial distance, from the trees trunk, at which the barriers should be erected and the entire area which should be encompassed by the barriers.

Appendix 3: Ground Screws

Screw Pile Foundations within a Root Protection Area (RPA) - Method Statement

Introduction

Stop Digging Screw piles are widely regarded as a very localised, low impact option upon which to mount structures within an RPA.

The use of hand held hand portable equipment and a no dig approach ensures that any damage to tree roots is heavily mitigated. This not only protects the major roots (over 25mm) but also the important fibrous root system often found close to the surface.

Construction Methodology

The location of the screw piles is important to provide adequate foundation support to the structure, whilst avoiding major tree roots above 25mm in diameter. The following procedure must be adhered to:

1. Mark out the proposed location of the structure, and the screw pile locations with shallow depth pegs.

2. Using a long metal bar such as a fencing bar or pin, drive a hole by hand into the proposed screw pile locations, rotating the bar to slightly enlarge the hole as it goes down in stages, to a depth of at least 500mm. The purpose of this is to ensure that there are no significant tree roots in that location. If roots above 25mm in diameter are discovered, then the screw pile pilot hole must be relocated to the nearest possible position that is free of roots.

3. The specialist hole punch tool can carefully be used to enlarge the start of the hole to 40mm, as part of the standard installation, paying attention to any obstructions that may be encountered. As the pointed tip is driven in, it will generally push any fibrous and small roots out of the way.

4. The pre drilling is carried out by a hand held SDS max drill with a 40mm masonry drill bit. This must be carefully and diligently undertaken by an experienced installer. The installer will be listening and watching for any indications that the drill tip has encountered a significant tree root. The feedback could include a change of speed, direction (plumb), sound and feel which the trained installer will be able to distinguish from normal drilling and from other ground obstructions such as stones.

5. If this occurs, then the screw pile must be relocated to the nearest possible position (no less than 3 times the diameter of the screw) with the process starting again from point 2. If this happens on a corner then an additional screw may be required to create a cantilever for the base frame.

6. The predrilling will continue down to suit the length of screw that will be installed. For structural integrity the predrilling should stop short of the final depth of the screw.

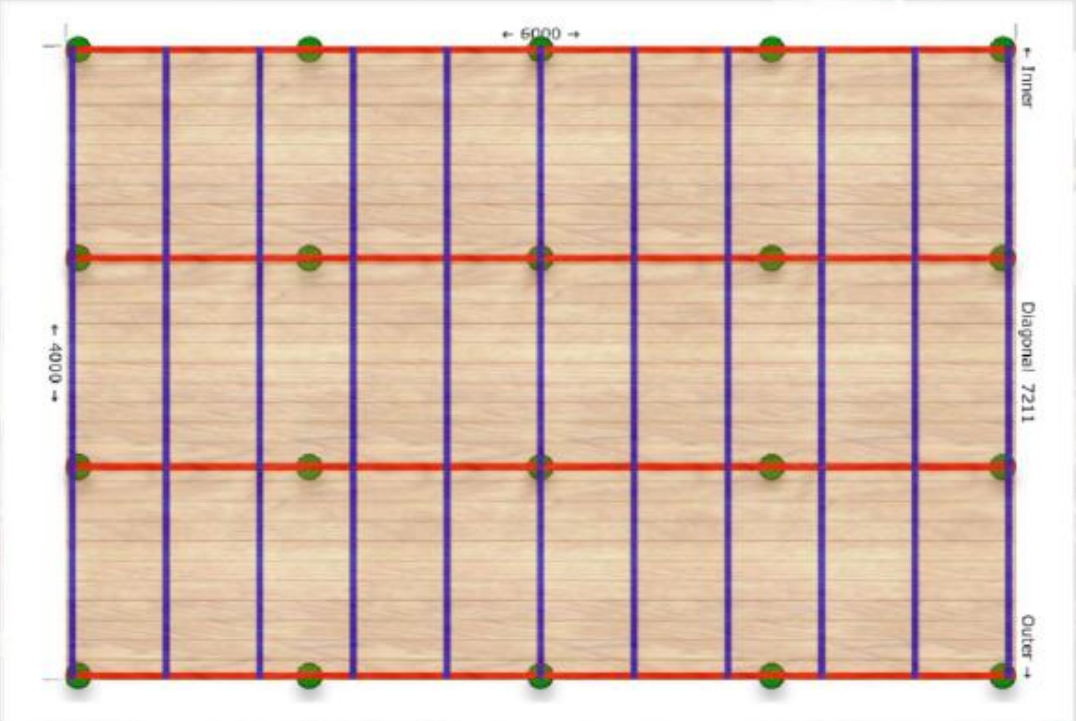
7. The screw is then installed, again using hand held and hand portable specialist equipment. The screw is wound in clockwise at a slow and steady rate and works on skin friction between the shaft/thread and the adjacent ground. The diameter of the screw is between 67mm – 76mm depending on which model is used.

8. There is a chance the ground screw shaft may affect a very small portion of the thin fibrous roots upon installation, however this should be minimal due to the threads being relatively blunt and the installation of the ground screws should act to move the roots out of the way rather than cut through them as with driven piles.

The result of following this method will ensure that all screw piles will be inserted into the soil without significant damage to any tree roots.

Example

An example structure would be a base for a garden room or similar as below. The spacings of the screw piles would typically be 1.2m – 1.8 m apart depending on the use and design of the structure.



Additional measures

In addition to the screw pile foundations it is advisable for the structure to be raised above ground level to allow air movement for root activity to a minimum of 150mm.

It is also advised that rainwater is captured from the roof and diverted into porous soakaway pipe which has been laid out underneath the base, to supply water to the roots below the shed. The piping will only be laid on the surface of the ground to avoid any excavation.

Suitability

Screw piles are suited to a wide range of soil types, with the main specification adaptation being the length of pile required for various soil types. Their site specific load capacities can be assessed by way of a pull, or load test. This involves installing a test screw(s) and assessing their performance. With the exception of the screw installation, the test is surface based and completely non-invasive. Please refer to the Stop Digging Design Specification Document for more information.

Consultation

Each project or site must be treated on its own merits and we would always advise that an Arboriculturist is consulted. Particular attention must be given if the site has trees with TPO's (Tree Preservation Order) and the local authority tree officer must be consulted.

Example Images

Screws installed ready for base frame

Appendix 4 'Cellweb' 'No-Dig' 3 Dimensional Cellular Confinement System
Example Specifications

Cellweb® TRP
Tree Root Protection

Cellweb® TRP is a 3D cellular confinement tree root protection system. The system provides a 'no dig' solution for the construction of new hard surfaces within root protection areas (RPAs). Cellweb® TRP has been designed and independently tested to comply with recommendations made in Arboricultural Practice Note 12 and BS 5837 2012 – Trees in relation to design, demolition and construction.

Cellweb® TRP Key Functions

Cellweb® is a 'no dig' solution which is constructed directly on the existing ground surface. This eliminates the requirement for excavation, preventing root severance.

Cellweb® is a completely porous system allowing continued water permeation and gas exchange between the rooting environment and atmosphere.

Cellweb® spreads point loads, minimising increases in soil compaction within the rooting environment. This maintains an open graded soil structure allowing continued root growth, water, gas and nutrient migration.

The Cellweb® TRP system comprises the following three components

Treetex™ Geotextile. Following minimal ground preparation the Treetex™ is laid onto the existing ground and top soil. This acts as a separation layer, separating the system above from the soil and rooting environment below. Treetex™ performs as a hydrocarbon pollution control measure in accordance with BS5837, holding 1.7lt of oil per square meter.

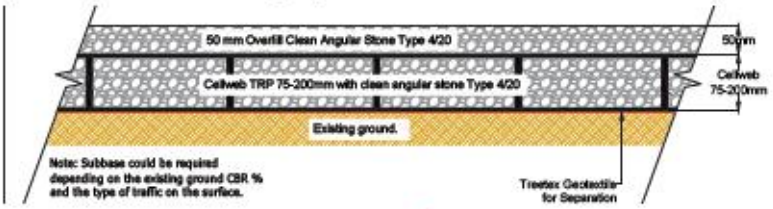
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

4-20mm Clean Angular Stone. The expanded Cellweb® is infilled with a 4-20mm clean angular stone. The confined angular stone locks together to produce a rigid stone mattress, while maintaining air pockets for continued water permeation and gas exchange. The low fines content of the stone prevents the Treetex™ layer from becoming blocked over time.

Which depth of Cellweb® TRP?

The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical and engineering support please contact Geosynthetics Ltd 01455 617139 or the full installation guide can be found on our website www.geosyn.co.uk.

Indicative Cellweb with overfill



Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk

Geosynthetics
Engineered Solutions

3 Dimensional ‘No-dig’ Installation Methodology

- Lay G4 Geotextile over existing ground between pegged timber edgings if used, ensuring overlaps of 300mm minimum. Temporarily retain G4 Geotextile with either stakes or weights.

- Install 8 Number 12mm diameter steel pins across the area to be covered by one panel of the confinement system (the product). The pins shall be orientated in order that each panel of the product may be laid over and remain in an expanded state.

- Install the product over steel pins; where necessary, remove surplus product with a craft knife.

- Immediately adjacent panels of the product shall be connected by providing four staples at each overlap.

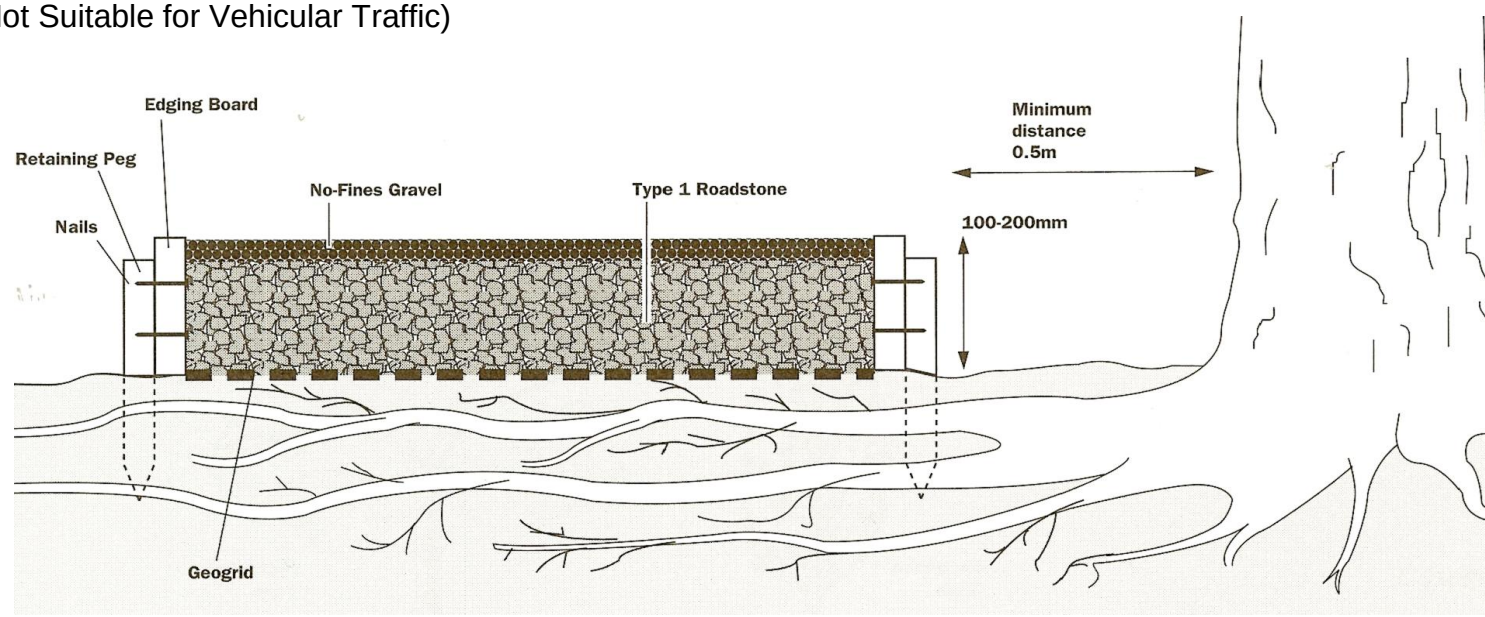
- The expanded product panels shall be infilled with 40/20mm clean angular stone using a Mini Excavator, under the direction of a chartered arboriculturist. The product shall be overfilled by 50mm to create a surcharge over the product which protects the leading edges of the cells. The Mini Excavator may track over areas of infilled product panels only ie it must not be operated/driven/stored outside the area over which the product is installed and within the RPA.

- The infilled aggregate shall be rolled and whacked to ensure compaction.

- Apply final surface eg block paving, tarmac etc.

2 Dimensional System – Example specification

(Not Suitable for Vehicular Traffic)



Cross Sectional Diagram Illustrating 'Geogrid No-Dig' Example Construction Specification.

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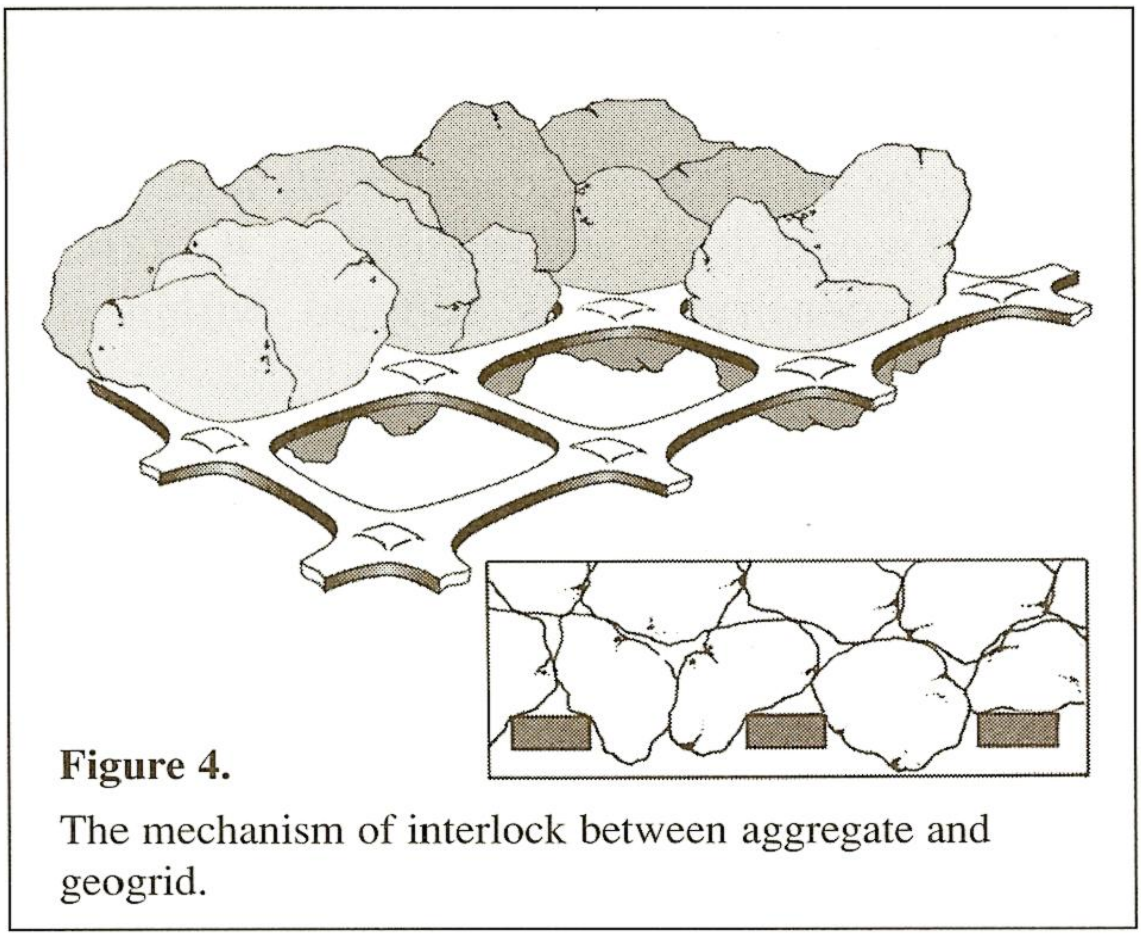

Figure 4.

The mechanism of interlock between aggregate and geogrid.

Appendix 5: Temporary Ground Protection

Ground-Guards

GreenTek

Ground protection and site access system

Ground-Guards are an "Instant Roadway" system of lightweight plastic panels, capable of taking vehicles of up to 50 tonnes weight.

Introduction The GreenTek Ground-Guards have become established as a proven alternative to the conventional method of stripping and stoning-up access roads on construction sites. By using this roadway system, ground damage and reinstatement work are minimised. This is an ideal method to use where there are tree roots under the surface as it avoids the need for excavation.

Applications The Ground-Guards site access system is designed to form temporary roads, car parks and footpaths. It is suitable for protecting grassed areas from erosion and rutting during construction projects and for the protection of tree roots where site access routes need to pass close to trees.

Green issues Ground-Guards are a very environmentally friendly product. They:

- Protect sensitive ground from erosion
- Are made from 100% recycled plastic, which is itself fully recyclable
- Provide a sustainable alternative to using up sheets of plywood for ground protection purposes

DESCRIPTION

The Ground-Guards site access system consists of virtually indestructible, lightweight plastic boards which clip together without tools to quickly form temporary roads, car parks and footpaths. They are made from 100% HDPE recycled plastic and are guaranteed unbreakable by vehicles of up to 50 tonnes.

These track mats can be easily moved around the site by just two people, without the need for a crane lorry.

Ground-Guard mats are available with a choice of different tread patterns. The "Standard" tread pattern creates a track way with a high level of traction for vehicles, whilst the "walk" pattern is designed for pedestrian walkways and event flooring.

Ground-Guards are also available with one side smooth which is ideal for trenching and utilities work as it enables the spoil to be easily backfilled into the trench afterwards.

When being used to protect tree roots, a base layer of Ground-Guard sheets should be covered by a cushioning layer of 150 mm of wood chippings. The Ground Guard trackway is then laid over the top of this in the normal way.

Dimensions Ground-Guard mats are available in sizes ranging from 1829 mm (6') x 610 mm (2') to 2438 mm (8') x 1219 mm (4'), with a choice of different tread patterns.

SUPPLY

GreenTek both supplies and hires Ground-Guards direct to construction companies nationally.

SERVICES

Ground Guards provides technical advice to specifiers and contractors. Brochures and samples are available on request.

Ground-Guard trackways may be used with a cushion of woodchips to protect tree roots

Greensward Engineering
GreenTek
Manor Farm
Otley Road
Adel
Leeds
LS16 7AL

Tel: +44 (0)113 267 6000
Fax: +44 (0)113 267 2222
Email: info@ground-guards.co.uk
Website:
www.ground-guards.co.uk
Contact: Phil Ellis
rps no: 21329

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John Booth Arboricultural Consultants Ltd

***John A Booth** MBA, MSc, FICFor, CEnv, FArborA, RCArborA, DipArb(RFS), CUEW, LCGI(Hort), NDArb.*

Director & Principal Consultant

Chartered Arboriculturist, Chartered Environmentalist
& Certificated Expert Witness,
Arboricultural Association
& Institute of Chartered Foresters Registered Consultant

242 Highfields Park Drive
Broadway
Derby
DE22 1JY

Mobile: 07783 968714
Email: info@jabooth.co.uk
Web: www.jabooth.co.uk

AA Registered CONSULTANT trees.org.uk

Arboricultural ASSOCIATION Fellow Member

Cardiff University Law School BOND SOLON CIVIL Expert Certificate

Institute of Chartered Foresters Registered Consultant