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Arboricultural Survey Report & Method Statement

at

Hillside
Woolley Bridge

for and on behalf of

Peter Fulham

July 2014

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SUMMARY

This report is concerned with trees located on a potential development site at Hillside, Woolley Bridge.

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 trees surveyed are calculated and recorded in the Tree Survey Schedule where they are expressed both in linear and square metres; it is at this distance/around this area that tree protective barriers should be erected around any trees to be retained. Where construction is proposed within these areas special techniques must be employed and general guidance is contained herein.

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1 INTRODUCTION

1.1 ***Author's Qualifications and Experience*****:** John Booth is a Chartered Arboriculturist, a Chartered Environmentalist, a Chartered Surveyor, a member of the Expert Witness Institute, a Fellow, a Registered Consultant and past national Chairman of the Arboricultural Association, a Fellow of the Institute of Chartered Foresters, a professional member of the Chartered Institute of Ecology and Environmental Management and the International Society of Arboriculture. He has over thirty years experience of arboriculture and amenity tree management and has written papers published in respected journals such as the International Journal of Urban Forestry. He is trained in the use of the Quantified Tree Risk Assessment (QTRA) methodology and is a Bond Solon/Cardiff University certificated Expert Witness. A full CV can be found at Appendix 1.

This report is based on his site observations and the information provided.

1.2 ***Instructions and Brief***: Simon Jones of SJ Design Ltd acting on behalf of Peter Fulham (the client) sought advice regarding the condition of trees located within a potential development site on land at Hillside, Woolley Bridge (the site). Guidance was sought as to what arboricultural constraints might arise were the site to be redeveloped. 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***: A topographical survey plan of the site was provided and has been annotated to reflect the findings of the survey.

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. 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 Where trees were clad with ivy (*Hedera helix*) or where dense twig growth obscured the tree trunk, this was recorded in the Tree Survey Schedule. The inspection of such trees is impeded; ivy and twig growth should be removed and a further inspection carried out.

1.4.5 The expertise of the author of this report 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*****:** A site visit was carried out on 21 July 2014 by John Booth. The trees were 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. Insignificant trees and shrubs were omitted from the survey.

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.

3.1.1 There is a direct proportional relationship between a tree's roots and its aerial parts and since the majority of tree roots occur in the upper 600mm of the soil horizon this balance can easily be upset by even shallow excavation and/or soil compaction. Root damage can result in instability or premature decline which may not manifest for a number of years, often long after development has

been completed.

Tree Roots are dynamic structures which constantly ‘seek’ new soil horizons which are conducive to their function and development; new roots can develop in these horizons whilst roots in less productive horizons might be aborted. Consequently, in general terms, trees will tolerate some construction related root disturbance if:

- The tree has sufficient vigour/vitality to sustain the disturbance in the short term,
- Any disturbance is kept to a minimum and special techniques are adopted to ensure such,
- Alternative soil horizons are available/can be created within which roots can develop and flourish.

British Standard 5837:2012 ‘*Trees in Relation to Design, Demolition and Construction - Recommendations.’* acknowledges that trees will tolerate certain construction techniques and examples are given in Section 4.

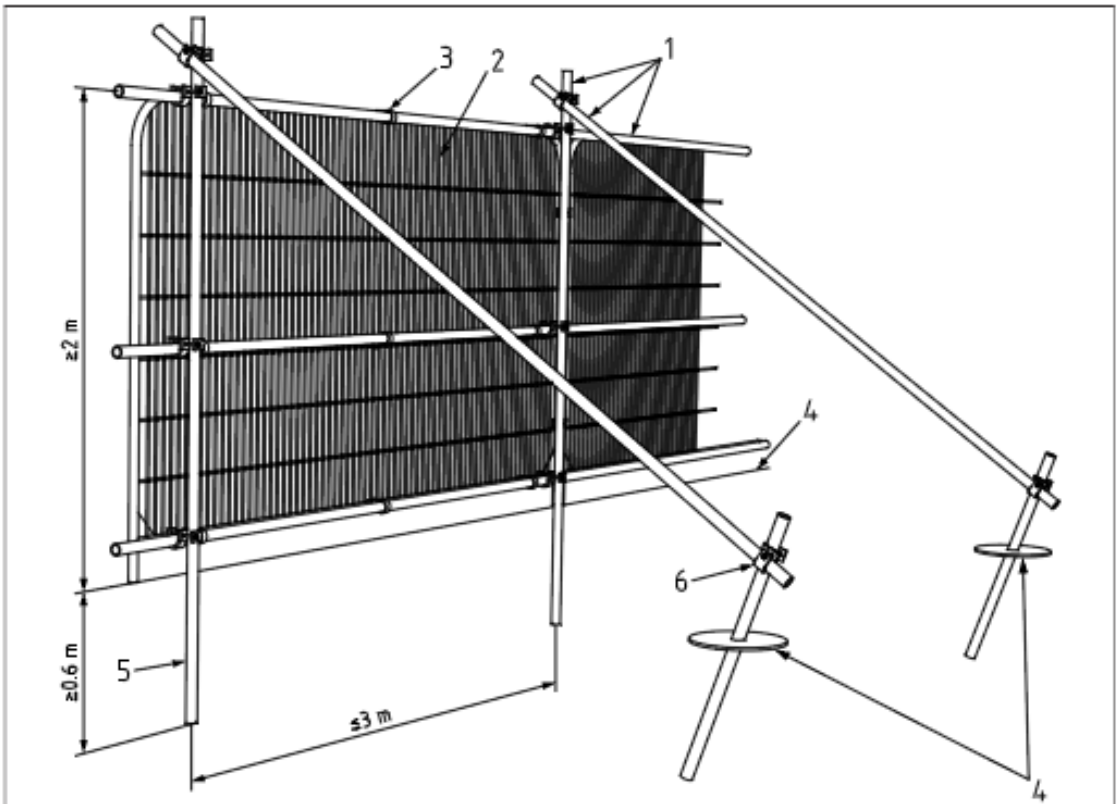
The ability of a tree to tolerate some disturbance and alteration of its growing conditions depends on specific circumstances, including prevailing site conditions, and in general, the older the tree, the less successfully it will adapt to new conditions.

3.1.2 In order to avoid damage to their 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 Figures 1 and 3. Such barriers should 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 2 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.



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 1 - Tree Protection Barrier
British Standard 5837, (2012), '*Trees in Relation to Construction: Recommendations'*, *Page 20.*

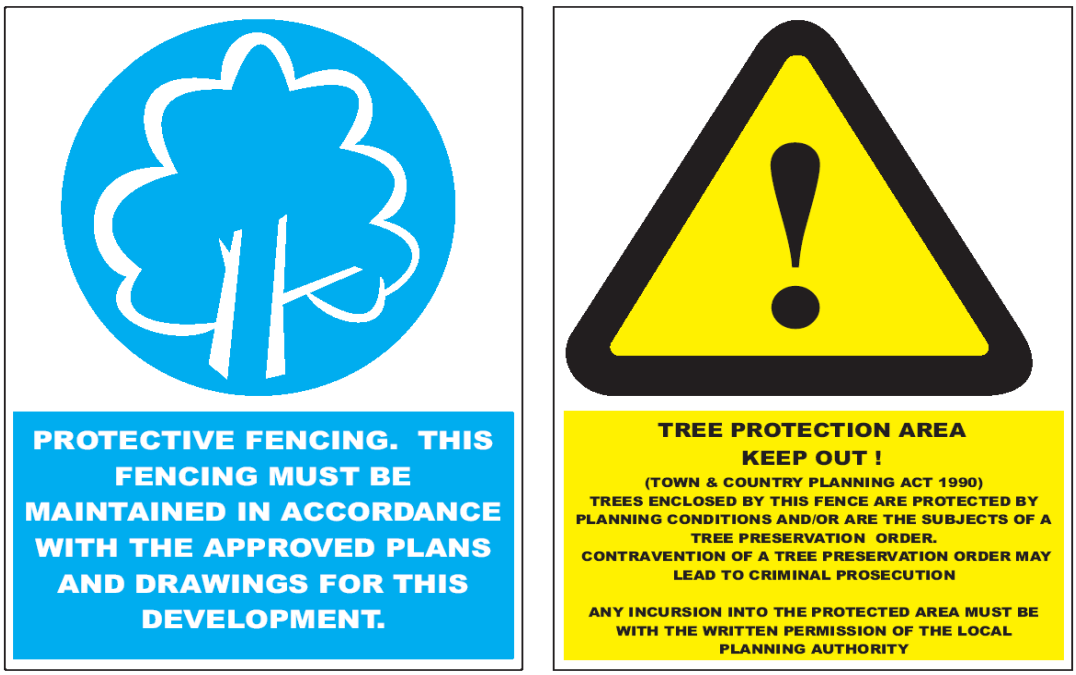


Figure 2 - Barrier Notice

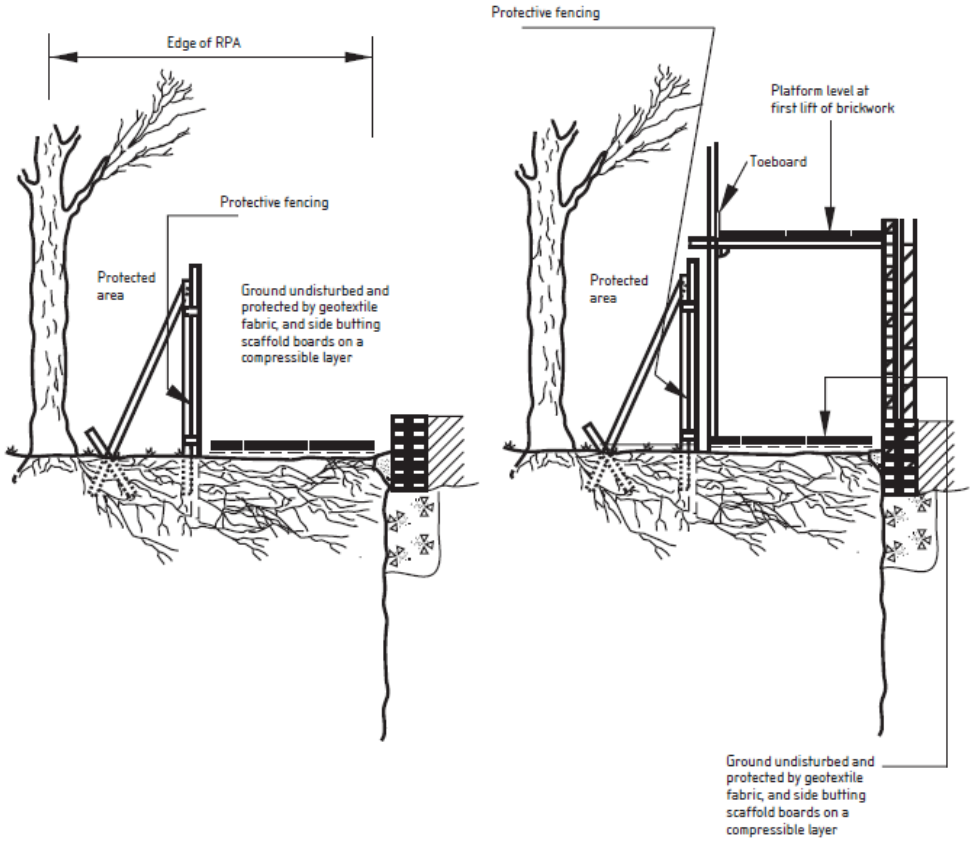


Figure 3
Adapted Barrier Incorporating Temporary Ground Protection

3.1.3 Where space is required within the RPA to facilitate the erection of scaffold this can be satisfactorily achieved incorporating ground protection within the scaffold structure as illustrated in Figure 3 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. 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; the piles should be sleeved so as to contain concrete which contains 'tree-toxic' chemicals. 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.

4.2 ***Hard Surfacing:***

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 3) methods. These techniques result in structures which are load bearing and negate the need for deep excavation. The hard surface should not cover more than 20% of the RPA and the final wearing course 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 Arboriculturalist.

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 eg see Appendix 4, 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 either Tree Preservation Orders (TPO) or Conservation Areas. The following is given as general advice.

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 from John Booth Ltd. Also, the Arboricultural Association's Register of Contractors 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 trees on site. 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. John Booth Ltd would be happy to represent the client at any such meeting.

6.3 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.

6.4 Once a final layout has been decided upon an Arboricultural Impact Assessment (AIA) should be undertaken.

7 REFERENCES

- Arboricultural Advisory & Information Service, (1996) '*Driveways Close to Trees'*
- Arboricultural Advisory & Information Service, (2007) '*Through the Trees to Development'*
- Building Research Establishment, (2000), BR380, *Environmental site layout planning: solar access, microclimate and passive cooling in urban areas*.

- Building Research Establishment, (1998), BR 209, *Site layout planning for daylight and sunlight: a guide to good practice.*
- Building Research Establishment, (1998), BR209, *Site layout planning for daylight and sunlight: a guide to good practice*.
- British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations.'* BSI
- British Standard 3998:2010 '*Recommendations for Tree Work*'. BSI
- Mattheck, C. Breloer H., (1994) *The Body Language of Trees*, Forestry Commission.
- Mattheck, C. (2007), *Updated Field Guide for Visual Tree Assessment*
- 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

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Director & Principal Consultant

Chartered Arboriculturist, Chartered Surveyor, Chartered Environmentalist & Arboricultural Association Registered Consultant

8 Tree Survey Schedule (Explanatory Notes Found at Appendix 2)

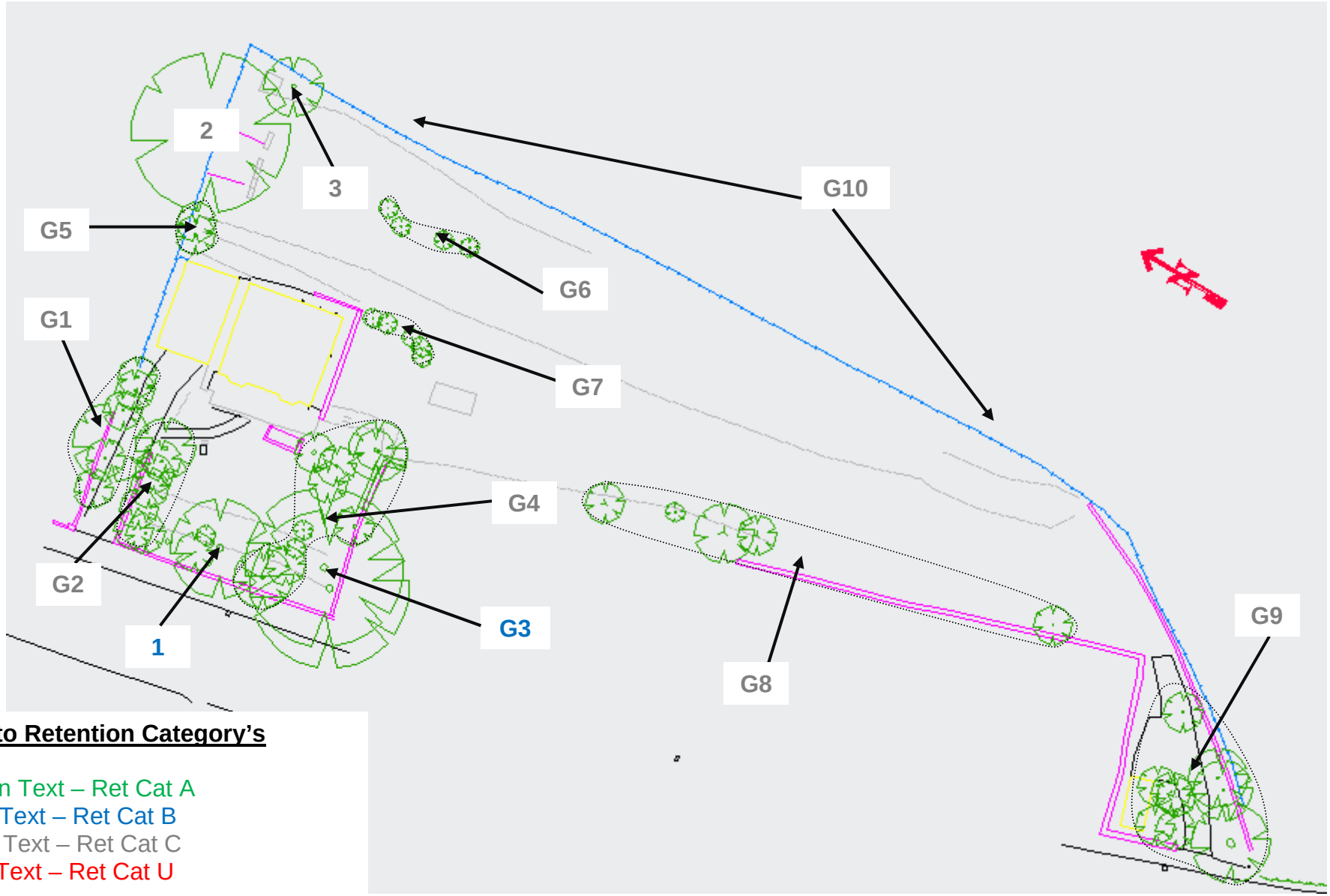
Tree No	Species	Ht (m)	Stem Dia (mm)	Branch Spread (m)				Crown Ht. (m)	Age Class	Cond	Comments/ Preliminary Recs.	Life Exp (yrs)	Ret Cat	RPA* (Lin M)	RPA** (M^2)
				N	E	S	W								
G1	Sycamore, Leyland cypress	12 (25)	190	1	1	1	1	1	Yng	B	No work required at this moment in time	>40	C	2.3	16
G2	Leyland cypress	12 (25)	270	1	1	1	1	1	Yng	B	No work required at this moment in time	>40	C	3.2	33
1	Beech	15 (25)	560	3	3	3	3	2	Mid	B	No work required at this moment in time	>40	B	6.7	142
G3	Leyland cypress, Lawson's cypress	10 (25)	250	1	1	1	1	1	Yng	B	No work required at this moment in time	>40	C	3.0	28
G4	Sycamore	16 (25)	500	5	5	5	5	4	Mid	B	No work required at this moment in time	>40	B	6.0	113
G5	Leyland cypress, Lawson's cypress	12 (25)	370	1	1	1	1	1	Yng	B	No work required at this moment in time	>40	C	4.4	62

* 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.
# Access restricted, inspection limited, dimensions estimated.

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								
2#	Hybrid poplar	15 (18)	700	5	5	5	5	6	Mid	C	Declining. No work required at this moment in time	<10	C	8.4	222
3	Goat willow	6 (10)	450	3	3	3	3	2	Mat	C	Topped. No work required at this moment in time	10-20	C	5.4	92
G6	Silver birch, Goat willow	3 (15)	300	1	1	1	1	1	Mid	C	Topped. No work required at this moment in time	10-20	C	3.6	41
G7	Cypress	4 (12)	200	1	1	1	1	1	Yng	B	No work required at this moment in time	>40	C	2.4	18
G8	Ash, Sycamore	4 (25)	<150	1	1	1	1	0	Yng	B	No work required at this moment in time	>40	C	1.8	10
G9	Hawthorn, Aspen, Goat willow	10 (25)	200	3	3	3	3	0	Yng	B	No work required at this moment in time	>40	B	2.4	18
G10	Hawthorn, Field maple	5 (12)	<150	2	2	2	2	0	Yng	B	No work required at this moment in time	>40	C	1.8	10

* 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 Survey Plan (Not to Scale)



Key to Retention Category's

Green Text – Ret Cat A
Blue Text – Ret Cat B
Grey Text – Ret Cat C
Red Text – Ret Cat U

9 APPENDICES

Appendix 1: Curriculum Vitae

John Booth **MBA, MSc, FICFor, CEnv, FArborA, AARC, MRICS, MEWI, MIEEM, MISA, 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

CONTINUING PROFESSIONAL DEVELOPMENT (CPD)
The maintenance of an active CPD record is a strict membership requirement of the following professional organisations to which the author subscribes –

- Royal Institute of Chartered Surveyors
- The Arboricultural Association
- The Institute of Chartered Foresters
- The Institute of Expert Witness's
- The Chartered Institute of Ecology and Environmental Management

MEMBERSHIP OF PROFESSIONAL BODIES
Fellow of the Institute of Chartered Foresters
Chartered Environmentalist
Chartered Arboriculturist
Fellow, past National Chair and Registered Consultant of the Arboricultural Association
Member of Institute of Ecology and Environmental Management
Licentiate of City & Guilds Institute
Assessor for the Professional Diploma in Arboriculture & Institute of Chartered Foresters Professional Membership applications.

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 first, with the botanical name after. In the case of groups only the principal species are recorded, other minor species may be omitted.

Tree Heights – are estimated in metres. Estimated mature heights are given in brackets. In the case of groups the mean current height is recorded.

Crown Height – the height to the lowest branch is estimated in metres. In the case of groups of trees minimum crown height was recorded.

Trunk Diameters – measured at 1.5 metres above ground and recorded in millimetres to the nearest 10mm. However, in accordance with British Standard 5837:2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations.'* where the trunk of any tree breaks below 1.5 metres it is considered a multi-stemmed tree. In the case of groups of trees the maximum diameter was recorded.

Crown Radius – was recorded in metres along each of the cardinal points. In the case of groups of trees the maximum peripheral spread was recorded.

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 trees is based upon a preliminary assessment categorised thus:

A - Good

B - Fair

C - Poor

D - Very Poor/Dead

In the case of groups the category awarded is that typical of the group.

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 and value, including public visual amenity 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.

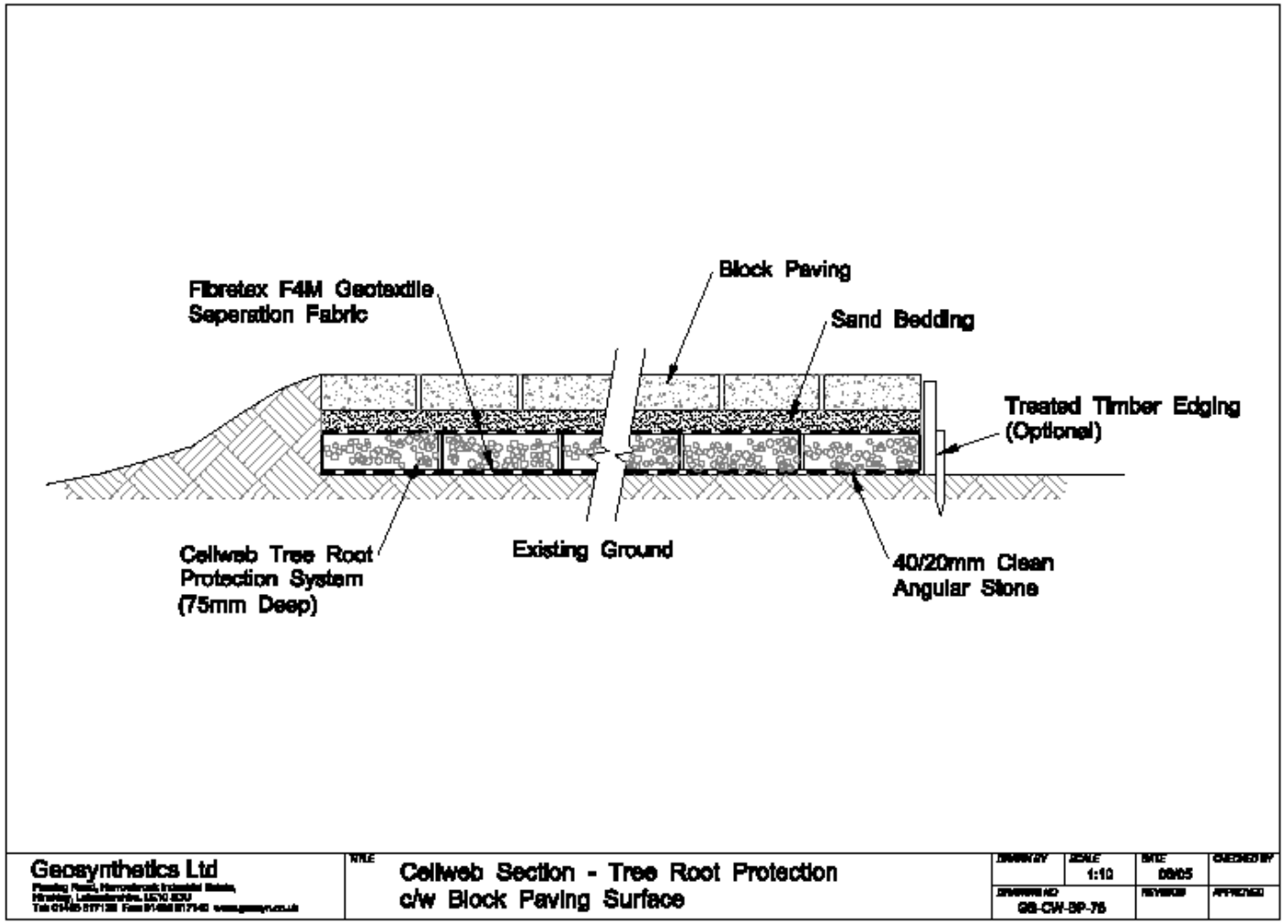
- **U** - Trees in such a condition that they are unsuitable for retention. Where category U trees have identifiable conservation, heritage or landscape value, even though only

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: ‘Cellweb’ ‘No-Dig’ 3 Dimensional Cellular Confinement System
Example Specifications



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.

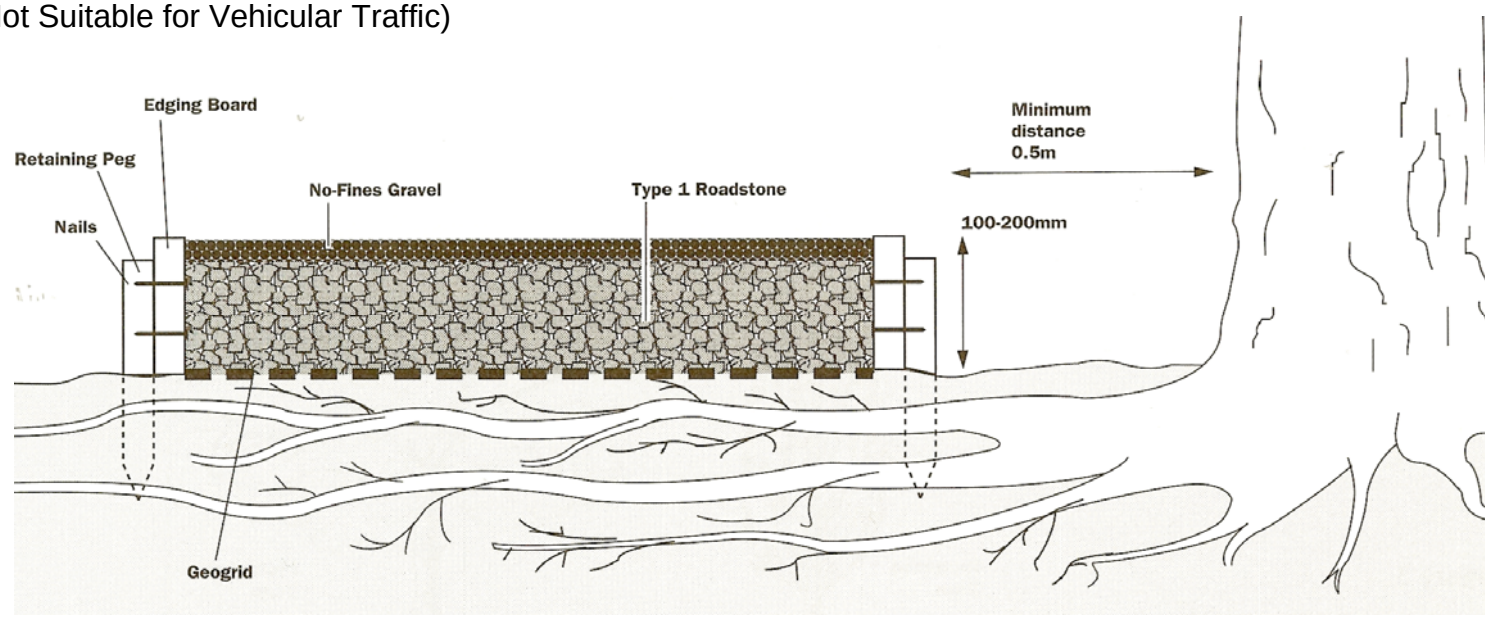
- The expanded product panels shall be infilled with 40/20mm clean angular stone using a Mini Excavator, under the direction of a chartered arboriculturist. The product shall be overfilled by 50mm to create a surcharge over the product which protects the leading edges of the cells. The Mini Excavator 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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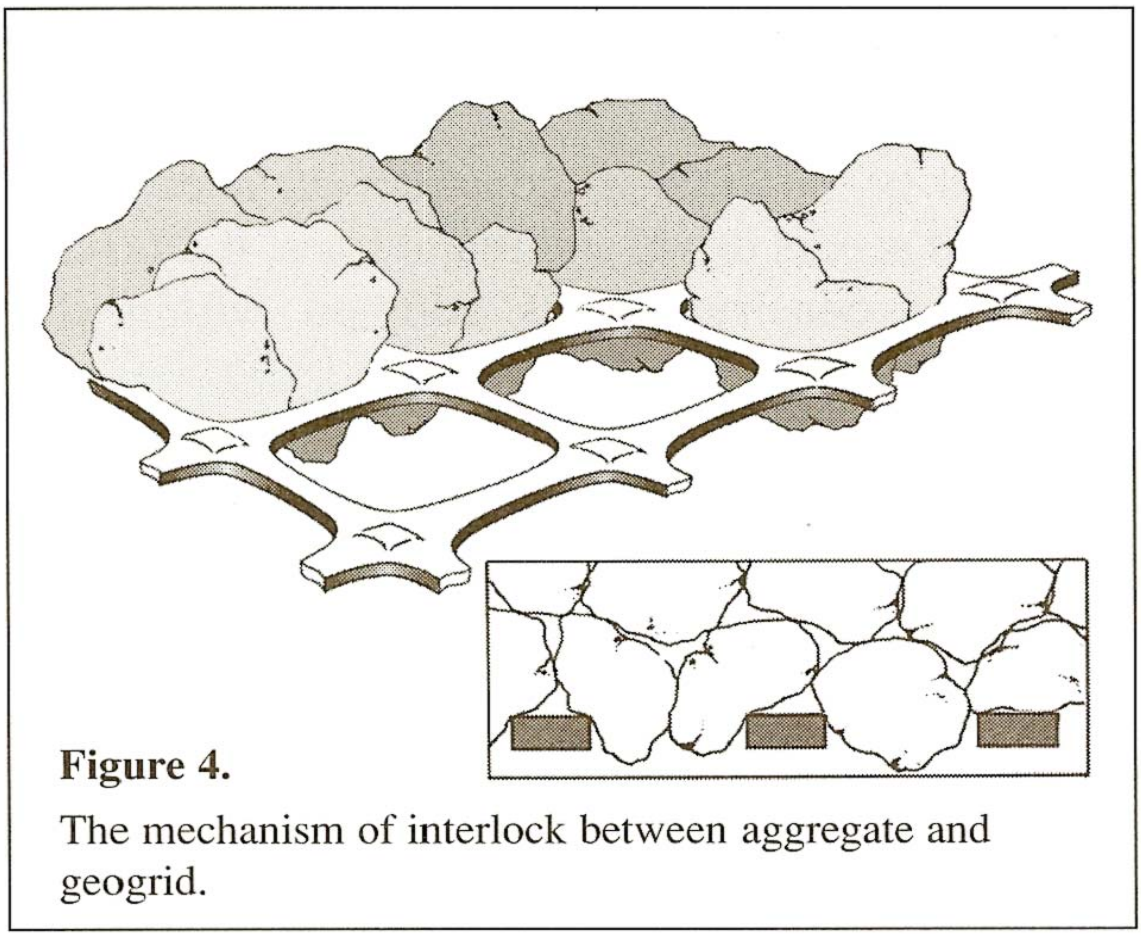

Figure 4.

The mechanism of interlock between aggregate and geogrid.

Appendix 4: 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

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