

TREE SURVEYS AND REPORTS  
BS 5837  
DECAY MAPPING  
CONSULTANCY



# Pre Development BS5837 Arboricultural Implications Assessment

21 Sunderland Road August 2015

## PICTURE

Produced For Fitz Architects  
By Jim Richardson BSc For. HND Arb. M.Arbor.A.



## Document Details

Document Title	Pre Development BS5837 Arboricultural Implications Assessment 21 Sunderland Road August 2015
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Pre Development BS5837 Arboricultural  
Implications Assessment  
21 Sunderland Road August 2015

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# 1. Introduction

1.1. Fitz Architects have commissioned this pre development Arboricultural Impact Assessment report on behalf of their clients for the proposed re-development of 21 Sunderland Road, Cleadon, Sunderland, SR6 7UR.

1.2. The survey and resulting report have been produced to be submitted as part of the planning application for the site to the local planning authority and have been produced in accordance with the best practice guidelines set out in BS 5837 (2012) *Trees In Relation To Construction Sites: Recommendations*.

1.3. Documentation used in preparation of this report; Site plans - *21 Sunderland Road – Cleadon, AL (90) 0200 - PROPOSED SITE PLAN*.

1.4. All observations have been made from ground level without detailed inspection. Some measurements may have been estimated.

1.5. Woodsman were provided with a site plan of the area An Arboricultural Constraints Plan (ACP) and Tree Protection Plan (TPP) have been produced to accompany this report and tree locations and protective measures should be referenced to these plans.

## 2. Site Details

2.1. Location: 21 Sunderland Road, Cleadon, Sunderland, SR6 7UR

2.2. Site Description; the site is a detached residential bungalow with gardens to the front and rear.

2.3. Site Visit Details; the site was surveyed on the 10<sup>th</sup> of August 2015 during calm clear weather conditions.

2.4. There are five significant individual trees within influence of the site. Small trees below 150mm in diameter at 1.5m in height from ground level have not been surveyed in detail and are classified as low retention value as per BS5837 guidelines.

2.5. The trees have had no significant recent management.

### 3. Statutory Tree Protection

- 3.1. Trees may be legally protected. Tree protection can include Tree Preservation Orders (TPOs) or Conservation Area status. The felling of large quantities of timber may also require a felling licence.
- 3.2. A formal search into the statutory protection of the sites trees has not been carried out as part of this survey and report. Statutory protection of trees can include Tree Preservation Orders (TPOs) and Conservation area status.
- 3.3. Large penalties may be enforced for illegally carrying out works on protected trees. It is therefore advised that clarification of protection status be sought from the local planning authority prior to any tree works being carried out on site. Where appropriate permission for works must be applied for.
- 3.4. Some exemptions to the above may apply such as the removal of trees where full planning permission has been granted where new buildings occupy the space where protected trees lie.

## 4. Summary of Findings

- 4.1. There are five significant individual trees within influence of the site. Small trees below 150mm in diameter at 1.5m in height from ground level have not been surveyed in detail and are classified as low retention value as per BS5837 guidelines.
- 4.2. The trees have had no significant recent management.
- 4.3. Collectively the trees provide the site with some amenity and screening. The trees surveyed trunks are beyond the boundaries of the site in a neighbouring property.
- 4.4. The proposed development will not require the removal of any trees.
- 4.5. Some ground-works and building works including foundation construction are scheduled in close proximity to retained trees within Root Protection Areas (RPAs). These works must employ special construction techniques in order to minimise disturbance to tree roots.
- 4.6. Providing that appropriate protective measures and construction techniques are enforced during development the trees on site can be retained and should provide amenity benefits for the site into the near future.
- 4.7. The development should not have any significant impact on the sites tree stock.
- 4.8. Retained trees should not conflict with site usage.

## 5. Arboricultural Impact Assessment

- 5.1. There are five significant individual trees within influence of the site. Small trees below 150mm in diameter at 1.5m in height from ground level have not been surveyed in detail and are classified as low retention value as per BS5837 guidelines.
- 5.2. The trees have had no significant recent management.
- 5.3. Collectively the trees provide the site with some amenity and screening. The trees surveyed trunks are beyond the boundaries of the site in a neighbouring property.
- 5.4. The proposed development will not require the removal of any trees.
- 5.5. Some ground-works and building works including foundation construction are scheduled in close proximity to retained trees (T4) within Root Protection Areas (RPAs). These works must employ special construction techniques in order to minimise disturbance to tree roots.
- 5.6. Providing that appropriate protective measures and construction techniques are enforced during development the trees on site can be retained and should provide amenity benefits for the site into the near future.
- 5.7. The development should not have any significant impact on the sites tree stock.
- 5.8. Retained trees should not conflict with site usage. The continued growth of neighbouring trees may eventually encroach on the new building although this is also the case with the existing building on site.



## 6. Arboricultural Method Statement

6.1. The retained trees will need protection for roots trunks and branches during demolition and construction. The trees will be protected by erecting barrier fencing as depicted on the Tree Protection Plan.

### 6.2. Aerial Protection

Aerial protection should take the form of barrier fencing constructed as per BS5837 Guidelines

### 6.3. Construction of Protective Fencing

Barriers should consist of a scaffold framework in accordance with BS 5837:2005 Trees in relation to construction - Recommendations; section 9, comprising a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto this, weld-mesh panels should be securely fixed with wire or scaffold clamps. Weld-mesh panels on rubber or concrete feet are not resistant to impact and should not be used unless they are effectively pinned down and braced. The use of any alternative method of fencing should only be allowed following prior approval from the site Arboricultural Consultant or the Local Planning Authority.

NOTE: The above is preferred because it is readily available, resistant to impact, can be re-used and enables inspection of the protected area.

6.3.1. Protective fencing should enclose tree canopies in all areas where ground-works are not required (other than where canopies extend over parking and access routes).

6.3.2. The fencing will remain in place until completion of the development and then only removed with the consent of the local planning authority to permit completion of the scheme.

6.3.3. Other than works detailed within this method statement or approved in writing by the local planning authority, no works including storage or dumping of materials shall take place within the Construction Exclusion Zones (CEZs) as defined by the protective fencing.

6.3.4. Protective Fencing Minimum Distances - The tree data table gives minimum distances from the trunk to protective fencing for retained trees. Wherever possible fencing beyond these distances is desirable and fencing should enclose tree canopies unless access beneath the canopy is absolutely necessary.

## 6.4. Construction Exclusion Zones

6.4.1. No works access should be allowed into the CEZs during the development phase. No storage of any building materials or any other materials should be allowed within the CEZs.

6.4.2. Once the exclusion zones have been protected by barriers and/or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as: "Construction Exclusion Zone — Keep out".

In addition the following should be addressed or avoided.

- A. Care should be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to trees

should be conducted under the supervision of a Banks-man to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning.

- B. Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10 m of the tree stem.
- C. Fires should not be lit in a position where their flames can extend to within 5 m of foliage, branches of trunk. This will depend on the size of the fire and the wind direction.
- D. Notice boards, telephone cables or other services should not be attached to any part of the trees.
- E. It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees. (Para BS5837)

## 6.5. Special Construction Techniques

6.5.1. Some ground-works/ building works including foundation construction are scheduled in close proximity to retained trees (T4) within Root Protection Areas (RPAs). These works must employ special construction techniques in order to minimise disturbance to tree roots.

6.5.2. If the development is to proceed with the current design layout then special no dig construction techniques will be required for the re-surfacing of the *access driveway/ foundation construction* within the areas that would normally form part of the CEZs.

## 6.6. Principle Rules of No Dig Construction

The principal rules of no dig construction are as follows:

- No roots are to be severed
- Soil must not be compacted
- Oxygen and water must be able to diffuse into the soil beneath engineered surfaces
- The construction of the roads, footpaths or parking bays will have to be above existing ground level and at least 1.5m away from the trunks of the retained trees.

## 6.7. No Dig Construction Method:

6.7.1. Construction should ideally be undertaken between May and October when the ground is at its driest and is less prone to compaction.

6.7.2. Ground vegetation should be carefully removed with any organic material being removed to prevent the build-up of anaerobic conditions beneath the surfacing which will damage the tree roots.

6.7.3. No digging should take place within the protective zone except for the careful removal of organic matter by hand tools. Hollows must be filled with sharp sand, any digging to remove rocks or protrusions must be by hand taking care not to sever any roots over 2.5cm in diameter. Stumps should be ground out rather than excavated to prevent damage to the retained trees roots.

## 6.8. Foundation Construction Within CEZs

6.8.1. Extreme care will be required to avoid damage to tree roots during foundation construction. Foundation design should follow the principles

of the 'House deck' or Swift foundation systems ([www.abbeypynford.co.uk](http://www.abbeypynford.co.uk) / [www.swiftfoundations.co.uk](http://www.swiftfoundations.co.uk) ) utilising mini-piles on which a raft is installed above ground level leaving a void beneath the building. This void allows for gaseous and moisture exchange in the soil and prevents soil compaction.

6.8.2. Temporary protective surfacing should be installed prior to accessing the area for foundation construction.

6.8.3. Foundation Construction Sequence

- Temporary ground protection installed throughout the area.
- Site marked out above temporary protection.
- Test holes excavated using *Excavations Within Root Protection Areas* techniques as detailed below.
  - Where significant roots are encountered the positions of the mini piles are altered to an area without significant root presence.
- Mini-piles installed.
- Raft foundation constructed on top of mini-piles.
- The original ground levels and conditions are left undisturbed throughout the area.

## 6.9. Instillation of Underground Utilities

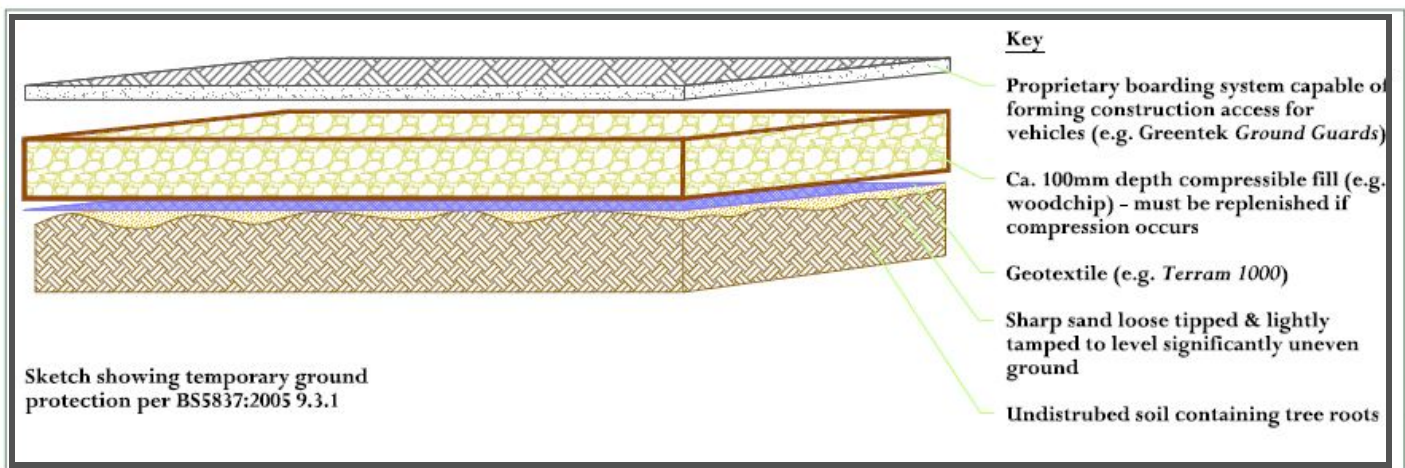
6.9.1. Woodsman are not aware of the need to install any underground utilities within RPAs.

## 6.10. Ground Protection During Works Within CEZs

6.10.1. Where required a practical solution to ground protection within areas requiring special construction techniques is the installation of a temporary surface to reduce ground compaction. This should take the form of a multi-layered protective barrier as detailed below:

## Temporary Ground Protection Layers

- Base Layer – Undisturbed soil containing tree roots.
- Layer 1 – Sharp sand loosely tipped and lightly tamped to level uneven ground.
- Layer 2 – Geo-textile (e.g. *Terram 1000*).
- Layer 3 – Minimum 10cm depth of compressible fill (e.g. woodchip) – **must be replenished if on-going compression occurs.**
  - 10cm depth of compressible fill allowable for pedestrian access only.
  - 15cm depth of compressible fill allowable for up to 2t Gross Weight.
  - Traffic exceeding 2t Gross Weight requires base layer of ground guards in addition to other layers detailed here.
- Layer 4 - Top layer – temporary boarding system capable of forming construction access for vehicles (e.g. *Greentek Ground guards*). (or possibly lighter surfacing for foot access only)



### 6.11. New Surfacing Within Root Protection Areas

- 6.11.1. New surfacing such as re-surfacing and pathways must use a non-compacting porous surface such as Cell Web (from Geosynthetics) or a similar cellular confinement system. No changes to ground level should be allowed prior to installation of new surfacing which should be installed above the existing ground level.

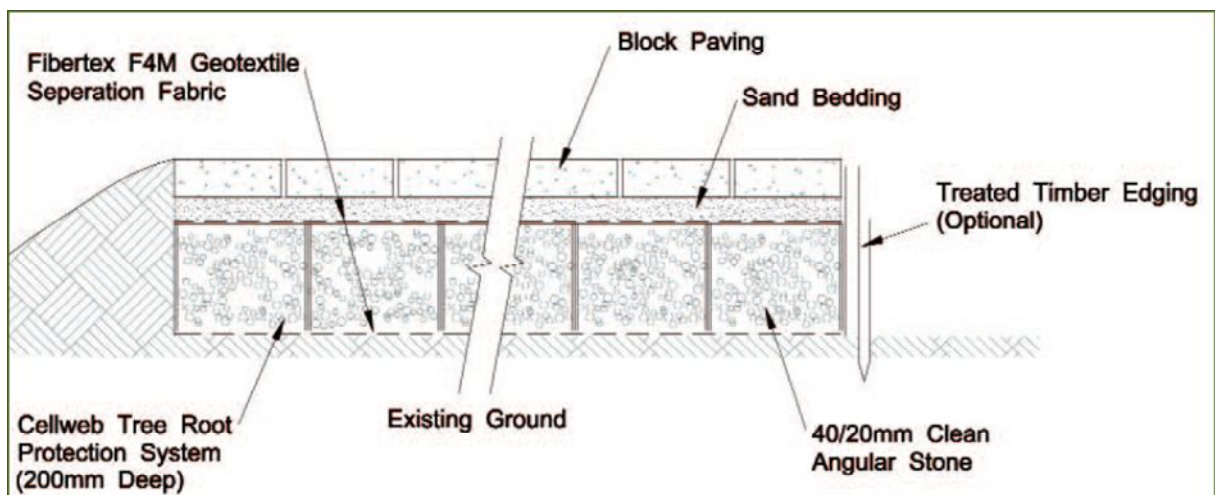
## 6.12. Instillation of Permeable Surfacing - The construction method

below is suitable for the construction of permeable surfaces. It is not a finished engineering solution. It is a methodology designed to allow the construction without damaging the nearby tree root systems.

- Lay a non-woven geotextile (Fibretex F4M or similar) on to the existing sub-grade. - Overlap dry joints by 300mm
- Lay and expand the cellular confinement system (Cellweb) and anchor open during infilling.
- Fill the cellular confinement system with a minimum of 75mm of aggregate (75mm is the minimum depth for domestic traffic). The aggregate should not contain any fines and be of an inert type material such as whinstone chips rather than any lime based product. The angular particle dimensions should be 20-40mm. As most urban soils are already alkaline in nature, the use of dolomite, limestone or crushed concrete is not suitable for this application as it can react with rain water with the potential to change the soil pH and form impenetrable layers which impede water movement and gaseous exchange
- Place the final surface material. -
  - **Block Paving** – lay a second layer of Fibrex F4M Geotextile separation fabric over the in-filled Cellweb sections. Lay a sharp sand bedding layer compacted with a vibro compaction plate to recommended depth. Place paviors as per the manufacturer's instructions. The use of porous blocks such as Aquaflo by Formpave are particularly tree friendly and allow natural rainfall to reach the rooting area.
  - **Porous tarmac** – place 25mm surcharge of the granular material above the Cellweb system and lay the bitumen base and wearing course
  - **Loose Gravel**- Place a second layer of Geotextile separation fabric over the in-filled Cellweb sections. Place decorative aggregate to the required depth. A treated timber edge should be provided to restrict gravel movement

- **Grass blocks or gravel in-filled blocks** - Lay a second layer of Geotextile separation fabric over the in-filled Cellweb sections. Place 50/50 rootzone bedding layer to the required depth. Lay recycled Duo Block 500 Grass protection system in-filled with 50/50 rootzone mix. Seed as required. Alternatively the grass blocks may be in-filled with gravel.
- **Edging** - supports such as angled steel section is advised although there varying kerbing options available which do not require any excavation and could be used above the existing ground level. Edging material must not encroach into the protected area and the use of conventional kerbing is not possible as the depth of excavation required for their installation will sever the tree roots.
- Wherever footpaths go through a protective zone, it is often not possible to erect the normal permanent protective fencing at the correct distance from the tree whilst maintaining access to construct the hard surfacing. The permanent protective fencing must be erected as per the plan as close to the edge of the working area as possible. Extreme care must be taken to avoid damage to unprotected areas prior to the surfacing system being laid and access must be prevented especially to vehicles and plant. Temporary Heras fencing should be erected at distance indicated on the Tree Protection Plan until the hard surfacing is constructed.

### New Surfacing Within Root Protection Areas (Example Diagram)





## New Surfacing Within Root Protection Areas (Construction Sequence)

### Area For Installation Is Cleared and Marked Out



### Geotextile Layed Out and Cellular Confinement System Pinned In Place



For Permanent Systems Edge Supports Are Installed



Aggregate Poured Into Cells – Once Full Access Over The Cells Is Allowable



## Finished Surface (Porous) Is Installed



### 6.13. Excavations Within Root Protection Areas

6.13.1. All excavations for landscaping or re-surfacing works within RPAs must be carried out following the guidelines set out in NJUG Volume4 (National Joint Utilities Guidance Volume 4 *Guidelines for the Planning, Installation And Maintenance Of Utility Apparatus in Proximity To Trees issue 2*).

6.13.2. Root Protection - Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where they are to be left

open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

6.13.3. All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed unless absolutely necessary following approval from the sites Arboricultural Consultant. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound possible. No roots above 50mm in diameter will be severed without prior approval from the local authority's arboricultural officer. It is not anticipated that severance of any large roots will be required. Careful hand digging will be employed within the RPAs with extreme care being taken not to damage tree roots and root bark. Exposed roots if left overnight will be covered to offer protection from the elements. No roots above 25mm in diameter will be severed.

6.13.4. Hand Digging/Airspade - The objective of hand digging is to retain as many undamaged roots as possible. Hand digging within RPA must be undertaken with great care preferably using an air-spade, preferably under supervision from the sites Arboricultural Consultant. After careful removal of any hard surface materials digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

## Use of An Airspade Allows For Soil Investigations Whilst Retaining Fine Roots.



6.13.5. Backfilling - Backfilling should where required be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them. The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be gently compacted prior to construction without damage to the roots securing a local aerated zone enabling the root to survive in the longer term. If required backfilling outside the direct influence of tree roots should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

## 6.14. Tree Works

6.14.1. All tree pruning and removal works must conform strictly to BS3998 (*Recommendations for Tree Works*), and must use target pruning in accordance with best practice.

### 6.14.2. Schedule of Arboricultural Works

1. Provide site managers with a copy of Arboricultural report.
2. Install protective fencing including information signs.
3. Demolition Phase.
4. Install Ground protection around T4 where foundations are to be constructed with Root Protection Area.
5. Tree Protection Plan to be mounted in works cabins.
6. Brief all site staff regarding protective measures (on-going).
7. Install new foundations using special construction techniques within Root Protection Areas.
8. Construction Phase – including all further construction and landscaping works.
9. De-install protective fencing – only once all other development activity is completed.
10. Re-assess site trees for general condition possible damage and remedial works requirements.
11. Completion

All staff on site should be briefed regarding the protective measures to be enforced. Construction should not proceed prior to the installation of the protective measures and these should remain in place for the entire duration of the construction phase. Only once the construction phase is completed in its entirety should the protective fencing be removed.

### 6.15. Arboricultural Supervision

- 6.15.1. Tree protection measures on this site are complex and special construction techniques are required. Arboricultural supervision is therefore considered desirable during the installation foundations within RPAs.

6.15.2. Any deviation from the prescribed method statement or the occurrence of any unforeseen damage to the sites trees must be immediately reported to the Arboricultural Consultant. All works on site must be halted immediately. The Consultant will make a site visit to assess the extent of the damage or deviation from the prescribed method statement and any resulting works required. The local authority planning department will also be immediately informed and the Consultant will provide them with a written assessment of any such damage or deviation from the prescribed method statement.

## 7. Other Arboricultural Site Factors

### 7.1. Hazard Trees

None of the trees on site have been identified as being obviously hazardous.

### 7.2. Recent Management

The trees have had no significant recent management.

### 7.3. Future Management

Some regular maintenance may be required in order to maintain trees in a safe condition.

### 7.4. Protected Wildlife

7.4.1. It is an offence under the Wildlife and Countryside Act 1981 (WCA and amendments) and the EU Habitats Directive to disturb and or destroy the nests of bats, birds and other protected wildlife. Birds are protected by; The Wildlife and Countryside Act 1981 and The Countryside (or CROW) Act 2000. Bats are protected by; The Wildlife & Countryside Act 1981 (WCA and the Conservation of Habitats and Species Regulations 2010

7.4.2. UK bats and their roosts are protected by law. You will be committing a criminal offence if you:

- Deliberately capture, injure or kill a bat
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
- Intentionally or recklessly obstruct access to a bat roost
- 4 Penalties on conviction - the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in



prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

- 7.4.3. When carrying out tree works contractor must carry out a specific 'bats in trees risk assessment' which can be obtained from the 'Arboricultural Association' or the 'Bat Conservation Trust' (BCT). If evidence of bats is found work must stop immediately and Natural England Batline contacted (0845 1300 228). A further inspection may well be required by a licensed bat handler or roost visitor.
- 7.4.4. No visual signs were found to indicate the presence of bats in the surveyed trees although a number of trees within the study area display characteristics found favourable to bats and as such caution must be exercised.
- 7.4.5. For birds as with bats there is an obligation to carry out visual checks prior to works commencing. Where possible tree works should be carried out in order to avoid the bird nesting season during the period from August to the end of February.

# Appendices

## I. Notes on Tree Assessment

The trees on site have been assessed and categorised as follows according to BS 5837 (2012) Trees In Relation To Construction Sites: Recommendations.

### Category U Trees:

Trees unsuitable for retention. Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

### Category C Trees:

Those of low quality and value: Currently in adequate condition to remain until new planting could be established or young trees with a stem diameter below 150mm. These trees although of some value should not be allowed to affect the design of the site layout as they can easily be replaced.

### Category B Trees:

Those of moderate quality and value: those in such a condition as to make a significant contribution for a minimum of twenty years. Site design should where practicable retain these specimens.

### Category A Trees:

Those of high quality and value: in such a condition as to be able to make a substantial contribution for a minimum of forty years. Site design should seek to retain these trees wherever it is practicable to do so.

## II. Tree Details

### Tree Table Details

- **Tree number:** An individual identifying number – usually relating to tree tag.
- **TPO:** Detail of Tree Preservation Order tree or group number
- **Common Name (Botanical Name)** Species identification is based on visual field observations. (Botanical name in brackets)
- **Retention Category:** For Retention category grading see cascade chart
- **Age Category:** Either an estimate (or statement if accurately known) of the age of the tree, classified as:
  - **Y** = Young tree, established tree usually up to one third of expected ultimate height & spread
  - **MA** = middle aged, usually between one third and two thirds of ultimate height & spread
  - **M** = Mature, more or less at full height but still increasing in girth & spread
  - **OM** = Over mature, grown to full size and becoming senescent,
  - **V** = Veteran tree, individuals surviving beyond the typical age range for the species
- **Stem Diameter:** Trunk diameter measured at 1.5 metres from ground level and recorded in millimetres. (Number of stems – MS = Multi stemmed)
- **Height:** Height estimated in metres. (Lower crown height - Height in metres of crown clearance above adjacent ground level)
- **Crown Spread:** Measurement of canopy from the trunk in metres - North, South, East, and West
- **Useful Life Expectancy:** Estimated Safe Useful Life Expectancy (SULE). Short: 0 – 10years Medium: 10– 20 Years, Intermediate: 20-40, Long: 40 + years.
- **Condition:** Physiological Condition;
  - Good = Healthy tree with good vitality.
  - Fair = Moderate health and vitality normal or slightly less for species and age,

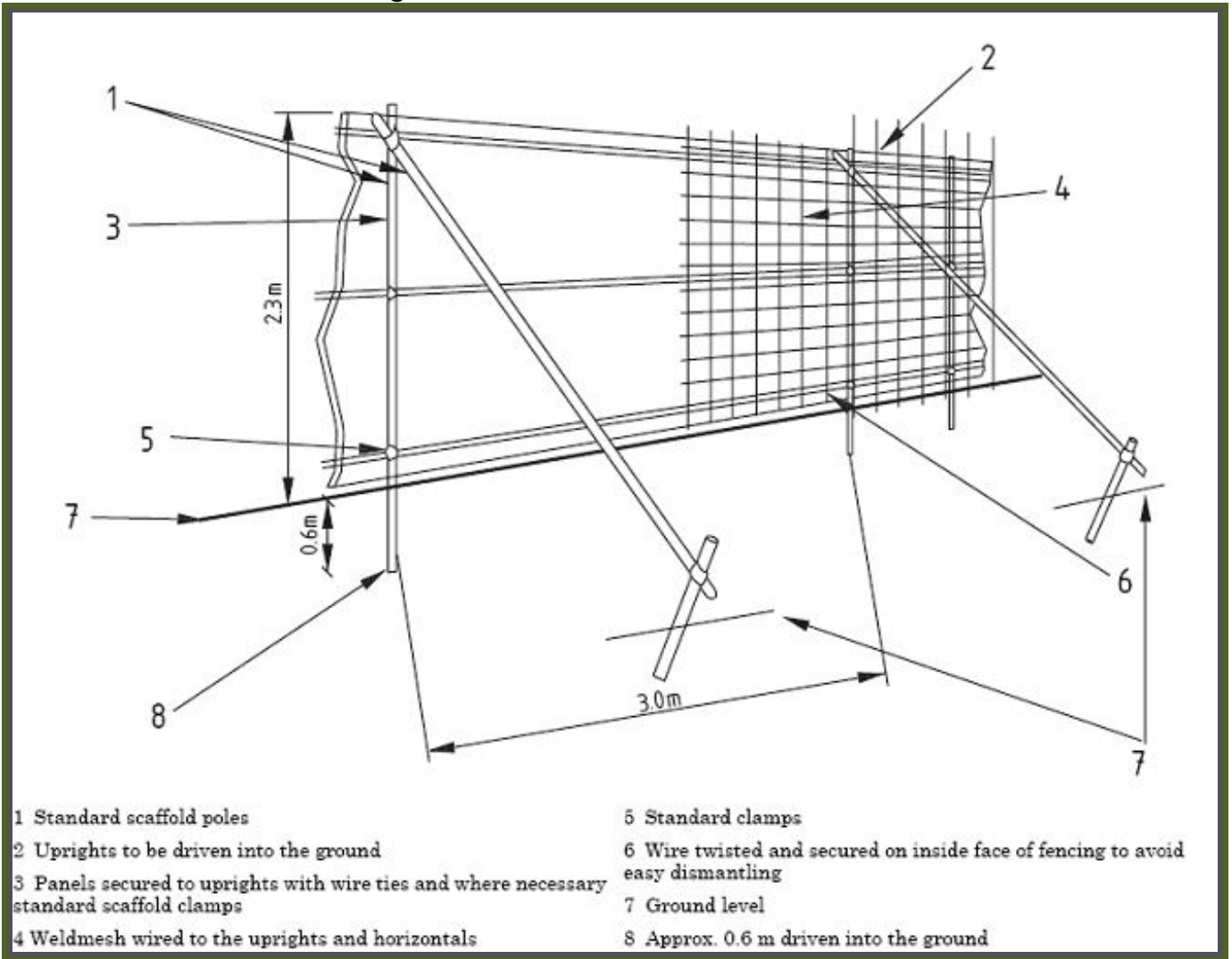
- Poor = Poor shape or form - signs of decline in crown, may have structural weakness.
  - Dead = dead or dying tree
- **Comments:** Notes on tree condition and other points of interest.
- **Recommendations:** Management recommendations – actions required.
- **Works Priority:**
  - A - Works to achieve safety or to facilitate the development.
  - B - Works to achieve higher levels of arboricultural management.
  - C - To improve the aesthetic appearance.
- **Root Protection Area (Radius) m:** The distance at which the protective barrier should be erected measured in a radii.
- **Root Protection Area m2:** The area of RPA required.
- **Root Protection Area Square (m):** The RPA area as a square.
- **Bat Roost Potential:**
  - None – No significant bat roost features.
  - Low – Only minor significant bat roost features.
  - Moderate – Some notable bat roost features.
  - High – Significant or multiple bat roost features.
  - Confirmed – Confirmed bat roost.
- **Potential for Future Growth:** H – High potential for future growth - A substantial increase in tree dimensions can be expected. M – Medium potential for future growth - A significant increase in tree dimensions can be expected. L – Low potential for future growth - A small increase in tree diminutions can be expected. N – No potential for future growth - Tree considered to be at full size, or only very slow growth anticipated.
- **Pruning:** Removal of living or dead parts of a tree.
- **Crown Cleaning:** The removal of dead, dying or diseased branch-wood, broken or crossing branches or stubs left from previous tree surgery operations unwanted objects, ivy, other climbing plants and general debris/rubbish.
- **Deadwood Removal:** Removal of significant dead and dying branches and limbs from the tree.
- **Crown Lifting:** Removal of all growth and branches below the height specified.
- **Crown Reduction:** Reduction of the complete outline of the canopy, pruning to appropriate growth points and leaving a natural silhouette.

Tag	TP O	Name Botanical Name	Retention Category	Age Category	Stem Diameter - mm (No of Stems)	Height -m (Lower Crown Height)	Condition	Useful Life Expectancy	North	South	East	West	Comments	Recommendations	Works Priority	Root Protection Area - Radius (m)	Root Protection Area - Area) (m2)	Root Protection Area - Square (m)	Likelihood of Protected Species Occupancy	Growth Potential
T1		Leyland Cypress (X Cupressocyparis leylandii)	B2	EM	500 (SS)	13 (1.5)	Go od	20 +	3	3	3	3				6	113.1	10.6	1	High
T2		Ash (Fraxinus excelsior)	B2	M	300, 300 (2)	12 (4)	Go od	20 +	4	4	4	4				5.09	81.4	9	2	High
T3		Leyland Cypress (X Cupressocyparis leylandii)	C2	EM	300 (SS)	5 (1)	Fai r	20 +	2	2	2	2				3.6	40.7	6.4	1	High
T4		Red Maple (Acer rubrum)	B2	EM	600 (SS)	10 (1)	Fai r	20 +	4	3	4	4	Trimmed back from site. Crown 4m from ground level over site.			7.2	162.9	12.8	2	High
T5		Ash (Fraxinus excelsior)	B2	EM	400 (SS)	11 (1)	Fai r	20 +	4	3	2	2	Crown trimmed back from site.			4.8	72.4	8.5	2	High

### III. Cascade Chart for Tree Quality Assessment

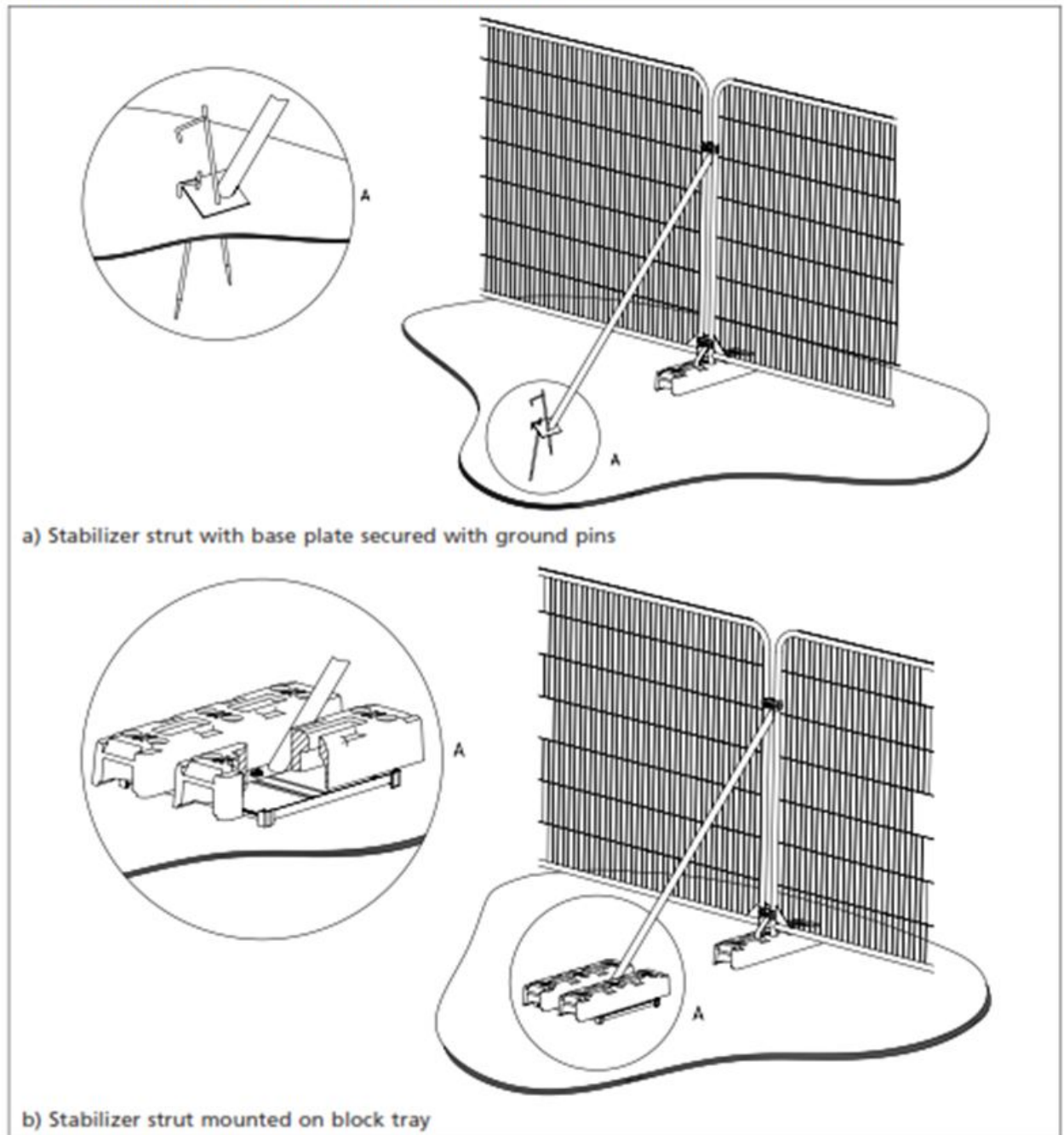
Category and definition	Criteria			Identification on plan
<b>Category U</b> Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve;</i>			<b>DARK RED</b>
<b>TREES TO BE CONSIDERED FOR RETENTION</b>				
Category and definition	Criteria - Subcategories			Identification on plan
	1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation	
<b>Category A</b> <b>Those of high quality and value:</b> in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)	Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular importance (e.g. avenues or other arboricultural features assessed as groups)	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood pasture)	<b>LIGHT GREEN</b>
<b>Category B</b> <b>Those of moderate quality and value:</b> those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)	Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage)	Trees present in numbers, usually as groups or woodlands such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semiformal arboricultural features (e.g. trees of moderate quality within an avenue that includes better category A specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits.	<b>MID BLUE</b>
<b>Category C</b> <b>Those of low quality and value:</b> currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit.	Trees with very limited conservation or other cultural benefits	<b>GREY</b>
	NOTE Whilst category C trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation.			

#### IV. Protective Fencing Details



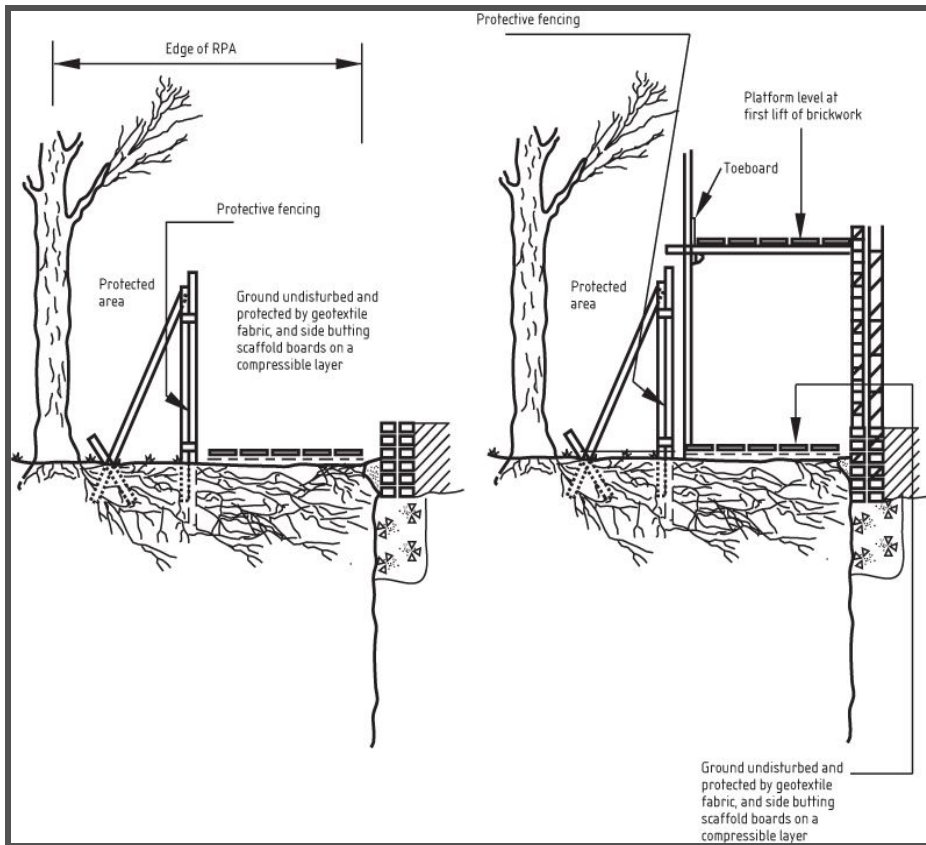
## V. Protective Fencing With Above Ground Stabilization

Figure 3 Examples of above-ground stabilizing systems





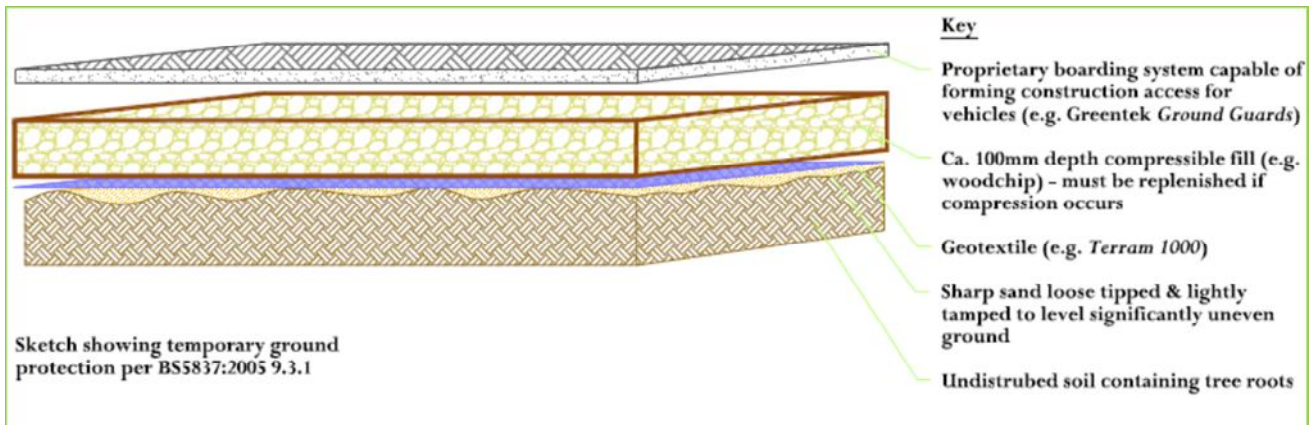
## VI. Erection of Scaffolding Within Root Protection Areas



## VII. Signs For Placement On Protective Fencing



## VIII. Temporary Ground Protection Layers



## IX. Photographic Record

Title

Title

Title

Title

## X. Scope of Report

This report has been produced in order to fulfil planning requirements and to ensure that best practice procedures are enforced prior to construction design in accordance with BS 5837 (2012) *Trees in relation to construction: - Recommendations.*

Tree conditions and amenity values have been assessed with regards to their suitability for retention during and following the proposed construction in accordance with the BS: 5837. (2012)

### a. Limitations

This report has not been designed as a hazard assessment or safety report and should not be used as such. As such only major visual tree defects are commented upon where appropriate.

This report makes no comment on any trees ability to cause either direct or indirect damage to buildings, walkways and other utilities other than where direct pressure damage is immediately and obviously foreseeable.

Trees are dynamic and changing structures and this report comments on tree condition as assessed on the day of surveying.

Please note that where trees in close proximity are selectively removed other adjacent specimens are initially more prone to failure due to increased wind loads. Given time healthy trees can adapt to this increased wind stress.

Further to this report it is recommended that all trees in areas where failure may result in significant risk of damage to people or property be assessed for hazard on an annual basis in order to fulfil the owner's duty of care.

### b. Survey Methodology

All trees were assessed from ground level only using visual assessment techniques. Heights and crown spreads have been measured using a laser hypsometer and tree diameters have been measured using a girth tape at 1.5m or where multi-stemmed immediately above the root flare as prescribed in the BS: 5837: 2012 *Trees in relation to construction - Recommendations*. No further inspection beyond this visual assessment has been carried out. Some measurements may have been estimated.