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Appendix 10A - Figure 10A. 1 Tree Survey Schedule and BS5837:2012 Table 1


[^0]Allocated sequential reference number - Tree (' T ), Group ('G'), Woodland ('W') or Hedge ('H') reference number - refer to plan and to numbered tags where applicable
Common name
In metres, to half nearest metre - where possible approximately $80 \%$ are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement isted is that of the highest tree Stem diameter in milimetres, to nearest 10 mm - measured and calcuiated as per Annex Cof BS5837.2012. MS $=$ multi-stemmed, $\mathrm{TS}=$ twin-stemmed

Estimated age class - $Y=$ young, $S M=$ semi-mature, $E M=$ early-mature, $M=$ mature, $P M=$ post-mature
Physiological Condition - a measure of the tree'(s)' overall vitality, ie. $D=D=D$ ead, $M D=$ Moribund, $P=$ Poor, $M=$ Moderate, $G=G o o d$
Comments relating to the tree'(s)' overall condition and any other pertinent factors including structural defects, current and potential direct structural damage, physiological decline, poor form etc
Eurveys trikinary or In Consideration of the Proposal - In the case of Arboricultural Constraints Surveys the recommended management works only take exiting site and tree circumstances and conditions into account and not proposed developments. Arboricultural Impact Assessment and Method Statement related Surveys take the proposed development into consideration with recommendations made accordingly. More than one option may be given if considered appropriate
Estimaed Remaning Contribution - in years as per BS5837:2012 (i.e. <10, $10+$, 20+, $40+$ )
Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1
Root Protection Area in $\mathrm{m}^{2}$ - calculated area around the tree that must be appropriately protected throughout the development process in order avoid root damage
Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection
Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a "\#" symbol













| FIGURE 10A.1- TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL |  |  |  |  |  |  |  |  |  |  | Surveyor: Joseph Lambert Bsc(Hons) FdSc MAbborA |  |  |  | Page: 14 of 19 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Site: $\quad$ Land off Cliffhill Lane, Thoroton, Nottinghamshire, NG13 9DS |  |  |  |  |  |  |  |  |  |  | Survey Dates: |  | $26 \text { \& } 28 \text { January } 2022$ |  |  |  |  |
| Agent for Client: Neo Environmental |  |  |  |  |  |  |  |  |  |  | Job Referenc |  | BTC2391 |  |  |  |  |
| No. | Species | Height | Stem. |  | $\underset{\substack{\text { Branh } \\ \text { spread }}}{ }$ | $\begin{gathered} \text { Branch \& } \\ \text { Canopy } \\ \text { Clearances } \end{gathered}$ | Stage | PC | General Observations and Comments |  |  |  | Management Recommendations | ERC | $\underset{\text { cate }}{\text { cate }}$ | RPA $\left(\mathrm{m}^{2}\right)$ | $\substack{\text { RPA } \\ \text { Radius } \\ \text { (m) }}$ |
| G21 | $\begin{gathered} 2 \text { no. } \\ \text { Sycamore } \end{gathered}$ | $\begin{gathered} \leq \\ 18 \end{gathered}$ | $\underset{2 \times 620}{\leq}$ <br> (ts) | N | $\mid \leq 8$ $\leq 80$ $\leq 10$ $\leq 8$ $\leq 5$ | $\begin{aligned} & \text { N/A } \\ & \geq 0 \end{aligned}$ | M | G | - Tree to west has moderately severe stem lean north-east from ground level. <br> - Tree to east is twin-stemmed from ground level with cupped union. <br> - Moderately dense ivy restricted detailed inspection. <br> - Prolific basal growth with multiple adventitious stems up to 250 mm diameter. |  |  | - |  | 20+ | B1 | $\begin{gathered} \leq \\ 348 \end{gathered}$ | $\begin{gathered} \leq \\ 10.52 \end{gathered}$ |
| G22 | Ash, Oak, Pine, Sycamore etc. | $\begin{gathered} \leq \\ 11 \end{gathered}$ | $\underset{\text { 220\# }}{\leq}$ | $\begin{array}{l\|} \hline N \\ E \\ S \\ S \\ W \\ \hline \end{array}$ | $\begin{aligned} & \leq 2 \\ & \leq 2 \\ & \leq 2 \\ & \leq 2 \end{aligned}$ | $\begin{aligned} & \text { N/A } \\ & \geq 0 \end{aligned}$ | $\begin{aligned} & \text { SM- } \\ & \text { EM } \end{aligned}$ | M-G | - Small shelterbelt planting on neighbouring land to south. <br> - Not accessed to inspect in detail. <br> - Tight included bark unions frequent throughout group. |  |  | - |  | 20+ | C1/2 | $\begin{aligned} & \leq \\ & 22 \end{aligned}$ | $\underset{2.64}{\leq}$ |
| G23 | 2no. <br> Elder | $\leq$ | $\begin{gathered} \leq \\ 75 \end{gathered}$ | N | $\begin{aligned} & \leq 1.5 \\ & \leq 1.5 \\ & \leq 1.5 \\ & \leq 1.5 \end{aligned}$ | $\begin{aligned} & \text { N/A } \\ & \geq 0 \end{aligned}$ | SM | P | - Loosely spaced group in bank showing a significant reduction in vitality. |  |  | - |  | <10 | U | $\begin{aligned} & \leq \\ & 23 \end{aligned}$ | $\begin{gathered} \leq \\ 2.7 \end{gathered}$ |
| G24 | Ash, Oak, Pine, Sycamore etc. | $\begin{gathered} \leq \\ 11 \end{gathered}$ | $\underset{\text { 220\# }}{\leq}$ | N | $\begin{aligned} & \leq 2 \\ & \leq 2 \\ & \leq 2 \\ & \leq 2 \end{aligned}$ | $\begin{aligned} & N / A \\ & \geq 0 \end{aligned}$ | SMEM | M-G | - Small shelterbelt planting on neighbouring land to east. <br> - Not accessed to inspect in detail. <br> - High percentage of Ash within group. |  |  | - |  | 20+ | C1/2 | $\begin{aligned} & \leq \\ & 22 \end{aligned}$ | $\underset{2.64}{\leq}$ |
| G25 | $\begin{gathered} 2 \text { no. } \\ \text { Sycamore } \end{gathered}$ | $\begin{gathered} \leq \\ 17 \end{gathered}$ | $\underset{630}{\leq}$ | $\begin{aligned} & \mathrm{N} \\ & \mathrm{E} \\ & \mathrm{~S} \\ & \mathrm{~W} \end{aligned}$ | $\begin{aligned} & \leq 7.5 \\ & \leq 8.5 \\ & \leq 6.5 \\ & \leq 7 \end{aligned}$ | $\begin{gathered} 0 \\ \geq 0 \end{gathered}$ | M | M | - Closely spaced pair in field centre. <br> - Evident holes below and around indicating burrowing animal activity in ground. <br> - Prolific adventitious shoots from base up to 200 mm diameter. <br> - Tree located to south-east has historic decay and basal wound on north-west side from ground level up to 500 mm height and 300 mm width which has part occluded and stem has moderately severe lean to south-east from ground level. |  |  | - |  | 20+ | B1 | $\begin{gathered} \leq \\ 180 \end{gathered}$ | $\leq$ |
| G26 | 2no. <br> Common Oak, 1no. Sweet Chestnut | $\leq$ | $\begin{gathered} \leq \\ 220 \end{gathered}$ | N | $\begin{aligned} & \hline \leq 2.5 \\ & \leq 2.5 \\ & \leq 2.5 \\ & \leq 2.5 \end{aligned}$ | $\begin{aligned} & N / A \\ & \geq 0 \end{aligned}$ | SM | G | - Located in highway verge. <br> - Canopy of tree to north-west has been excessively raised. |  |  | - |  | 10+ | C1 | $\begin{aligned} & \leq \\ & 22 \end{aligned}$ | $\leq$ |
| G27 | Cherry Laurel, Field Maple, Hawthorn, Larch, Sitka Spruce, Willow | $\begin{aligned} & \leq \\ & 13 \end{aligned}$ | $\underset{270}{\leq}$ | N | $\leq 4.5$ $\leq 4.5$ $\leq 4.5$ $\leq 4.5$ | $\begin{aligned} & \text { N/A } \\ & \geq 0 \end{aligned}$ | SM | M-G | - Very closely spaced group. <br> - Not accessed due to dense canopies and dense bramble. <br> - South-west corner pruned to clear overhead high voltage power line. |  |  | - |  | 10+ | C1 | $\leq$ | $\begin{gathered} \leq \\ 3.24 \end{gathered}$ |







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Appendix 10A - Figure 10A. 2 Tree Impact Plans (1-3)



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Appendix 10A - Figure 10A. 3 Temporary Fencing Specification

## - TEMPORARY PROTECTIVE FENCING \& GROUND PROTECTION SPECIFICATION -

## Construction Exclusion Zones (CEZs), shall be enclosed by Temporary Protective Fencing and/or, where necessary, Temporary Ground Protection Measures. The fencing/ground protection Type(s), locations, and extents shall be agreed, in writing, with the Local Planning Authority (LPA). In turn, the Temporary Protective Fencing and/or Temporary Ground Protection Measures shall:

1. be constructed as in accordance with the Type 1, Type 2 or Type 3 'Temporary Protective Fencing Construction' sections and, where applicable the 'Temporary Ground Protection Measures' section, as detailed herein and agreed, in advance with the LPA;
2. be retained in place throughout the development process until completion of the project, and only removed following receipt of written permission from the LPA;
3. be sited in the area(s) defined by the Root Protection Areas on the associated Tree Impact Plan, or as the CEZs on the Tree Protection Plan;
4. be erected prior to any construction, demolition or excavation works and remain in place for the duration of the project;
5. preclude any delivery of site accommodation and/or materials and/or plant machinery;
6. preclude all construction related activity, with the sole exception of specified arboricultural works and any other works to be carried out under supervision that have been agreed by all parties;
7. preclude the storage of all development related materials and substances including fuels, oils, additives, cement and/or any other deleterious substance; and
8. be affixed with a $600 \mathrm{~mm} \times 300 \mathrm{~mm}$ warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1, below), at every 10.0 metre length of protective fencing.
9. Important: Any incursion into CEZs must be by prior arrangement, following consultation with the LPA.

Figure 1: CEZ Warning Sign

## - TREE PROTECTION AREA KEEP OUT!

 (TOWN \& COUNTRY PLANNING ACT 1990)THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR SUBJECTS OF A ‘TREE PRESERVATION ORDER’, THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION
THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:

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

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

## Type 1 (i.e. 'Default') Temporary Protective Fencing Construction (see Figure 2, below)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall butt together and be securely fixed to a scaffold framework, as per points 3 to 5 of Figure 2, overleaf.
3. The scaffold framework shall comprise of upright poles of at least 3.0 metres in length driven no less than 0.6 metres into the ground at maximum 3.0 metre centres with horizontal and diagonal poles fixed to the uprights, as per points 4 to 5 .
4. The two horizontal rail poles shall be attached to the uprights at heights of 0.6 and 1.8 metres with 3 no. clamps to each joint.
5. The diagonal scaffold pole struts be clamped to the top rail of the scaffold framework at a $45^{\circ}$ angle and extend back into the CEZ and clamped to a 0.7 metre length of scaffold tube that shall be driven no less than 0.5 m into the ground.
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A $600 \mathrm{~mm} \times 300 \mathrm{~mm}$ warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

Figure 2: BS5837:2012 Default specification for protective barrier


## Type 2 Temporary Protective Fencing Construction (see Figure 3(a), below)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a $455^{\circ}$ angle and extend back into the CEZ and shall be attached to a base plate, which shall be secured to the ground with pins (Figure 3a).
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A $600 \mathrm{~mm} \times 300 \mathrm{~mm}$ warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

Figure 3(a): Type 2 Fencing (BS5837:2012 above-ground strut stabilising system with ground pins)


## Type 3 Temporary Protective Fencing Construction (see Figure 3(b), overleaf)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a $45^{\circ}$ angle and extend back into the CEZ and shall be attached to a block tray base (Figure 3b).
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A $600 \mathrm{~mm} \times 300 \mathrm{~mm}$ warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

Figure 3(b): Type 3 Fencing (BS5837:2012 above-ground stabilising system with strut on block tray)


## Temporary Ground Protection

1. Any necessary Temporary Ground Protection areas shall conform to Figure 4, below, unless otherwise agreed with the LPA.
2. The Ground Protection Area shall be left undisturbed and covered by a semi-permeable geotextile membrane which shall, in turn, be covered by a compressible layer consisting of a material such as woodchip.
3. Side-butting scaffold boards shall then be fitted to cover the Ground Protection Area.
4. On completion of installation, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Ground Protection.
5. The Temporary Ground Protection shall remain in place until completion of the project and only removed following receipt of written permission from the LPA.

Figure 4: Temporary Ground Protection - Recommended Construction


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Appendix 10A - Figure 10A. 4 Manufacturer's Brochure for Cellular Confinement System


TREE ROOT PROTECTION (TRP) SYSTEM
Powered by GEOSYSTEMS ${ }^{\ominus}$ technology.


## THE PROBLEM

## CONSTRUCTION-RELATED TREE DAMAGE

Critical Root Zone/Tree Protection Zone is the minimum area beneath a tree that must remain undisturbed to
 preserve a sufficient amount of root mass in order to give a tree a chance of survival.

When construction equipment and vehicles intrude a tree's Critical Root Zone, they can cause negative impacts to the soil environment including compaction of the soil, damage to near-surface roots and ultimately endanger the structural integrity of the tree. The majority of a tree's root system is contained within the top three feet of the surface, and construction excavation and compaction can damage or even destroy roots to the point where trees may not survive.

Tree Root Protection (TRP) systems should be eco-friendly as well as comply with local standards and regulations.*

*Compliance with Standards:
In the United Kingdom, Tree Root Protection systems must comply with the Arboricultural Method Statement as outlined in BS5837:2005 and may require supervision by an Arboriculturist.


## THE GEOWEB ${ }^{\circledR}$ SOLUTION TREE ROOT PROTECTION (TRP) SYSTEM

Used extensively in civil engineering construction for over 30 years, the $\mathrm{GEOWEB}^{\circledR}$ system is a three-dimensional structure that:

- provides strength to confined soils
- distributes loads laterally, not vertically
- reduces point loads
- reduces compaction of the subsoil

Manufactured from high quality, high-strength polyethylene with a textured surface and perforated walls, GEOWEB ${ }^{\oplus}$ cells with selected infill control shearing, lateral and vertical movement, and reduce subbase depth requirements.

The GEOWEB ${ }^{\circledR}$ system is a low impact development (LID) solution with exceptional load-bearing capabilities and environmental benefits. The system has a long history of solving heavy load support problems for roadways, road base support, parking lots, road shoulders, ports, trucking/intermodal terminals and railroads.

## COST BENEFITS

The GEOWEB ${ }^{\circledR}$ TRP system is an economical solution for reducing construction vehicle impact to the tree root zone compared with other methods. Once installed, the system has minimal-to-no visibility.

## ENVIRONMENTAL BENEFITS

With permeable infill (topsoil/vegetation, aggregate, sand), perforated GEOWEB ${ }^{\circledR}$ cell walls offer environmental benefits:

- water infiltration
- lateral movement of air and water
- water and nutrient migration
- promotes root development

The tree root protection system can be a temporary or permanent solution.

the GEOWEB ${ }^{\circledR}$ Granular Pavement System


By distributing and bridging applied loads, the GEOWEB ${ }^{\circledR}$ TRP system reduces vertical stresses that are typically applied to the underlying soil and root zone.

The GEOWEB ${ }^{\circledR}$ system is ideally suited for tree root protection applications where weak subsoil or no-dig restrictions exist.

## GEOWEB ${ }^{\circledR}$

## TRP SYSTEM INSTALLATION

Step 1: Remove the upper grass and soft soils by hand or by machine if acceptable.

Step 2: Install a high-strength woven geotextile allowing adequate drainage as a separation layer between soft subgrade and GEOWEB® infill material.

Step 3: Expand GEOWEB ${ }^{\circledR}$ sections over the area to be protected and use temporary stakes or weights to hold sections open to prevent movement during infilling.

Step 4: Connect adjacent sections using ATRA ${ }^{\circledR}$ Keys. Position the sections so the slots are aligned, insert the key and turn 90 degrees locking the panels together. ATRA ${ }^{\circledR}$ Keys provide a long-term connection that is safer, quicker and stronger than staples or cable ties. In environmentally protected areas (SSSI in United Kingdom), ATRA ${ }^{\circledR}$ Keys can be used without the requirement for diesel-fueled compressors.

Step 5: For permeability, infill the fully connected GEOWEB ${ }^{\circledR}$ system with a well graded, crushed, angular stone such as MOT Type 1X (also known as MOT Type3). Over fill the cells by up to 30 mm to allow for compaction.

Step 6: Compact the fill material with conventional plant or non-vibratory plant when required. Fill should be maintained above the GEOWEB ${ }^{\circledR}$ system by a minimum of 10 mm at all times or a permanent wearing course of blocks, porous asphalt or gravel installed.


DESIGN CONSIDERATIONS

It is important to ensure the correct GEOWEB ${ }^{\circledR}$ cell size and cell depth are specified and installed based on the anticipated pavement loads. These are calculated based on the following criteria:

- traffic type and loading
- frequency of traffic
- subgrade strength
(typically CBR, Ev2,
Cu or SPT values)
- infill type
- allowable settlement of the pavement


To assist you in determining the correct GEOWEB® solution for your application, Presto GEOSYSTEMS ${ }^{\circledR}$ or their network of distributors/representatives can assist with the calculation for your project. You can be confident that you will receive the most suitable and economical solution for your project.

PRESTO GEOSYSTEMS ${ }^{\oplus}$ COMMITMENT — To provide the highest quality products and solutions.
Presto GEOSYSTEMS ${ }^{\circledR}$ is committed to helping you apply the best solutions for your tree root protection needs. Our solutions-focused approach to solving problems adds value to every project. Rely on the leaders in the industry when you need a solution that is right for your application. Contact Presto GEOSYSTEMS ${ }^{\circledR}$ or our worldwide network of knowledgeable distributors/representatives for assistance.

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# nein 

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Appendix 10B - Disclaimer

## Appendix 10B

## DISCLAIMER


 written instructions. Comments upon evident tree safety relate to the condition of said tree at the time of the survey only.


 identified and varying site conditions and associated risks



 relevant Council. Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule
 ordination. Where this is not possible then locations are estimated. Restrictions in these respects are detailed in the report.



 new buildings.


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 statutory protection exists



 otherwise stated in the report.


 removal of existing site vegetation, including trees.

## GLASGOW - HEAD OFFICE

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www.neo-environmental.co.uk

| N. IRELAND OFFICE |  |  | IRELAND OFFICE |  | RUGBY OFFICE |
| :--- | :--- | :--- | :--- | :--- | :--- |


[^0]:    Headings and Abbreviations:
    $\stackrel{N}{\mathrm{No}} \mathrm{S}$.
    Species:
    Height:
    Stem Diam.
    Stem Diam.:
    Branch Spread
    Branch \& Canopy Clearances
    Life Stage:
    PC:
    General Observations and Comments:
    Management Recommendations:
    ERC:
    Cat. Grade:
    RPA $m^{2}$ :
    \# (Estimated Dimensions)

