# BS5837 Arboricultural Impact Assessment

Trees in Relation to design, demolition and construction – Recommendations

# Lloyd Watson Haulage Site, Ellesmere Road, Bronington, Nr. Whitchurch, SY13 3HD



**Date:**
30th January 2025
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**Client:**
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Ellesmere Road
Bronington
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# 1. INTRODUCTION

## 1.1 Brief

Emma Davies, Arboricultural Consultant, has been commissioned to conduct a BS5837 'Trees in Relation to design, demolition and construction – Recommendations', arboricultural survey and report for the construction of a new storage building at the Lloyd Watson haulage yard, Ellesmere Road, Bronington, Nr. Whitchurch, SY13 3HD.

## 1.2 Scope

- Conduct ground level Visual Tree Assessment in accordance with the guidance provided in Annexe C of BS5837:2012 of all trees within influencing distance of the proposed development.
- Assess and quantify the retention value of the surveyed trees.
- Make recommendations on how to facilitate the Safe Useful Life Expectancy (SULE) of the surveyed trees.
- Provide a report detailing the impact the proposed development will have on the surveyed trees discussing protection measures required during demolition/construction phase.

These sections combine to provide the relevant information needed by the Local Planning Authority to assess the trees in the context of the proposed development.

This report consists of:

1. A survey data sheet which records all relevant information for assessing the retention of trees and any impacts the proposed development may have on the trees. This document should be read in conjunction with Tree Constraints Plan (TCP) which details the location of the trees surveyed, their crown spread, estimated rooting zone and their retention category.

2. An Arboricultural impact assessment, detailing the impact the proposed development may have on the trees, on and within influencing distance of the site. The above and below ground constraints of the trees is discussed and mitigation measures are provided and illustrated in the Tree Protection Plan (TPP). Tree management recommendations are made to facilitate the current design of the development as per the architects topographic drawing provided.

3. An Arboricultural Method Statement, detailing the timing and measures to be taken to protect the trees for the duration of the development. This section is to be read in conjunction with the Tree Protection Plan (TPP) which identifies the areas of the site that require protective fencing to prevent damage to the trees for the duration the development.

## 1.3 Limitations of Scope

- The assessment of the trees impacted by the proposed development focuses solely on their retention value and safe, future contribution to the development site. Work recommendations are made to facilitate the safe retention of the surveyed trees, however no warranty or guarantee is expressed or implied that deficiencies may not arise in the future.

- No decay inspection equipment was used as this is outside the scope of BS5837, if further inspection is deemed necessary this will be detailed Section 4.

- No subterranean investigation was conducted during this survey therefore the condition of the roots is unknown. If a subterranean survey is deemed necessary, this will be detailed in Section 4.

## 2. KEY POINTS

- There is one tree present within the application site. All other trees within the area of influence from the proposed development are situated within neighbouring arable land on the on the north and west boundaries of the site.

- There are no active Tree Preservation Orders on or adjacent to the site nor protection under s211of the Town & Country Planning Act 1990.

- The rooting zone for G1 and H1 has been restricted by physical barriers comprising drainage ditches. The rooting zone for T1, T2, T3 and H2 has been restricted by existing hardstanding). The RPA drawn reflects the maximum possible rooting extent considering the barriers present.

- The proposed design will not negatively impact any of the trees within the area of influence if the tree protection requirements outlined are adhered to. Therefore, the arboricultural impact of the development in considered to be low.

- No trees require removal or any work regardless of the development.

## 3. TREE SURVEY METHOD

The assessment of the trees has been carried out in accordance with the guidance provided in Annexe C of BS5837:2012. In summary this requires that any tree on or within influencing distance of the site with a stem diameter (dbh) ≥ 75mm at 1.5m above ground level is recorded. Tree diameters were measured using a calibrated surveyor's tape, a laser hypsometer was used for recoding distance and height. Terms and definitions are detailed in Appendix 2.

### 3.1 Tree Categorisation

In accordance with the BS5837:2012, trees and groups are categorised objectively based on their quality and assigned a category designed to quantify their value within any future development. Table 1 presents a summary of the categories from the British Standard. The full table has been reproduced in Appendix 2.

Table 1 Summary of BS5837 tree quality categorisation criteria:

| | |
|---|---|
| Category A | Trees of high quality with an estimated remaining life expectancy of at least 40 years |
| Category B | Trees of moderate quality with an estimated remaining life expectancy of at least 20 years |
| Category C | Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm |
| Category D | 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 |

Additionally, BS5837:2012 provides sub-categories 1-3 within the category system outlined in table 1 which indicate the area(s) in which a tree or group retention value lies:

1. Mainly arboricultural
2. Mainly landscape
3. Mainly cultural, including conservation.

### 3.2 Tree Identification

Individual trees were assigned a 'T' number e.g. T1 followed by the BS5837 category and sub-category. Where age distribution and species mix were relatively uniform, trees were plotted as groups. Tree groups were assigned a 'G' number e.g. G1 followed by the BS5837 category and sub-category. Hedgerows were assigned a 'H' number. As all the trees and groups are located in 3rd party private properties, they were not tagged.

### 3.3 Tree Constraints

#### 3.3.1 Above Ground Constraints

Where the current and / or ultimate height of a Category A, B or C tree will cause an obstruction to the proposed development, this must be considered as a constraint. This is usually considered in terms of issues relating to shade and light. However, it can also include leaf litter and potential branch drop.

#### 3.3.2 Below Ground Constraints

The below ground constraints are defined as the likely spread and disposition of the root system of the tree and are plotted in the TCP and is termed the Root Protection Area (RPA).

As per BS 5837:2012, the RPA is calculated using the trees diameter at 1.5 metres (refer to Appendix 2) and represents the minimum area around each tree that must be left undisturbed to ensure their survival.

Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present.

The majority of tree roots are found in the top 600 mm of soil and most of the fine roots that absorb water and nutrients are found in the top 100 mm. Compaction of soil removes air within the soil and causes root death, this subsequently leads to tree decline. Compaction of soils on construction sites is a major cause of tree decline the effects of which are often not realised until after the construction phase.

The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in their extent and the RPA may not be a circular area centred on the tree stem.

# 4. ARBORICULTURAL IMPACT ASSESSMENT

## 4.1 Site Description

The development site is currently an area of hardstanding within the existing haulage yard. One tree (T3 a Monterey Cypress) is located within the applicant's land ownership, while all other trees within the area of influence are located within the adjoining arable land and form a hedge line that is adjacent to the north and western site boundaries. There are two oak trees in the adjoining land to the north west and dense hedgerows along these boundaries. There is a drainage ditch, approximately 1.8m deep which forms the western site boundary.

## 4.2 Development Proposals

- Construct new storage building on current concrete hardstanding.
- Plant soft landscaping along the north and western site boundaries adjacent to the new building.

## 4.3 Onsite Survey

The survey was carried out on 30th January 2025 from ground level by Emma Davies BSc (Hons), LANTRA PTI, a qualified arboriculturist with 10 years industry experience. Trees were assessed objectively using a methodology guided by BS5837:2012 Trees in Relation to design, demolition and construction – Recommendations.

The weather conditions at the time of survey were fine, clear and dry and there were no limiting factors to the survey.

A topographic site plan provided by the client was used to record the position of trees and vegetation. Where age distribution and species mix were relatively uniform, trees were plotted as groups. A total of three individual trees (T1-T3), two groups of trees (G1-G2) and three hedgerows (H1-H3) were surveyed. All arboricultural information recorded during the survey is presented in Appendix 1.

The nature of soils on site was not assessed, the possibility of minor soil movement due to tree root activity cannot be discounted. Prior to any soil disturbance the exact location of all tree root protection areas (RPA) should be measured.

## 4.4 Statutory Protection Constraints

### 4.4.1 Tree Preservation Orders & Conservation Area Designations

There are no TPO's on or adjacent to the application site. The application site is not within and Conservation Area.

### 4.4.2 Protected Species – Bats

Mature trees can contain features of significant habitat value for roosting bats which are protected under Schedule 5 of the Wildlife and Countryside act 1981 and Schedule 2 of the Conservation of Species and Habitats Regulations 2010. Therefore, disturbing a roost site is an offence.

A preliminary ground level appraisal of the habitat potential of each tree and group was made, the site contains several mature trees but no features suitable for bat roost habitat were observed. The full extent of roost potential should be determined by the project ecologist. This report concludes that the proposed development will not negatively impact any bat roosting potential on the site.

### 4.4.3 Protected Species - Birds

Trees are potential habitat for nesting birds, which are protected under Wildlife and Countryside act 1981. It is therefore a criminal offence to intentionally or recklessly damage or destroy an active bird nest.

Due to the suitability of all the trees surveyed on the site for nesting birds, any recommended works should be undertaken outside of British nesting birds season March – August inclusive. If this is not

possible then a detailed inspection of each tree by the project ecologist should be undertaken immediately prior to the arboricultural works. Should an active nest be found then all work must stop until chicks have fledged, and the nest is inactive.

**4.5 Impact of Development Overview**

The report author has been told the site has existed for approximately 60 years. The trees and hedgerows will have established with their root areas constrained by the drainage ditch and impermeable hardstanding along the western and northern site boundaries, with the majority of their root systems developing under the adjoining arable land. It is highly unlikely that any significant root area will be present under the hardstanding of the development site.

In any event (see Appendix 1 – Arboricultural Survey Data Sheets) the southern portion of the root areas of T1 and T2 are only c5m due to hardstanding preventing their development in this location and the proposed design has fully considered the impact the development will have on the neighbouring trees. All foundations and service installation required has been located sufficient distances from the site boundaries. The site is located a sufficient distance away from the Monterey Cypress trees (T3) located on the north east corner of the site.

**4.6 Trees and Groups that require removal to facilitate development**

No trees require removal.

**4.7 Trees and groups to be retained that require work to facilitate development**

None.

**4.8 Trees requiring work regardless of the development**

None.

**4.9 Trees requiring protection for the duration of the proposed development**

T1, T2 and T3 are within the zone of influence and require protection during construction works as recommended on Section 5 of this report.

**4.10 Site photographs**

Photographs of the relevant trees are shown overleaf.



Tree T1



Tree T2



Tree T3



Tree Group G1




Tree Group G2

# 5. TREE PROTECTION REQUIREMENTS

**5.1 Protective Fencing and Construction Exclusion Zones (CEZ)**

T1, T2 and T3 are within the zone of influence. It is unlikely that significant roots exist beneath the hardstanding, but care will be required during construction works to protect the canopies.

Prior to any construction work, protective fencing shall be erected to create a CEZ, and the storage of vehicles, machinery and building materials within these areas is prohibited for the duration of the development.

Examples of protective fencing are shown in Appendix 3.

**5.2 Excavations within RPA's**

There are no planned excavations within the RPA of any trees within the zone of influence for this development.

**5.3 Ground Contamination**

Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any trees on or within proximity to the site due to the risk of soil contamination caused by accidental spillage. Particular care must be taken when working on or close to sloping ground to avoid unintentional runoff into the drainage ditch and rooting areas of retained trees.

**5.4 Ground Level Changes**

A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment. Existing ground levels within the Construction Exclusion Zone should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

**5.5 Site access**

Site access will be from the existing Ellesmere road access, if the CEZs are adhered to as per the TPP then movements of plant and machinery within the site will not impact on any trees or hedges.

**5.6 Post development Protection**

Work recommendations have been made for the trees on this site detailed in the survey data sheet (Appendix 1), these recommendations are to prolong the trees useful contribution to the site. Regular inspection and management of trees is essential to ensure the trees remain in good condition and do not pose an unacceptable risk in the future.

## 6. ARBORICULTURAL IMPACT ASSESSMENT SUMMARY

- The survey conducted in accordance with BS5837:2012 identified three trees, two tree groups and three hedge groups within influencing distance of the proposed development site.
- Appropriate working corridors and storage areas are achievable outlined in the TPP.
- Protective Heras fencing is required to protect T1, T2 and T3. Ref TPP.
- The current design will not negatively impact any of the retain trees on the site if the tree protection requirements outlined are adhered to. Therefore, the arboricultural impact of the development in considered low.

## 7. ARBORICULTURAL METHOD STATEMENT

### 7.1 Pre-start Meeting

To reinforce the required tree protection measures and avoid the requirement for ongoing arboricultural supervision, a pre-start meeting should be arranged between the site contractor, a qualified Arboricultural Consultant and the Council's Arboricultural Officer. During the meeting the alignment of protective fencing will be marked out, and any technical or logistical issues discussed.

### 7.2 Timing of operations

Tree protection and retention post development can only be achieved if a logical timeline of operations is established and adhered to, as follows:

1. Undertake all tree works recommended to facilitate the development outlined in section 4 before the construction phase of the development begins. These works must account for statutory constraints outlined in section 4.4 and are subject to approval from the Sefton Council Arboricultural Officer. It is the responsibility of the developer to ensure no legislation is breached.

2. Install protective tree fencing as per the TPP to create CEZs on the site prior to the site becoming an active construction site. This fencing will remain in place for the duration of the development, signs indicating the CEZ shall be affixed to the fence panels for the duration of the development such as the example below.



3. Construction of proposed development in accordance with the relevant construction method statement.

4. Completion of development, all materials, machinery and construction waste removed from the site.

5. Removal of protective fencing shall only occur once the construction phase has been completed. Landscaping shall be undertaken post construction.

## 8. REFERENCES

John Roberts, N. J. (2018). *Tree Roots in the Built Environment.* Stonehouse: Arboricultural Association.

Lonsdale, D. (2020). *Principles of Tree Hazard Management.* Stone House: Arboricultural Association.

Spatz, H. C., & Theckes, B. (2013). Oscillation damping in trees. *Plant science*, 66-71.

# Appendix 1 – Arboricultural Survey Data Sheets

| | | | |
|---|---|---|---|
| **Survey Date** | 30th January, 2025 | **Client** | LLOYD WATSON HAULAGE LTD |
| **Site** | Lloyd Watson Haulage, Bronington, Nr Whitchurch, SY13 3HD | **Surveyor** | Emma Davies |

| ID | Species | Height (m) | DBH (mm) | Crown Spread (m) | | | | Canopy Height (m) | Age Class | Structural Condition | Physiological Condition | Comments | Recommendation | Priority | SULE | Cat | RPA (m) | RPA Area ($m^2$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N | E | S | W | | | | | | | | | | | |
| T1 | Oak | 12.0 | 1050 | 5.0 | 5.0 | 4.5 | 4.3 | 9.0 | Mature | Fair | Fair | Dominant tree in the landscape crown asymmetric, two dead limbs. Rooting zone to S prevented by hardstanding, several dead stubs on stem no deadwood of concern. Three stems have been pruned towards the boundary line. | Sever and remove ivy from stem. Remove 2no.dead limbs. | Low | >20 | B1 | 12.6 | 499 (not in site boundary) |
| T2 | Oak | 12.0 | 1050 | 4.5 | 4.8 | 4.1 | 4.2 | 9.0 | Mature | Fair | Fair | Dominant tree in the landscape crown asymmetric, one dead limb. Rooting zone to S prevented by hardstanding, several dead stubs on stem no deadwood of concern. Two stems have been pruned towards the boundary line. | Sever and remove ivy from stem. Remove 1no.dead limbs. | Low | >20 | B1 | 12.6 | 499 (not in site boundary) |
| T3 | Monterey Cypress | 12.5 | 1000 | 3.8 | 4.1 | 4.0 | 4.1 | 10.0 | Mature | Good | Good | Dominant tree in the landscape. Good needle density, minimal deadwood. Rooting zone to S and W prevented by hardstanding, no sign of stress present. | No work required. | N/A | >40 | B1 | 12.0 | 452 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G1 | Hawthorne<br>Hazel<br>Oak<br>Sycamore | 9.0 | 450 | NA | 3.0 | 3.0 | NA | 7.5 | Early Mature | Good | Fair | Hedgerow group in fair to good condition forming boundary screen under different ownership. Rooting zone to E prevented by drainage ditch. Group has been pruned on east side towards the boundary line. | No work required. | N/A | >40 | B2 | 5.4 | 94 |
| G2 | Hawthorne<br>Hazel<br>Oak<br>Sycamore | 9.0 | 450 | NA | 3.0 | 3.0 | NA | 7.5 | Early Mature | Good | Fair | Hedgerow group in fair to good condition forming boundary screen. Rooting zone to E prevented by drainage ditch. Group has been pruned on east side towards the boundary line. | No work required. | N/A | >40 | B2 | 5.4 | 94 |
| H1 | Hawthorne<br>Elder<br>Holly<br>Hazel<br>Rowan<br>Sycamore<br>Crataegus | 5.0 | 450 | NA | 2.0 | 2.0 | NA | 4.0 | Early Mature | Good | Fair | Hedge group along south and west boundary. Rooting zone to E prevented by drainage ditch. | No work required. Consider planting gaps to reinforce hedgerow as a landscape feature and improve biodiversity. | N/A | >40 | B2 | 5.4 | |
| H2 | Hawthorne<br>Elder<br>Holly<br>Hazel<br>Rowan<br>Sycamore<br>Crataegus | 5.0 | 450 | NA | 2.0 | 2.0 | NA | 4.0 | Early Mature | Good | Fair | Hedge group along south and west boundary. Rooting zone to S prevented by hardstanding. | No work required. Consider planting gaps to reinforce hedgerow as a landscape feature and improve biodiversity. | N/A | >40 | B2 | 5.4 | 94 |
| H3 | Leyland Cypress | 4.0 | 300 | NA | 1.5 | 1.5 | NA | 3.0 | Mature | Good | Good | Hedge group along south and west boundary. Rooting zone to W prevented by hardstanding, no sign of stress present. | No work required. | N/A | >40 | B2 | 3.6 | 41 |

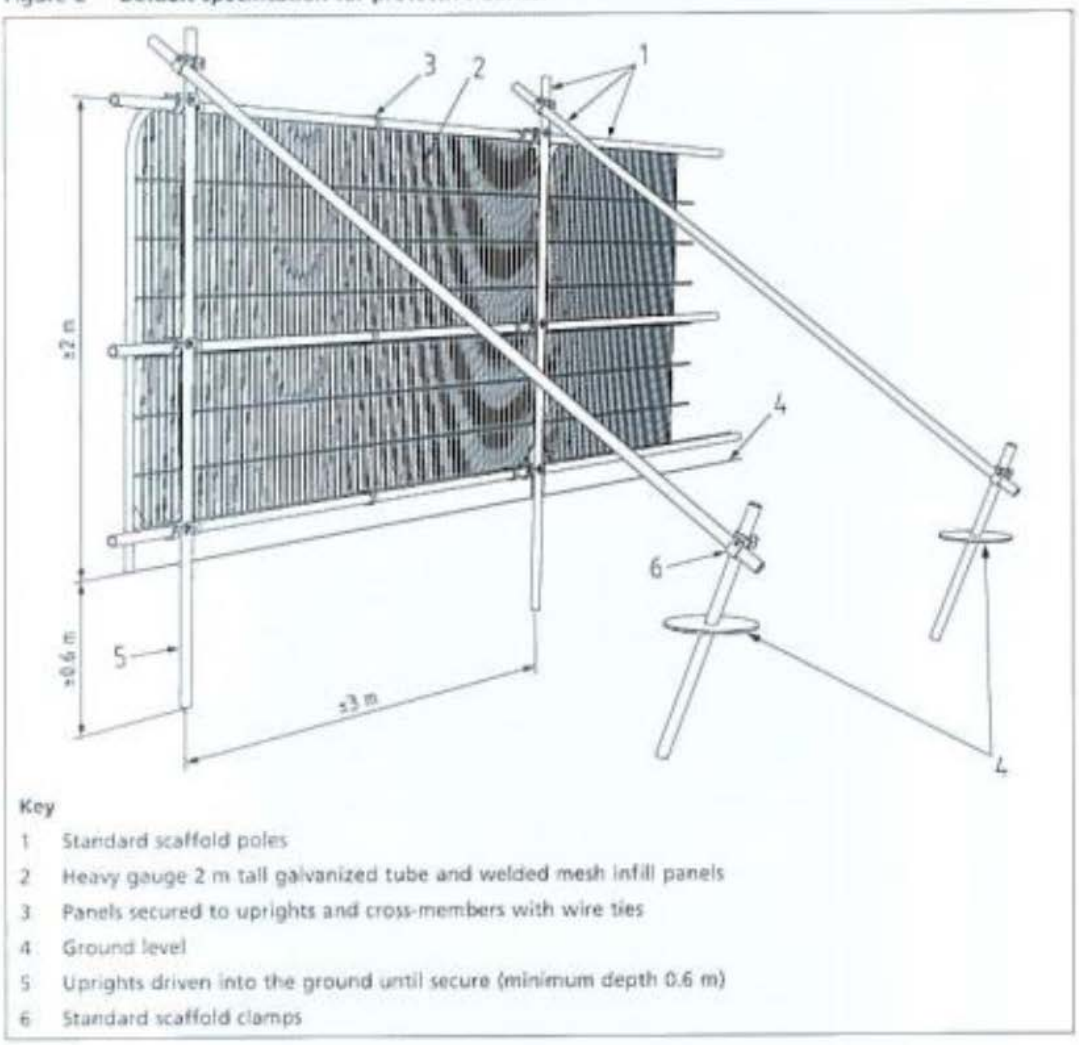
# Appendix 2 – Terms and Definitions

| Data field | Definition/ description |
|---|---|
| **Tree No.** | Recorded as either individuals e.g. T1 or groups e.g. G1 |
| **Species** | Common tree name and taxonomic name recorded in italics in brackets e.g. Wild cherry (*Prunus avium*) |
| **Age Class** | Young<br>Recently planted or establishing tree i.e., less than 150mm DBH |
| | Semi- Mature<br>An established tree, but with some growth to make before reaching its potential maximum height. A tree within the first third of its lifespan |
| | Early Mature<br>A tree that is reaching its ultimate height potential, who's growth rate is slowing but if healthy will still increase in stem diameter and crown spread. A tree within its second third of its lifespan |
| | Mature<br>A specimen with limited potential for any significant increase in size. A tree within its final third of its lifespan |
| | Over Mature<br>A senescent or moribund specimen of low vigour. A tree within the final third of its lifespan. Possibly also containing sufficient structural defects with safety/duty of care implications |
| | Veteran<br>Specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. |
| **Height (m)** | Measured from ground level using Nikon Forestry Pro hypsometer |
| **DBH (mm)** | Diameter of tree stem at 1.5m. For multi stemmed trees all stems are measured, and an average taken. Where trees folk before 1.5 the measurement was taken below the fork |
| **Crown spread (m)** | Measured from the base of the stem to the extreme of the tree crown in all 4 cardinal point directions and used to plot the crown shape of the tree or group |
| **1st significant branch (m/dir)** | The height and direction of the first significant branch from the tree stem |
| **Canopy height (m)** | Distance from the ground to the main bulk of the tree crown |
| **General Observations** | A brief description of the tree and any noteworthy observations to aid identification of the tree(s) and to provide context, N E S W used refer to the cardinal points. Accompanied by an assessment of the tree's structural conditions SC and physiological condition PC as **good fair** or **poor** |
| | Good<br>Generally, in good health typical of the species needing little if any attention. Few minor defects of little overall significance such as physical damage or suppressed branches. Showing no obvious adverse risk of failure/defects |
| | Fair<br>A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover. Showing minor signs of deterioration. Tree that may require work to remove or improve defect. |
| | Poor<br>A tree or trees with major structural and or physiological detects or stressed such that it would be a risk to retain in its current situation. Unlikely to return to a good condition given time or remedial work |

| | |
|---|---|
| **Recommendations** | Management required to improve the trees condition and or reduce the risk it poses to an acceptable level. Sometimes more than one option is recommended |
| **Priority** | The time frame within which the work recommendations should be carried out |
| | **Urgent** – As soon as possible |
| | **High** – Within 3 months of survey |
| | **Medium** – Within 1 year of survey |
| | **Low** – Within 2 years of survey |
| | **NWR** – No Work Required |
| **Remaining Contribution (years)** | An estimate of the remaining life expectancy as a healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey. < 10, 10 – 20, >20, >40 |
| **Root Protection Area RPA diameter (m)** | RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area ($m^2$) and as the radius of a circle (m) typically plotted from the centre of the stem. The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.6 and Table D.1) and is based on a trees stem diameter. In some cases, the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion. |
| **BS5837 Cat.** | See Table 1 |

# Appendix 3 – Protective Fencing Examples

Figure 2 **Default specification for protective barrier**

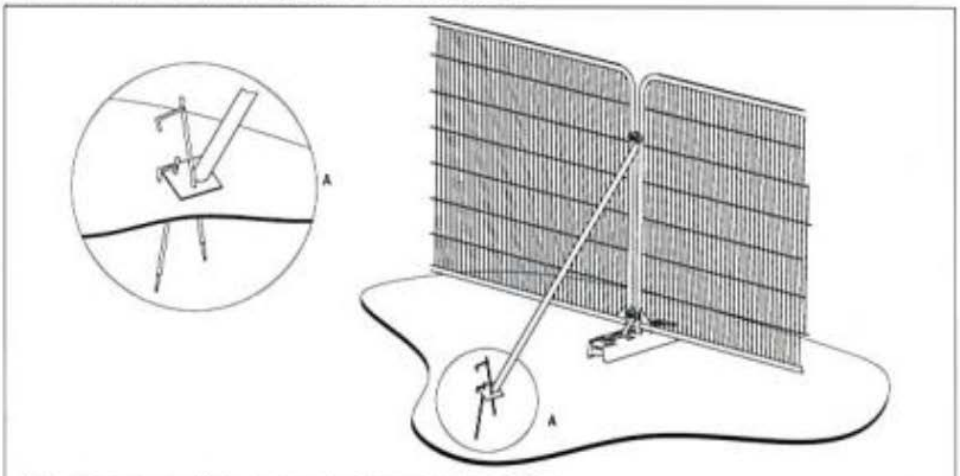



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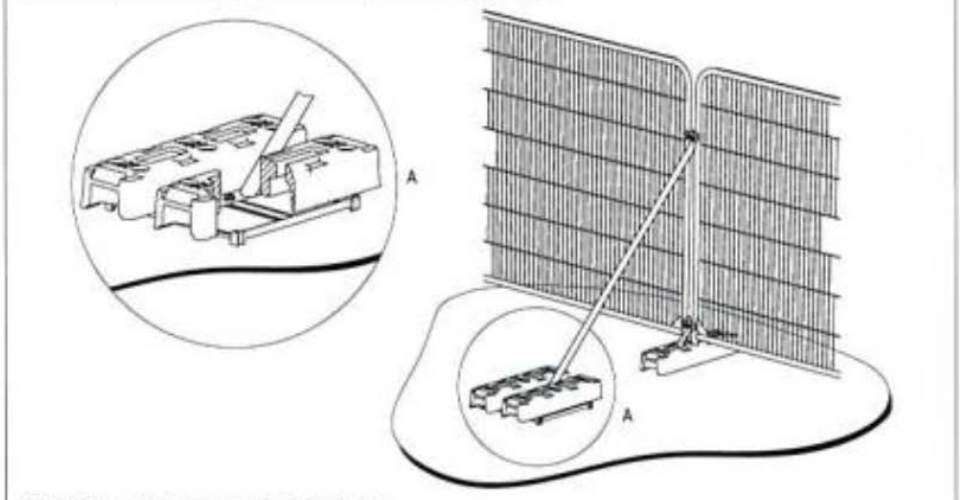
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

20 • © The British Standards Institution 2012

Figure 3 **Examples of above-ground stabilizing systems**




a) Stabilizer strut with base plate secured with ground pins




b) Stabilizer strut mounted on block tray

# Appendix 4 – Tree Constraints Plan



# Appendix 5 – Tree Protection Plan

