# Tree Care Consultant

**Phillip J. Ellis** MI Hort, Tech Arbor A

## ARBORICULTURAL REPORT IN RELATION TO DEVELOPMENT PROPOSALS BS5837: 2005

**REF:** PJE/107/11

**CLIENT**: Thakeham Homes, Gillman's Industrial Estate, Natts Lane, Billingshurst, West Sussex, RH14 9EZ.

**LOCATION**: Church Field, Station Road, East Preston, West Sussex, BN16 3AR.

**INSPECTION DATE:** 7th March 2011

**SURVEYED BY:** Phillip J. Ellis MI Hort Tech Arbor A

**INSTRUCTIONS RECEIVED**:
I am instructed by Mr A. Becket of Thakeham Homes on the 1st of March 2011 to review existing tree protection plan and update information with recommendations for protection of trees during the construction phase of the development.

**Documents Supplied:**
Schedule of trees dated 21.02.07. Plan for tree retention, removal and protection during construction by Tom La Dell drawing number 1079/09/2 and site layout plan 0.120.08.100B by Thakeham Homes.

**Summary:**
Proposal is to construct 14 housing units on the site. 43 trees are present or close to the proposed development and we understand the trees on the bank alongside Station road are subject to a Tree preservation order described by Arun District Council as Group 1. There are 5 trees classified as category "A" 17 trees classified as category "B", 11 as category "C" and 9 trees as category "R" on the site. The 5 category "R" trees are required to be removed. Tree protection measures are prescribed in this report that will safeguard the long term well being of the retained trees.

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## TREE SURVEY

### 1.0 Scope of Survey

1.1 The survey is concerned with the arboricultural aspects of the site only.

1.2 The survey of the trees was carried out on the 7th March 2011 by Phillip Ellis. Weather conditions were dry and sunny.

1.3 The planning status of the trees on the site has been confirmed by a visit to Arun District Council Planning Department that the only trees currently subject to a tree Preservation Order are those on the bank alongside Station Road described as G1 and not as specific trees.

1.4 This survey relates to a proposed development by constructing 14 units. For the purposes of this report, these areas will be referred to as 'the site'.

1.5 This survey is restricted only to the trees close to the development that could be affected.

1.6 The survey was carried out following guidelines detailed in British Standard 5837:2005 'Trees in relation to construction - Recommendations' [BS5837]

1.7 The trees were inspected based on the Visual Tree Assessment method expounded by Mattheck and Breloer (The Body Language of Trees, DOE booklet Research for Amenity Trees No. 4, 1994).

1.8 Any observations made with regard to the condition of built structures are from a layperson's view.

### 2.0 Survey Method

2.1 The survey was conducted from ground level with the aid of binoculars.

2.2 The positions of trees were taken from plan 1079/09/2 by Tom La Dell.

2.3 No tissue samples were taken nor was any internal investigation of the subject trees undertaken.

2.4 The height of each tree was estimated using a laser clinometer.

2.5 The trunk diameters [SD] of single stemmed trees were those provided by existing schedule reference CCFEP.0207.TS01.

2.6 The crown radii were taken from existing schedule reference CCFEP.0207.TS01.

### 3.0 The Site

3.1 The site is level located in the Parish of East Preston next to St Mary's Church on the east side of station Road. A residential area of mainly detached housing with a public park on the east side of the site. On the site currently is a large detached house to be demolished for the development. In the garden is a drained ornamental pond. The trees on site are around the edge with evidence of some tree removal having taken place.

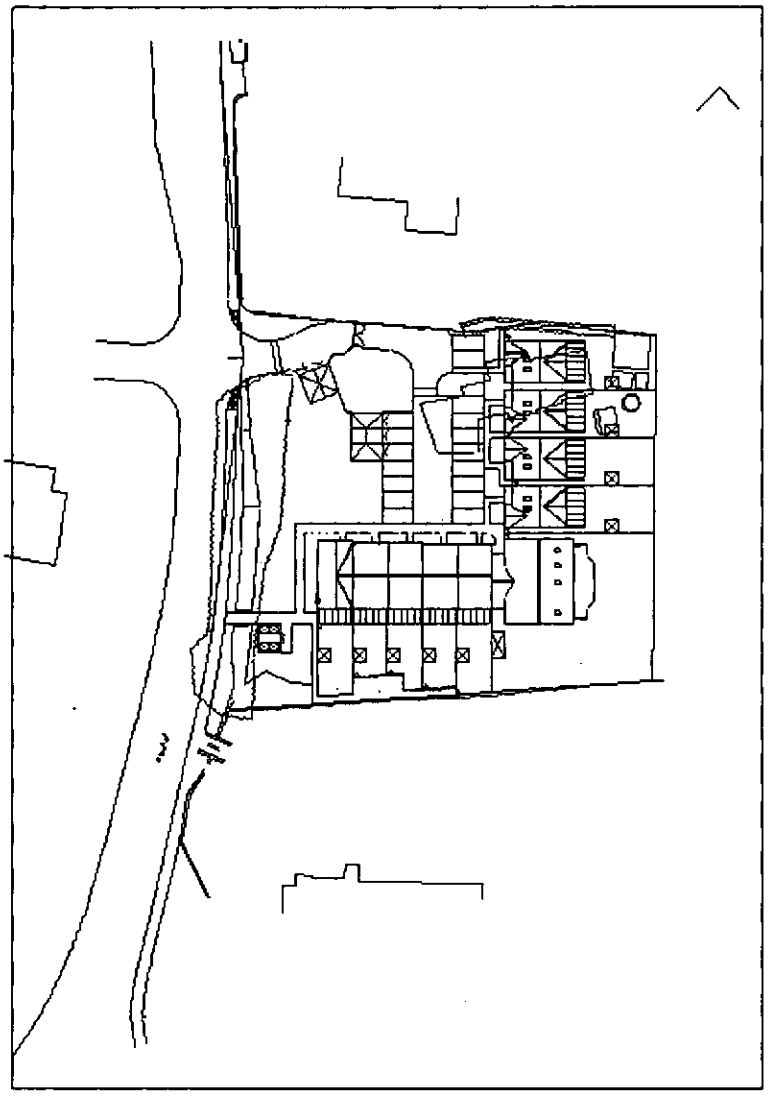
3.2 Access to the site would be from Station Road onto an existing tarmac drive.

3.3 From the British Geological survey map, the soil is described loamy with a high water table.



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**Proposed layout Plan (not to scale)**



## 4.0 Existing Trees

4.1 Only trees of significant stature were inspected and trees with a stem diameter (SD) of less than 75mm have in general been excluded.

4.2 Each tree has been assessed in terms of its Arboricultural, landscape, cultural and conservation values in accordance with BS 5837:2005 'Trees in relation to construction' and placed within one of the following categories:

**Category R**: Trees in such condition that any existing value will be lost within 10 years and which should , in the current context, be removed for reasons of sound Arboricultural contribution (a minimum of 40 years is suggested).

**Category A:** Trees of high quality and value: in such a condition as to make a significant contribution (a minimum of 40 years is suggested)

**Category B:** Trees of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).

**Category C:** Trees of low quality and value which might remain for a minimum of 10 years or young trees with stems less than 150mm diameter.



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4.3 Whilst the assessment of a trees condition is a subjective process, Table 1 of British Standard 5837: 2005 (see appendix 1a) gives clear guidance on the appropriate criteria for categorizing trees and in, particular, the factors that would assist the Arboricultralist in determining the suitability of a tree for retention.

4.4 BS 5837 makes a clear differentiation between trees on development sites and trees in other situations where retention of lower quality trees may be acceptable or possible for the short term:

> ***4.3.4*** *In the categories, A, B, C, which together deal with trees that should be a material consideration in the development process, the subcategories are intended to reflect arboricultural, landscape and cultural values respectively. Category R trees are those that would be lost in the short term for reasons connected with their physiological or structural condition. For this reason, they should not be a consideration in the planning process.*
>
> ***4.3.7*** *When assigning trees to any of the categories, the presence of any serious disease or tree-related hazards should be taken into account. If disease is fatal and/or irremediable or likely to require sanitation for the protection of other trees, the trees concerned may need to be categorized as R, even if they otherwise have considerable value. If mechanical defects present an unacceptable risk to people and property, the extent to which the defects are remediable, including the effect that this might have on the tree's remaining value, should indicate whether the tree should still be assigned to the category that it would otherwise merit.*

4.5 There are no young trees growing on the site for consideration.

4.6 Five trees were graded as category "A", those in such a condition to make a substantial contribution of a minimum of 40 years.

4.7 Seventeen trees were graded category "B". Generally, these trees do not have high individual merit however; they have some landscape significance and can be expected to thrive for 20 years or more.

4.8 Eleven trees were graded as category "C". These trees are of low quality or have low individual landscape value but may have some screening value.

4.9 Nine trees were graded for removal as category "R" having no long-term value.

4.10 The surveyed trees are listed in Appendix A, which includes key and explanatory notes.

4.10 Each tree has been assessed in terms of its Arboricultural, landscape, cultural and conservation values in accordance with BS 5837:2005 'Trees in relation to construction' and placed within one of the following categories:

4.11 Whilst the assessment of a trees condition is a subjective process, Table 1 of British Standard 5837: 2005 (see appendix 1a) gives clear guidance on the appropriate criteria for categorizing trees and in, particular, the factors that would assist the Arboricultralist in determining the suitability of a tree for retention.



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***Category R criteria from BS 5837:2005 - Table 1:***

- *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 R category trees (i.e. 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 (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality.*

4.13 BS 5837 makes a clear differentiation between trees on development sites and trees in other situations where retention of lower quality trees may be acceptable or possible for the short term:

***4.3.4*** *In the categories, A, B, C, which together deal with trees that should be a material consideration in the development process, the subcategories are intended to reflect arboricultural, landscape and cultural values respectively. Category R trees are those that would be lost in the short term for reasons connected with their physiological or structural condition. For this reason, they should not be a consideration in the planning process.*

***4.3.7*** *When assigning trees to any of the categories, the presence of any serious disease or tree-related hazards should be taken into account. If disease is fatal and/or irremediable or likely to require sanitation for the protection of other trees, the trees concerned may need to be categorized as R, even if they otherwise have considerable value. If mechanical defects present an unacceptable risk to people and property, the extent to which the defects are remediable, including the effect that this might have on the tree's remaining value, should indicate whether the tree should still be assigned to the category that it would otherwise merit.*

## THE DEVELOPMENT

### 5.0 Development Appraisal

5.1 The proposed development is to construct 14 housing units. I do not consider the construction to cause any long-term problems for the survival of the remaining trees if the recommendations in this report are followed.

5.2 It will be necessary to identify an appropriate location within the site for the positioning of site huts and for the storage of construction materials during the construction period where no harm will be done to the remaining trees.

5.3 Access for construction traffic will be from Station Road and no other access will be possible.

5.4 No specific information has been provided regarding the positioning of any new underground services. It would need to be routed to avoid damage to the roots of remaining trees.



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## 6.0 Arboricultural Implications Assessment

6.1 The primary criterion in arboricultural terms is the retention of as many appropriate trees as is practicable. Quite apart from the requirement to retain some of the existing character, the presence of trees is generally accepted as being beneficial to the environment. The following is an assessment of the effects of the proposed development on existing trees and the future landscape. Full details of recommended works are provided within the schedule of trees at Appendix A. Supervision of this work may be required at the time of work by an arboricultural consultant.

**Recommended tree removals for reasons of sound arboricultural management**

6.2 The removal of 9 category "R" trees together with a further 4 "C" category is recommended as a matter of good arboricultural practice and would be advisable irrespective of these development proposals.

**Tree pruning required to facilitate development**

6.3 Some minor tree pruning works will be required to facilitate the construction and eliminate damage from high sided vehicles. Some work is recommended to the trees for management and safety that is recommended prior to the development commencing. The pruning requirements are included in the schedule of trees at Appendix A.

**Tree losses to facilitate the development**

6.4 A number of trees have already been removed prior to this current survey report and further tree removals are now recommended.

**Encroachment of the Root Protection Area**

6.5 The construction will involve encroachment of the root protection areas by two trees T2 and T4 and the developer may find it necessary to excavate within the RPA's of these two trees to provide services. Only five timber framed garages will be constructed over this area on concrete lintels on top of the RPA.

**Potential for Damage to Tree Trunks**

6.7 Due to the proximity of the proposed building to the adjacent trees, there is always a risk of direct physical damage to the trunk of the trees during the construction process and its related activity. There should be no construction activity in this area or storage of materials.

**Landscaping**

6.8 On completion of the development, planting has already been planned for the site. On the west side I would further recommend cleaning out undergrowth of brambles and elder bushes, then planting with evergreen shrubs on the bank to screen the development and return the edge to how it was viewed from the road prior to erection of boundary hoarding. All planting must be ensured to establish and any dead, replaced in the next planting season over a five year period.

6.9 Suggested tree species tall standards 3.6-4.2 m high for planting to maintain the character of the site could be selected from would be:

English Oak, Tulip Tree, Birch, Turkish Hazel, Manna Ash, Pride of India (*Koelreuteria*), Double Flowered Wild Cherry, Mountain Ash and Whitebeam.

**Underground services**

6.10 Whilst no specific information has been provided regarding underground services, it is anticipated that installation of new underground services can be achieved without passing through, or close to, the root protection areas of retained trees.

**Future Pressures/Shading**

6.11 There is likely to be some shading to the units on the south side from remaining trees and those in the churchyard.

6.12 I consider that the relationship between the development and retained trees to be tenable and similar to that being enjoyed by many similar developments in the area. I do not foresee any significant post development pressures for or inappropriate pruning of retained trees.

6.13 Due to the presence of trees around the site, it would be prudent to design the rainwater collection system to allow easy maintenance such as meshed grill caps or easily cleanable traps to down pipes for leaf collection. It is important that these be checked during leaf fall and after to prevent flooding into the buildings. It would also be prudent to allow the rainwater to drain into soakaways from the garages to maintain moisture content of the soil.

## 7.0 TREE PROTECTION MEASURES

**Root Protection Area (RPA)**

7.1 BS5837 provides guidance within paragraph 5.2 for the calculation of root protection areas [RPAs] of those trees to be retained. The RPA is the recommended area in square metres that should be left undisturbed around each tree to ensure that excessive damage to its roots or rooting environment is avoided.

7.2 In the case of open grown trees with an even, radial root distribution, it would normal for the boundaries of the RPA to be equidistant from the trunk of the tree. However, BS5837 acknowledges that the disposition of tree roots can be significantly affected by a number of factors and that the actual position of the RPA will be influenced by specific tree and site factors. These factors are to be assessed by the arboriculturist and appropriate adjustments to the siting of the RPA made.

7.3 The RPA for the retained trees is shown at Appendix B - Plan 2. These measurements should be used when setting out the tree protective fencing.

**Tree Protection Barriers**

7.4 BS5837 requires that the RPA of all retained trees be protected from the effects of development by the installation of protective barriers.

7.5 It should be noted however, that the position of these barriers may also be influenced by the presence of any tree canopies that extend beyond the RPA and that could be damaged by construction works or where it is desirable to protect areas for future tree planting.

7.6 The protective barriers demarcate the 'Construction Exclusion Zone' [CEZ] and should be installed prior to the commencement of any construction works, including clearance or demolition. They should be maintained for the duration of the works. All weather notices should be erected on the barriers with words such as 'Construction exclusion zone – Keep out'. Protective barriers should be in accordance with Figure 2 of BS5837 (or similar accepted), a copy is included as Appendix C. If Heras fencing is used it must be fixed to the ground that it cannot be moved easily



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7.7 The position of protective barriers and the boundary of the CEZ are shown as a blue line in Plan PJE/TPP/CF/ 001 at Appendix B.

7.8 The area within the CEZ is to be regarded as an exclusion zone during the construction period and protective fences and barriers should not be taken down or moved without the written approval of the Local Planning Authority, or where present, the supervising Arboricultural Consultant.

**Ground Protection**

7.9 It will be necessary to provide access for vehicles within the RPA of trees T2 and T4 both Beech trees over the existing tarmac drive. Additional hard surfacing is to be provided under the canopies of these two trees for access and the construction of five garages. It is recommended that the entire RPA of T4 be protected as described in Appendix F and over the tarmac drive during the construction phase. It is accepted that delivery vehicles will be driving over this area and is important that the area remain protected and monitored. Should any excavations be required within the area, they must be carried out by hand and no roots over 25nmm in diameter shall be damaged or cut through. Ground protection is not anticipated in other areas unless fencing has to be moved back over any RPA of trees to allow workmen access. In these instances protection as described in Appendix A shall be employed or alternatively place heavy steel plates that can easily be moved as work proceeds.

**Protection of Tree Stems and Root Buttresses**

7.10 Where the stems of trees are close to the area of construction activity, they may require additional protection to prevent direct physical damage from machinery and vehicles. Only T2 and T4 are close to the construction with a high risk of damage from the sides of Lorries.

7.11 This protection should take the form of a robust vertical barrier constructed from strong timber or scaffolding. It should be securely fixed in a position that allows a minimum gap of 300mm between the barrier and the stem and buttresses of the tree. The barrier should be at least 2m high and should afford protection from any direction from which the risk of injury may arise.

**Cranes and Excavators**

7.12 Particular care and planning is necessary to accommodate the operational arcs of excavation, unloading and lifting machinery, including their loads, especially large building components such as beams and roof trusses. Operations like these have the potential to cause incidental damage to trees and logistical planning is essential to avoid conflicts.

7.13 Therefore, any transit or traverse of plant and materials in close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times.

**General Tree Protection Measures**

7.11 Do not raise or lower soil levels or strip topsoil around trees - even temporarily.

7.13 Avoid disturbing the natural water table level.

7.14 Do not light fires near trees.

7.15 Do not attach notice boards, telephone cables or other services to any part of a tree.

7.16 No construction materials should be stored within root protection areas. Toxins such as diesel, petrol or cement should be suitably stored to prevent such substances leaching into the soil.



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7.17 In addition to protecting existing trees, BS 5837 recommends that areas of the site in which new or replacement tree planting is proposed should also be protected from the effects of construction. There is ample space within those areas already areas already identified, as 'construction exclusion zones' for post development tree planting and landscaping and it is not necessary to specifically protect additional areas for this purpose.

## ARBORICULTURAL METHOD STATEMENT

### 8.0 Preliminary Works

8.1 Prior to the commencement of any other works, the pruning specified in Appendix A and tree removal should be carried out by an appropriately qualified tree contractor. Workmen on the site should be made aware of how to prevent any damage to the tree structure and roots before commencing operations.

8.2 Ground protection measures around tree T 2 and T4 shall be completed prior to demolition of the house and commencement of the construction phase of the development.

8.3 Site huts will be positioned in such positions so as not to cause harm to existing trees required and materials to be delivered, not to be stored where there will not encroach Root Protection Areas of the trees .

8.4 Tree protection measures shall remain in place until completion of the development and may only otherwise be removed to facilitate any post development landscaping.

8.5 No excavations to be made over the Root Protection Areas deeper than 50mm to avoid damaging any roots and no machinery shall be employed.

### 9.0 Installation of Access

9.1 Contractor will only make use of the existing access off Station Road and provide ground protection as appendix F.

### 10.0 Underground Services

10.1 We have seen no information regarding the installation of underground services and it is assumed services required would be electricity, foul, gas and water and can be achieved without damaging the root systems of the trees. It is suggested that services are brought in from the site entrance and routed to the right side of T4. Routing services under the existing drive will have potential to damage roots of T2 & T4 even if dug by hand. If this route is chosen a solution would be to use an "Airspade" that uses compressed air to break up and remove the soil from around roots, leaving them exposed but not damaged to enable ducting and pipes to be installed without damaging the root structure.
For further information see: http://www.aie.org.uk/articles/article_ttrees.htm

***10.2*** Should the installation of underground services within a RPA be unavoidable, it is essential that it be carried out in accordance with National Joint Utilities Group Volume 4: Issue 1:08/10/2007 'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees' [formally NJUG10] and under the supervision of the Arboriculturist.
***http://www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf***



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## 11.0 Arboricultural Supervision

11.1 The installation of tree protection measures should be supervised by an appropriately experienced Arboriculturist who should be appointed to monitor the observance of those measures for the duration of the development.

11.2 The Arboriculturist should directly supervise any works that have to be undertaken within RPAs. These include the removal of any hard surfacing, the installation of any underground services and the construction of any new footpaths or hard surfaces.

11.3 The Arboriculturist should be informed immediately of any accidental damage made to trees and make written recommendations to rectify damage.

## CONCLUSIONS

12.1 These development proposals have been assessed in accordance with British Standard 5837: 2005 'Trees in relation to construction'

12.2 There are tree removals recommended and necessary in terms of good arboricultural practice.

12.3 These development proposals have been assessed in accordance with British Standard 5837: 2005 'Trees in relation to construction'

12.4 All the retained trees will be protected from the effects of development by means of appropriate protective barriers and ground protection throughout the duration of the works.

12.5 The observance of the Arboricultural Method Statement, together with any additional guidance from the Arboricultralist will ensure the successful integration of these proposals with the retained trees.

12.6 No irresistible post-development pressures are anticipated that would oblige the Local Planning Authority to give consent to inappropriate tree works in the future.

12.7 In consideration of the information provided and my own site observations I am satisfied that the proposals for this site are arboriculturally sound and that the long term well being of retained trees will be safeguarded in a sustainable manner.

## RECOMMENDATIONS

13.1 The nine category R trees, T1, T5, T6, T12a, T14b, T26, T39, T50 and T54 that fall within category R as defined by British Standard 5837: 2005 and should be removed for arboricultural reasons.

13.2 Four "C" category trees T37, T42, T43 and T44 all are recommended for removal for arboricultural reasons and to benefit the site in the long term.

13.3 Pruning works as specified in the schedule of trees should be carried out both in the interests of sound arboricultural management and, where required, to avoid damage to trees during construction.

13.4 The tree protection measures detailed in this report should be implemented and supervised by an appropriately experienced Arboricultralist.

13.5 Appropriate post development landscaping proposals should be implemented to ensure sustained, effective tree cover on the site.



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Signed:

**Phillip Ellis** MI Hort, Tech Arbor A

Date: 14th March 2011

**The statements in this Report do not take account of the effects of extremes of climate, vandalism or accident, whether physical, chemical or fire. Phillip Ellis cannot therefore accept any liability in connection with these factors, nor where prescribed work is not carried out in a correct and professional manner in accordance with current good practice. The authority of this Report ceases at any stated time limit within it, or if none stated after two years from the date of the survey or when any site conditions change, or pruning or other works unspecified in the Report are carried out to, or affecting, the subject tree(s), whichever is the sooner.**



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**Appendix a – Schedule of trees**
**NB**. Trees with (TPO) in species column are those in group G1 identified by Arun District Council.

**Recommended contractors**:

I offer two local firms as being capable of carrying out the work to the required BS standard. Recommended tree works will be required to be in accord with British Standard 3998: 2010 Tree Work [BS3998].

Mr Ian Tooth
Fox Earth,
58 Roedean Road,
Worthing,
West Sussex,
BN13 2BT.

Mob: 07787 566 991
Tel: 01903 610086
www.fox-earth.co.uk

Mr P. Arnott,
ArbTec Tree Care,
58 Downside Avenue,
Worthing,
West Sussex,
BN14 0EX.

Tel: 01903 216362
Mob: 07941 321239
Email: arbtectreecare@hotmail.co.uk
Web: www.arbtectreecare.co.uk

# Appendix A - Key

1. **Tree No:** Relates to individual tree numbers on a plan or, where used, tags on trees or groups of trees. The prefix indicates whether the tree or trees are an individual, a group, a woodland or a hedge (T, G, W or H)

2. **Species:** The name given is the 'common name'. Where Latin names are given they are shown in *italics*

3. **SD:** Trunk diameter at 1.5 metres ('breast height') above ground level, given in millimetres. In the case of multi-stemmed trees (ms) the stem diameter is taken just above the root flare

4. **H** (Height) The height measured in metres with the aid of a clinometer

5. **R (Crown radius)** The average crown spread taken from the centre of the trunk to the tips of the live lateral branches given in metres. May be given as separate measurements following the compass points N-E-S-W.

6. **Age:**

| | |
|---|---|
| Y | Young |
| MA | Middle aged - 1/3 to 2/3 life expectancy |
| M | Mature - over 2/3 life expectancy |
| OM | Over-mature - fully mature, past peak condition and beginning to decline |
| V | Veteran - trees of interest biologically, aesthetically or culturally because of significant age. |

7. **PC:** Physiological Condition – An assessment of the health and vigour of the tree compared with what would normally be expected of the species:

| | |
|---|---|
| G | Good |
| F | Fair |
| P | Poor |
| D | Dead |

8. **Comments:** Comments have been made in relation to the following:

- Health or condition
- Structural defects/safety
- Aesthetics
- Future potential
- Relationship to other trees or features
- Extent of ivy growth, if present
- Any other relevant details

9. **Recommendations:** Preliminary management recommendations in relation to the proposed development are made where appropriate. These may include remedial tree works that are deemed necessary to improve the quality of the tree or for safety reasons. Recommended tree works will be required to be in accord with British Standard 3998:1989 Tree Work [BS3998].

10. **Life Expectancy**: an estimate of the future life expectancy of the tree(s) in the present setting given normal circumstances, given in years (< = less than > = greater than).

11. **BS5837 Category**: A qualitative assessment of the tree based on criteria detailed in BS5837:2005 Table 1.

| | |
|---|---|
| R: | Trees for removal |
| A: | Those of high quality and value |
| B: | Those of moderate quality and value |
| C: | Those of low quality and value |

Please note that trees are living organisms and their condition is subject to change over time. Assessments are based on their condition on the day of inspection and cannot cover unforeseen circumstances.



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## Table 1 — Cascade chart for tree quality assessment

**TREES FOR REMOVAL**

| Category and definition | Criteria | Identification on plan |
|---|---|---|
| **Category R**<br>Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management | • 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 R category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)<br>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline<br>• Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality<br>NOTE Habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost; installation of bat box in nearby tree). | DARK RED |

**TREES TO BE CONSIDERED FOR RETENTION**

| Category and definition | Criteria — Subcategories | | | Identification on plan |
|---|---|---|---|---|
| | 1 Mainly arboricultural values | 2 Mainly landscape values | 3 Mainly cultural values, including conservation | |
| **Category A**<br>**Those of high quality and value:** 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 visual 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) | LIGHT GREEN |
| **Category B**<br>**Those of moderate quality and value:** 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 semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category 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 | MID BLUE |
| **Category C**<br>**Those of low quality and value:** 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 150 mm | 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 | GREY |
| | NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm should be considered for relocation. | | | |

## Appendix B – Root Protection Areas (RPA) of Retained Trees

| Tree ID | Species | Stem Dia (mm) | RPA (m2) | RPA Radius (M) |
|---|---|---|---|---|
| T2 | Beech | | 137 | 6.5 |
| T4 | Beech | 1150 | 598 | 13.5M |
| T7 | Yew (TPO) | 250 | 28 | 3 |
| T8 | Yew (TPO) | 450 | 92 | 5 |
| T10 | Oak (TPO) | 250 | 28 | 3 |
| T11 | Yew (TPO) | 250 | 28 | 3 |
| T12 | Fastigiate Beech var Dawyck (TPO) | 350 | 55 | 4 |
| T13 | Magnolia campbellii var mollicomata | 600 | 18 | 2 |
| T14 | Paper Bark Maple (TPO) | 200 | 18 | 2 |
| T16 | Flowering cherry (TPO) | 120 | 6 | 1.5 |
| T17 | Norway Maple (TPO) | 380 | 41 | 3.5 |
| T22 | London Plane | 350 | 55 | 4 |
| T23 | Sycamore (TPO) | 200 | 18 | 2 |
| T24 | Yew | 50 | 1 | 0.5 |
| T25 | Yew | 400 | 72 | 4.8 |
| T27 | Lawson's cypress | 200 | 18 | 2.4 |
| T28 | Sycamore | T600 | 163 | 7.2 |
| T29 | Euchryphia nymansensis | 150 | 10 | 1.8 |
| T30 | Sycamore | 200 | 18 | 2 |
| T32A | Yew | 1800 | 15 | 707 |
| T33 | Japanese Maple | M75 | 2 | 0.75 |



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| Tree ID | Species | Stem Dia (mm) | RPA (m2) | RPA Radius (M) |
|---|---|---|---|---|
| T34 | Handkerchief tree | 500 | 113 | 6 |
| T35 | Purple leafed Hazel | M50 | 1 | 0.5 |
| T37 | Lawson's cypress | 100 | 5 | 5 |
| T38 | Cedar | 75 | 3 | 1 |
| T42 | Lawson's cypress | 75 | 3 | 1 |
| T43 | Western Red Cedar | 100 | 5 | 1 |
| T46 | Sweet Gum | 250 | 28 | 3 |
| T48 | Incense Cedar | 300 | 41 | 3.6 |
| T49 | Sweet Gum | 175 | 14 | 2 |
| T50 | Maple | 300 | 41 | 3.5 |
| T51 | Aesculus hippocastanum | 400 | 72 | 4 |

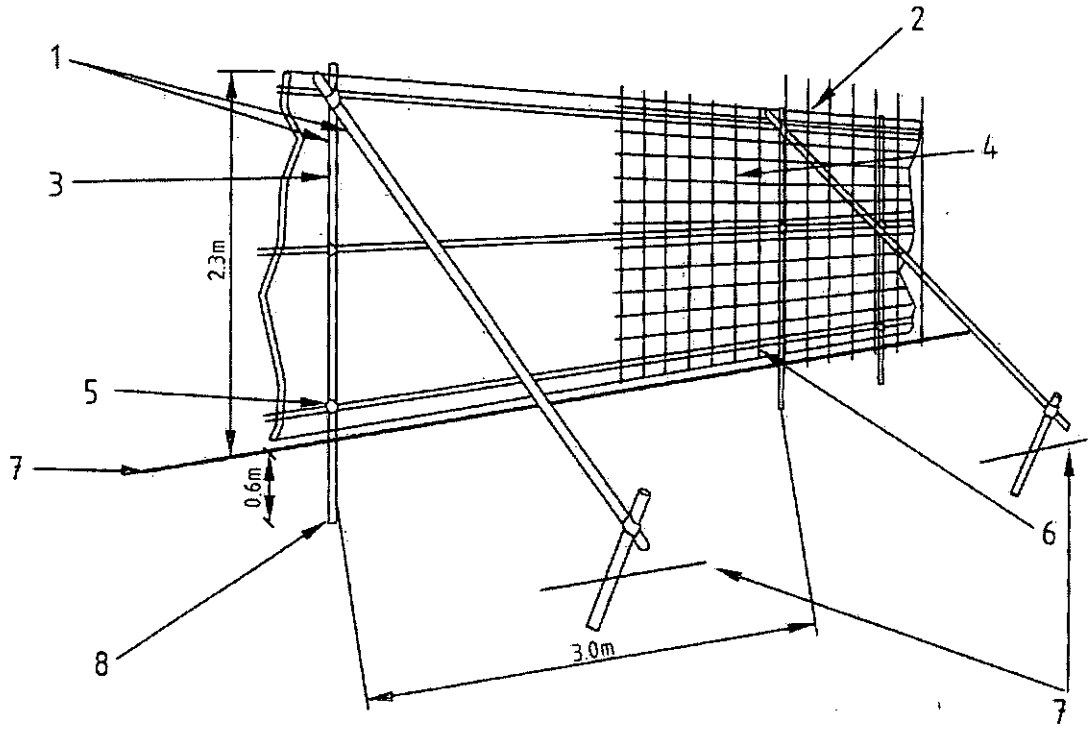
**Notes:**
Root Protection Area radii are rounded to the nearest 0.5m
Stem diameters (SD) are measured at 1.5 metres ('breast height') above ground level, given in millimetres. In the case of multi-stemmed trees (ms), the stem diameter is taken just above the root flare in accordance with BS 5837: 2005.



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## Plan 2 - Tree Protection Plan PJE/TPP/001

# Appendix C Protective Barriers [BS 5837:2005 Figure 2)




1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and where necessary standard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

**Figure 2.— Protective barrier**



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## Appendix D

## **Scaffolding within a Root Protection Area** [Figure 3, BS 5837: 2005]

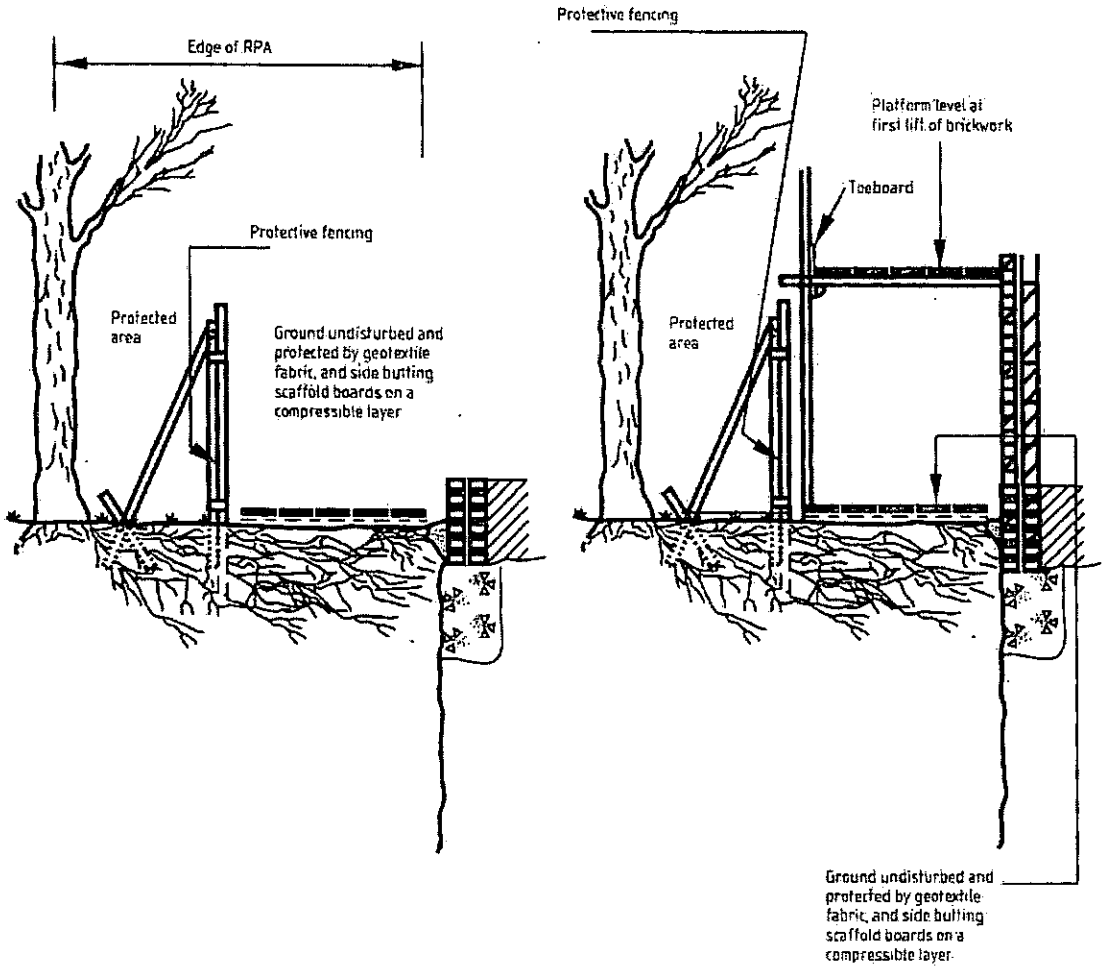



**Figure 3 — Scaffolding within the RPA**

## Appendix E

### Method Statement for the removal of hard surfacing and buildings near trees

[RPA refers to the Root Protective Area as specified in the Report, derived from paragraph 5.2.2 of British Standard 5837:2005 'Trees in relation to construction –Recommendations']

1. The uptake of the existing surface and buildings should be carried out from outside the RPA whenever possible and from within the footprint of the existing surfacing or building where this is within the RPA of a tree.

2. The excavation of the material must not extend into the soil underneath. In practical terms the bucket of the excavator must be used so that the cutting edge is horizontal so that any disturbance of the underlying soil is kept to an absolute minimum. The cutting edge of the bucket should be flat and without 'teeth' to further reduce the risk of root damage. Where the surfacing is very thin and/or roots are very near the surface, the digging should be done manually.

3. The rubble must not be stockpiled within the RPA of the tree and must be exported without crossing the RPA.

4. Due care and planning must be taken to ensure that the operational arcs of excavators do not damage the crowns of retained trees.

5. Where new surfacing is to be installed, if the depth of the old surface is insufficient, the wearing surface may need to be higher than existing in order to accommodate the appropriate thickness. There may be a requirement for a geo-textile membrane to be laid on the soil surface, but this is an engineering matter dependent upon soil type. The separation is beneficial for root development.

6. Where the old surface is taken up and not replaced, the infill should be of good quality topsoil laid without compaction.



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## Appendix F Installation of driveways close to trees using the 'No Dig' method and a cellular confinement system

1. Remove surface vegetation using a systemic herbicide and gather dead organic material. Care must be taken to select (by reading the product label) a herbicide that will not affect the roots of retained trees and vegetation. This must be carried out by an appropriately trained operative.

2. Remove major protrusions such as rocks and stumps (stumps should be ground out to minimise ground disturbance).

3. Any exposed roots should be covered with good quality top soil immediately to prevent them drying out. Any damaged roots should be cut cleanly with a hand saw or secateurs.

4. Fill significant hollows with sharp sand.

5. Install the non woven 'Geotextile' directly on top of the finished soil grade level to provide protection to and separation from the soil level.

6. Lay the three dimensional 'Geogrid' directly onto the soil over the whole of the driveway or parking area. http://www.geosyn.co.uk/products/cellweb.asp?product_id=2

7. Install kerbs or edgings directly on top of the existing soil grade level. For light structures a treated peg and edging board may be acceptable. For more substantial construction railway sleepers, drilled kerbstones or gabions should be used and held in place with track or road pins.

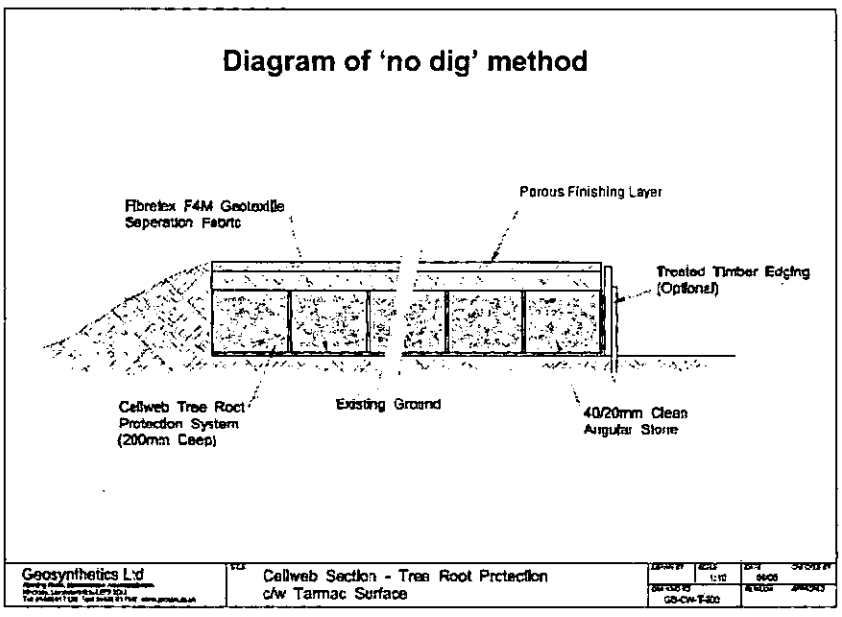
8. Cover the geogrid with a minimum of 100mm of aggregate (DoT Type1). This should be placed near one end and spread along the geogrid so that machinery only moves on the laid sub-base. The aggregate should not be tipped straight onto the geogrid.

9. Compact the sub-base to ensure binding with the geogrid and to minimise future rutting of the surface.

10. Install temporary surface if necessary

11. Install final surface which should be permeable and gas porous. Where brick paviors are used these should be laid on a dry bed and should not be pointed/grouted.

**Diagram of 'no dig' method**

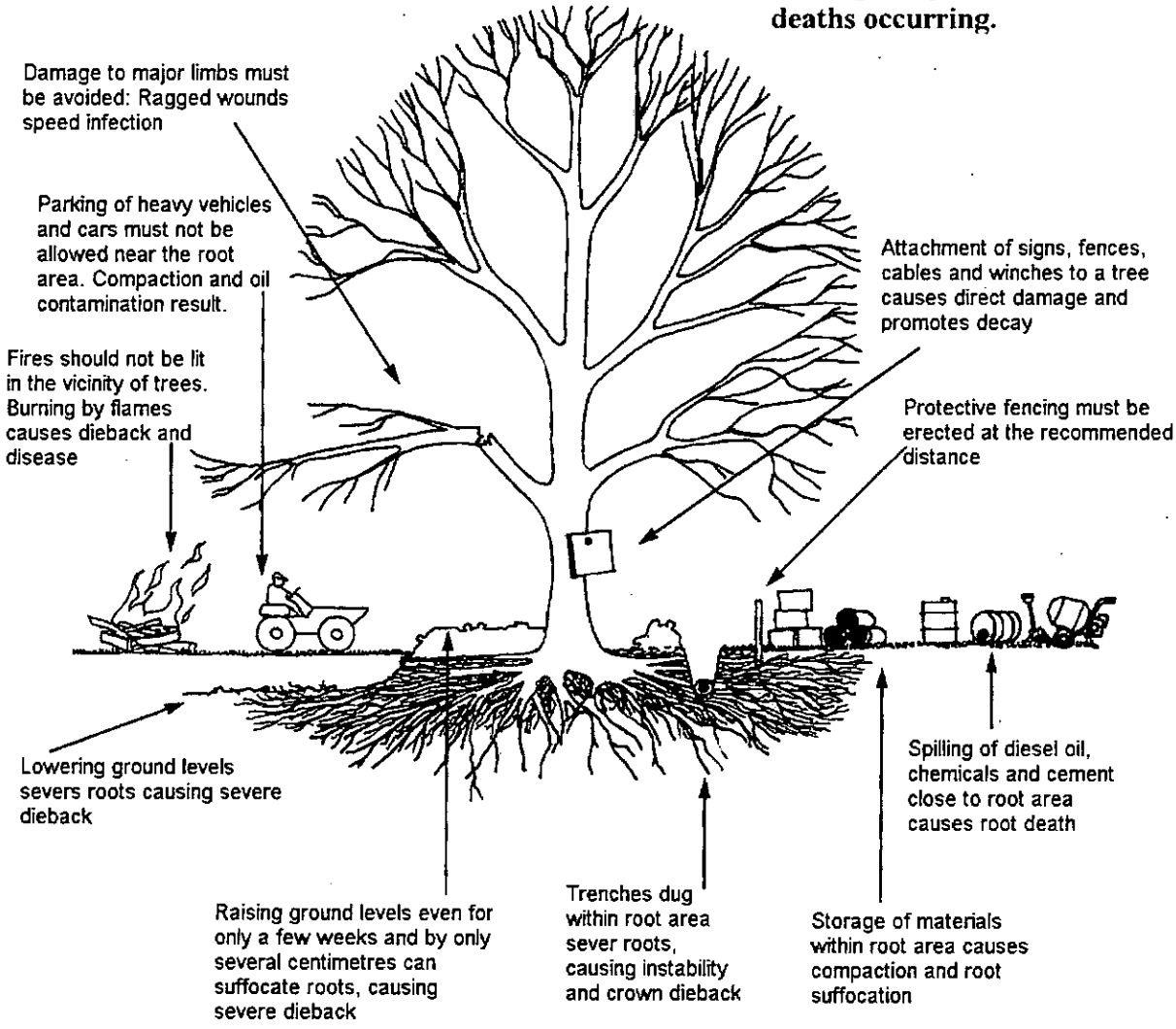





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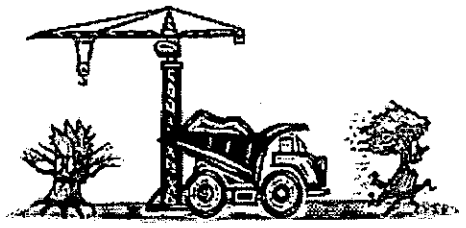
# *Common causes of Tree Death*

**The use of properly positioned protective fencing can prevent tree deaths occurring.**




*Please use copies of this as an on-site poster for personnel*

# Construction and Trees



## Why Is Fencing Erected Around Trees?

1. The major cause of damage to trees on construction sites is due to **soil compaction**.

2. Roots use the spaces between soil particles to obtain Oxygen, Water and Nutrients.

3. Heavy plant and machinery compresses (compacts) the soil, squashing out the air spaces and preventing root function.

4. A compacted soil structure will stay compacted.

5. Consequently the tree suffers and will show signs of branch die-back.

6. Symptoms such as die-back may take several years to appear.

7. Soil compaction over roots can be prevented by maintaining a fenced exclusion zone over the tree roots.

8. The exclusion zone distance is calculated using British Standard 5837.

9. Protective Fencing is installed at the calculated distance.

10. Protective Fencing is a condition of planning approval, if it is removed or repositioned the construction firm is in breach of a condition and may be subjected to legal action.



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