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Site **New Sports Centre, Lancing College**

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Arboricultural Assessment to cover the requirements Under B.S.5837:2005. Trees in relation to construction

For

The re development of the existing Sports Hall and Swimming Pool, Lancing College, Lancing, West Sussex, BN15 0RW.

Prepared by

Steve Wood O.N.D.Arboriculture

M.Arbor.A

Date: 15th December 2010

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1.0 Introduction

1.1 Purpose of this arboricultural method statement.

This document draws together all the information relevant to tree protection and management on the site. A copy must be given to the site manager before development commences. It must be available on site throughout the development process as a quick reference for the site manager.

1.2 Relevant references:

This arboricultural method statement is based on the assumption that the minimum general standards for development issues are those set out in British Standards Institution (2005) BS ~5837: Trees in relation to construction Recommendations and National Joint Utilities Group (1995) Publication Number 10:

Guidelines for the planning, installation and maintenance of utility services in proximity to trees.

It is based on a ground level tree assessment and examination of external features only – described as the 'Visual Tree Assessment' method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994).

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1.3 **Details of Consent and description of development**

Location of development: Area to the north of the Chapel with existing buildings forming the Sports Centre and Swimming Pool.

Council reference: None available.

Description of development: New Sports Hall and Swimming Pool.

Local Authority: Ardur District Council

2.0 ISSUES AND SPECIFICATIONS

2.1 **Pre-Commencement**

Site meeting: A pre-commencement meeting must be held on site before any of the demolition or construction work starts. This must be attended by the site manager/agent, the arboricultural consultant and a council representative. If a council representative is not present, the arboricultural consultant must inform the council in writing of the details of the meeting. **All tree protection measures detailed in this document must be fully discussed so that all aspects of their implementation and sequencing are understood by all the parties. To avoid any possible disagreement with the Tree officer over the correct location of the tree protection barriers I would strongly recommend that this is erected with on site Arboricultural supervision. If this is not authorised I cannot accept any liability if issues arise over the incorrect positioning of the barriers and possible site construction delays**. Any clarifications or modifications must be recorded and circulated to all parties in writing. It may be appropriate for the tree surgery contractor to attend this meeting.

3.0 Site Details

3.1 **Development location:** The area to the north of the chapel is currently used as the college's sports hall, swimming pool and associated car parking.

4.0 TREE SURVEY

4.1 **Scope and Limitations of Survey**

The survey and this report are concerned with the arboricultural aspects of the site only.

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4.2 This survey is restricted to trees within the site or those outside the site that may be affected by its re-development. No other trees were inspected.

It is based on a ground level tree assessment and examination of external features only – described as the 'Visual Tree Assessment' method expounded by Mattheck and Breloer (The Body Language of Trees, DoE booklet Research for Amenity Trees No. 4, 1994).

4.3 Only trees of significant stature were surveyed. In general, trees with a stem diameter at breast height [DBH]) of less than 75mm have been excluded unless they have particular merit that warrants comment.

4.4 No plant tissue samples were taken and no internal investigation of the trees was carried out.

4.5 No soil samples were taken or soil analyses carried out.

4.6 The risk of tree-related subsidence to structures has not been assessed.

4.7 I have no knowledge of existing or proposed underground services.

4.8 The positions of trees have been plotted by GPS this being accurate to +/- 1m. They have been overlaid on to plans provided my client (produced by others) and are shown on my Tree Survey Plan SMW/L.C Sports hall/TS/001. (See Appendix 3). The tree locations have also been verified from the topographical survey also issued to me.

4.9 This report should be read in conjunction with viewing this amended plan and the Tree Protection Plan [TPP] SMW/L.C/Sports hall/TPP/002 Revision 2 (see Appendix 4).

4.10 General exclusions.

Unless specifically mentioned, the report will only be concerned with above ground inspections. No below ground inspections will be carried out without the prior confirmation from the client that such works should be undertaken.
The validity, accuracy and findings of this report will be directly related to the accuracy of the information made available prior to and during the inspection process. No checking of independent third party data will be undertaken. SMW Consultancy will not be responsible for the recommendations within this report where essential data are not made available, or are inaccurate.
This report will remain valid for one year from the date of inspection, but will become invalid if any building works are carried out upon the property, soil levels altered in any way close to the property, or tree work undertaken.

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If alterations to the property or soil levels are carried out, or tree work undertaken, it is strongly recommended that a new tree inspection be carried out.

5.0 Survey Method

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

In some cases groups of trees are discussed collectively where individual identification has been deemed unnecessary.

5.2 The stem diameters [SD] of single stemmed trees were measured in millimetres at 1.5m above ground level. Multi-stemmed trees were measured immediately above the root flare [ARF].

5.3 The height of each tree was estimated visually or, where possible, by using a Clinometer.

5.4 The crown radii were laser measured and is given for each main compass point: north, east, south and west.

5.5 The dimensions of trees within groups are given as an average figure unless otherwise stated.

5.6 Where access to trees was obstructed or obscured measurements/ dimensions have been estimated.

6.0 Each tree has been assessed in terms of its arboricultural, landscape, cultural and conservation values in accordance with BS 5837 and placed within one of the four following categories:

Category R: Trees in such 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.

Category A: Trees of high quality and value: in such a condition to make a substantial 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 of less than 150mm diameter.

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6.1 Whilst the assessment of a tree's condition is a subjective process, Table 1 of BS5837 (see Appendix 8) gives clear guidance on the appropriate criteria for categorising trees and, in particular, the factors that would assist the arboriculturist in determining the suitability of a tree for retention.

7.0 Assessed trees:

7.1 A total of 62 trees have been included in the report, these been deemed to be within influencing distance of the proposed development area.

7.2 Six category A trees were identified within the inspected area or adjacent to it.

7.3 Thirty nine category B trees where assessed none have high individual merit but, benefit the general landscape.

7.4 Seventeen category C trees these have little benefit to the landscape, due to the high density of the surrounding vegetation and lack of maintenance or crown suppression.

7.5 No category R trees / groups were assessed on site.

8.0 Development proposal.

8.1 The proposal is to demolish the existing sports hall and swimming pool buildings and construct replacement buildings of a slightly larger footprint , The Swimming Pool is to be located on the east side of the new Sports Hall in the existing car Park area. Both locations should provide greater clearance to the more desirable retentive trees.

8.2 There will be a slight alteration to the entrance road layout in the increase in turning radius on the north west corner, this has little impact on the retained trees.

8.3 There may be a requirement to re surface sections on the entrance/exit road and car park, if this is necessary this construction will be fully covered later in this report .

8.4 No information has been provided as to the positioning of any underground services to the buildings, it is presumed these will be positioned clear of any tree root protection areas.

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9.0 Arboricultural Implications Assessment

9.1 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 6.

9.2 The sound side of the existing building area has been excavated to allow construction of the building, this has resulted in a steep slope up to the existing internal road level, within this area number of significant trees which are vital to the sites continued high aesthetic environmental impact, the slope causes issues for good root development and continued tree stability, this is evident form the large amount of surface supportive roots being visible.

10.0 Recommended tree work and management:

10.1 The removal of tree numbers, T17, T26, T27 and T28 Some minor trees below 75mm in stem diameter where on the site but not assessed.

10.2 All remaining trees are to be retained.

10.3 All these recommendations are included in the tree survey in Appendix **6.**

11.0 Replacement planting: There is sufficient area to provide additional planting for any trees removed to allow for the development to proceed.

11.1 A planting scheme is being prepared and to be submitted with the application, this has been designed by a specialist Landscape design company.

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12.0 Access Road:

If any new road surface has to be constructed within any trees RPA then the following construction method must be followed. The construction would be under the guidance of APN 12 (See Appendix 5) and would simply be of a cellular confinement grid filled with a none fines aggregate. There will be no requirement to excavate within the RPA's for this type of construction and therefore don't anticipate any detrimental effect upon the trees, particularly as they have become accustomed to vehicular movement under them for some time with less protection. This construction should be carried out without the use of machinery within the RPA as per the guidance in APN12. (See Appendix 5)

12.1 General construction method

1) Tanalised softwood pegs at 1500mm centres.
2) Top soil banked up to edging.
3) Softwood boards / Concrete edging 'tiles'.
4) Existing surface to be cleared of ground vegetation using a translocated herbicide.
5) Geo-textile matting "Terram" laid on top of footpath.
6) "Geocell" Cellular Confinement System (150mm deep) with gravel chippings.
7) Geo-textile matting "Terram" laid on top of cellular confinement system.
8) Gravel or paving laid on top of permeable sub-base.

12.2 Where surfaces under the trees RPA has to be re laid and re surfaced within these areas, this must not be carried out with the aid of any mechanical excavators. The work must be carried using hand tools, if roots are found Arboricultural advice must be sought on how to overcome the issue, this is likely to be an issue with the Poplars along the north boundary if this road is re-laid. A more detailed construction method and mitigation procedure is documented in appendix 2 Para 2.0-4.0

Tree protection measures:

13.0 **Protective barriers and root protection areas (RPAs):** Illustrative guidance for protective barriers based on advice in BS 5837 is included as Appendix **1.** The approximate location of the barriers and RPA is illustrated on plan SMW/ L.C/Sports hall/TPP/002 Revision 2 as set out on the plan key. The precise location of the barriers must be agreed with the council on site before any development activity starts. Measurements are provided for the correct positioning of the protective fencing in Appendix **9**

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13.1 **Site guidance for working in RPAs:** Any work in RPAs must be done with care as set out in Appendix **2**.

13.2 **Root Protection Area:** 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.

13.3 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 sighting of the RPA made.

Tree Protection Barriers

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

13.5 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. To permit the construction of the new drive the Protective Barriers have been positioned not in accordance with the shown RPA's but at the drive edge. Until this is completed no machinery should be allowed in to this area

13.6 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 **1**.

13.7 The position of protective barriers and the boundary of the CEZ are shown as a solid Blue line in SMW/ L.C/Sports hall/TPP/002 Revision 2 in Appendix 4.

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13.8 I have not allowed for any Root Protection Area offset for the trees along the south boundary and the internal road, this is due to there being no validity in doing so due to the natural root restriction created by the road and retaining wall. To provide the maximum protection the whole of the area has been indicated to be fenced off.

13.9 **Removal of existing surfacing and replacement with new surfacing:** Trees which have existing surfacing and structures to be removed and replaced with soft landscaping within their RPAs and may be adversely affected by this activity. Any adverse impact must be minimised by following the general guidance set out in Appendix **2.**

13.10 **Installation of new surfacing:** Trees having new surfaces to be installed on exposed soil within their RPAs and may be adversely affected by this activity. Any adverse impact must be minimised by following the general guidance set out in Appendix 5 Illustrative specifications for special surfacing are included as Appendix **5.**

13.11 Any future footpaths which may be within the RPA(s) recommended in BS 5837:2005, Table 2. Specific detail will be paid to the design and specifications of any hard surfaces. In these areas, it is proposed that the construction of footpath will be along the lines of the Arboricultural Advisory Information Services (AAIS) Practice Note 1 "Driveways Close to Trees", the only difference being that in conjunction with the 'geo-web, the road stone will be incorporated in and retained by 'Terram' geo-web, cellular confinement system' or similar. Where it is necessary to remove the existing hard surface or lower the ground level exposing roots within the BS 5837:2005 RPA, this will be excavated by hand and the roots surrounded by sharp sand, with the greatest of care being taken to cause the minimum of damage to the roots.

13.12 **Installation of new structures**: Trees having new retaining walls for a parking area and the building to be installed close to the edge of their RPAs and may be adversely affected by this activity. Any adverse impact must be minimised by following the general guidance set out in Appendix **2.**

13.13 There is a proposal to construct an access footbridge from the main internal road to the first level of the complex, and a flight of steps to the car park. Their location is in the approximate area of T2, T3 and T4. The construction details have yet to be finalised as is the impact on these trees, T2, and T4 both have a limited life expectancy, it may be possible to utilise the existing ground support for the concrete steps as a new support for this access. When a decision is made over the exact

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location and construction I can build this in to the report , and its likely affect on the trees.

13.14 **Site storage, cement mixing and washing points**: All site storage areas, cement mixing and washing points for equipment and vehicles must be outside RPAs unless otherwise agreed with the council. Where there is a risk of polluted water run off into RPAs, heavy-duty plastic sheeting and sandbags must be used to contain spillages and prevent contamination. Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bund compound shall be at least equivalent to the capacity of the tank plus 10%. If there are multiple tanks, the compound shall be at least equivalent to the capacity of the largest tank, or the combined capacity of interconnected tanks, plus 10%. All filling points, vents, gauges and sight glasses shall be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipe-work shall be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets shall be detailed to discharge downwards into the bund.

No specific details have been released as to the compound location but I would anticipate this will be at some point in the car park area, providing the above criteria is adhered to the should be no impact on the trees.

13.15 **Services**: If services need to be installed within RPAs, great care must be taken to minimise any disturbance. Trenchless installation should be the preferred option but if that is not feasible, any excavation must be carried out by hand according to the guidelines in Appendix **2**. If services do need to be installed within RPAs, written approval must be obtained from the council before any works are carried out.

13.16 With regards to raising levels, it is necessary to maintain adequate supplies of water and oxygen through the soil to the trees' roots. Therefore, where necessary, a granular material will be used which will not inhibit gaseous diffusion e.g.; no-fines gravel or cobbles, Type 2 road-stone, and all hard surfaces will be of suitable specification to allow such gaseous diffusion, such as brick pavers.

13.17 To allow the landscaping scheme to be implemented it will be necessary to access areas with some RPA's, this work providing its carried out by hand should not affect the trees health. Prior to commencing this work the Local Authority Tree Officer should be notified.

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Specialist foundations.

14.1 The main buildings location has been carefully positioned to not encroach in to any trees Root Protection area the requirement to construct any specialist foundations nave been avoided. The construction method detailed below only applies to foundations for secondary features i.e. retaining walls to which I'm not aware of at this stage.

14.2 Where the foundations are within the trees RPA there will be a requirement for these to be constructed causing minimal root damage, this I would suggest is in the form of a mini pile and beam type, or House Deck System, The size and location will be dependant on the recommendations of a structural engineer, but flexibility must be incorporated within the
scheme to allow for pile movement if substantial roots are found.

14.3 The construction of this MUST be carried in accordance with Appendix 2 subsection 4.3 and should be supervised by an Arboricultural Consultant to advise on if roots are found.

14.4 The existing building construction involved the excavation on the south side to a depth varying from 2.5 to 3.5m, this probably would have resulted in root damage to the trees along this boundary, which in the subsequent period the trees have adapted to this damage and root loss.

14.5 The proposed new building location does not encroach any further in to this vital root development area ad as such I don't anticipate any additional health impact on these trees. I've highlighted this area in yellow on the Tree Protection Plan as an area of sensitivity to ensure that no construction activity is carried in this area.

14.6 I've also similarly highlighted the area to the north and south of the Rifle range to afford the same protection, there are trees between the building and the internal access road which I've not included in the survey as they are not affected by the development, but should be noted as being present.

15.0 Schedule of tree works: A schedule of recommended tree works is located in appendix **6** all trees are shown on the plan with a reference letter T for trees H for hedges, G for tree groups and W for woodland followed by a number.

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15.1 Conformation should be sought from the relevant Local Authority if there are any restrictive order effecting the trees on the site, and if so the appropriate consent gained.

15.2 Prior to commencement of any works detailed in the schedule of work in Appendix **6** discussions should be held with an appropriately qualified arboricultural contractor. To ensure both parties are fully conversant with the nature of the work to be undertaken.

16.0 Scheduling of works that may affect protected trees:

16.1 In general terms, no construction, excavation or other site operations will commence until tree protection measures are in place and have been agreed in writing as acceptable by the council.

17.0 Developer's responsibilities, initial site visit and subsequent procedures for reporting:

17.1 It is the developer's responsibility to ensure that the details of this arboricultural method statement are known and understood by all site personnel. A copy must be kept on site at all times and the site manager must brief all personnel who could have an impact on trees on the specific tree protection requirements. This must be a part of the site induction procedures and written into appropriate site management documents. The developer must instruct an arboricultural consultant to comply with the supervision requirements set out in this document before any work begins on site. More specifically, the following guidance must be observed:-

17.2 **Supervision visits**: The supervising arboriculturist must visit at an interval agreed at the pre-commencement site meeting. The supervision arrangement must be sufficiently flexible to allow the supervision of all sensitive works as they occur.

17.3 Reporting: The arboriculturist must advise the site manager on any relevant tree issues at the time of the visit, followed by a formal letter of confirmation circulated to all parties, including the council. These site visit reports will form the mechanism for confirming that the tree related planning conditions have been complied with for the duration of the development activity.

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18.0 Wildlife considerations: Prior to commencement of any tree works a full wildlife survey must be carried out to ascertain the possible presence of any wildlife on the ground or within the trees and appropriate action must be taken. Greater detail is covered under the **Landscape protection, recreation and public access: Countryside and Rights of Way Act 2000 (CROW)** http://www.defra.gov.uk/wildlife-countryside/cl/index.htm.

I understand a full survey has been carried out by James Johnston ecology to fulfill these requirements.

19.0 **Summary:** To allow this development to proceed there will be a requirement to remove Trees T17, T26, T27 and T28 to allow the construction of the new building. T14 and T15 overhang the existing building by some degree and are known for branch failure, as they both have weak fork structure both at the branch and basal stem bifurcation I would advise they are pollarded to 4.0m removal to prevent future failure and damage to the new building.

The only other possible impact on the trees could be from the road re surfacing, providing this is carried out as per the guidelines detailed in Para 12.0 then damage will be minimised. As the trees in this vicinity have developed and become accustomed to the root restrictions caused by the existing road then I don't foresee any further health issues being caused.

No significant post development pressures on retained trees are anticipated as they are either young enough or sufficient distance to tolerate the affects of the development.

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Appendix 1: Guidance for tree protective barriers.

1: Barriers should be installed at the location illustrated on the plan no 2 and agreed as acceptable in writing by the council before any site works start that could affect protected trees.

2: All uprights should be fixed in position for the duration of the development activity as either scaffold tubes or wooden posts banged or dug into the ground and braced sufficiently to withstand the pressures of everyday site work.

3: The framework supported by the uprights must be suitable for firmly attaching either heras panels or heavy duty ply in a way that will not allow the facing to be moved.

The minimum barrier height is 2.3m unless agreed with council.

Inside the protective barriers the following rules must be strictly observed:-

No vehicular access

No fires

No storage of excavated debris, building materials or fuels

No mixing of cement

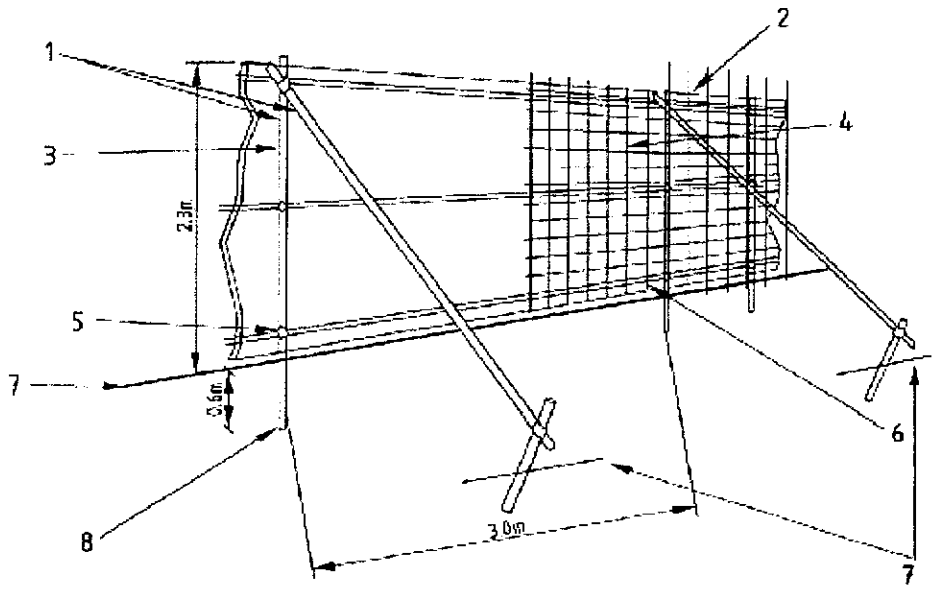
No service installation or excavation without written consent of council

No excessive cultivation for landscape planting

No barriers should be moved or temporarily dismantled without the written permission of the council.

Barrier condition to be regularly monitored to ensure it remains effective.

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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

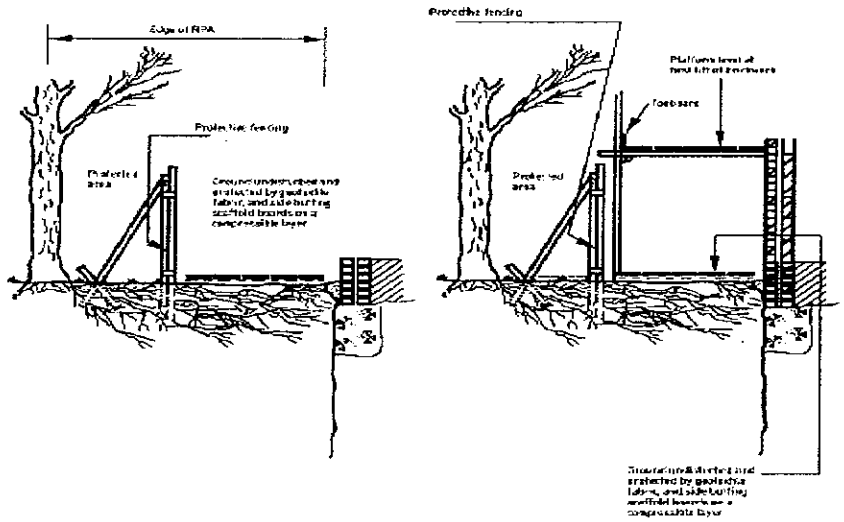


Figure 3 — Scaffolding within the RPA

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Appendix 2: Site guidance for working in root protection areas (RPAs)

1 GENERAL GUIDANCE FOR WORKING IN RPAs

1.1 What is the purpose of this guidance? This guidance sets out the general principles that must be followed when working in RPAs. Where more detail is required, it will be supplemented by illustrative specifications in other appendices of this arboricultural method statement. Before work starts on site, the purpose of this guidance is to demonstrate to the council that tree protection issues have been properly considered and to provide a written record of how they will be implemented. Once the site works start, this guidance is specifically for the site personnel to help them understand what has been agreed and explain what is required to fully meet their obligations to protect trees. All personnel working in RPAs must be properly briefed about their responsibilities towards important trees based on this guidance.

1.2 What are RPAs? RPAs are the areas surrounding important trees where disturbance must be minimised if they are to be successfully retained. All RPAs close to the construction area are illustrated on the tree protection plans accompanying this guidance. Damage to roots or degrade of the soil through compaction and/or excavation within RPAs is likely to cause serious damage. Any work operations within RPAs must be carried out with great care if trees are to be successfully retained.

1.3 When should this guidance be followed? Anyone entering a RPA must follow this guidance if important trees are to remain unharmed. Anyone working in a RPA must take care to minimise excavation into existing soil levels and limit any fill or covering that may adversely affect soil permeability. There are two main scenarios where this guidance must be followed when entering and working within a RPA:-

1. Removal of existing surfacing/structures and replacement with new surfacing, structures and/or landscaping.
2. Preparation and installation of new surfacing, structures and/or landscaping.

Broad definitions of surfacing, structures and landscaping are set out in the following sections.

1.4 Where does this guidance apply? This guidance should always be read in conjunction with the site plans illustrating the areas where specific precautions are necessary. Each area where precautions are required is annotated on the plans as identified on the key. All plans are illustrative and intended to be interpreted in the context of the site conditions when the work is started. All protective measures should be installed according to the prevailing site conditions and agreed as satisfactory by the appropriate

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supervising officer before any demolition or construction work starts.

Appendix 2: Site guidance for working in root protection areas (RPAs)

1.5 What references is this guidance based on? This guidance is based on the assumption that the minimum general standards for development issues are those set out in British Standards Institution (2005) BS 5837: *Trees in relation to construction Recommendations* and National Joint Utilities Group (1995) Publication Number 10: *Guidelines for the planning, installation and maintenance of utility services in proximity to trees.*

1.6 Preventing adverse impact to the RPA beyond the immediate work area: Any part of the RPA beyond the agreed work area must be isolated from the work operations by protective barriers or ground protection to at least the minimum standard described in BS 5837 for the duration of the work.

1.7 Excavation and dealing with roots: All excavation must be carried out carefully using spades, forks and trowels, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available. All soil removal must be undertaken with care to minimise the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of smaller roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage. If digging by hand, a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, the trowel should be used to clear the soil away from them without damaging the bark. Exposed roots to be removed should be cut cleanly with a sharp saw or secateurs 10-20cm behind the final face of the excavation. Roots temporarily exposed must be protected from direct sunlight, drying out and extremes of temperature by appropriate covering. Roots greater than 2.5cm in diameter should be retained where possible. Roots 2.5-10cm in diameter should only be cut in exceptional circumstances. Roots greater than 10cm in diameter should only be cut after consultation with the appropriate supervisory officer.

1.8 Arboricultural supervision: Any work within RPAs requires a high level of care. Qualified arboricultural supervision is essential to minimise the risk of misunderstanding and misinterpretation. Site personnel must be properly briefed before any work starts. Ongoing work must be inspected regularly and, on completion, the work must be signed off by the arboriculturist to confirm compliance by the contractor. In the context of this guidance, an

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appropriate supervising officer would normally be an arboriculturist.

Appendix 2: Site guidance for working in root protection areas (RPAs)

2.0 REMOVING SURFACING/STRUCTURES IN RPAs

2.1 Definitions of surfacing and structures: For the purposes of this guidance, the following broad definitions apply:-

- Surfacing: Any hard surfacing used as a vehicular road, parking or pedestrian path including tarmac, solid stone, crushed stone, compacted aggregate, concrete and timber decking. This does not include compacted soil with no hard covering.

- Structures: Any man-made structure above or below ground including service pipes, walls, gate piers, buildings and foundations. Typically, this would include drainage structures, car ports, bin stores and concrete slabs that support buildings.

2.2 Access: Roots frequently grow adjacent to and beneath existing surfacing/structures so great care is needed during access and demolition. Damage can occur through physical disturbance of roots and/or the compaction of soil around them from the weight of machinery or repeated pedestrian passage. This is not generally a problem whilst surfacing/structures are in place because they spread the load on the soil beneath and further protective measures are not normally necessary. However, once they are removed and the soil below is newly exposed, damage to roots becomes an issue and the following guidance must be observed:-

1. No vehicular or repeated pedestrian access into RPAs unless on existing hard surfacing or custom designed ground protection.
2. Regular vehicular and pedestrian access routes must be protected from compaction with temporary ground protection as set out in BS 5837.
3. RPAs exposed by the work must be protected as set out in BS 5837 until there is no risk of damage from the development activity.

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Appendix 2: Site guidance for working in root protection areas (RPAs)

2.3 Removal: Removing existing surfacing/structures is a high risk activity for any adjacent roots and the following guidance must be observed:-

1. Appropriate tools for manually removing debris may include a pneumatic breaker, crow bar, sledgehammer, pick, mattock, shovel, spade, trowel, fork and wheelbarrow. Secateurs and a handsaw must also be available to deal with any exposed roots that have to be cut.
2. Machines with a long reach may be used if they can work from outside RPAs or from protected areas within RPAs. They must not encroach onto unprotected soil in RPAs.
3. Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction of soil. Alternatively, it can be lifted out by machines provided this does not disturb RPAs.
4. Great care must be taken throughout these operations not to damage roots as set out in 1.7 above.
5. If appropriate, leaving below ground structures in place should be considered if their removal may cause excessive root disturbance.

3 INSTALLATION OF NEW SURFACING IN RPA's

3.1 Basic principles: New surfacing is potentially damaging to trees because it may require changes to existing ground levels, result in localised soil structure degrade and/or disrupt the efficient exchange of water and gases in and out of the soil. Mature and over-mature trees are much more prone to suffer as a result of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in RPAs.

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Appendix 2: Site guidance for working in root protection areas (RPAs)

Generally, the most suitable surfacing will be relatively permeable to allow water and gas movement, load spreading to avoid localised compaction and require little or no excavation to limit direct damage. The actual specification of the surfacing is an engineering issue that needs to be considered in the context of the bearing capacity of the soil, the intended loading and the frequency of loading. The detail of product and specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist.

3.2 Establishing the depth of excavation and surfacing gradient The precise location and depth of roots within the soil is unpredictable and will only be known when careful digging starts on site. Ideally, all new surfacing in RPAs should be no-dig, i.e. requiring no excavation whatsoever, but this is rarely possible on undulating surfaces. New surfacing normally requires an evenly graded sub-base layer, which can be made up to any high points with granular, permeable fills such as crushed stone or sharp sand. This sub-base must not be compacted as would happen in conventional surface installation. Some limited excavation is usually necessary to achieve this and need not be damaging to trees if carried out carefully and large roots are not cut. Tree roots and grass roots rarely occupy the same soil volume at the top of the soil profile, so the removal of a turf layer up to 5cm is unlikely to be damaging to trees. It may be possible to dig to a greater depth depending on local conditions but this would need to be assessed by an arboriculturist if excavation beyond 5cm is anticipated. On undulating surfaces, finished gradients/levels must be planned with sufficient flexibility to allow on-site adjustment if excavation of any high points reveals large unexpected roots near the surface. If the roots are less than 2.5cm in diameter, it would normally be acceptable to cut them and the gradient formed with the preferred minimal excavation of up to 5cm. However, if roots over 2.5cm in diameter are exposed, cutting them may be too damaging and further excavation may not be possible. If that is the case, the surrounding levels must be adjusted to take account of these high points by filling with suitable material. If this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made.

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3.3 Base and finishing layers: Once the sub-base has been formed, the load spreading construction is installed on top without compaction. In principle, the load spreading formation will normally be cellular and filled with crushed stone although the detail may vary with different products. Suitable surface finishes include washed gravel, permeable tarmac or block paviours set on a sand base. However, for lightly loaded surfacing of limited widths «2m) such as pedestrian paths, pre-formed concrete slabs may be appropriate if the sub-base preparation is as set out above. In some situations, limited width floating concrete rafts constructed directly on to the soil surface may be acceptable but the design must not include any strip-dug supports.

3.4 Edge retention: Conventional kerb edge retention set in concrete filled trenches is likely to result in damage to roots and should be avoided. Effective edge retention in RPAs must be custom designed to avoid any significant excavation into existing soil levels. For most surfaces, the use of pre-formed edging secured by metal pins or wooden pegs is normally an effective way of minimising any adverse impact on trees from the retention structure.

3.5 Installing new surfacing on top of existing surfacing: In some instances, existing surfacing can be retained and used as a base for new surfacing. Normally, this will not result in significant excavation that could expose roots so special precautions are not necessary. However, if large roots already protrude above the proposed sub-base level, then the precautions and procedures set out above must be observed.

4 INSTALLATION OF NEW STRUCTURES IN RPAs

4.1 Basic principles: New structures in RPAs are potentially damaging to trees because they may disturb the soil and disrupt the existing exchange of water and gases in and out of it. Mature and over-mature trees ate much more prone to suffer as a result of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimising the extent of these changes in RPAs. This can be done by constructing the main structures above ground level on piled supports and redirecting water to where it is needed. The detailed design and specification of such structures is an engineering issue that should be informed and guided by tree expertise.

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Appendix 2: Site guidance for working in root protection areas (RPAs)

4.2 Small sheds and bin stores: These light structures do not normally require substantial foundations and can have permeable bases. Ideally, their bases should be of a no-dig, load spreading construction set directly on to the soil surface. They require a flat base and so an undulating site will need levelling to provide a suitable surface. Excavation of any high points by up to 5cm and filling depressions with permeable fill to provide a flat base will normally be acceptable provided no roots greater than 2.5cm in diameter need to be cut. If large roots are found, the preferred course of action would be to raise the base level of the structure by filling rather than cutting roots.
However, if this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made. Above the base, there will often be a protective covering fixed onto a frame that can rise directly from the base or be fixed to supports either banged into the ground or set in carefully dug holes. Provided the supports are well spaced, i.e. greater than 1.5m apart, and of a relatively narrow diameter, i.e. not in excess of 1 5cm, it is unlikely they will cause any significant disturbance to RPAs.

4.3 Walls, gate piers, buildings and bridges on new foundations: Conventional strip foundations in RPAs for any significant structure may cause excessive root loss and are unlikely to be acceptable. However, disturbance can be significantly reduced by supporting the above ground part of the structures on small diameter piles and beams or cast floor slabs set above ground level. The design should be sufficiently flexible to allow the piles to be moved if significant roots are encountered in the preferred locations. Before the actual installation of the new structure starts, all RPAs that may be affected should be covered with temporary ground protection as set out in BS 5837. Gaps in the ground protection should be left where it is expected to install the piles or dig the holes for gate piers. Pile locations should be initially hand dug to a depth of 75cm to establish if there are any significant roots over 2.5cm in diameter that could be damaged. If significant roots are found, then the pile location must be moved slightly and a new exploratory hole dug. Once the piles have been installed, the supporting beams for the structure must be raised above the ground level between the piles and not require any further excavation. The beams between the piles can be pre-cast and imported to the site ready to fix or can be cast in position using shuttering for the sides and a biodegradable void former for the base. Gate piers generally require

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larger holes and have less flexibility for relocation if large roots are found.

Appendix 2: Site guidance for working in root protection areas (RPAs)

Localised loss of roots may be unavoidable so each situation should be assessed on its own merits by an appropriate supervising officer once the careful excavations have been completed. Any roots found should be dealt with as set out in 1.7 above. When installing any of these structures, the ground protection must remain in place until the construction is completed and there is no risk of damage to RPAs.

4.4 Walls on existing foundations: A free standing wall on an existing foundation is unlikely to require any additional excavation and so its construction should have no adverse impact on RPAs if the appropriate protection is in place. However, replacing walls that retain the soil of RPAs normally requires some limited excavation back into the exposed soil face to provide a working space of at least 10-20cm behind the inside wall face. This should be done carefully and limited to no more than required to construct the new wall. Any roots found should be dealt with as set out in 1.7 above. Once the wall is completed, any voids behind it should be filled with good quality top soil and firmed into place but not over compacted. Specific difficulties with large roots that emerge during the course of the construction should be referred to the supervising officer.

4.5 Services: For the purposes of this guidance, services are considered as structures. Excavation to upgrade existing services or install new services in RPAs may damage retained trees and should only be chosen as a last resort. In the event that excavation emerges as the preferred option, the decision should be reviewed by the supervising officer before any work is carried out. If excavation is agreed, all digging should be done carefully and follow the guidance set out in 1.7 above.

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Appendix 2: Site guidance for working in root protection areas (RPAs)

5 SOFT LANDSCAPING IN RPAs

Upgrading existing soft landscaping or replacing existing surfacing/structures with new soft landscaping: For the purposes of this guidance, soft landscaping includes the reprofiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the installation of solid structures or compacted surfacing. Soft landscaping activity after construction can be extremely damaging to trees. No significant excavation or cultivation, especially by rotovators, should occur within RPAs. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting. Ideally, all areas close to tree trunks should be kept at the original ground level and have a mulched finish rather than grass to reduce the risk of mowing damage.

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Appendix 3: Plan number SMW/L.C/Sportshall/TS/001 Tree Survey Plan

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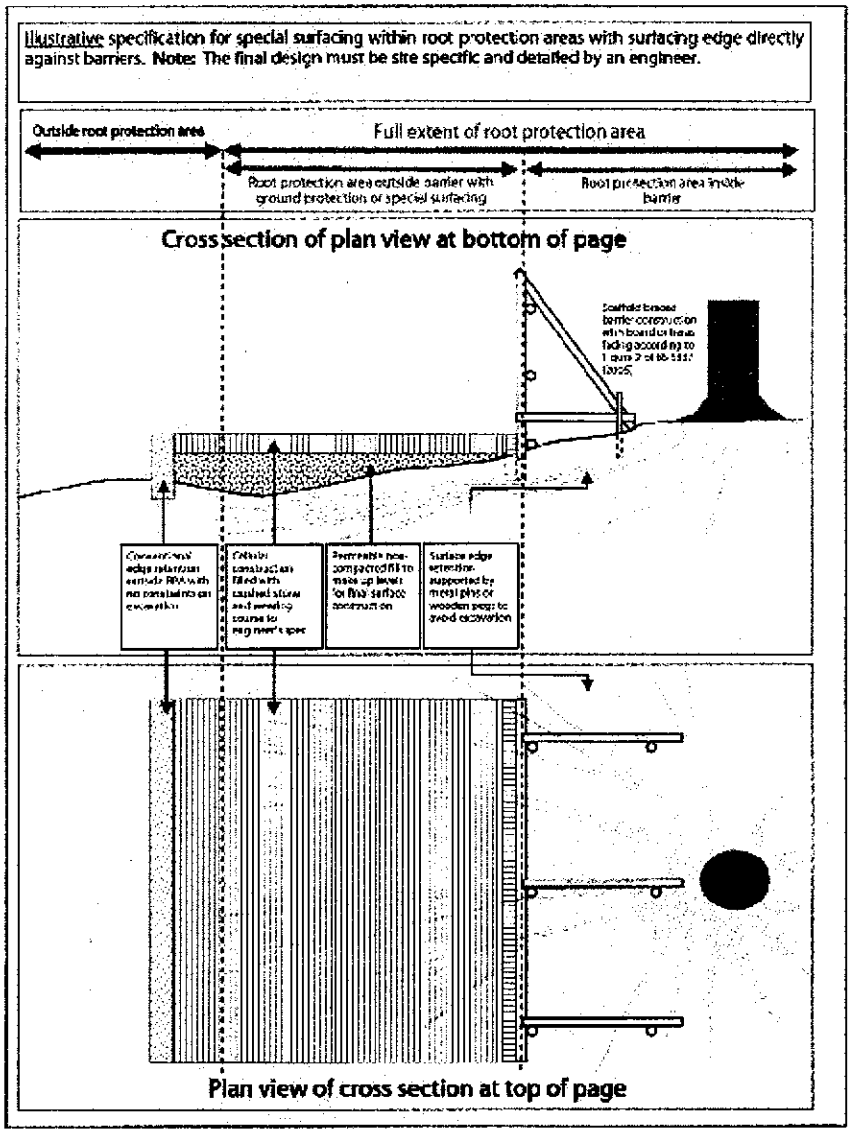
Appendix 4: Plan number SMW/L.C./Sportshall/TPP/002 Revision 2 Tree Protection Plan

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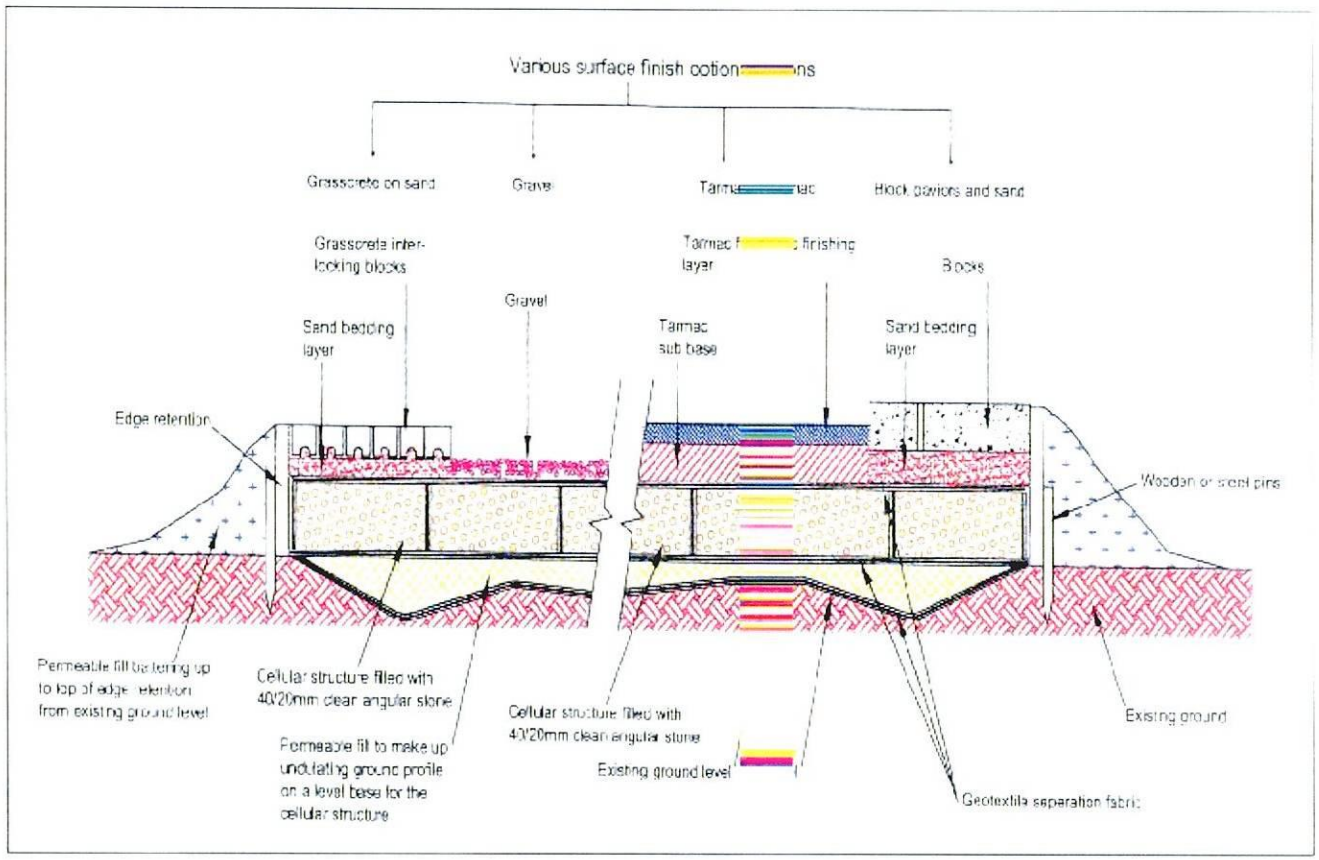
Appendix 5 APN 12 Special surface Construction under RPA's Through the Trees to Development.

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Appendix 5: Illustrative specification for special surfacing in RPAs



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Appendix 5: Illustrative specification for special surfacing in RPAs

CellWeb

GEOSYNTHETICS

The CellWeb System uniquely prevents rutting action of sub-soils by confining infill material within the hoop structure of the panel increasing the infills shear strength. The use of a CellWeb System increases the load capacity of granular infill by up to 50% reducing the overall construction depth required. Perforated cell walls permit lateral drainage and also provide frictional interface of the infill material increasing the shear strength of the system.

A non woven geotextile filtration/separation membrane is used beneath the system to prevent migration of materials and also to aid with drainage vertically through the system.

The CellWeb panels are infilled with a clean angular gravel which provides load support and permits air and moisture transfer to the roots ensuring the long term preservation of the tree root structure (fig. 5).

Surfacing materials are at the discretion of the client, however for specific advice please contact our sales office.

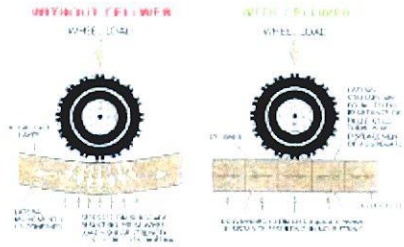
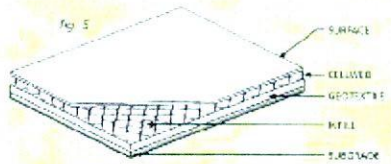


fig. 4

Benefits of using CellWeb

- **Reduction in construction depth.**
- **Prevent compaction of sub-soils.**
- **Prevent oxygen/nutrient depletion.**
- **Environmentally friendly option.**
- **Fast and economic installation.**
- **Technical support available.**

fig. 5



CellWeb is available in four cell depths; 75mm, 100mm, 150mm and 200mm.

The cell depth required is dependant upon specific site conditions. For specification details or project specific design assistance please contact our sales office.

Please contact

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Fleming Road
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Hinckley. LE10 3DJ

Telephone: 01455 617139

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Appendix 6 Tree Survey Data

Excel Spread sheet

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Appendix 7 – 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 Brackets

3. **SD:** Stem 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 (ARF)

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. Crown height – ground clearance of lowest part of canopy given in metres

8. **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

9. **Notes:** 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

10. **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].

11. **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).

12. **BS5837 Category**: A qualitative assessment of the tree based on criteria detailed in BS5837:2005 Table 1 (See appendix 1a)

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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Appendix 8 Table 1 - Cascade chart for tree quality assessment

TREES FOR REMOVAL				
Category and definition	Criteria			Identification on plan
Category R 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) • 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 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 1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation	Identification on plan
Category A 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 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, Acategory 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 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.			

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Appendix 9: Root Protection Calculations.

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Appendix 11

REFERENCES

Biddle P.G. (1998). Tree Root Damage to Buildings, Volumes 1 & 2. Willowmead Publishing Ltd.

British Standards Institute. (1989). Recommendations for Tree work BS 3998:1989 HMSO, London.

British Standards Institute. (1999). Code of practice for site investigations BS 5930:1999 HMSO, London.

British Standards Institute. (2005). Trees in relation to Construction BS5837:2005 HMSO, London.

British Standards Institute. (1992). Lighting for Buildings, Part 2: Code of Practice for daylight BS 8206-2:1992. TSO.

Building Research Establishment (1975) Availability of Sunshine CP75/75. BRE.

Building Research Establishment. Littlefair P.J. (2002) Site Layout planning for Good daylight and Sunshine a guide to good practice. BRE.

Cutler D.F. & Richardson I.B.K, (1989). Tree Roots & Buildings. Longman Scientific & Technical.

DETR. (2000). Tree Preservation Orders, A Guide to Good Practice. Department of the Environment, Transport and the Regions.

Lonsdale D. (1999). Research for Amenity Trees No 7: Principles of Tree Hazard Assessment and Management, HMSO, London.

Mattheck & Breloer H. (1994). Research for Amenity Trees No.4: The Body Language of Trees, HMSO, London.

NHBC Standards (2003) Chapter 4.2 'Building Near Trees'. National House-Building Council.

NJUG 4 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Issued 16 November 2007.

Patch D. Practice Note 1. Driveways Close to Trees (APN 1) Arboricultural Advisory Information Services (AAIS).

Patch D. Holding B. (2006) Arboricultural Practice Note 12 (APN12), Through the Trees to Development. Arboricultural Advisory and Information Service (AAIS).

Roberts J., Jackson N. & Smith M. (2006). Research for Amenity Trees No.8: Tree Roots in the Environment: Department for Communities and Local Government, HMSO, London.

Schwaze F.W.M.R. Engels J. & Mattheck C. (2000) Fungal Strategies of Wood Decay in Trees. Springer.

Strouts R.G. & Winter T.G. (1994).Research for Amenity Trees No.2: Diagnosis of ill-health in Trees. Department of the Environment, HMSO.

Weber K., Mattheck C. (2003). Manual of Wood Decays. The Arboricultural Association

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Tree ID	Common Name	Latin Name	Maturity	Number of Stems	Height (m)	Stem Dia (mm)	Spread - N	Spread - E	Spread - S	Spread - W	CH - Average	Crown	Stem	Basal Area	B.S.Category	Life Expectancy	Phys Condition	Work Recommendations	Inspection Date	Comment
T1	Common Ash	Fraxinus excelsior	Mature	1	22	670	6	5	7	6	10	Fair	Good	Fair	B	20 Years	Fair		15/11/2010	On steep slope dense vegetation, Minor deadwood in the crown, high crown, bifurcation of main stem at 7m.
T2	Common Ash	Fraxinus excelsior	Mature	1	14	430	5.5	3	3	5	4	Poor	Poor	Fair	B	20 Years	Fair		15/11/2010	Recently reduced, some regrowth poor habit tree located on a slope. Located 10m from building
T3	Common Ash	Fraxinus excelsior	Mature	1	23	650	4.5	5	8	7	8	Fair	Fair	Fair	B	20 Years	Fair	Remove deadwood	15/11/2010	11 m from building two large limbs at 5m over road, early stages of decline.
T4	Common Ash	Fraxinus excelsior	Mature	1	14	390	4.5	3	1	4.5	5	Poor	Fair	Fair	B	20 Years	Fair		15/11/2010	Located 8 m from building recently reduced, biased crown towards building. major old decaying pruning wounds on main stem.
T5	Common Ash	Fraxinus excelsior	Mature	1	15	510	8	5	4	4	4	Good	Fair	Fair	B	40 Years	Good		15/11/2010	Located 9m from building, tree on a steep slope 1.2m from road 3m from steps bifurcation of main stem at 2.5m.
T6	Common Ash	Fraxinus excelsior	Semi-mature	1	4	100	1.5	1.5	1	1	3	Good	Good	Good	C	40 Years	Good		15/11/2010	Located 1 m from rd. partially suppressed
T7	Common Ash	Fraxinus excelsior	Mature	1	16	340	5	3	3	3	4	Fair	Fair	Fair	B	20 Years	Good		15/11/2010	Located 8m from building 1.2 from road on steep slope, roots are growing over concrete retaining edging.
T8	Common Ash	Fraxinus excelsior	Mature	1	17	480	3.5	4	6	3	6	Good	Good	Fair	B	40 Years	Good	Remove deadwood	15/11/2010	Located 7m from building 1m from road, on a steep slope with same edging to slope.
T9	Common Ash	Fraxinus excelsior	Mature	1	14	440	7	3	8	4	5	Good	Good	Fair	B	40 Years	Good	End weight reduction by 30%	15/11/2010	Located 6m from building 1.3 from road 2.5 from top of slope restricted root area.
T10	Common Ash	Fraxinus excelsior	Mature	1	17	630	6	3.5	8	7	6	Good	Fair	Fair	B	20 Years	Good	Remove deadwood	15/11/2010	Located 5m from building 1.3 from road restricted root development area, 2.5 from top of slope. Old pruning wound on main stem.
T11	Crab Apple	Malus sylvestris	Mature	1	4	130	3	2	2	2.5	2	Good	Fair	Fair	C	20 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 5m from building corner, minor stem wounds.
T12	Crab Apple	Malus sylvestris	Semi-mature	1	3.5	110	2	2	1.5	1.5	1.5	Fair	Fair	Fair	C	10 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 5.4m from building. 3.5 from top of slope.
T13	Winter Cherry	Prunus subhirtella	Mature	1	3.5	120	2	3	3.5	1.5	1	Fair	Fair	Fair	C	10 Years	Fair	Remove to permitt development to proceed	15/11/2010	Suppressed crown, slight lean towards road.

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Tree ID	Common Name	Latin Name	Maturity	Number of Stems	Height (m)	Stem Dia (mm)	Spread - N	Spread - E	Spread - S	Spread - W	CH - Average	Crown	Stem	Basal Area	B.S.Category	Life Expectancy	Phys Condition	Work Recommendations	Inspection Date	Comment
T14	White Willow	Salix alba	Mature	2	17	560	3	6	4	4	3	Good	Fair	Fair	B	20 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 5m from building, twin stemmed at 0.5m included bark forks, 3m from top of slope.
T15	White Willow	Salix alba	Mature	2	17	720	6	6	2	6	3	Fair	Fair	Fair	B	20 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 5m from building multi stemmed at 1.3m. some low branches over building.
T16	Common Lime	Tilia europaea	Mature	1	28	720	6	7	6	5	5	Good	Fair	Fair	A	40 Years	Fair		15/11/2010	Located 0.5 from corner of access rd. several wounds on main stem minor decay.
T17	John Downie	Malus 'John Downie'	Mature	2	4	320	2.5	1.5	1.5	1.5	1.5	Fair	Fair	Poor	C	10 Years	Fair		15/11/2010	Edge of access rd, 6.2m from house. biased crown to west several old decaying pruning wounds
T18	Common Lime	Tilia europaea	Early Mature	1	6	260	3	1	1	3.5	3	Fair	Fair	Fair	B	20 Years	Fair		15/11/2010	Edge of access road part of tree row biased crown to north.
T19	Grey Poplar	Populus canescens	Early Mature	1	14	290	3	2	3	2	4	Good	Good	Fair	B	40 Years	Good		15/11/2010	Edge of access road part of tree row biased crown to north.
T20	Sycamore	Acer pseudoplatanus	Early Mature	1	7	170	3	3	3	3	3	Good	Good	Fair	B	20 Years	Fair		15/11/2010	Edge of access road part of tree row biased crown to north.
T21	Common Lime	Tilia europaea	Early Mature	1	6	310	3	1	2	2	3	Fair	Fair	Fair	C	20 Years	Fair	Sever/remove ivy, Raise low canopy To 4.0m	15/11/2010	Edge of access road part of tree row, small damaged branch over road
T22	Grey Poplar	Populus canescens	Mature	1	14	460	5	4	7	4	4	Good	Good	Fair	B	20 Years	Good		15/11/2010	Edge of access road part of tree row
T23	Common Lime	Tilia europaea	Semi-mature	1	4	120	2	2	1.5	2	2	Fair	Fair	Fair	B	10 Years	Fair		15/11/2010	Edge of access road part of tree row
T24	Grey Poplar	Populus canescens	Mature	1	15	510	6	7	5	5	4	Good	Good	Fair	B	40 Years	Good	Remove deadwood	15/11/2010	Edge of access road part of tree row, 14m from building
T25	Grey Poplar	Populus canescens	Early Mature	1	14	340	3	3	4	3	65	Good	Fair	Fair	B	40 Years	Fair		15/11/2010	Edge of access road part of tree row
T26	Mountain Ash	Sorbus aucuparia	Semi-mature	3	3.5	320	1.5	1.5	1.5	1.5	2.5	Fair	Fair	Fair	C	10 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 8.1 from building, 8.3 to corner, 18m to corner, 7.8,
T27	Mountain Ash	Sorbus aucuparia	Semi-mature	3	4	280	1	1	1.5	1.5	2	Fair	Fair	Fair	C	10 Years	Fair	Remove to permitt development to proceed	15/11/2010	Located 8m from the building
T28	Common Lime	Tilia europaea	Early Mature	1	5	240	3	2	2	2	2	Good	Good	Poor	C	20 Years	Fair	Remove to permitt development to proceed	25/11/2010	Located close to car park.
T29	Black Italian Poplar	Populus x canadensis 'Serotina'	Mature	1	15	470	6	5	5	4	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T30	Common Lime	Tilia europaea	Early Mature	1	5	190	2	2	2	2	2	Good	Good	Poor	C	20 Years	Fair		25/11/2010	Located close to car park.

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Tree ID	Common Name	Latin Name	Maturity	Number of Stems	Height (m)	Stem Dia (mm)	Spread - N	Spread - E	Spread - S	Spread - W	CH - Average	Crown	Stem	Basal Area	B.S.Category	Life Expectancy	Phys Condition	Work Recommendations	Inspection Date	Comment
T31	Black Italian Poplar	Populus x canadensis 'Serotina'	Mature	1	16	380	5	4	5	4	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T32	Common Lime	Tilia europaea	Early Mature	1	5	160	2	2	2	2	2	Good	Good	Poor	C	20 Years	Fair		25/11/2010	Located close to car park.
T33	Black Italian Poplar	Populus x canadensis 'Serotina'	Mature	1	16	490	6	4	5	4	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T34	Common Ash	Fraxinus excelsior	Early Mature	1	5	160	2	2	2	2	2	Fair	Fair	Poor	C	20 Years	Fair		25/11/2010	Located close to car park.
T35	Black Italian Poplar	Populus x canadensis 'Serotina'	Mature	1	17	475	5	5	5	4	4	Good	Good	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T36	Common Ash	Fraxinus excelsior	Mature	1	14	485	7	6	5	4	4	Fair	Fair	Poor	B	40 Years	Fair	Remove deadwood	25/11/2010	Crown biased over field
T37	Common Lime	Tilia europaea	Early Mature	1	5	165	2	2	2	2	2	Fair	Fair	Poor	C	20 Years	Fair		25/11/2010	Located close to car park.
T38	Black Italian Poplar	Populus x canadensis 'Serotina'	Mature	1	15	580	7	6	5	4	4	Good	Good	Fair	B	40 Years	Good		25/11/2010	Located close to car park.
T39	Common Lime	Tilia europaea	Mature	1	14	480	4	5	4	4	3	Fair	Fair	Fair	B	40 Years	Fair	Raise low canopy To 5.0m	25/11/2010	Located close to car park.
T40	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	18	500	2	2	2	2	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T41	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	19	510	2	2	2	2	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T42	Common Lime	Tilia europaea	Mature	1	13	410	5	6	5	4	4	Good	Fair	Fair	B	40 Years	Good		25/11/2010	
T43	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	18	530	2	2	2	2	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T44	Common Lime	Tilia europaea	Mature	1	14	390	4	5	4	4	4	Good	Fair	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T45	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	19	570	2	4	2	2	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T46	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	19	350	1	1	1	1	4	Good	Good	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T47	Common Lime	Tilia europaea	Mature	1	15	570	6	6	5	5	4	Fair	Fair	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T48	Lombardy Poplar	Populus nigra 'Italica'	Early Mature	1	15	200	1	1	1	1	4	Fair	Fair	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T49	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	19	400	2	2	2	2	4	Fair	Good	Poor	B	40 Years	Fair		25/11/2010	Located close to car park.
T50	Lombardy Poplar	Populus nigra 'Italica'	Mature	1	19	470	2	3	2	1	4	Good	Good	Poor	B	40 Years	Good		25/11/2010	Located close to car park.
T51	Sycamore	Acer pseudoplatanus	Mature	1	11	470	6	6	3	5	4	Fair	Fair	Poor	C	20 Years	Fair	Fell	25/11/2010	Located at edge of road steep slope.
T52	Sycamore	Acer pseudoplatanus	Early Mature	1	14	280	2	5	4	3	4	Fair	Fair	Poor	C	20 Years	Fair		25/11/2010	Located at edge of road steep slope.

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Tree ID	Common Name	Latin Name	Maturity	Number of Stems	Height (m)	Stem Dia (mm)	Spread - N	Spread - E	Spread - S	Spread - W	CH - Average	Crown	Stem	Basal Area	B.S.Category	Life Expectancy	Phys Condition	Work Recommendations	Inspection Date	Comment
T53	Sycamore	Acer pseudoplatanus	Mature	1	14	410	4	5	4	2	4	Fair	Poor	Poor	C	20 Years	Fair		25/11/2010	Located at edge of road steep slope, leans over field, metal fence embedded in stem
T54	Common Hawthorn	Crataegus monogyna	Mature	1	5	420	3	3	3	3	1.5	Fair	Fair	Fair	C	20 Years	Fair	Raise low canopy To 2.5m, Sever/remove ivy	25/11/2010	Located at edge of road steep slope.
T55	Common Lime	Tilia europaea	Mature	1	28	640	7	6	6	6	5	Good	Good	Good	A	40 Years	Good	Raise low canopy To 5.0m	25/11/2010	Located between two buildings
T56	Common Lime	Tilia europaea	Mature	1	28	580	3	5	7	4	6	Good	Good	Good	A	40 Years	Good		25/11/2010	Located between two buildings
T57	Common Lime	Tilia europaea	Mature	1	28	560	3	4	6	3	4	Good	Good	Good	A	40 Years	Good		25/11/2010	Located between two buildings
T58	Common Lime	Tilia europaea	Mature	1	27	520	2	5	6	4	4	Fair	Fair	Fair	B	40 Years	Fair	Remove deadwood	25/11/2010	Located between two buildings
T59	Common Lime	Tilia europaea	Mature	1	29	610	7	4	3	5	4	Good	Good	Fair	A	40 Years	Good	Remove deadwood	25/11/2010	Located at edge of car park
T60	Common Lime	Tilia europaea	Mature	1	29	690	6	7	5	4	4	Poor	Fair	Poor	B	20 Years	Decline	Remove deadwood, End weight reduction 30%	25/11/2010	Located at edge of car park, declining tree
T61	Common Lime	Tilia europaea	Mature	1	30	670	7	7	6	4	5	Fair	Fair	Fair	B	40 Years	Fair	End weight reduction by 30%, Remove deadwood	25/11/2010	Between two buildings
T62	Common Lime	Tilia europaea	Mature	1	30	580	6	7	4	4	5	Good	Good	Fair	A	40 Years	Good		25/11/2010	Rear of building close to road

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Tree number	No. of stems	Stem Diameter mm	RPA m2	Radius
T1	1	670	203.10	8.04
T2	1	430	83.66	5.16
T3	1	650	191.16	7.8
T4	1	390	68.82	4.68
T5	1	510	117.68	6.12
T6	1	100	4.52	1.2
T7	1	340	52.30	4.08
T8	1	480	104.24	5.76
T9	1	440	87.59	5.28
T10	1	630	179.58	7.56
T11	1	130	7.65	1.56
T12	1	110	5.47	1.32
T13	1	120	6.52	1.44
T14	2	560	98.53	5.6
T15	2	720	162.88	7.2
T16	1	720	234.55	8.64
T17	2	320	32.17	3.2
T18	1	260	30.59	3.12
T19	1	290	38.05	3.48
T20	1	170	13.08	2.04
T21	1	310	43.48	3.72
T22	1	460	95.74	5.52
T23	1	120	6.52	1.44
T24	1	510	117.68	6.12
T25	1	340	52.30	4.08
T26	3	320	32.17	3.2
T27	3	280	24.63	2.8
T28	1	240	26.06	2.88
T29	1	470	99.95	5.64
T30	1	190	16.33	2.28
T31	1	380	65.33	4.56
T32	1	160	11.58	1.92
T33	1	490	108.63	5.88
T34	1	160	11.58	1.92
T35	1	475	102.08	5.7
T36	1	485	106.43	5.82
T37	1	165	12.32	1.98
T38	1	580	152.20	6.96
T39	1	480	104.24	5.76
T40	1	500	113.11	6
T41	1	510	117.68	6.12
T42	1	410	76.06	4.92
T43	1	530	127.09	6.36
T44	1	390	68.82	4.68
T45	1	570	147.00	6.84
T46	1	350	55.42	4.2
T47	1	570	147.00	6.84
T48	1	200	18.10	2.4
T49	1	400	72.39	4.8
T50	1	470	99.95	5.64
T51	1	470	99.95	5.64
T52	1	280	35.47	3.36
T53	1	410	76.06	4.92
T54	1	420	79.81	5.04
T55	1	640	185.32	7.68

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Tree number	No. of stems	Stem Diameter mm	RPA m2	Radius
T56	1	580	152.20	6.96
T57	1	560	141.89	6.72
T58	1	520	122.34	6.24
T59	1	610	168.36	7.32
T60	1	690	215.41	8.28
T61	1	670	203.10	8.04
T62	1	580	152.20	6.96

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