ARBORICULTURAL METHOD STATEMENT & TREE PROTECTION PLAN REPORT (including site works setup)

for

Plot 3, 60 Sinah Lane, Hayling Island, Hampshire PO11 0LJ

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1.0 INTRODUCTION

1.1 This proposal involves the re-development of the site with a new plot being created and a detached house with detached garage erected.

1.2 The site is currently part of the garden area to 'Windfalls' to the west and is mainly laid to lawn with some perimeter planting beds. An existing brick garden wall runs east to west across the middle of the garden. This would be removed.

1.2 A full planning application has been submitted to Havant Borough Council for new buildings as shown on the Architect's plans.

1.3 Reference is to be made to the Arboricultural Constraints Assessment prepared by Bernie Harverson, Arboricultural Consultant, reference BJH.0298 as submitted with the planning application.

2.0 ASSESSMENT OF TREE CONSTRAINTS & RECOMMENDED TREE WORKS

2.1 Tree Losses, Retentions and Protection Measures

2.2 Tree data and references are taken from the Arboricultural Constraints Assessment referred to in item 1.3 above.

2.3 The following is an assessment of the individual trees on the site:

Tree No. 1

Not applicable - previously removed for safety reasons.

Tree No. 2 – Beech (Fagus sylvatica)

Can be retained and fully protected in accordance with BS5837 recommendations.

Tree No.3 – Sawara Cypress (Chamaecyparis pisifera)

Will need to be pruned on north-east side to allow for construction of the new detached garage. Category C tree - could be removed but does provide some minor benefit in landscaping terms.

Tree No.4 – Lawsons Cypress (Chamaecyparis pisifera)

To be removed to allow access to the new development.

Tree No.5 – Pedunculate Oak (Quercus robur)

Although previously damaged by root loss, can be retained and fully protected from further damage in accordance with BS5837 recommendations.

Tree Group No.1 – Oaks x 2, Holly x 1, Ash x 1

Reduce and reshape to help trees to cope with previous root loss and manage future growth to avoid excessive overshadowing on west side.

2.0 PHASING OF OPERATIONS

Phase 1 - Pre-Construction Tree Works

2.1 All approved pre-development tree work as described in Section 2.00 above.

2.2 The tree surgery specialist contractors are to be given clear guidelines and a remit that prohibits heavy plant (Lorries, Cranes and Work Platforms) tracking through the site within tree protection zones.

Phase 2 - Pre-Construction Protective Fencing Works

2.3 Erect the protective fencing - the protective fencing barriers are to be located exactly as specified on the Tree Protection Plan & Site Setup Plan attached which is in full accordance with the recommendations contained within British Standard 5837:2005- Figure 2. A copy of the Tree Protection Plan is to be pinned up in the temporary offices/mess but on site for all site staff to see. The area within the construction exclusion zone is to be regarded as **sacrosanct** and the fencing shall not be taken down or relocated at any time without the prior written approval of the monitoring arboriculturist or local authority tree officer, unless this has already been agreed as part of the planning application consent process and is detailed in writing and shown on a plan. The fencing shall comprise of interlocked Weldmesh (Heras) panels (or agreed alternative which meets the BS5837 standards), well braced to resist impacts and securely attached to a scaffolding framework by means of wires or scaffold clamps. It shall have top and bottom horizontal bars, with uprights set into the ground at no greater interval than 3m spacings. Angled bars shall be located behind the fencing to act as braces, these will be firmly clamped to the top rail and set into the ground braced as necessary; these shall be spaced at no less an interval than one brace per two panels.

2.4 The following prohibitions shall apply within the area enclosed by the Tree Protection Fencing :-

2.4.1 **No** mechanical digging or scraping once the initial ground cover vegetation has been cleared and the site fenced off.

2.4.2 **No** storage of plant, equipment or materials

2.4.3 **No** vehicular or plant access

2.4.4 **No** fire lighting

2.4.5 **No** handling, discharge or spillage of any chemical substance, including cement washings

2.4.6 **No** action likely to cause localised water-logging

2.4.7 **No** change in ground levels

2.4.8 **No** construction of a hard surface

2.5 The temporary ground protection measures to take the weight off the scaffolding along the eastern flank of the main building and protect the ground are to be applied as specified under Section 9.3 and Figure 3 of BS85837.

2.6 Ideally machinery that will be used to excavate the foundations will work from within the footprint of the building and not have to use the protected ground zone between the building line and the protective fencing. However, if this proves to be impractical then the ground protection **must first be upgraded** from metal sheeting /scaffold boards to a more substantial system such as Geogrid and Cell Web filled with washed aggregate that will be removed on completion of the works. In this way the weight of the machinery will be spread across an area of protected ground and not lead to ground compaction and air exclusion.

Phase 3 — Site Operations

2.7 All portable offices; mess facilities; toilet units and materials storage areas must be sited outside the protective fencing zone.

2.8 A 10m separation distance shall be observed (measured from the centre of any retained tree) and substances injurious to tree health, including fuels, oil and bitumen, cement (including cement washings), builders' sand, concrete mixing and other noxious chemicals.

Phase 4 — Landscaping Works

2.9 General landscaping works are to be organised in accordance with the BS5837 extracts included in this report.

2.10 On completion of all building works and immediately prior to landscaping works being undertaken and with the agreement of the LPA Tree Officer the Protective Fencing may be removed and the area within opened up for soft landscaping and final surface treatments.

2.11 This is to be hand excavation works only with no machinery being used unless specific ground protection has been laid. Even then only lightweight mini excavators are to be permitted access.

2.12 It is acknowledged that by the nature of the works some surface excavation is needed to prepare for tree and shrub planting or laying of lawns. This work shall be undertaken with hand forks and any exposed roots are to be cleanly severed to encourage new growth and an adequate soil medium laid around them to encourage same.

3.0 UTILITY SERVICE CONNECTIONS

3.1 The route of underground service connections would link in with the existing service runs out to **Sinah Lane** with no adverse impact on retained trees. See services and underground drainage layout as submitted with the planning application.

3.2 Extracts from NJUG 10 Guidelines are included in this report in the unlikely event that it proves unavoidable to run service routes through tree protection zones.

4.0 AVOIDING DAMAGE TO TREE TRUNKS AND BRANCHWORK

4.1 Care shall be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights and static and mobile cranes can operate without coming into contact with the retained trees. Such contact could result in serious injury which might make a tree's safe retention impossible.

4.2 **ALL** machine operators are required to undergo an induction session prior to being allowed to work on site, where the Method Statement will be explained to them and a copy provided for their reference. In addition a copy of the Tree Protection Plan will be provided or pinned up in the site but and the trees which are to be retained and protected will be pointed out to the operator and they will also be shown which trees these are on site before they start work. In this way it is hoped that unnecessary damage, by root disturbance and collision of machinery booms and operating arms with tree crowns can be avoided.

5.0 REPORTING DAMAGE TO TREES AND PROTECTIVE FENCING

5.1 Should any damage occur to trees noted for retention either by the above works or as the result of any other action, the damage must be reported to the site manager immediately. The site manager shall report up the chain of responsibility and also to the retained consultant arboriculturist or in the absence of such an appointment to an appropriately qualified arboriculturalist, to enable remedial measures to be specified and implemented as appropriate.

5.2 Should protective fencing become damaged so as to impair its function in protecting trees, all work shall cease in the vicinity of the damage until the fence has been returned to standard.

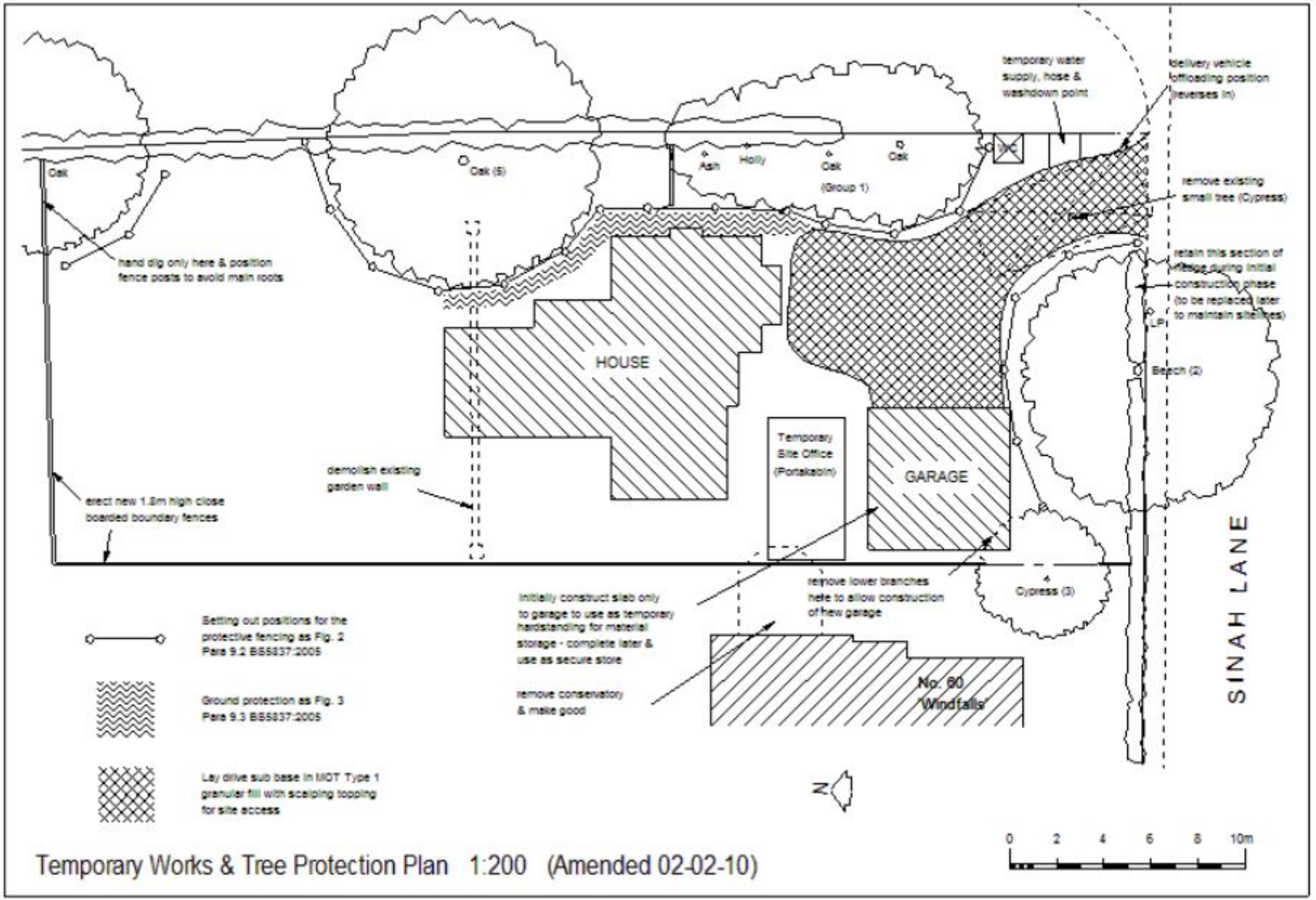
6.0 SOFT LANDSCAPING WORKS

6.1 Any soft landscape works within the protected areas shall be in accordance with Table 3 and Sections 13 & 14 of BS5837:2005 (see copy extracts attached).

7.0 CONCLUSIONS

7.1 Provided that the methodology prescribed in this statement is strictly adhered to it would be expected that the retained trees would survive the development and in due course recover the lost areas of root fibre and crown.

7.2 This is therefore a project which is considered to be supportable in arboricultural terms.



Temporary Works & Tree Protection Plan 1:200 (Amended 02-02-10)

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. **Approximately 0.6m driven into the ground**

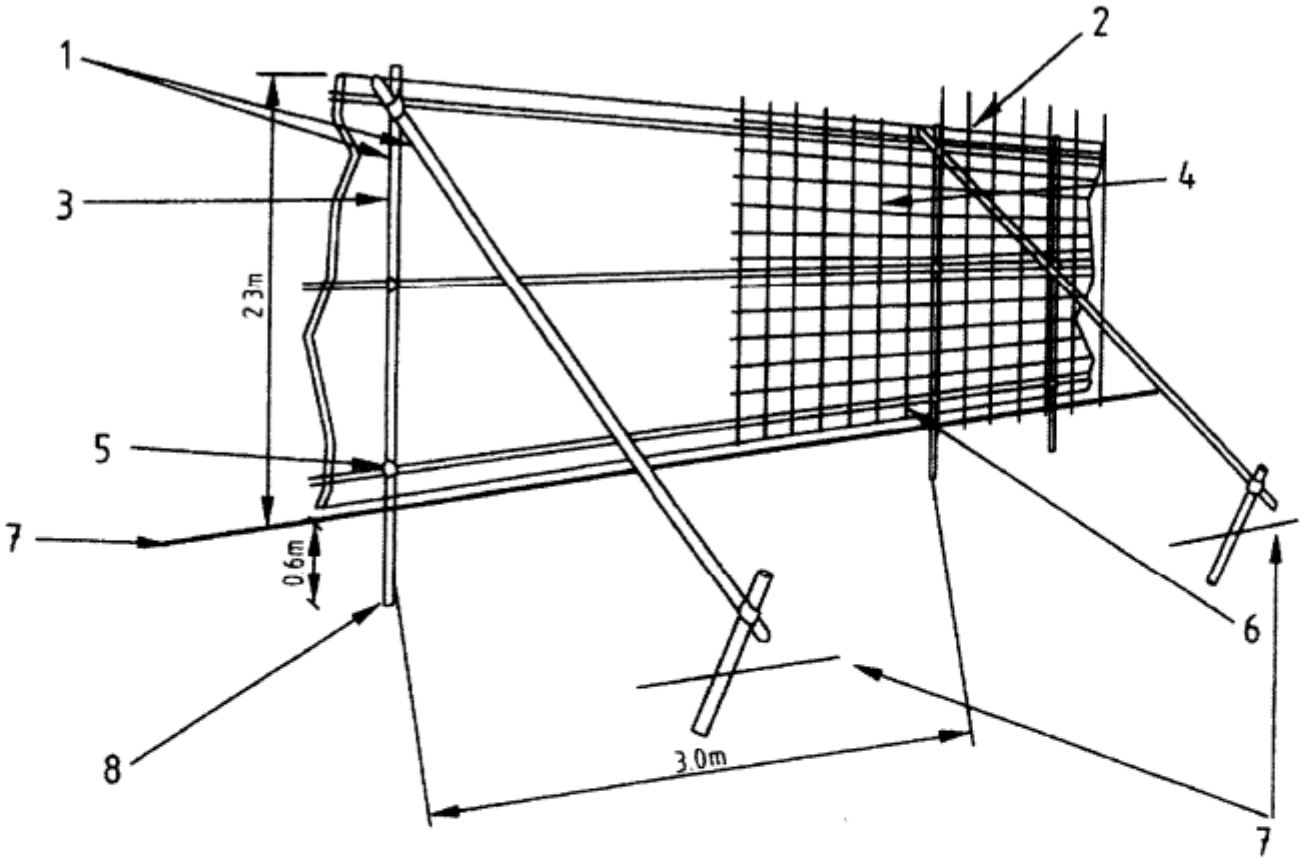


Figure 2 - Protective Barrier

Extract taken from BS5837:2005

Barriers

- Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). On all sites, special attention should be paid to ensuring that barriers remain rigid and complete.
- In most cases, barriers should consist of a scaffold framework in accordance with Figure 2. comprising a vertical and horizontal framework, well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Onto this, Weldmesh panels should be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not resistant to impact and should not be used
  NOTE The above is preferred because it is readily available, resistant to impact, can be re-used and enables inspection of the protected area.
- It may be appropriate on some sites to use temporary site office buildings as components of the tree protection barriers.

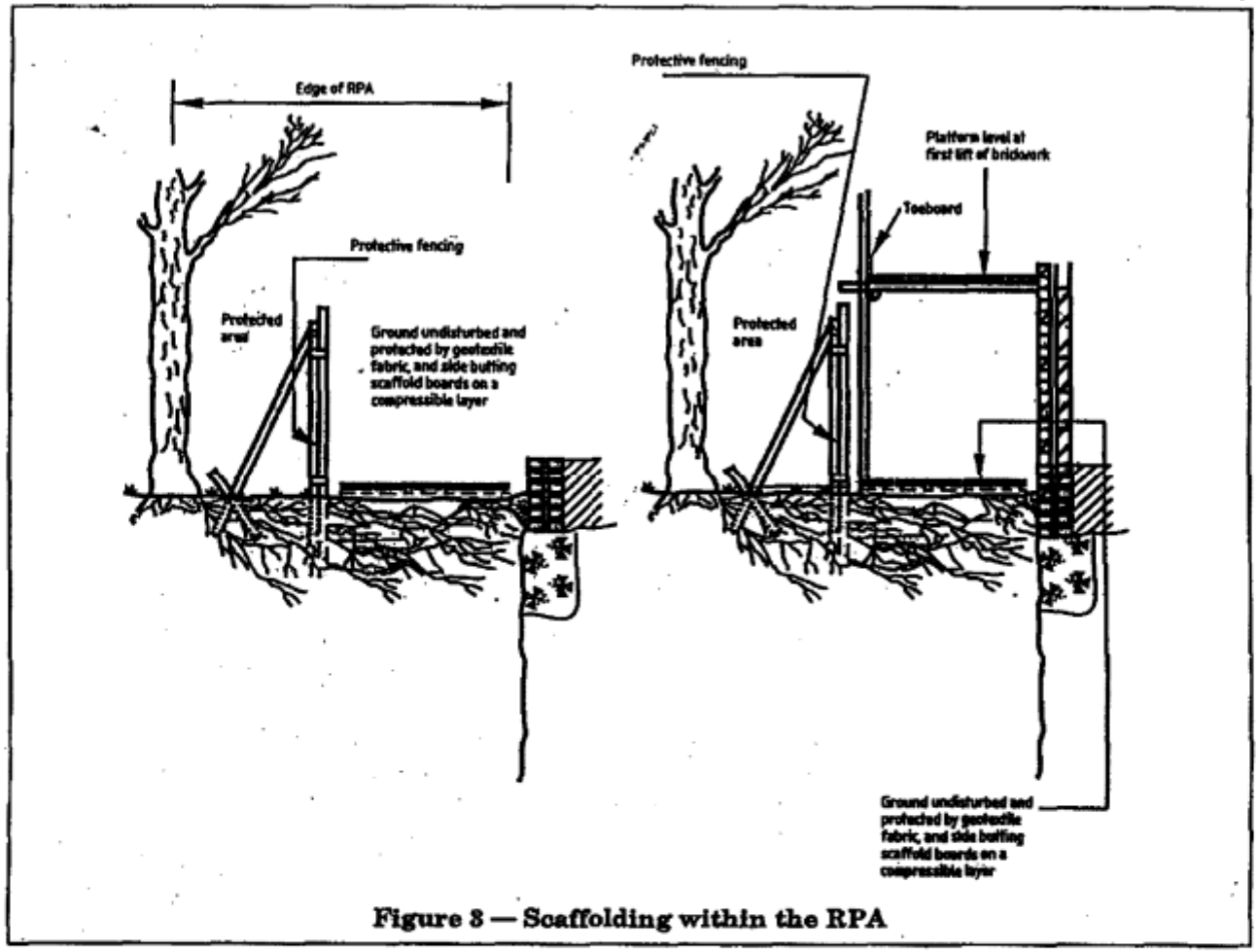


Figure 3 — Scaffolding within the RPA

Extract taken from BS5837:2005

Ground Protection

- Where it has been agreed during the design stage, and shown on the tree protection plan, that vehicular or pedestrian access for the construction operation may take place within the root protection area (RPA), the possible effects of construction activity should be addressed by a combination of barriers and ground protection. The position of the barrier may be shown within the RPA at the edge of the agreed working zone, but the soil structure beyond the barrier to the edge of the RPA should be protected with ground protection.
- For pedestrian movements within the RPA the installation of ground protection in the form of a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold, may be acceptable (see Figure 3).
- For wheeled or tracked construction traffic movements within the RPA the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems or reinforced concrete slabs.

TREE PROTECTION AREA

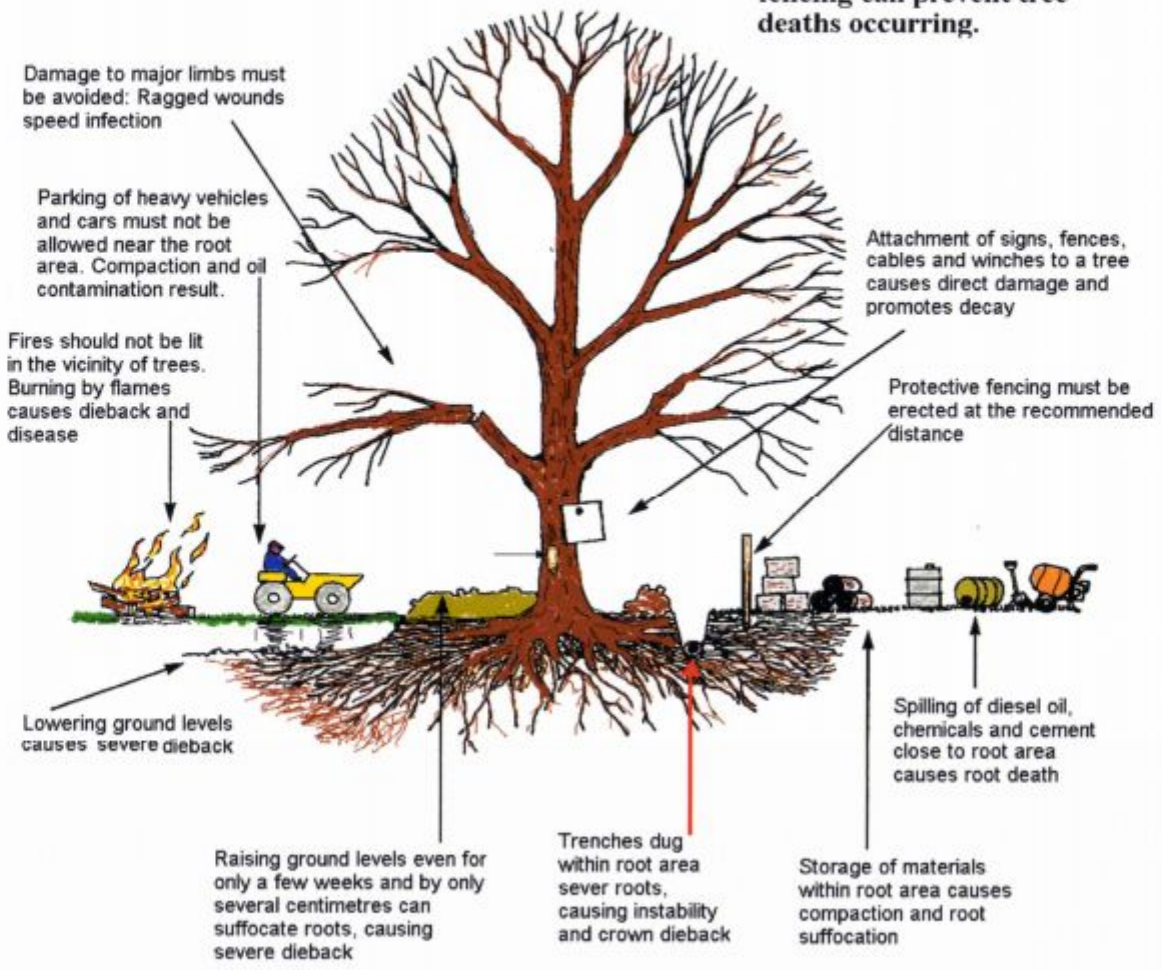
KEEP OUT

- NO EXCAVATION OR TRENCHING WORKS PERMITTED
- NO STORAGE OF PLANT OR MATERIALS PERMITTED
- NO VEHICLE ACCESS PERMITTED
- NO FIRE LIGHTING PERMITTED
- NO CHEMICAL HANDLING
- VEHICLES WORKING CLOSE TO PROTECTIVE FENCING MUST AVOID CONTACT WITH OVERHANG FROM TREE CANOPY
- REPORT DAMAGE TO TREES OR FENCING IMEDIATELY

Common causes of Tree Death

(Source: Arboricultural Information Exchange website, 2005)

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



EXTRACTS TAKEN FROM NJUG 10 – National Joint Utilities Group

GUIDELINES FOR THE PLANNING, INSTALLATION AND MAINTENANCE OF UTILITY SERVICES IN PROXIMITY TO TREES

GAS - ELECTRICITY - TELECOMMUNICATIONS - WATER

UNDERGROUND SERVICES

HOW ROOTS ARE DAMAGED

Contrary to popular belief, the root system of a tree is not a mirror image of the branches, nor is there usually a 'tap root'. The majority of the root system of any tree is in the surface 600mm of soil, extending radially in any direction for distances frequently in excess of the tree's height. Excavation or other works within this area are liable to damage roots.

The root system

The base of the trunk typically flares out in buttresses, with these extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil, and to conduct water and nutrients. Even a short distance (3m) from a large mature tree, most roots will be less than 10mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1mm diameter, develop off all parts of this root system. These fine roots absorb the water and nutrients which are essential for the growth of the tree.

The main structural roots (close to the trunk) develop as the tree grows in response to the need for the tree to have physical stability. Beyond these major roots, root growth is influenced by the availability in the soil of water, air and nutrients. The cultivation of soil provides ideal conditions for root growth. Services are often cooler than surrounding soil, encouraging moisture within the soil to condense on the surface, thereby encouraging roots to grow close to the service. For all these reasons, root growth is often most prolific within the backfilled trench and in the soil around the services. The variability of soil conditions and the presence of obstacles to root growth results in a very variable and unpredictable distribution of the roots within the general guidance above.

Types of damage

Root systems can be damaged by:-

- The severance of a root, for example by trenching, which will destroy all parts of the root beyond that point. Even roots less than 10mm diameter may be serving the fine roots over a wide area. The larger the root severed, the greater the impact on the tree.
- Damage to the bark on the root. The bark protects the root from decay, and is also essential for further root growth. It is loosely attached and easily damaged. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.

- Compaction of the soil. Compaction which is avoidable may occur from storage of material or passage of heavy equipment over the roots. This can restrict or even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Alterations in soil level. Lowering the level will strip out the mass of roots near the surface. Raising levels will have the same effect as soil compaction.
- Incorrect application of herbicide.
- Spillage of oils or other harmful materials.

If roots are damaged :-

1. close to the trunk, the anchorage and stability of the tree can be adversely affected.
2. anywhere along their length, all of the fine roots which they serve will be destroyed.

Damage to the fine roots by severance of a main root, or by compaction or alteration in levels, will prevent these fine roots from absorbing the water and nutrients which are essential for the well-being and growth of the tree. The effects of damage from different causes, for instance by successive excavations for different services, or by excavation in one part and compaction in another part of the system, will be cumulative.

If the root system is damaged, new roots must develop to sustain the tree. These may develop from damaged root or by increased growth of other parts of the system. It may take years to replace all the lost roots. Vigorous young trees are the most likely to be capable of rapid root regeneration, but mature tress find it very difficult to recover from major root damage, if at all. While roots may regenerate, they will not necessarily provide their original anchorage.

Trees with damage may not show any immediate symptoms. If the root system is capable of rapid regeneration the tree may recover without any noticeable ill-effects, but usually the symptoms will take several years to develop. Such symptoms may range from only minor branch dieback to deterioration and ultimate death of the tree, dependant on the severity of damage and the ability of the roots to regenerate.

There is frequently a need for operational land (e.g. substations) to be kept clear of weed growth for safety and as a fire precaution. Herbicides provide an efficient method of killing both herbaceous and woody weeds. There are several types of herbicide with different modes of action and persistence. The most attractive chemicals are those that can be applied to the ground, usually as a granule, and which remain active in the soil for long periods. The wide-ranging root system of a tree may extend into the operational land from adjoining properties, and may absorb some types of herbicides which have been applied to the ground. Material absorbed in one part of the root system can kill the whole tree.

Other materials which can leach into the soil can also damage the root system. For instance, oil spilled into the soil is broken down by soil bacteria which deplete the soil of oxygen and so asphyxiate the roots. Other materials may have a direct toxic effect on roots.

HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage top trees which should be adopted by utilities.
The local authority (or for privately owned trees, the owner or his advisor), should be informed about planned work at an early stage prior to commencement.

Wherever trees are present, precautions should be taken to minimise damage to the root system. As the shape of the root system is unpredictable, there should be careful control and supervision of any excavation, particularly if this involves digging through the surface 600mm where the majority of roots develop.

The precautions advocated in this section are applicable to any excavations or other works occurring within a distance from the tree equal to 4 times the circumference of the trunk (circumference measured around the trunk at a height of 1.5m above ground level; distance measured from the centre of trunk to nearest part of any excavation or other work). This area around the trunk is referred to as "the precautionary area" hereafter.

Although, ideally, services should be diverted or re-aligned outside the precautionary area, it is recognised that this will not always be practicable. Where works are required for the laying or maintenance of any service within the precautionary area, there are various techniques to minimise the damage. The appropriate method of laying will depend on the circumstances, such as:

- scope of the works (one off repair, or part of an extensive operation)
- degree of urgency (for restoration of supplies)
- soil conditions
- amenity value of tree
- cost

Acceptable techniques in order of preference are:-

1. Trenchless
2. Broken trench – hand dug
3. Continuous trench — hand dug

Excavation of open trenches by machine is totally unacceptable within the precautionary area.

Trenchless

Wherever possible trenchless techniques should be used. The pit excavations for starting and receiving the machinery should be located outside the precautionary area.

In order to avoid damage to roots by the mole, it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the mole with materials other than water (e.g. oil, bentonite) should be avoided, unless precautions are taken to ensure that there is no contamination of the soil within 600mm of the surface within the precautionary area.

Broken Trench

This technique combines hand dug trench sections with trenchless techniques. If excavation is unavoidable, it should be limited to practical access and installation around/below the roots. The trench is excavated by hand with precautions taken as for continuous trench below. Open sections of the trench should only belong enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible.

Continuous Trench

The object of the exercise is to use manual excavation so as to retain as many roots as possible, bearing in mind the need for working space, access to the service in question and room to install the new service. Hand digging needs to be undertaken with great care and for this reason is likely to require closer supervision than normal operations and an understanding by all operatives and staff as to exactly what is expected.

After careful removal of the hard surface material, digging should proceed with hand tools. All roots greater than 25mm diameter should be retained and worked around. Where clumps of smaller roots (including fibrous roots) are found these should also be retained. During the excavation great care should be taken to minimise damage to retained roots, including the bark around the roots. Roots with a diameter in excess of 25mm must not be severed without the advice of the owner of the tree or the local authority arboriculturist, who should respond within one working day. If severance is unavoidable, roots must be cut back using a sharp tool (as listed below), leaving the smallest wound.

Suggested tools required: fork, breaker bar, secateurs, handsaw (folding, silky or bow saw), post hole shoveller and hand fork and trowel.

Backfilling

Any reinstatement must comply with the requirements of street works in Great Britain must comply with the requirements of the code of practice approved under the New Roads and Street Works Act 1991 (Specification for the Reinstatement of Openings in Highways). Without prejudice to the requirements of this code as to the specification of materials to be used and the standards of workmanship to be observed, backfilling of any excavation should be carefully carried to avoid direct damage to the retained roots and excessive compaction of the soil around them.

The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builders sand) around the retained roots. This should allow the soil to be compacted for resurfacing without damage to the roots, and should secure a local aerated zone enabling the root to survive in the longer term.

Backfilling outside the highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them, e.g. winter diurnal temperatures. It is important, therefore, to protect exposed roots where a trench is to be left open overnight when there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

Special Considerations when planning service routes

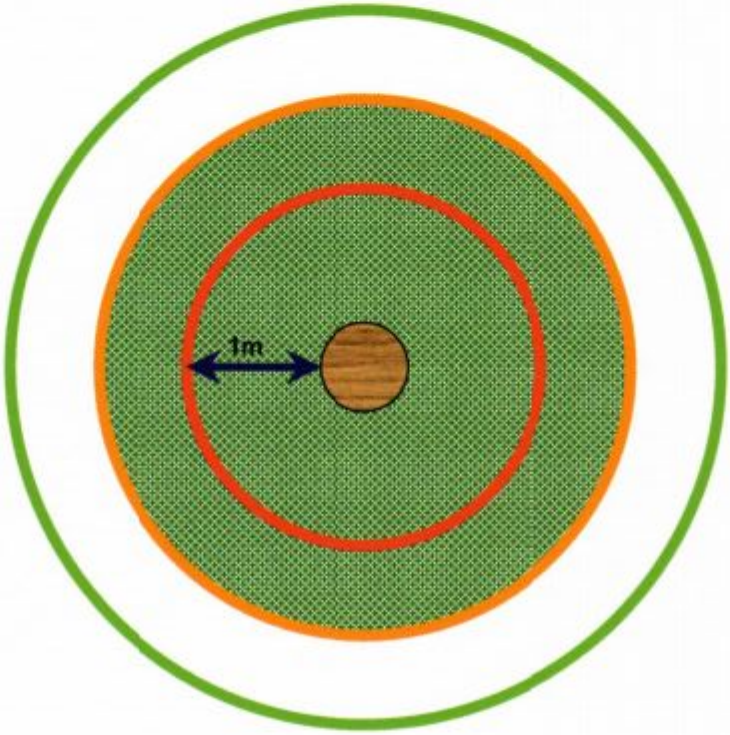
The potential for future conflict with trees can be reduced at the stage of initial planning approval by the appropriate alignment of services and the provisions for future tree and shrub planting. Appropriate and separate space should be provided for each. Local authorities should liaise with developers.

If planning requirements and site constraints dictate that trees (existing or to be planted) and services share the same area, consideration should be given to increasing the depth of services, if possible to a minimum of 600mm, and to laying the service in ducts which will resist root penetration but allow replacements to be laid without extensive excavation. As this may incur additional costs, allowance must be made for these costs and the responsibility for meeting them at the planning stage.

When laying new services or replacements, to avoid risk of future direct damage, allowance should be made for future root growth.

Services laid in clay or peat should be constructed to tolerate movements associated with swelling or shrinking of the subsoil cause by root activity. Special precautions for differential movement should be incorporated where services join rigid structures founded at a different depth to the service.

FIGURE 1 – Tree Protection Zone



Key

Trunk of tree

Canopy or branch spread

PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with the local authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.

PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with the local authority Tree Officer if in any doubt.

PERMITTED ZONE – outside of the precautionary zone. Excavation works may be undertaken within this zone, however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

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