



BJH.0654

ARBORICULTURAL IMPACT ASSESSMENT

Merok House, New Brighton Road, Emsworth

-prepared on behalf of Caldwell Group Ltd. –

- September 2013-

Bernie Harverson M.Arb.

3 foxcombe cottages • south harting • west sussex • gu31 5pl
tel: 01730 825297 • mob: 07875 520881 • email: bernie.harverson@virgin.net • VAT Reg No. 881 5056 16

Section	Subject Heading
1	INTRODUCTION & CLIENTS BRIEF
2	DOCUMENT DISCLOSURE STATEMENT
3	TOPOGRAPHICAL SURVEY & SOIL ASSESSMENT & TREE SURVEY & ROOT PROTECTION AREAS - (in accordance with Section 4 of BS5837)
4	CONSTRAINTS POSED BY EXISTING TREES – ASSESSMENT OF ABOVE & BELOW GROUND CONSTRAINTS - (in accordance with Section 5.2 of BS5837)
5	PROXIMITY OF STRUCTURES TO TREES - (in accordance with Section 5.3 of BS5837)
6	ARBORICULTURAL IMPACT ASSESSMENT - (in accordance with Section 5.4 of BS5837)
7	TREE PROTECTION PLAN - (in accordance with Section 5.5 of BS5837)
8	NEW PLANTING DESIGN - (in accordance with Section 5.6 of BS5837)
9	ARBORICULTURAL METHOD STATEMENT - Heads of Terms - (in accordance with Section 6.1 of BS5837)
10	BARRIERS AND GROUND PROTECTION & SITE MONITORING - (in accordance with Section 6.2 and 6.3 of BS5837)
11	DEMOLITION AND CONSTRUCTION IN PROXIMITY TO EXISTING TREES - (in accordance with Section 7 of BS5837)
12	SITE WORKS, LANDSCAPE OPERATION AND MANAGEMENT - (in accordance with Section 8 of BS5837)
13	TREE MANAGEMENT - (in accordance with Section 8.8 of BS5837)
14	CONCLUSIONS
<u>Appendices</u>	<u>Subject</u>
BH1	Tree Survey Schedule + Figure 1 Flow Diagram from BS5837 + Tree Survey Notes
BH2	Tree Survey & Root Protection Area Schedule & Root Protection Area Plan [BJH.01/02]
BH3	Tree Retentions & Removals Plan [BJH.03]
BH4	Tree Protection Plan–BJH.04 [+ BS5837 Extracts + Example Warning Notices]
BH5	Tree Works Schedule - (in accordance with Section 8.8 of BS5837)
BH6	NJUG 10 Extract
BH7	Qualifications & Experience

1.0 INTRODUCTION & CLIENTS BRIEF

- 1.1 The proposed development site is currently in everyday use as a residential Nursing Home.
- 1.2 This project involves adding extensions to the side and rear and refurbishing the interior layout – shutting off the northern access point and increasing car parking provision on the frontage.
- 1.3 I have been employed to address the arboricultural issues and to compile all necessary reports and plans in support of the scheme - part of which involves surveying the trees present on site.
- 1.4 In advising my clients I am duty bound to comply with ‘Best Practice’ industry guidelines and to follow the recommendations contained in BS5837:2012 – Tree In Relation To Design, Demolition and Construction Recommendations – adopting the sequential approach illustrated in the *Figure 1 Flow Diagram – The design and construction process and tree care.*

2.0 DOCUMENT DISCLOSURE STATEMENT

- 2.1 I have been supplied with a copy of the Topographical Base Plan for this site at 1:200 scale.
- 2.2 I have also been supplied with a copy of the following **Proposed Ground Floor Plan** drawing as prepared by – **PWP Architects – 4963-1250-Sept.13 - 1:200 @ A3** scale as an extract and I rely totally on the accuracy of this for the purposes of my assessment and production of this report.

3.0 TOPOGRAPHICAL SURVEY & SOIL ASSESSMENT & TREE SURVEY & ROOT PROTECTION AREA (RPA) SCHEDULES & PLANS

- 3.1 A Topographical Survey has been undertaken and the drawing has been prepared, and to the best of my knowledge this accords with the requirements of BS5837 as listed at Section 4.2
- 3.2 No data has been made available to me in respect of a Soil Assessment.
- 3.3 The Tree Survey exercise was carried out on **18th July 2013** - in accordance with the requirements of BS5837:2012 (see copy of Schedule at [appendix BH1](#)).

- 3.4 The data obtained from the Tree Survey exercise has been utilised to prepare the Root Protection Area Schedule - in accordance with the requirements of BS5837:2012 – (see copy of RPA Schedule and combined tree survey and root protection Plan BJH.02 at [appendix BH2](#)).

4.0 CONSTRAINTS POSED BY EXISTING TREES – ASSESSMENT OF ABOVE AND BELOW GROUND CONSTRAINTS

- 4.1 The RPA's have been plotted onto a copy of the Draft Layout Proposals and the implications of the below ground impact on trees both on and adjacent to the development site has been recorded on the **Tree Retentions and Removals Plan** [see copy of **Plan BJH.03** at [appendix BH3](#)] and this has been disclosed to the clients as part of the ongoing design process leading up to the submission of this report which is based on the Finalised Layout Proposals.
- 4.2 RPA's represent below ground constraints and the above ground constraints might arise from the following:-
- 4.2.1 ***The current and ultimate height and spread of the retained trees***
- The trees at this location are a mix of native self-sown trees and planted ornamental conifers and shrubs arranged around the periphery of the site and in the rear garden area - ranging from semi-mature to early mature with scope for further growth and development subject to available space. There is one large off-site mature Oak at the rear which has reached its optimum height and spread at this location and on this soil. Most of these trees will require regular cyclic pruning to keep them clear of building lines as has been the already established and accepted practice.
- 4.2.2 ***Species characteristics, including evergreen or deciduous, density of foliage, and factors such as susceptibility to honeydew drip, branch drop, fruit fall, etc.*** – There is a good evergreen content on this site of trees and hedges and shrubs. To the best of my knowledge there are no significant or specific problems associated with any of the retained tree species.
- 4.3 The BS warns that *'Whilst either shade or sunlight might be desirable, depending on the potential use of the area affected, the design should avoid unreasonable obstruction of light.* In this respect the BS suggests at NOTE 1 *'An indication of potential direct obstruction of sunlight can be illustrated by plotting a segment, with a radius from the centre of the stem equal to the height of the tree drawn from due north-west to due east, indicating the shadow pattern through the main part of the day.*

It would only be necessary to undertake this exercise where shading is likely to be a significant or unacceptable issue with ‘unreasonable obstruction of light’ and this will not in my opinion be the case on this site as the situation of close proximity to trees and accepted pruning works as and when needed is established.

4.4 The BS also lists the following factors as requiring to be taken into account during the design process:-

- 4.4.1 ***The presence of tree preservation orders, conservation areas or other regulatory protection*** – I have not been made aware of any Tree Preservation Order or Conservation Area cover on this site and at this juncture with no remit to do so have made no enquiries of my own in this respect.
- 4.4.2 ***Potential incompatibilities between the layout and trees proposed for retention*** – in order to gain access to this building for erection of scaffolding it will be necessary to prune back some trees/shrubs and hedge sections but nothing major that would have a significant impact in the landscape. One small Pear tree in the rear garden (T14) will also need to be removed to facilitate same.
- 4.4.3 ***The working and access space needed for the construction of the proposed development*** – the areas to the front of the site will be needed for the purposes of materials storage and a small works compound - as the existing tarmac surfaced car park is to be retained this will act as adequate protection and no further measures are required to protect tree roots.
- 4.4.4 ***The effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space*** – answer as per 4.4.2 above.
- 4.4.5 ***The requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy*** – this has been noted on the Root Protection Plan and where appropriate due notice will have been taken of this in the setting out of the protective fencing and layout of new buildings.
- 4.4.6 ***Infrastructure requirements in relation to trees e.g. easements for underground or above ground apparatus; highway safety and visibility splays; and other infrastructural provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines :*** –
- ***Easements for underground or above ground apparatus*** – I have not been made aware of any at this juncture.
 - ***Highway safety and visibility splays*** – with existing access points this is not an issue with trees on this project and safety issues and highways standard requirements will be for others to determine.

- ***Substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines*** – I have not been made aware of the need to excavate for laying any new connections but if there is a requirement at a later stage then they can be readily covered by means of satisfying a Planning Condition.

4.4.7 ***The proposed end use of the space adjacent to retained trees*** – the arboricultural issues have all been discussed within this report and resolved or mitigated.

4.4.8 ***The potential for new planting to provide mitigation for tree losses*** – this site offers limited scope for establishing new shrub and tree planting given the requirements for parking facilities on the frontage and ultimately the proximity to the trees to the rear of the new extension.

5.0 PROXIMITY OF STRUCTURES TO TREES

BS5837 states that the default position should be that structures are located outside the RPA's of trees to be retained. However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s) and requires that if operations within the RPA are proposed, the project arboriculturist should:

- a) demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA
- b) propose a series of mitigation measures to improve the soil environment that is used by the tree for growth

5.1 This situation has been assessed as part of the Arboricultural Impact Assessment at 6.0 below.

5.2 The BS also raises the issue of shrinkable soils and the need to cater for the potential for shrinkage or heave resulting from removed; retained or newly planted trees.

5.2.1 No soils information has been provided to me for consideration on this project so I am unable to offer any guidance and advice on this matter.

5.3 BS 5837 states that a realistic assessment of the probable impact of any proposed development should take account of the retained trees future growth and maintenance requirements to maximise the chances of successful tree retention. The following headings are listed and a realistic response is provided under each one relative to this specific development layout.

5.3.1 ***Shading of Buildings*** – not an issue on this project as the situation already exists and is accepted by the site owners.

5.3.2 ***Shading of Open Spaces*** – not an issue on this project as the situation already exists and is accepted by the site owners.

- 5.3.4 **Privacy and Screening** – the existing conifer and shrub screening along the north and south boundary will be retained as will all of the tree cover which is valuable screening for the neighbours.
- 5.3.5 **Direct Damage** – not an issue on this project.
- 5.3.6 **Future Pressure For Removal** – none anticipated as the retained trees are some distance away.
- 5.3.7 **Seasonal Nuisance** – minor seasonal inconvenience as the retained trees are some distance away.
- 5.3.8 **Indirect Damage** – I am unable to comment on the potential for this to take place in the future as I have not been provided with a soils assessment.
- 5.3.9 **Hard Standing (less than 20% within any RPA)** – the level of hard standing proposed does not exceed this requirement for retained trees as the majority already exists and is like for like replacement and where new is proposed it covers a minimal surface area.

6.0 ARBORICULTURAL IMPACT ASSESSMENT

- 6.1 The finalised planning layout drawing has been provided and an assessment made as to the viability of retaining trees as part of this layout in order that they meet the RPA requirements of BS5837 - The data is presented here in tabular format:-

Key: **RSAM** = Remove for sound arboricultural management reasons **RTFD** = To be removed to facilitate development

UF of. = Under footprint of development **TRANS** = Transplant to an alternative location on site

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Polygon Area m ²	Distance from Site Features (see key above)	Can Tree Be Retained
Group 1	Mixed Conifers & mature Shrubs	B2	Av 150 x 4	3.6	41	2m to existing tarmac car parking surfaces which are to remain undisturbed Pruning back of lateral spread will be required	YES (1)
1	Common Ash <i>Fraxinus excelsior</i>	B1	560	6.7	142	1m to existing tarmac car parking surfaces which are to remain undisturbed	YES
2	Field Maple <i>Acer campestre</i>	B1	280	3.4	35	1m to existing tarmac car parking surfaces which are to remain undisturbed Pruning back of lateral spread will be required	YES (1)

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Polygon Area m ²	Distance from Site Features (see key above)	Can Tree Be Retained
Group 2	Common Ash x 4 of <i>Fraxinus excelsior</i>	C2	100 to 300	1.2 3.6	5 41	2m to 4m to existing tarmac car parking surfaces which are to remain undisturbed Pruning back of lateral spread will be required	YES (1)
3	Monterey Cypress <i>Cupressus macrocarpa</i>	C1	400	4.8	72	1m to existing tarmac car parking surfaces which are to remain undisturbed Pruning back of lateral spread will be required	YES (1)
Group 3	Common Ash x 3 of <i>Fraxinus excelsior</i>	C2	Av 220	2.6	22	2m to existing tarmac car parking surfaces which are to remain undisturbed Pruning back of lateral spread will be required	YES (1)
4	Common Ash <i>Fraxinus excelsior</i>	B1 / C1	300 #	3.6	41	2m to existing building line Pruning back of lateral spread will be required	YES (1)
5	Bay Laurel <i>Laurus nobilis</i>	C1	220	2.6	22	3.6m to new garden room extension 1m to new hard surfacing detail Pruning back of lateral spread will be required	YES (1)
6	Pedunculate Oak <i>Quercus robur</i>	B1	660 450 #	9.6	289	9.6m to new garden room extension 8m to new hard surfacing surround to building	YES (1)
7	Pedunculate Oak <i>Quercus robur</i>	C1	1000	12.0 Adjusted to 8m in view of decline	452 200	1.3m to existing Summer House 9.5m to new building extension 8m to new hard surfacing surround to building	YES (1)
8	Bay Laurel <i>Laurus nobilis</i>	B1 / C1	250	3.0	28	2m to existing Summer House 9.5m to new building extension 8m to new hard surfacing surround to building	YES
9	Elderberry <i>Sambucus nigra</i>	C1	160	1.9	12	9.7m to new building extension 8m to new hard surfacing surround to building	YES
10	Golden Irish Yew <i>Taxus baccata</i> 'Fastigiata'	B1	25 x 10	0.9	3	3.4m to new building extension 1.4m to new hard surfacing surround to building	YES
11	Golden Lawsons Cypress <i>Chamaecyparis lawsoniana</i>	B1	300 #	3.6	41	6.6m to new building extension 3.9m to new hard surfacing surround to building	YES

Tree No	Species	Cat	Stem Diam mm	BS5837:2012 Radial Protection Area m	BS5837:2012 Polygon Area m ²	Distance from Site Features (see key above)	Can Tree Be Retained
12	Blue Spruce <i>Picea pungens</i> 'Glauca'	B1	280	3.4	35	7m to new building extension 5m to new hard surfacing surround to building	YES
13	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	C1	150 x 4	3.6	41	7.3m to new building extension 5.3m to new hard surfacing surround to building	YES
14	Domestic Pear <i>Pyrus domestica</i>	C1	100	1.2	5	2.4m to new building extension 0.5m to new hard surfacing surround to building	NO – RTFD
Hedge 1	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	C2	Av 90	1.1	4	5m to new building extension One small end section of hedge will need to be removed 1m to new hard surfacing surround to building	Majority YES Some NO – RTFD
15	Common Ash <i>Fraxinus excelsior</i>	C1	350 #	4.2	55	4.8m to new building extension with a boundary brick wall in between the two	YES
Group 4	Hawthorn (<i>Crataegus</i>) & Bay Laurel (<i>Laurus</i>)	C2	Av 170	2.0	13	3.7m to existing building line 1m to existing car parking surfacing Pruning back of lateral spread will be required	YES (1)

6.2 NO – RSAM

- There are **0** trees within this category on this project which is recommended for removal for health and safety reasons regardless of any redevelopment proposals.

6.3 NO – RTFD

- There is **1** tree and a small section of **1** hedge within this category on this project which cannot be retained with the proposed new layout.

T14 – Pear – a dwarf and distorted tree of poor quality which will not be greatly missed and if necessary a replacement tree can be planted further down the rear garden.

Hedge 1 – Cypress hedge (part of) – a collection of poor quality trees of low C grading – only the end ‘return’ section of these trees would have to be removed to provide adequate room for the new development.

6.4 **YES**

- There are **8** trees and most of **1** hedge in this category on this project which can be retained and fully protected in accordance with BS5837 recommendations (see Tree Protection Plan BJH.04 at [appendix BH4](#) and full listing in schedule at 6.1 above).

Trees 1; 8 to 13 and tree 15 along with Hedge 1 (majority of).

6.5 **YES (1)**

- There are **6** trees and **4** groups in this category on this project where work will impact on them requiring mitigation measures or facilitation pruning works to be applied:-

Tree 2 – Field Maple – the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

Tree 3 – Monterey Cypress – the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

Tree 4 – Ash – the works to the outside of the building will require scaffolding to be erected which would conflict with the crown and requires facilitation pruning as well as ground protection measures around the periphery of the building within the trees RPA.

Tree 5 – Bay – the works to the outside of the building will require scaffolding to be erected which would conflict with the crown and requires facilitation pruning as well as arb expert supervised ‘hand digging’ and root severance (roots of 25mm diameter or less with the use of secateurs) within the RPA where new hard surfacing detail is to be laid around the building.

Tree 6 – Oak – the building is exactly on the RPA for this tree but erecting scaffolding will require ground protection measures and the new hard surfacing detail around the building will be within the RPA so there will be a need for arb expert supervised ‘hand digging’ and root severance (roots of 25mm diameter or less with the use of secateurs).

Tree 7 – Oak – the building is outside the RPA for this tree but erecting scaffolding will require ground protection measures and the new hard surfacing detail around the building will be within the RPA so there will be a need for arb expert supervised ‘hand digging’ and root severance (roots of 25mm diameter or less with the use of secateurs).

Group 1 – Conifers/Shrubs – the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

Group 2 – Ash – the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

Group 3 – Ash – the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

Group 4 – Hawthorn/Bay - the roots are protected by the tarmac which is to be retained but the crown has low overhang of the site and will need to be lifted to accommodate site traffic for construction purposes and then everyday car parking usage – see works listed in Tree Schedule at [appendix BH5](#).

7.0 TREE PROTECTION PLAN

- 7.1 The Tree Protection Plan (TPP) has been superimposed on the layout plan based on the topographical survey.
- 7.2 The plan clearly indicates the location of protective barriers to form a Construction Exclusion Zone around the retained trees.
- 7.3 The TPP has been annotated with descriptive text where possible and additional information prepared as a separate text document where necessary that must accompany the Plan at all stages e.g. when handed to the Site Manager.
- 7.4 Where there is a need for Ground Protection this has been clearly indicated and a specification provided for same.
- 7.5 The following is a list of factors that BS recommends need to be considered to avoid disturbance to the barriers during the construction process and this list has been provided to the clients Architect and where responses have been received these details will have been addressed and incorporated on the Tree Protection Plan or in the text document – in the event that issues have not been satisfactorily resolved at this juncture it is suggested that the Planning Authority seek detailed responses as part of any Method Statement submission to satisfy Planning Conditions:-

- a) site construction access
- b) the intensity and nature of the construction activity
- c) contractors car parking
- d) phasing of construction works
- e) the space needed for foundation excavations and construction works
- f) the availability of special construction techniques
- g) the location and space needed for all temporary and permanent apparatus and service runs, including foul and surface water drains, land drains, soakaways, gas, oil, water, electricity, telephone, television or other communication cables
- h) all changes in ground level, including the location of retaining walls, steps and making adequate allowance for foundations of walls.
- i) working space for cranes, plant, scaffolding and access during works
- j) space for site huts, temporary toilet facilities (including their drainage) and other temporary structures
- k) the type and extent of landscape works which will be needed within the protected areas, and the effects these will have on the root system
- l) space for storing (whether temporary or long term) materials, spoil and fuel and the mixing of cement and concrete
- m) the effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.

8.0 NEW PLANTING DESIGN

- 8.1 As an arboriculturist my level of expertise does not extend to Landscape design which is a specialist area requiring expert input from a Landscape Architect with a detailed scheme to accompany the planning application.
- 8.2 If a Soil Assessment has been undertaken and flagged up a Shrinkable Soil then I will have advised the client of the need to address issues of potential for shrinkage or heave from existing, removed or newly planted trees.
- 8.3 Even if there are no trees on the site, areas for future planting should be plotted on the plans and protected from damage, especially soil compaction due to construction activity, by the erection of barriers and/or ground protection. Where such pre –development protection is not implemented, prior remediation measures should be employed, such as soil ripping with a winged-tined plough or subsoil aeration. In practice this is extremely difficult to

implement and the best that can be hoped for is that the ground is adequately protected and then appropriate de-compaction, aeration and mulching undertaken at the completion of works during the soft landscaping works phase. The TPP may where appropriate indicate notional areas outside the RPA's where appropriate ground protection measures might be implemented to protect the ground during the course of demolition and construction works in anticipation of subsequent new tree planting.

9.0 ARBORICULTURAL METHOD STATEMENT – Heads of Terms

- 9.1 At the Planning Application stage BS5837 requires that the arboriculturist is to identify any areas where the ability to achieve a successful outcome for retained trees on a development site can be defined in principle. Then under 'Heads of Terms' list those areas where more detailed input from other specialists is required and/or where more technical information is required to be submitted to satisfy Planning Conditions.
- 9.2 ***Above Ground Formed – Pile and Beam Footings*** – not required on this project
- 9.3 ***'Ground Protection Measures'*** – some requirement on this project as detailed and shown on the Tree Protection Plan – no further details necessary.
- 9.4 ***Utility Service Connections*** – information has not been provided at this juncture but I am assured that all such connections will be made outside of retained tree RPA's – there may therefore be a need for this detail to be included at a later date.
- 9.5 ***Highway safety and visibility splays*** – to be dealt with by others but no tree impact.
- 9.6 ***Site Huts/Toilets/Materials Storage & Site Compound/Cement Mixing Area*** – this information has not been made available to me at this time but there is limited space for all of these facilities to be incorporated at the front of this development site (subject to relocation of existing cars out onto the street for the duration of the build process); this is not envisaged to have any adverse impact on retained trees. It is suggested that this can best be shown on a Site Set-Up drawing to be provided to satisfy a Planning Condition.
- 9.7 ***Substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines*** - full details are not available at this stage but IF they are required then this would need to be addressed within a separate Method Statement.
- 9.8 ***Site Monitoring Program*** – to be carried out by an appointed arboricultural expert with an auditable system of recording visits and events noted once the build program has been identified i.e. not possible at this juncture. The monitoring of the 'hand digging works will need to form part of this and would need to be addressed within a separate Method Statement.

10.0 BARRIERS AND GROUND PROTECTION & SITE MONITORING

- 10.1 All trees that are being retained on site are to be protected by barriers and/or ground protection before any materials or machinery are brought onto site, and before any demolition, development or stripping of soil commences.
- 10.2 Barriers are to be 'Fit For Purpose' to exclude demolition/construction activity and must be maintained to ensure that they remain rigid and complete and in the original setting out positions.
- 10.3 The default position will always be to erect fencing to the standard illustrated at Figure 2 (see drawing and specification at [appendix BH4](#)).
- 10.4 Where site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification will be agreed and deployed.
- 10.5 Where the fencing is to be erected over retained hard surfacing (whether temporary or permanent) it may not prove feasible or is undesirable to drive pins or struts down through the surfacing and through protected tree roots with the resultant high risk of damage. In these circumstances it will be appropriate to erect scaffolding as illustrated at Figure 3 (see drawing and specification at [appendix BH4](#)).
- 10.6 Where construction working space or temporary construction access is justified within the RPA, this will be facilitated by a set-back in the alignment of the protective fencing and the appropriate levels of Ground Protection laid. It is possible in certain circumstances to retain the existing hard surfacing to act as ground protection but where open ground has to be protected one of the following specifications will be applied :-
- For Pedestrian Movements Only** – a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100mm depth of woodchip), laid onto a geotextile membrane.
- For Pedestrian Operated Plant up to a gross weight of 2 tonnes** – proprietary inter-linked ground protection boards placed on top of a compression resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane.
- For Wheeled or Tracked Construction Traffic exceeding a gross weight of 2 tonnes** – an alternative system (e.g. proprietary systems of pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

- 10.7 In any event the appropriate levels of protection for either Protective Fencing or Ground Protection will be illustrated and specified on the Tree Protection Plan and in its accompanying text.
- 10.8 A copy of the **Tree Protection Plan – BJH.04** is to be pinned up in the offices/mess hut on site for all site staff to see. The area within the fenced off 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 following prohibitions shall apply within the area enclosed by the Tree Protection Fencing :-

- **No** mechanical digging or scraping once the initial ground cover vegetation has been cleared and the site fenced off.
 - **No** storage of plant, equipment or materials
 - **No** vehicular or plant access
 - **No** fire lighting
 - **No** handling, discharge or spillage of any chemical substance, including cement washings
 - **No** action likely to cause localised water-logging
 - **No** change in ground levels
- 10.9 In addition any materials whose accidental spillage would cause damage to a tree are to be stored, handled or mixed well away from the outer edges of a retained trees RPA or if this is unavoidable then appropriate polythene sheeting must be laid to prevent soil contamination.
- 10.10 It will be very important for any vehicle drivers to have undergone a pre-contract induction session where the trees to be retained are to be highlighted and the need for care and attention when working nearby with wide loads; tall loads; plant with swinging booms, jibs and counterweights (including drilling rigs) or slewing hydraulic arms to avoid contact with trunks or crowns.
- 10.11 **Site Monitoring –**
- BS5837 recommends that wherever trees on or adjacent to a site have been identified within the tree protection plan for protection measures, there should be an auditable system of arboricultural site monitoring and this is referred to under Reserved Matters/Planning Conditions in Table D1.

- This should extend to direct arboricultural monitoring whenever construction and development activity is to take place within or adjacent to any RPA.
- Existing planning regulations include the provision for local authorities to enforce planning requirements so it is important that local authorities recognise the need to include a Condition to require the supply and approval of an auditable system of arboricultural site monitoring.
- The project arboriculturist appointed by the developer can help monitor site activity, but enforcement is the responsibility of the local authority.
- In this instance I recommend at least one pre-start meeting – prior to the Construction Phase - which should be held out on site with the Contracts Manager to inspect the protective fencing and ground protection measures to verify that they are fit for purpose and in the correct location according to the Tree Protection Plan.

11.0 DEMOLITION AND CONSTRUCTION IN PROXIMITY TO EXISTING TREES (general points)

11.1 Demolition –

- There is no specific requirement for Demolition although parts of the existing buildings walls will need to be removed to facilitate the revised layout and extension works therefore protective fencing must be erected prior to commencement of these works with the positioning and suitability verified by an arboriculturist prior to any demolition contractors being allowed onto the site.

11.2 Construction –

- It is essential before commencing Construction works or bringing machinery onto site that the positioning and suitability of the Protective Fencing has been checked and verified by an arboriculturist.

12.0 SITE WORKS, LANDSCAPE OPERATIONS AND MANAGEMENT

12.1 Any soft landscape works within the protected areas shall be carried out in accordance with Section 8 of BS5837 and BS4428 & BS8545.

12.2 At this juncture appropriate de-compaction, aeration and mulching should be undertaken on any areas designated for planting, which for practical operational reasons could not be fully protected during the build process.

- 12.3 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.

13.0 TREE MANAGEMENT

- 13.1 Based on the finalised layout for the development a schedule of tree works listing all trees that require work as follows :-

- Trees for removal to enable development to take place and also any stump grinding works required.
- Remedial tree works, including those required to establish acceptable levels of risk and management in the context of the proposed land use
- Access facilitation pruning – which will be required on this project.

- 13.2 A Tree Works Schedule forms part of this report and is included at [appendix BH5](#).

14.0 CONCLUSIONS

- There is only one small low graded Pear tree which needs to be removed to facilitate this layout revision [possibility it could be transplanted].
- The facilitation pruning works which have been stipulated will not have an adverse impact on the visual appearance or the overall health and vitality of retained trees.
- There is limited scope on this site to plant replacement trees further down the rear garden but this could be done if requested and should be shown in any accompanying landscape master plan for the project.
- Provided that the methodology prescribed in this report is strictly adhered to I would anticipate that the retained on and off site tree will readily survive the development works.
- Overall it is felt that in arboricultural terms a case has been made for this development to proceed and the proposals are therefore in my opinion fully supportable.

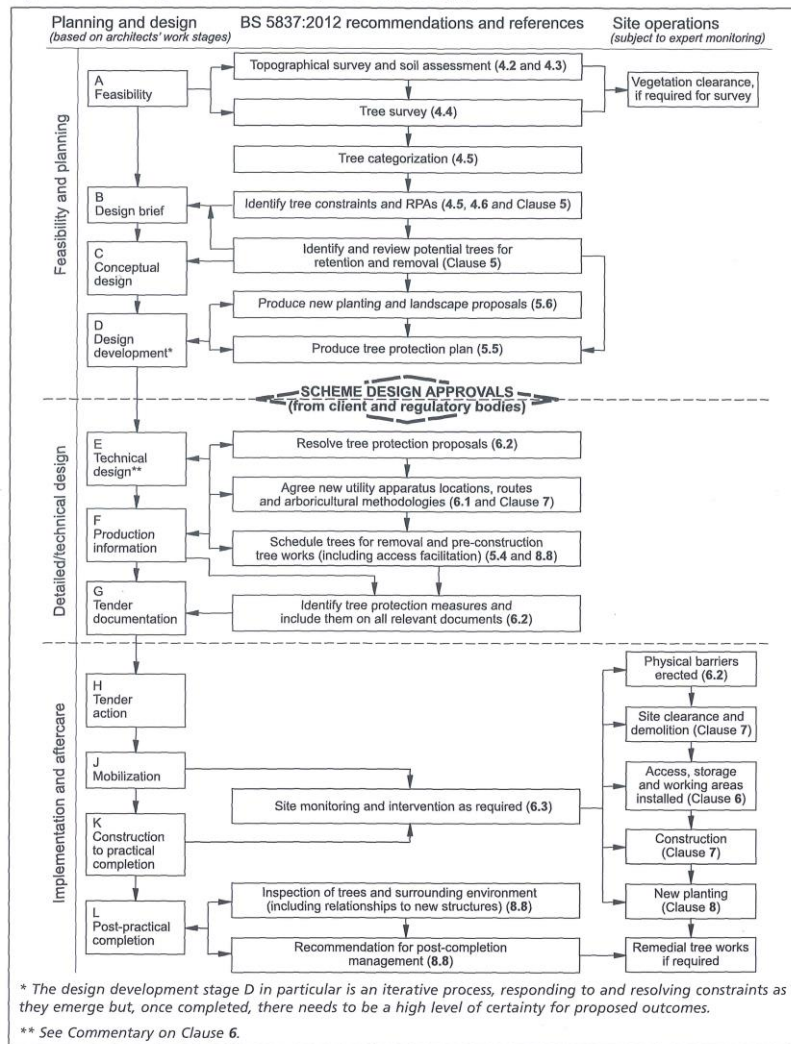


BH 1

Tree Survey Schedule & Plan BJH 01

with Figure 1 Flow Diagram & Tree Survey Notes

Figure 1 The design and construction process and tree care



TREE SURVEY NOTES

These Tree Survey Notes have been prepared in accordance with the recommendations of **British Standard 5837:2012** and they define the criteria for pre –development tree surveys.

- Each tree/group/hedge/shelterbelt/woodland has been allocated a unique number (**No.**), where specifically requested and appropriate fees are agreed small durable numbered metal tags can be applied to each tree/group surveyed.
- The tree species (**Species**) is provided in both English and Latin name formats.
- Height assessments (**Ht**) are estimated in metres. This will be adequate for the majority of cases, but where accurate heights become a critical issue it may be necessary to return to site, as a separately commissioned exercise, to collect accurate measurements with the aid of optical instruments.
- Trunk/stem diameters (**Diam**) are measured in millimetres at 1.5m above ground level – where the tree is inaccessible the diameter is estimated as indicated by suffix #
- Radial crown spread assessments (**Brch Sprd**) are estimated in metres from the centre of the trunk/group to each of the four primary points of the compass (**N**-north; **E**-east; **S**-south and **W**-west) in order to achieve a representation of the crown shape which will be shown on the accompanying tree survey plan. These provide a general guide as to the main bulk outline of a tree/groups crown but are not tape measured dimensions. These would only be undertaken as part of a separately commissioned exercise, where precise dimensions are critical to the project at hand.
- Both the canopy ground clearance (**GC**) and the height & compass direction of the lowest major branch (**LMB**) are estimated and shown in metres
- An assessment of a tree/groups ‘life stage’ (**LS**) is made in terms of its site specific maturity as part of the surrounding landscape, taking into account its overall shape and form in that setting, and is recorded thus :-
Y - Young tree/group; **SM** - Semi-Mature tree/group; **EM** - Early-Mature tree/group;
M – Mature tree/group; **OM** - Over – mature tree/group
- Data on the structural condition (**Condition Comments**) of the tree/group is provided to give its visual appearance and any significant health and safety issues.
- Details of any recommended tree works required at the time of survey is given under the heading – **Preliminary Management Recommendations**.
- An estimate of a tree/groups remaining contribution in years (**RC**) is made and is recorded thus :-
0-5; 5-10; 10-20; 20-30; 30-40 or **>40** years.
- The category grading (**Cat**) for each tree/group is assessed according to the criteria provided within **BS5837:2012**. The assessment is made of the tree/group in its current condition and within the

environment encountered bearing in mind its suitability for retention as part of any future proposed development; although the exact layout detail of any specific scheme will not be known at the time of surveying. The trees have been classified into one of four categories and colour coded as BS5837 recommends :- **U** (dark red); **A** (light green); **B** (mid-blue) and **C** (grey). Please note that suffixed numerical sub-categories are also applied for guidance only and do not carry any cumulative or increased value for the tree/group. This colour coding scheme will be applied to all drawings provided.

Table 1 – Cascade chart for tree quality assessment

Category and definition	Criteria			Colour on plan
Trees unsuitable for retention				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	- 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 category U 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, or very low quality trees suppressing adjacent trees of better quality NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.			Dark Red
Trees to be considered for retention				
	Criteria – Subcategories			
	1	2	3	
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual, or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and /or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Light Green
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in the category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	Mid Blue
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	Grey



TREE SURVEY SCHEDULE

Client : Caldwell Group Ltd.

Site Location : Merok House, New Brighton Road, Emsworth

Surveyor : Bernie Harverson *M.Arb.*

Date Surveyed : 18th July 2013

Tree No.	Species	Ht m	Diam mm	Brch Sprd m	GC m	LMB m	LS	Condition Comments	Preliminary Management Recommendations	Rem Con yrs	Cat
Group 1	Mixed Conifers & mature Shrubs	4 to 6	Av 150 x 4	N3 E3 S3 W3	0	0 nesw	EM	Crown shape dictated by group pressure-merged crowns-crown lifted to 2m-low branching habit-dense massing of evergreen shrubs and conifers	No work considered essential at time of survey	30-40	B2
1	Common Ash <i>Fraxinus excelsior</i>	14	560	N6 E6 S6 W6	3	4s	EM	Ivy smothering base and trunk-bifurcated 2.5m above ground level-small diameter deadwood throughout	Remove all deadwood for safety reasons	>40	B1
2	Field Maple <i>Acer campestre</i>	6	280	N3.5 E5 S5 W3.5	1	1.5 nesw	EM	Suppressed by Tree1-crown lifted to 2m over access-low branching habit	No work considered essential at time of survey	>40	B1
Group 2	Common Ash x 4 of <i>Fraxinus excelsior</i>	10	100 to 300	N4 E4 S4 W4	1.5	2 nesw	Y To SM	Ivy smothering base, trunk and through crown-crown shape dictated by group pressure-merged crowns-small and large diameter deadwood-poor quality trees	Sever ivy-remove all deadwood for safety reasons	>40	C2
3	Monterey Cypress <i>Cupressus macrocarpa</i>	11	400	N5 E3 S1.5 W3	0.5	0.5 nesw	SM	Bifurcated 1.7m above ground level-suppressed to south side by other trees-low crown density-dieback in central area-small diameter deadwood throughout	Sever ivy-crown lift to 3m to avoid damage to cars	>40	C1
Group 3	Common Ash x 3 of <i>Fraxinus excelsior</i>	13	Av 220	N5 E5 S5 W5	3	2 nesw	SM	Ivy smothering base-crown shape dictated by group pressure-merged crowns-small diameter deadwood-crown lifted to clear building line	Crown lift to clear from building line	>40	C2
4	Common Ash <i>Fraxinus excelsior</i>	12	300 #	N4 E4 S4 W4	3	3 nesw	EM	Unable to access as tree is fenced off and is possibly off site-smothered in ivy-multi stemmed at 3m above ground level-stubs from old pruning wounds in lower crown-crown lifted to clear building lines to north and south	No work considered essential at time of survey	>40	B1 / C1
5	Bay Laurel <i>Laurus nobilis</i>	7	220	N5 E1.5 S1 W1.5	1.5	1.5s	SM	Suppressed by Oak-previously heavily topped-reduced and reshaped-poor quality tree-has been hard pruned back to boundary line to south side-flattened shape to crown-some fungal dieback of leading shoots	No work considered essential at time of survey	20-30	C1

6	Pedunculate Oak <i>Quercus robur</i>	14	660 450 #	N6 E5 S5 W8	5	4s	M	Unable to access-off site tree-epicormics-decay and cavities-large open cavity at junction of main fork on largest trunk which is probably the reason it was heavily topped out-small and large diameter deadwood and stubs-previously heavily topped	No work considered essential at time of survey	>40	B1
7	Pedunculate Oak <i>Quercus robur</i>	13	1000	N3 E6 S4 W2	2	5e	M	Epicormics-low crown density-low vigour and vitality-significant dieback-small and large diameter deadwood and stubs-previously heavily topped-cavities in old pruning wounds-poor quality tree-has not responded well to heavy lopping-minimal live crown area	Remove all deadwood for safety reasons and monitor for future signs of dieback-if this continues it will need to be removed	10-20	C1
8	Bay Laurel <i>Laurus nobilis</i>	8	250	N4.5 E2 S2 W2	0.5	2.5n	EM	Suckers-prolific around base of tree-bifurcated 2m above ground level-leans north east-small diameter deadwood-some fungal dieback of leading shoots	No work considered essential at time of survey	30-40	B1 / C1
9	Elderberry <i>Sambucus nigra</i>	6	160	N3.5 E2 S1 W1	2	2 nesw	SM	Suppressed by Bay-low crown density-dieback-small diameter deadwood throughout-poor quality tree-has been pruned back close to boundary line	Remove all deadwood for safety reasons	10-20	C1
10	Golden Irish Yew <i>Taxus baccata</i> 'Fastigiata'	4	25 x 10	N0.5 E0.5 S0.5 W0.5	0	0 nesw	SM	Multi stemmed at ground level-Bay Laurel has wrapped itself around the north side of the Yew	Advise removal of the Bay to benefit the Yew	>40	B1
11	Golden Lawsons Cypress <i>Chamaecyparis lawsoniana</i>	9	300 #	N1.5 E1.5 S1.5 W1.5	0	0 nesw	SM	Unable to access due to dense vegetation-bifurcated 2m above ground level-patches of shoot browning and dieback throughout	No work considered essential at time of survey	>40	B1
12	Blue Spruce <i>Picea pungens</i> 'Glauca'	9	280	N4.5 E4 S4 W4	1	2 nesw	SM	Ivy smothering base and trunk-roots exposed-mower damage 2m-3m from trunk-some dieback	Re-lay turf building up soil over roots to avoid mower damage	>40	B1
13	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	2.5	150 x 4	N2.5 E2.5 S2.5 W2.5	0	0 nesw	SM	Suppressed by Tree 13-has been topped out close to ground level and pruned as a rounded shrub form	Prune to clear lower crown of Spruce	10-20	C1
14	Domestic Pear <i>Pyrus domestica</i>	2	100	N0.5 E0.5 S1.5 W1.5	0.5	0.3 nesw	Y	Grafted tree with union visible close to ground level-climber growing through crown on east side-has been pruned for fruit production	No work considered essential at time of survey	>40	C1
Hedge 1	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	3	Av 90	N0.5 E0.5 S0.5 W0.5	0	0 nesw	Y	Crown shape dictated by group pressure-merged crowns-has been pruned with a flat top and tailored sides as a formal hedge screen	No work considered essential at time of survey	>40	C2

BJH.0654

15	Common Ash <i>Fraxinus excelsior</i>	8	350 #	N4 E1.5 S2.5 W2	3	3 nesw	SM	Unable to access due to off site tree-previously heavily topped to control growth in view of proximity to buildings-poor quality tree	No work considered essential at time of survey	>40	C1
Group 4	Hawthorn (<i>Crataegus</i>) & Bay Laurel (<i>Laurus</i>)	4	Av 170	N2.5 E2.5 S2.5 W2.5	2	0 nesw	SM	Crown shape dictated by group pressure-merged crowns-lower crowns have been pruned as part of the low hedge	No work considered essential at time of survey	>40	C2



BH 2

Tree Root Protection Area
Schedule & Plan BJH 02



ROOT PROTECTION ZONE/AREA SCHEDULE

Client : Caldwell Group Ltd.

Site Location : Merok House, New Brighton Road, Emsworth

Tree No.	Tree Species	Cat	Diam mm	BS5837:2012 Table1 Radial Protection Zone m	BS5837:2012 Table D1 Polygon Area m ²	Is An Offset Required To Cater For Existing Rooting Pattern Restrictions
Group 1	Mixed Conifers & mature Shrubs	B2	Av 150 x 4	3.6	41	NO – there is competition for rooting space between the plants but not sufficient to require an offset
1	Common Ash <i>Fraxinus excelsior</i>	B1	560	6.7	142	NO – there are constraints all around this tree which cancel each other out
2	Field Maple <i>Acer campestre</i>	B1	280	3.4	35	NO – there are constraints all around this tree which cancel each other out
Group 2	Common Ash x 4 of <i>Fraxinus excelsior</i>	C2	100 to 300	1.2 3.6	5 41	NO – there are constraints all around these trees which cancel each other out
3	Monterey Cypress <i>Cupressus macrocarpa</i>	C1	400	4.8	72	NO – there are constraints all around this tree which cancel each other out
Group 3	Common Ash x 3 of <i>Fraxinus excelsior</i>	C2	Av 220	2.6	22	NO – there are constraints all around these trees which cancel each other out
4	Common Ash <i>Fraxinus excelsior</i>	B1 / C1	300 #	3.6	41	NO – there are constraints all around this tree which cancel each other out
5	Bay Laurel <i>Laurus nobilis</i>	C1	220	2.6	22	NO – fairly free rooting to all directions
6	Pedunculate Oak <i>Quercus robur</i>	B1	660 450 #	9.6	289	NO – fairly free rooting to all directions and this is the dominant tree at this location
7	Pedunculate Oak <i>Quercus robur</i>	C1	1000	12.0 Adjusted to 8m in view of decline	452 200	NO – although the RPA requirement is 12m this tree is in a serious state of decline with low vigour and vitality which is why I have adjusted and reduced the RPA
8	Bay Laurel <i>Laurus nobilis</i>	B1 / C1	250	3.0	28	NO – there is competition for rooting space between the plants but not sufficient to require an offset

9	Elderberry <i>Sambucus nigra</i>	C1	160	1.9	12	NO – there is competition for rooting space between the plants but not sufficient to require an offset
10	Golden Irish Yew <i>Taxus baccata 'Fastigiata'</i>	B1	25 x 10	0.9	3	NO – free rooting to all directions
11	Golden Lawsons Cypress <i>Chamaecyparis lawsoniana</i>	B1	300 #	3.6	41	NO – free rooting to all directions
12	Blue Spruce <i>Picea pungens 'Glaucua'</i>	B1	280	3.4	35	NO – free rooting to all directions
13	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	C1	150 x 4	3.6	41	NO – suppressed by T12 and also heavily reduced an topped out
14	Domestic Pear <i>Pyrus domestica</i>	C1	100	1.2	5	NO – free rooting to all directions
Hedge 1	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	C2	Av 90	1.1	4	NO – there is competition for rooting space between the plants but not sufficient to require an offset
15	Common Ash <i>Fraxinus excelsior</i>	C1	350 #	4.2	55	NO – assumed free rooting to all directions – unable to access
Group 4	Hawthorn (<i>Crataegus</i>) & Bay Laurel (<i>Laurus</i>)	C2	Av 170	2.0	13	NO – there are constraints all around these trees which cancel each other out



BH 3

Tree Retentions & Removals Plan

BJH 03



BH 4

Tree Protection Plan

BJH 04

Figure 2 Default specification for protective barrier

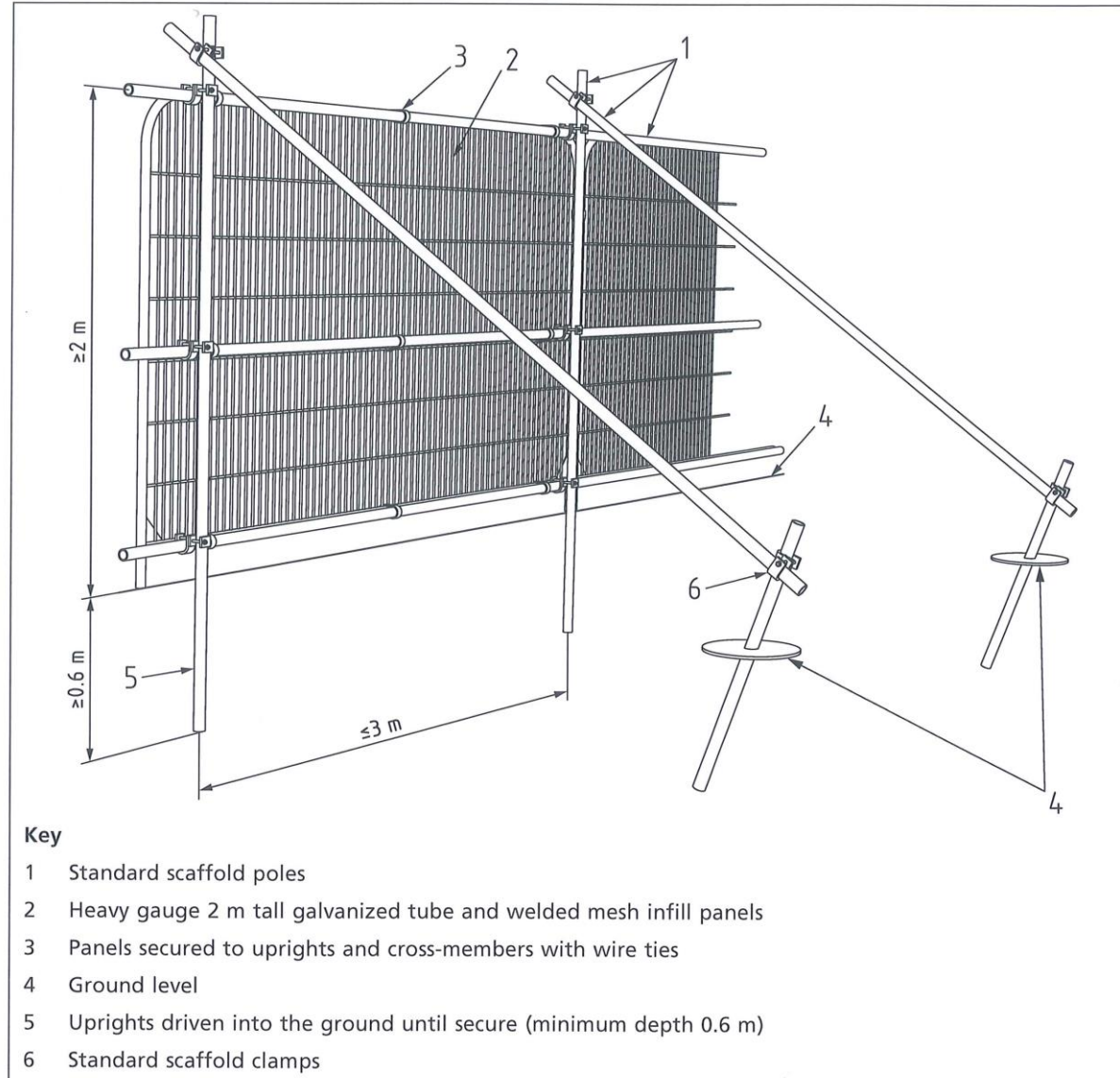
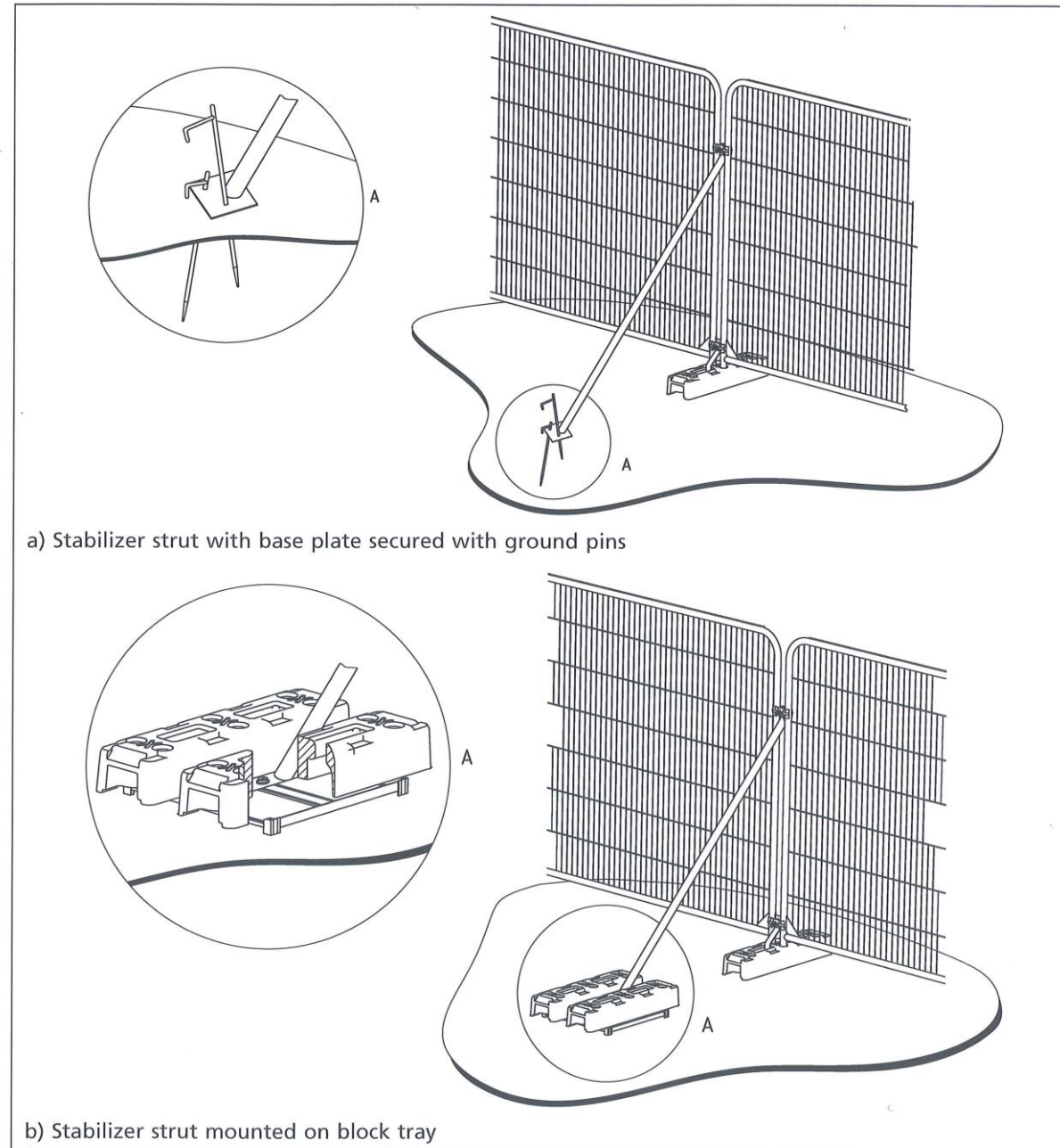


Figure 3 Examples of above-ground stabilizing systems

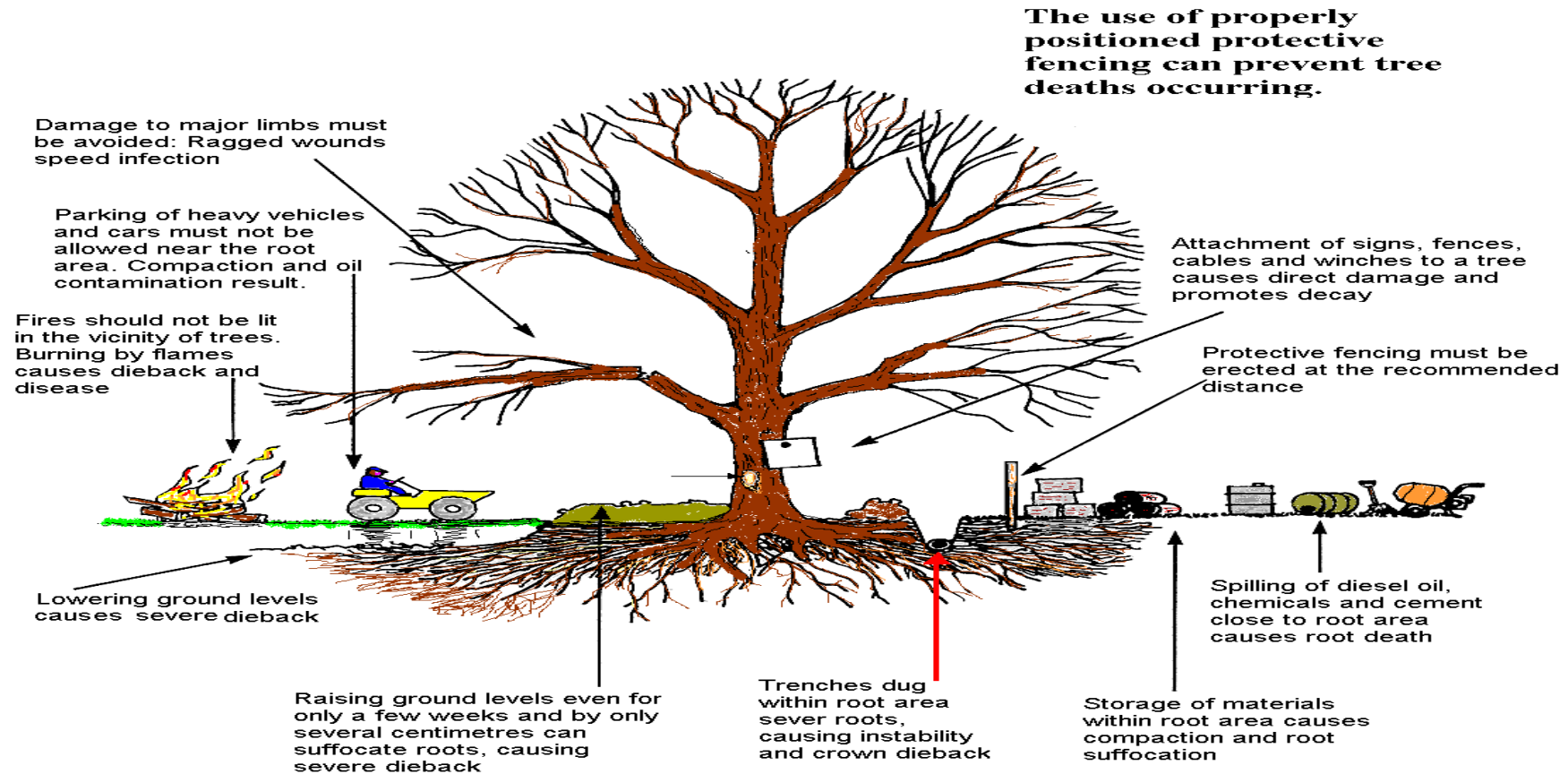


TREE PROTECTION AREA

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**

Common causes of Tree Death



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





BH 5

Tree Works Schedule

TREE WORK SPECIFICATION

Client : Caldwell Group Ltd.

Site Location : Merok House, New Brighton Road, Emsworth

Attention is drawn to the fact that some mature trees could provide suitable habitat for bird nesting (ivy and cavities) and bat roosting (ivy, branch cracks and cavities) and this might at certain times of year influence and possibly restrict the form of management which can be applied. Given the legal constraints imposed by the Habitat Regulations and the Wildlife and Countryside Act this may necessitate expert ecological advice being sought before proceeding with recommendations.

No	Species	Tree Works Recommended
Group 1	Mixed Conifers & mature Shrubs	Shorten the lateral spread by between 1m & 2m as necessary to provide adequate clearance for site vehicles
1	Common Ash <i>Fraxinus excelsior</i>	Remove all dead wood for safety reasons
2	Field Maple <i>Acer campestre</i>	- Shorten the lateral spread to the south side only by between 2m & 2.5m as necessary to provide adequate clearance for site vehicles - All final cuts are to be made adjacent to living growth points
Group 2	Common Ash x 4 of <i>Fraxinus excelsior</i>	- Shorten the lateral spread to the north side only by between 2m & 2.5m as necessary to provide adequate clearance for site vehicles - All final cuts are to be made adjacent to living growth points - Sever all ivy at ground level plus remove all dead wood
3	Monterey Cypress <i>Cupressus macrocarpa</i>	- Shorten the lateral spread to the north side only by between 1.5m & 2m as necessary to provide adequate clearance for site vehicles - All final cuts are to be made adjacent to living growth points - Sever all ivy at ground level plus remove all dead wood
Group 3	Common Ash x 3 of <i>Fraxinus excelsior</i>	- Shorten the lateral spread to the north-east side only by between 1.5m & 2m as necessary to provide adequate clearance for scaffold erection - All final cuts are to be made adjacent to living growth points
4	Common Ash <i>Fraxinus excelsior</i>	Lightly crown lift as necessary spread to the north side only to provide adequate clearance for scaffold erection
5	Bay Laurel <i>Laurus nobilis</i>	- Shorten the lateral spread to the north side only by between 2.5m & 3m as necessary to provide adequate clearance for scaffold erection and building clearances - All final cuts are to be made adjacent to living growth points
6	Pedunculate Oak <i>Quercus robur</i>	No works required at this time
7	Pedunculate Oak <i>Quercus robur</i>	Remove all dead wood and dieback
8	Bay Laurel <i>Laurus nobilis</i>	No works required at this time

9	Elderberry <i>Sambucus nigra</i>	Remove all dead wood
10	Golden Irish Yew <i>Taxus baccata 'Fastigiata'</i>	Remove the competing Bay Laurel which is wrapped around the north side of the crown of the Yew making final cut at ground level so that roots of Yew are not disturbed
11	Golden Lawsons Cypress <i>Chamaecyparis lawsoniana</i>	No works required at this time
12	Blue Spruce <i>Picea pungens 'Glauca'</i>	Lift the turf around this tree and lay topsoil to raise levels and then re-turf – to protect roots from mower damage
13	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	Prune to clear back from lower crown of the Spruce tree
14	Domestic Pear <i>Pyrus domestica</i>	- Fell or transplant to bottom of garden to facilitate development - Grub out the stump
Hedge 1	Golden Leyland Cypress <i>Cupressocyparis leylandii</i>	- Remove and grub out the return (south) section of this hedge only - No works required to remainder
15	Common Ash <i>Fraxinus excelsior</i>	No works required at this time
Group 4	Hawthorn (<i>Crataegus</i>) & Bay Laurel (<i>Laurus</i>)	- Shorten the lateral spread to the south and east sides only by between 1.5m & 2m as necessary to provide adequate clearance for site vehicles - All final cuts are to be made adjacent to living growth points



BH 6

NJUG 10 Extract

NJUG 10 - NATIONAL JOINT UTILITIES GROUP**2. HOW ROOTS ARE DAMAGED**

2.1 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

2.2 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.

2.3 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 in para 2.1.

Types of damage

2.4 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.

2.5 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.

2.6 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 trees 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.

2.7 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.

2.8 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.

2.9 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

4.1 This section gives general guidance on methods of work to minimise damage to 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.

4.2 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.

4.3 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.

4.4 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.

4.5 Trenchless

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

4.5.2 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.

4.6 Broken Trench

4.6.1 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.

4.7 Continuous Trench

4.7.1 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.

4.7.2 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.

4.8 Backfilling

4.8.1 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.

4.8.2 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.

4.8.3 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.

4.8.4 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.

4.10 Special Considerations when planning service routes

4.10.1 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.

4.10.2 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.

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

4.10.4 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.



BH 7

Qualifications & Experience



QUALIFICATIONS AND EXPERIENCE

- My name is Bernie Harverson and I am a self employed independent arboricultural consultant in private practice. I take instructions primarily in the South of England but also on occasions work nationwide and abroad and have offices at : –
3 Foxcombe Cottages, South Harting, West Sussex GU31 5PL and also at Cedar Court, 5 College Street, Petersfield GU31 4AE
- I hold the following arboricultural qualification - **Master of Arboriculture** (Royal Forestry Society – 1976)
- I have over **forty** years of practical and managerial experience in the arboricultural industry including periods in both the public and private sectors.
- My Local Government sector experience comprises one year as a tree surgeon with Brighton Parks and nine years spent in Arboricultural Officer posts with both Westminster City Council and Portsmouth City Council
- My past practical experience in the private sector includes two years at Tilhill Forest Nursery and over ten years for various companies as a Climbing Arborist/Tree Surgeon.
- Managerial work in the private sector includes two years as manager of Beechings tree surgery company and twelve years with CBA Trees as an Arboricultural Consultant.
- As an independent self employed Arboricultural Consultant I now provide a comprehensive range of services including :-
tree surveys, appraisals, assessments and inspections with particular reference to planning and development and tree safety audits with a service offered as a climber to undertake full climbing inspections to better understand the condition of a given tree before prescribing a management strategy.
 - I also undertake litigation work appearing as an Expert Witness in Court Actions and at Planning Appeals, Hearings and Public Local Inquiries.

Bernie Harverson M.Arb.

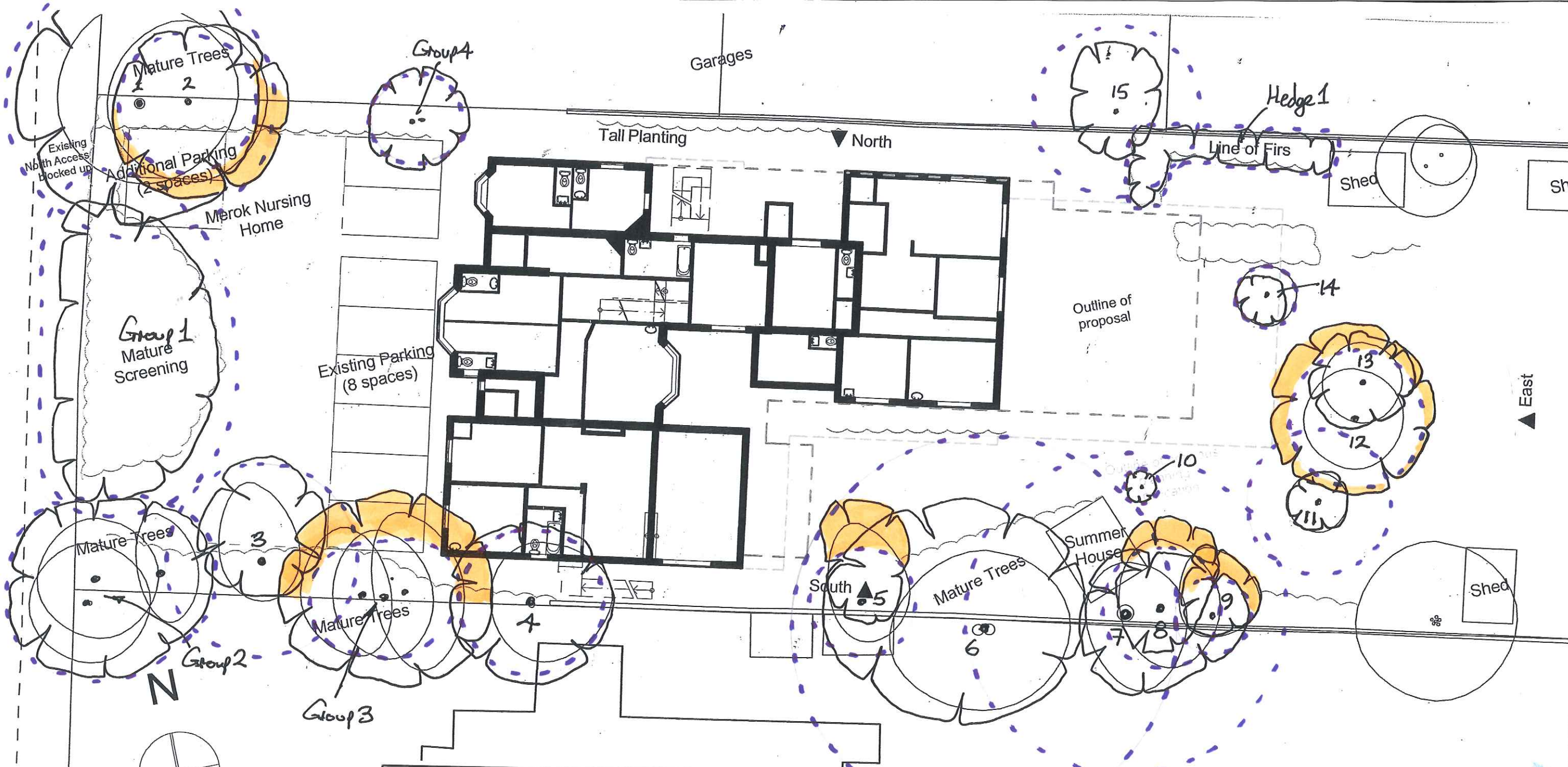
3 foxcombe cottages • south harting • west sussex • gu31 5pl
tel: 01730 825297 • mob: 07875 520881 • email: bernie.harverson@virgin.net • VAT Reg No. 881 5056 16

NEW BRIGHTON ROAD

West

North

East



	project	Merok House New Brighton Road Emsworth			
	client:	Caldwell Group Limited			
	title:	Root Protection Area Plan			
drwg BJH 02	scale: 1:200 @ A3	job 0654	date: July 2013	drawn by: bjh	

Bernie Harverson M.Arb.

3 foxcombe cottages • south haring • west sussex • gu31 5pl
tel: 01730 825297 • mob: 07875 520881 • email: bernie.harverson@virgin.net • VAT Reg No. 881 5056 16

Key:



- = Root Protection Area in accordance with BS5837 recommendations.
- = The crown spread exceeds the recommended RPA – IF the tree has a low branching habit then it may prove necessary to increase the RPA to encompass the full crown or undertake facilitation pruning works.

N.B. - these options would only be necessary if the tree is to be retained.

As Existing

project:

Caldwell
Alterations

NEW BRIGHTON ROAD

West

North

East

Garages

Tall Planting

Hedge 1

Line of Firs

remove end of hedge

Shed

remove shrub hedge

can be retained but advise removal due to proximity

Outline of proposal

remove bay laurel

10

shorten back lateral spread

Summer House

Shed

South

Mature Trees

Mature Trees

Additional Parking (2 spaces)

Merok Nursing Home

Group 1 Mature Screening

crownlift to clear head height above parking (Existing Bay) (8 spaces) and access

crownlift to clear building line

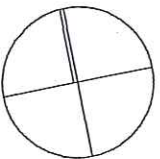
Mature Trees

Group 2

Mature Trees

Group 3

Group 4



project:	Merok House New Brighton Road Emsworth			
client:	Caldwell Group Limited			
title:	Tree Retentions & Removals Plan			
drwg BJH 03	scale: 1:200 @ A3	job 0654	date: July 2013	drawn by: bjh

Bernie Harverson M.Arb.

3 foxcombe cottages • south haring • west sussex • GU31 5PL
tel: 01730 825297 • mob: 07875 520881 • email: bernie.harverson@virgin.net • VAT Reg No. 881 5056 16

Key:



= Trees which are to be retained and fully protected



= Trees which cannot be accommodated and will be removed to facilitate the layout



= The extent of pruning works required to facilitate the layout

project:

Caldwell
Alterations

