



ARBORICULTURAL IMPACT ASSESSMENT **& METHOD STATEMENT**

for

20 Forest Avenue, Cowplain

-prepared on behalf of Debtorbook Solutions Limited-

- October 2012-

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ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT

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1.0 INTRODUCTION & CLIENTS BRIEF

- 1.1 This currently derelict and overgrown site is owned by **Debtorbook Solutions**.
- 1.2 There is an extant approval for this site but my clients seek to vary the layout for three residential units with access and garaging.
- 1.3 As part of this exercise the primary trees on and adjacent to the development site have been surveyed and will be referred to in this report.
- 1.4 In advising my client 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 A topographical base plan has been provided upon which I rely and all of my plan works are based.
- 2.2 The Architects layout proposals have been made available to me in electronic and hard copy format – Ref: **H.J.CONCEPTS Ltd. – 12-885-PL02 - 1:200 @ A1** - I rely totally on the accuracy of these drawings for the purposes of my work on this project.
- 2.3 Also included for the purposes of detailing the Methodology for developing this site are the following:-
 - **12 - 885 - PL04 – 1:100@A1 and Plot 2 RC Grd Beam Section**
 - **12 - 885 - Trial Hole Excavations Report – Oct 2012 - as carried out by Phil Hamblin of HJ Concepts**
 - **12 – 885 - PL01B – 1:500/1:1250 – Sight Line Plan – Contractors Plan – Site Location Plan**

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 Data has been made available to me in respect of a preliminary **Soil Assessment Exercise carried out by Phil Hamblin of HJ Concepts** (see report at [appendix BH6](#)) with these additional comments 'As qualified Structural and Civil Engineers we can state that the soil is of a shrinkable nature and that the soil looks and feels highly plastic. As a result the foundations will be designed in accordance with the NHBC recommendations Chapter 4.2 Building near trees. Also taking into account the soils shrinkability and the existing and new trees proposed. The default position is to assume a highly shrinkable

soil with the relevant heave protection. The proposed foundations are to be auger piles with a cast insitu reinforced concrete ground beam and suspended ground floor. This results in the buildings being protected by damage from the trees and their roots in the cohesive shrinkable clay soil. Desiccation tests are not always done as the piles would go well beyond any tree roots. We would expect the piles on this project to be circa 300mm diameter and go about 8m maximum into underlying soil.'

- 3.3 The **Tree Survey** exercise was carried out on **2nd August 2012**- 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*** – in this situation existing tree cover is concentrated in two main groupings – one to the north and the other to the south of the site. The primary trees are detailed here :-

North Grouping

The **Oak (tree 1)** is the best tree in this small copse and since my first involvement on this project some eight years ago now the trees around it have shown signs of dieback and decline. The exception being **Grp 1 Oaks** which have actually improved in their overall condition. **Trees 3 Hawthorn and 4 Ash and Willow 2** were always poor trees and there is no change in their situation. The more recent casualty is tree **8 Ash** which has gone into a state of terminal decline and will need to be removed. All of the trees within this grouping are fighting for limited space and root development and competing for available nutrients so their potential for future increases in height and spread are very limited.

Southern Grouping

Four **Oaks (trees 9,10,11 & 12)** make up one grouping and the other trees are **Oak 14 and Yew 13 with the Oak** being dominant but given its close proximity to nearby houses and back gardens has suffered some very heavy lopping. As with the northern grouping these trees are all showing various degrees of decline in condition since I first looked at them. The best trees are Oak 11 and Oak 14 with 9, 10 & 12 showing distinct signs of low crown density and low vigour and vitality. Given their condition there is not much chance of them increasing significantly in height and spread in the future. I suspect that trees 11 & 14 will hold their own and show some increase but this will be limited in its extent.

- 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.*** – The vigour and vitality of these trees has been highlighted in the above text. The major upper canopy trees are all deciduous with only one conifer along the south boundary. There are no species weaknesses to be aware of with this collection of trees.

- 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. The site is relatively open to the south side and building design and orientation has taken account of the aspect of these trees and whilst some shading will occur at various times during a normal day this would in my opinion be regarded as acceptable.

- 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 am aware of a Tree Preservation Order covering the trees on this site – it is a Woodland form of Order administered by **Havant Borough Council Ref: 1614-1995.**
- 4.4.2 ***Potential incompatibilities between the layout and trees proposed for retention*** – these have already been explored in section 4.2 and 4.3 of this report or flagged up and dealt with in the draft Tree Retentions and Removals Plan submitted as part of the design process.
- 4.4.3 ***The working and access space needed for the construction of the proposed development*** – there is adequate space on this site to accommodate working and access although due to its long and narrow shape there will be a requirement to carefully plan the construction works so that trees are not

pressurised. This has all been shown on the **HJ Concepts Plan Ref: 12-885 – PL01B** – a copy of which is included at [appendix BH6](#) and detailed under Section 9.0 of this report.

- 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*** – there will not be a need to prune trees to facilitate access although some trees may require remedial surgery to allow for scaffolding erection - this is detailed in the Tree Works Schedule at [appendix BH5](#).
- 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 allowed for in the plans accompanying this report.
- 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*** – see Method Statement at section 9.0 of this report.
- 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 end use of space is not something in my opinion that can be determined by an arboriculturist as it is a subjective matter for my client and his architect to agree with the local authority planners to meet local plan and policy requirements – however having studied the layout I would comment that the buildings are well clear of retained trees and they have adequate and useable open space around them.
- 4.4.8 ***The potential for new planting to provide mitigation for tree losses*** – please see the Landscape Master Plan being submitted with the planning application.

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 and there is one circumstance that encroachment requires mitigation measures and this relates to the Car Port on Plot 2 and this has been discussed in some detail under Section 6 of this report.
- 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 Soils information has been provided to me (see at 3.2 above and Appendix BH6) for consideration on this project so I am able to confirm that the most appropriate way forward is to apply Pile and Beam footings to all Plots to mitigate against potential subsidence and heave problems in the future.
- 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** – there is no direct overhang of branches over building lines
- 5.3.2 **Shading of Open Spaces** – the copse to the north is shaded in the summer months but this feature has been incorporated into a large area of garden associated with the major plot and allowance has been made for other areas of open space around the building that are not affected by tree cover.
- 5.3.4 **Privacy and Screening** – the majority of the current tree cover is concentrated around the periphery of the site leaving the central area largely open for redevelopment – as such the existing tree cover will be retained for privacy and screening.
- 5.3.5 **Direct Damage** – the new buildings and road and drive infrastructure will be far enough away from existing trees that this will not be an issue.
- 5.3.6 **Future Pressure For Removal** – the new buildings and drives will be far enough away from existing trees that this will not be an issue.
- 5.3.7 **Seasonal Nuisance** – this would be an issue on any site with trees on it – as far as the buildings are concerned some relief can be gained from placing grills in guttering and over down pipes – however the distance from trees to property is such that the major leaf fall would be within open space areas which is simply a seasonal inconvenience which cannot be avoided and is easily cleared away – I would not regard the tree cover to be so dense on this site that this would create a major problem.
- 5.3.8 **Indirect Damage** – see information at 3.2 and appendix BH6.
- 5.3.9 **Hard Standing (less than 20% within any RPA)** – the level of hard standing proposed does not exceed this requirement.

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
1	Pedunculate Oak <i>Quercus robur</i>	A1 / B1	450	5.4	92	6.2m to turning head 7.4m to garage	YES
2	Grey Willow <i>Salix cinerea</i>	U	300 250 200 100	n/a	n/a	n/a	NO – RSAM
3	Hawthorn <i>Crataegus monogyna</i>	U	170	n/a	n/a	n/a	NO – RSAM
4	Ash <i>Fraxinus excelsior</i>	U	250	n/a	n/a	n/a	NO – RSAM
5	Ash <i>Fraxinus excelsior</i>	B1	520	6.2	122	24m to turning head 24m to garage	YES
6	Pedunculate Oak <i>Quercus robur</i>	B1	380	4.6	65	11.4m to garage	YES
Grp 1	Pedunculate Oak <i>Quercus robur</i>	B2	300 300 240 180	6.2	122	7m+ to garage	YES
7	Ash <i>Fraxinus excelsior</i>	C1	380	4.6	65	15.4m to building	YES
8	Ash <i>Fraxinus excelsior</i>	U	360	n/a	n/a	n/a	NO – RSAM

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
Grp 2	Ash <i>Fraxinus excelsior</i>	C2	80 to 150	1.8	10	7m+ to building	YES
9	Pedunculate Oak <i>Quercus robur</i>	C1	500	6.0	113	8.4m to building	YES
10	Pedunculate Oak <i>Quercus robur</i>	C1	390	4.7	69	10.5m to building 7.4m to garage	YES
11	Pedunculate Oak <i>Quercus robur</i>	B1	650	7.8	191	9.5m to garage 9.4m to building	YES
12	Pedunculate Oak <i>Quercus robur</i>	C1	460	5.5	96	4.2m to garage 6.3m to building	YES (1)
13	English Yew <i>Taxus baccata</i>	C1	360	4.3	59	12.2m to building	YES
14	Pedunculate Oak <i>Quercus robur</i>	B1	700	8.4	222	9.8m to building	YES

6.2 NO – RSAM

- There are **4** trees in this category on this project which it is proposed be removed for reasons of health and sound arboricultural management.
 - 2 - Willow** – very poor quality multi-stemmed tree with inherent decay in tight forks with no long term value – it might be coppiced rather than felled and grubbed out.
 - 3 – Hawthorn** – has been uprooted in storms and would be lying on the ground if it were not for the support it gains from the crown of Ash tree 4.
 - 4 - Ash** – low crown density and lacking in vigour with the added problem of the Hawthorn resting in its crown.
 - 8 – Ash** - low crown density and lacking in vigour with significant dieback – this tree is in a terminal state of decline.

6.3 NO – RTFD

- There are **0** trees and **0** groups in this category on this project as all remaining trees that are not within the RSAM category will be retained.

6.4 YES

- There are **9** trees and **2** groups 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](#)) :-

Trees 1; 5; 6; 7; 9; 10; 11; 13; 14 & Group 1 and Group 2

6.5 YES (1)

- There is **1** tree in this category on this project which can be retained and safeguarded subject to special construction techniques being employed :-
12 – Pedunculate Oak – the garage for Plot 2 marginally overlaps the RPA for this tree and therefore special foundation treatments are required and also ground protection measures to ensure that no root damage occurs – a mini piling rig can be brought to site to auger the pile holes and this will have to work from outside the RPA at all times OR operate in accordance with the following BS5837 guidance :-

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.

Preliminary ‘**hand dug**’ investigations have been conducted on site and have determined that at the position of the corner of the garage closest to the tree the soil is disturbed ground and back filled with brick rubble and debris to a depth of at least 200mm below grade. Therefore it will be possible to sink the pile caps into the ground such that they do not compromise levels across the site. It will be noted that on Plan the crown of tree 12 overhangs the garage roof but this is not an issue of conflict as the tree has been high crown lifted in the past.

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. 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 :-
- 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.

N.B. – detailed responses to items a) to m) above are provided in the Method Statement at Section 9.0 of this report.

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. I understand that Nigel Trowell – Landscape Architect has been appointed to fulfil this task in order to prepare a Landscape Master Plan which will accompany the Planning Application.
- 8.2 Thus no specific advice or guidance on this subject is contained within this report although an indication of where mitigation planting works might be required is provided – hampered by the requirement from Southern Water to maintain an easement zone along the western boundary to the site.
- 8.3 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.
- 8.4 Even if there are no trees on the site, areas for future planting should be plotted on the TCP 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.

In this specific instance the history of this site prior to my clients taking on the ownership was one of tipping and distribution of rubble and other builders debris throughout the site and then consolidation by vehicles. Thus most areas (except the Copse) have suffered from these actions and it would be futile to fence off areas in readiness for new planting. The only way to deal with this will be to undertake decompaction; aeration and soil amelioration as well as the introduction of fresh topsoil once the main phase of construction has been completed.

9.0 ARBORICULTURAL METHOD STATEMENT

- 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 Reserved Matters / Planning Conditions.

On this project my client requires that I provide the detailed Method Statement in tandem with the Planning Application as follows:-

9.2 a) site construction access

- All pedestrian and vehicular access to this development will be via the existing access point from Forest Avenue as shown on **Plan 12-885-PL01 RevB** – under the headings of Block Plan and Sightline Plan.
- There are no trees at the access or throughout the route of the access road into the site so there are no issues to deal with under this heading.

9.3 b) the intensity and nature of the construction activity

- It is intended that throughout the build phase the areas within the site on either side of the access road and outside of any retained tree RPA's will be utilised for materials delivery and storage; Site Offices and Welfare Units; Contractors Parking; Concrete & Cement Mixing & Fuel Storage as shown on **Plan 12-885-PL01 RevB** – under the headings of Contractors Parking and Compound Plan.
- Any power and drainage connections to and from the Site Offices and Welfare Units must be positioned outside of tree RPA's and any effluent discharged into closed piping which will be routed away from tree RPA's and not be allowed to percolate into the soil causing contamination.
- Concrete and Cement mixing must be undertaken outside of tree RPA's and within areas where there is an impervious sealed layer separating it from the soil beneath - such that any potential discharge cannot reach the soil and percolate into it causing contamination.
- Any fuel and chemicals stored on site must be contained within sealed vessels or have similar ground sealing measures applied.

9.4 c) contractors car parking – see comments at 9.3 above.

9.5 d) phasing of construction works

- H J Concepts inform me that there will be no phasing of works on this project and all three units will be constructed at the same time – given that all work must be undertaken outside of the sealed off Construction Exclusion Zone this should not have an adverse impact on retained trees.

9.6 **e) the space needed for foundation excavations and construction works**

- Plots 1 & 3 have sufficient space around them to cater for construction works without the need to relax any of the Protective Fencing. Plot 2 protection zones are hard up against the building line on the north side so allowance has been made for ground protection measures (see Tree Protection Plan at BJH.04 at [appendix BH4](#)) so that scaffolding can be erected to facilitate standard construction techniques – this will of course limit any activity to pedestrian access only.

9.7 **f) the availability of special construction techniques**

- These will need to be applied in respect of the car port for Plot 2 the corner of which intrudes into the RPA for tree 12 – thus necessitating the use of a ‘Pile and Beam’ form of footing - see cross section drawing at [appendix BH6](#) which shows how this can be achieved with minimal impact on the health of the tree and its root system – the trial excavation work undertaken recently has shown that the ground is made up of brick rubble and debris to quite some depth in this region so it will be possible to sink the pile caps into the ground – the piling rig is to operate over ground protection at all times and never over open exposed ground – the default position will be to operate over the footprint of the new car port to the south side.

9.8 **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**

- The route for all new service and utility service connections will be via the access road in from Forest Avenue as shown on **Plan 12-885-PL01 RevB** – under the heading of Foul, Storm & Incoming Utility Service Routes which is outside of any tree RPA’s and will not have an impact on same.
- This plan also shows the existing Southern Water Drain which is under the north-western side of the site and this will need to be connected to - but all connections are outside of tree RPA’s so open trench excavation will not be a problem.
- The soil investigations have revealed that the use of soakaways is not practical on this site.

9.9 **h) all changes in ground level, including the location of retaining walls, steps and making adequate allowance for foundations of walls.**

- No changes in levels or positioning of retaining walls, steps or wall foundations will be undertaken within tree RPA’s.

9.10 **i) working space for cranes, plant, scaffolding and access during works**

- Protective fencing is to be erected as shown on TPPlan BJH.04 and this will remain in place for the duration of the construction process and thus defines the available space for the introduction of cranes, plant and access. The detail of scaffolding has already been discussed.

9.11 **j) space for site huts, temporary toilet facilities (including their drainage) and other temporary structures**

- This is shown on **Plan 12-885-PL01 RevB** – under the heading of Contractor Parking and Compound Plan.
- See 9.3 above in relation to the drainage of toilet facilities.

9.12 **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**

- See details at Section 12 of this report and also the Landscape Master Plan submitted with the planning application.

9.13 **l) space for storing (whether temporary or long term) materials, spoil and fuel and the mixing of cement and concrete**

- See 9.3 above

9.14 **m) the effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.**

- This site is at grade throughout and as detailed at 9.3 above all spillages will have been catered for with impervious underlay.

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 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 – **in this case when the work on Plot 2 garage is being undertaken.**
- Existing planning regulations include the provision for local authorities to enforce planning requirements so it is important that local authorities recognise this need – **in this specific instance we have provided Planners with a robust scheme of protection and information and this will be the subject of direct supervision and monitoring by the appointed Arboricultural Expert as part of the Construction process as referred to above and this information will be recorded and copies provided to the Council for their records.**
- 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. **A second meeting will be required when the works on Plot 2 are being undertaken.**
- Beyond this further meetings could be at agreed intervals for the duration of the works on site or as required by the Client to address any issues which may arise.

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

11.1 Demolition –

- There is no requirement for Demolition work on this project.

11.2 Construction –

- All Tree Works are to be undertaken at the outset before any other contractors occupy the site – see Tree Works Schedule at Appendix BH5.
- Protective Fencing in accordance with BS5837:2012 – Section 6.2 and Figure 2 will be erected on completion of the Tree Works and prior to the Construction contractors taking possession of the site. Where appropriate (see Tree Protection Plan) Ground Protection Measures will be applied as per BS5837:2012 – Section 6.2.3.3.
- Whilst the default position is to exclude all excavation works from within the RPA of a tree that is to be retained under certain situations where it is agreed with the local authority some ‘Hand Digging’ work may be permitted.
- Roots, whilst exposed are to be immediately wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping will be removed prior to backfilling, which is to take place as soon as practical after the initial exposure.
- Roots smaller than 25mm (Section 7.2.3 of BS5837) diameter are to be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or hand saw), except where roots occur in clumps. Roots occurring in clumps or of 25mm diameter or more are only to be severed after consultation with and approval from an arboriculturist, as such roots might be essential to the tree’s health and stability.
- Prior to backfilling the retained roots are to be surrounded with topsoil or uncompacted sharp sand (builders sand is not suitable as it is high in salt content which is toxic to trees), or other loose inert granular fill, before soil or other suitable material is replaced. This material is to be free of contaminants and other foreign objects potentially injurious to tree roots.

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 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.

- 12.3 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.
- 12.4 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
 - 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
- 13.2 The Tree Works Schedule forms part of this report and is included at [appendix BH5](#).

14.0 CONCLUSIONS

- There is no direct tree loss required on this site in order to facilitate development although some trees are shown for removal for sound arboricultural management reasons regardless of any redevelopment proposals.
- There is scope for some limited tree and hedge planting on this project and this is to be shown on the Landscape Master Plan prepared by Nigel Trowell (a qualified Landscape Architect) to accompany the Planning Application.
- All trees of high; moderate and low grade and value are to be retained and fully protected – in particular the Oaks (trees 1; 11 and 14) and the Yew (tree 13).
- Overall it is felt that in arboricultural terms a robust case has been made for this development to proceed and the proposals are therefore fully supportable.