ARBORICULTURAL IMPACT ASSESSMENT

Land off Brunel Place, Crawley

-prepared on behalf of Terra Firma Consultancy –

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# ARBORICULTURAL IMPACT ASSESSMENT

<table>
<thead>
<tr>
<th>Section</th>
<th>Subject Heading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION &amp; CLIENTS BRIEF</td>
</tr>
<tr>
<td>2</td>
<td>DOCUMENT DISCLOSURE STATEMENT</td>
</tr>
<tr>
<td>3</td>
<td>TOPOGRAPHICAL SURVEY &amp; SOIL ASSESSMENT &amp; TREE SURVEY &amp; ROOT PROTECTION AREAS - (in accordance with Section 4 of BS5837)</td>
</tr>
<tr>
<td>4</td>
<td>CONSTRAINTS POSED BY EXISTING TREES – ASSESSMENT OF ABOVE &amp; BELOW GROUND CONSTRAINTS - (in accordance with Section 5.2 of BS5837)</td>
</tr>
<tr>
<td>5</td>
<td>PROXIMITY OF STRUCTURES TO TREES - (in accordance with Section 5.3 of BS5837)</td>
</tr>
<tr>
<td>6</td>
<td>ARBORICULTURAL IMPACT ASSESSMENT - (in accordance with Section 5.4 of BS5837)</td>
</tr>
<tr>
<td>7</td>
<td>TREE PROTECTION PLAN - (in accordance with Section 5.5 of BS5837)</td>
</tr>
<tr>
<td>8</td>
<td>NEW PLANTING DESIGN - (in accordance with Section 5.6 of BS5837)</td>
</tr>
<tr>
<td>9</td>
<td>ARBORICULTURAL METHOD STATEMENT - Heads of Terms - (in accordance with Section 6.1 of BS5837)</td>
</tr>
<tr>
<td>10</td>
<td>BARRIERS AND GROUND PROTECTION &amp; SITE MONITORING - (in accordance with Section 6.2 and 6.3 of BS5837)</td>
</tr>
<tr>
<td>11</td>
<td>DEMOLITION AND CONSTRUCTION IN PROXIMITY TO EXISTING TREES - (in accordance with Section 7 of BS5837)</td>
</tr>
<tr>
<td>12</td>
<td>SITE WORKS, LANDSCAPE OPERATION AND MANAGEMENT - (in accordance with Section 8 of BS5837)</td>
</tr>
<tr>
<td>13</td>
<td>TREE MANAGEMENT - (in accordance with Section 8.8 of BS5837)</td>
</tr>
<tr>
<td>14</td>
<td>CONCLUSIONS</td>
</tr>
</tbody>
</table>

## Appendices

<table>
<thead>
<tr>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH1</td>
</tr>
<tr>
<td>BH2</td>
</tr>
<tr>
<td>BH3</td>
</tr>
<tr>
<td>BH4</td>
</tr>
<tr>
<td>BH5</td>
</tr>
<tr>
<td>BH6</td>
</tr>
<tr>
<td>BH7</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION & CLIENTS BRIEF

1.1 The proposed development site is derelict and overgrown and buildings which once stood on this plot have been demolished leaving the concrete slabs/hard surfacing and old building footings in situ; these cover the majority of the surface area on this development site.

1.2 This project involves the construction of a new modern bespoke development.

1.3 There are tree both on and adjacent to this site that might be affected by the proposals which is why I have been employed to address the arboricultural issues and to compile all necessary reports and plans in support of the scheme.

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 original Topographical Base Plan for this site at 1:200 scale.

2.2 I have also been supplied with a copy of the following planning layout drawings:-

- HNW Architects – Proposed Site Plan – 13028 – P105 - Rev J - 1:200 at A1
- Terra Firma Landscape Consultancy – Planning – 1553-1001 – Rev 02 – 1:200 at A1

2.3 I place total reliance on the accuracy of these drawings in advising my clients on tree issues and compiling 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.

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 7th October 2013 and a copy of the Tree Survey Schedule is included 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 methodology prescribed at Section 4.6 of BS5837.

- a copy of the RPA Schedule is included at appendix BH2
- a copy of the Tree Survey and Root Protection Plans BJH 01 & 02 are included at appendix BH3

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 Layout Proposals and the implications for the above and below ground impact on trees both on and adjacent to the development site has been recorded on the Tree Retentions and Removals Plan with a copy of Plan BJH.03 provided at appendix BH4 - whenever possible this will have 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.

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 detail them and explain how they might be overcome or mitigated and this is dealt with in detail as part of the Arboricultural Impact Assessment at 6.0 below and shown on the Tree Retentions & Removals Plan BJH.03 and Tree Protection Plan BJH.04 both of which are included at appendix BH4.
6.0 ARBORICULTURAL IMPACT ASSESSMENT

6.1 The finalised planning layout drawing has been provided to me 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 and the data is presented here in tabular format:

**Key:**
- **UF** = Under footprint
- **YES (1)** = can be retained subject to mitigation measures being applied
- **NO-RSAM** = Remove for sound arboricultural management reasons
- **NO-RTFD** = To be removed to facilitate development

<table>
<thead>
<tr>
<th>Tree No</th>
<th>Species</th>
<th>Cat</th>
<th>Stem Diameter (mm)</th>
<th>BS5837:2012 Radial Prot. Area (m)</th>
<th>BS5837:2012 Polygon Area (m²)</th>
<th>Distance from Site Features (see key above)</th>
<th>Can Tree Be Retained (see key above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp 1</td>
<td>Silver Birch (<em>Betula</em> x 3 of)</td>
<td>A2</td>
<td>350 to 600</td>
<td>4.2</td>
<td>55</td>
<td>3.5m to existing brick boundary wall</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.5m to closest part of new building N.B. Roots will not have gone past the wall because of levels changes and natural deflection</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Pedunculate Oak <em>Quercus robur</em></td>
<td>B1</td>
<td>670</td>
<td>8.0</td>
<td>203</td>
<td>8.6m to closest part of new building 8.6m to new patio area</td>
<td>YES (1)</td>
</tr>
<tr>
<td>Hedge 1</td>
<td>Leyland Cypress <em>Cupressocyparis leylandii</em></td>
<td>B2</td>
<td>140 to 360</td>
<td>1.7</td>
<td>9</td>
<td>7.6m to closest part of new building N.B. Client preference is to have these trees removed</td>
<td>NO-RTFD</td>
</tr>
<tr>
<td>2</td>
<td>Goat Willow <em>Salix caprea</em></td>
<td>B1</td>
<td>240 380</td>
<td>5.4</td>
<td>91</td>
<td>UF of new development</td>
<td>NO-RTFD</td>
</tr>
<tr>
<td>3</td>
<td>Rowan (Variety) <em>Sorbus species</em></td>
<td>C1</td>
<td>150 x4</td>
<td>3.6</td>
<td>41</td>
<td>UF of new development</td>
<td>NO-RTFD</td>
</tr>
<tr>
<td>4</td>
<td>Golden Leyland Cypress <em>Cupressocyparis leylandii ‘Castlewellan’</em></td>
<td>B1</td>
<td>300 200 170 100 x 2</td>
<td>5.1</td>
<td>81</td>
<td>UF of new development</td>
<td>NO-RTFD</td>
</tr>
<tr>
<td>5</td>
<td>Ash <em>Fraxinus excelsior</em></td>
<td>C1</td>
<td>300</td>
<td>3.6</td>
<td>41</td>
<td>UF of new development</td>
<td>NO-RTFD</td>
</tr>
<tr>
<td>6</td>
<td>Goat Willow <em>Salix caprea</em></td>
<td>C1</td>
<td>160</td>
<td>1.9</td>
<td>12</td>
<td>UF of new development</td>
<td>NO-RTFD</td>
</tr>
</tbody>
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6.2 **NO – RSAM**

There is 1 tree within this category on this project which is recommended for removal for health and safety reasons regardless of any redevelopment proposals:

**T8 – Goat Willow**

- Undermined by the actions of heart rot decay fungi – remove for safety reasons

6.3 **NO – RTFD**

There are 6 trees and 1 group and 1 hedge within this category on this project which cannot be retained with the proposed new layout.

**Hedge 1 – Leyland Cypress** - a linear belt of conifers of poor individual value but collectively they currently perform a screening function and thus have limited landscape merit – nevertheless the preference is for them to be removed and new landscape plantings of four Fastigiate Oaks planted in their place which will offer greater long term merit.

**Tree 2 – Goat Willow** – a nice enough tree of the species but has limited merit as part of a new layout and in any event would be under the footprint of the proposed new building.

**Tree 3 – Rowan** – low crown density and of poor overall quality and not a tree for the future and in any event would be under the footprint of the proposed new building.
Tree 4 – Golden Cypress - a nice enough tree of the species but has limited merit as part of a new layout and in any event would be under the footprint of the proposed new building.

Tree 5 – Ash – Low crown density and small leaf size are evidence that this tree is struggling to survive at this location and has no long term value and in any event would be under the footprint of the proposed new building.

Tree 6 – Goat Willow – suppressed by the Ash and conifers – a poor quality tree and in any event would be under the footprint of the proposed new building.

Group 2 – Leyland Cypress – suppressed and dominated by its neighbours and of poor overall quality with no long term value - would be under the footprint of the proposed new building.

Tree 7 – Birch – suppressed and distorted trunk entwined with the fence line – poor quality tree with a limited life expectancy - would be under the footprint of the proposed new building.

6.4 YES

There are 2 off site groupings 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).

Group 1 – Birch x 3
Off site Maples x 2

6.5 YES (1)

There is 1 mature tree in this category on this project where work will abut its RPA as listed at 6.1 above and as shown on the TRR Plan BJH03:-

T1 – Pedunculate Oak – the RPA is not compromised but there has to be an allowance for the use of scaffolding and also the movements of a crane around the new building and therefore it will be necessary to set the protective fence line slightly further back than the prescribed line and to lay appropriate ground protection to protect the intervening ground from compaction and contamination during the build process. It will also be necessary for a professional arborist to prune back the branch work to provide for a 2m clearance for the same reasons. This will not have an adverse effect on tree health or visual appearance.
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 and a key 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 – some of these matters will have been dealt with in this report but in the event that there are issues that have not been satisfactorily resolved at this juncture it is suggested that the Planning Authority seek detailed responses as part of Method Statement submissions 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 levels, 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 and 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 – Terra Firma Landscape Consultancy have been appointed to fulfil this function and I have had input to their design concept.
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’ – there will be a need for the use of ground protection measures as specified at 6.5 above and this will comprise the following specification in accordance with BS 5837 requirements:-

a) 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.

9.4 Utility Service Connections – no information has been provided at this juncture but I have been assured that all such connections will be made outside of retained tree RPA’s.

9.5 Highway safety and visibility splays – not applicable as the existing access points are to be utilised.
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 space for all of these facilities to be incorporated within this development site without any adverse impact or overlap of retained tree RPA’s. 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 and IF they are applicable to this project and required then this would need to be addressed within a separate Method Statement.

9.8 **Site Monitoring Program** – there will be a need for some arboricultural monitoring of this project 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.

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.

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.
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

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.

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.

**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 an initial 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.

• There is unlikely to be a requirement on this project for any further site visits and monitoring.

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.

• All concrete slabs and old building footings will need to be dug up in a careful manner close to Tree 1 such that any vehicles keep to the hard surfacing and work back out of the site and away from the trees- with protective fencing and ground protection laid immediately as open ground is exposed beneath the hard surfacing.

• Local regulations regarding the lighting of fires must be strictly observed but in general there are to be no fires lit within 10m of the outside edge of any retained trees canopy spread.

11.2 Construction –

• All tree works must first be undertaken and then protective fencing must be erected immediately following on from this exercise and the positioning and suitability verified prior to any construction contractors being allowed onto the site.

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 within tree RPA’s with no machinery being used unless specific ground protection has been laid. Even then only lightweight mini excavators are to be permitted access.

12.4 Excavation works to plant trees and shrubs or to lay grass must be undertaken carefully with the use of forks and trowels only and NOT spades as significant root damage could result from this – any roots that are teased out and exposed during this process may be cut with secateurs provided that they are 25mm or less in diameter and not in clusters where their loss could adversely affect the health and vigour of retained trees.

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.

13.2 A Tree Works Schedule forms part of this report and is included at appendix BH5.

14.0 CONCLUSIONS

- There will be a requirement to remove poor quality trees to make way for redevelopment of this site but nothing of any landscape merit or significance will be removed and there will be a comprehensive landscape scheme to accompany the planning layout.
- The significant trees around the periphery of the site and also any off site trees can be afforded appropriate levels of protection to ensure their safe and healthy retention.
- Provided that the methodology prescribed in this report is strictly adhered to I would anticipate that the retained trees will readily cope with the levels of disturbance anticipated and survive the development works without adverse impact.