

# arbconsultants ltd

## Arboricultural Implication Assessment (AIA)



**Prepared by**

**Arbconsultants Ltd**

Consultants in Urban Forestry, Arboriculture and Environmental  
Sciences

**May 2013**

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## 1.0 Scope and Limitations of Report

- 1.1 This report has been commissioned by Mr Keith Gleeson and the scope of the report reflects his instructions.
- 1.2 The scope of the report is limited to a visual inspection of the trees (VTA Visual Tree Assessment).
- 1.3 The brief is to appraise the trees in relation to the proposed development of the site in accordance with British Standard 5837:2012 'Trees in relation to Construction – Recommendations'.
- 1.4 To prepare a clear set of report recommendations with supporting plans and data to facilitate consideration of the Arboricultural implications by the Local Planning Authority.
- 1.5 To consider the development proposals and identify areas where there are arboricultural issues and to recommend possible solutions.
- 1.6 To consider additional information supplied and identify arboricultural issues arising from this information and to recommend possible solutions.
- 1.7 This report is not a Tree Risk Management or a Hazard Analysis Report and its use as such is invalid.
- 1.8 The report refers to the condition of the trees and an assessment of the site on the day that the evaluation was undertaken. The tree was not climbed but was assessed from ground level.
- 1.9 Due to the changing nature of trees and their site circumstances this report and any recommendations made are limited to a 1 year period. Any alteration to the application site or any development proposals could change the current circumstances and may invalidate this report and any recommendations made. Should this be the case this report will require revision to reflect the development proposals.
- 1.10 Trees are dynamic structures that can never be guaranteed 100% safe; even those in good condition can suffer damage under average conditions. Regular inspections can help to identify potential problems before they become acute.

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- 1.11 A lack of recommended work does not imply that a tree is safe and likewise it should not be inferred that a tree will be made safe following the completion of any recommended work.
- 1.12 Trees dimensions were measured using a combination of a Haglof digital Clinometer, a Leica Disto Laser Rangefinder and a Fujikura Diameter tape. All instruments were used in accordance with appropriate user guides.
- 1.13 Decay detection where used is undertaken using an IML Resistograph.
- 1.14 All data provided by the testing equipment has been verified according to the equipment manufacturer's instructions.
- 1.15 No soil samples were taken and no soils analysis was undertaken.
- 1.16 Any legal description or information given to Arbconsultants Ltd is believed to be accurate.
- 1.17 Where solutions to arboricultural problems are specified which require the usage of a third party product e.g. no dig roadway construction. No liability is assumed for the performance or suitability of the product and specialist advice as to the suitability or installation of the product should be sought from the manufacturer or other specialist.
- 1.18 No responsibility is assumed by Arbconsultants Ltd for legal matters that may arise from this report, and the Consultant shall not be required to give testimony or to attend court unless additional contractual arrangements are made.
- 1.19 Any alteration or deletion from this report shall invalidate it as a whole.

## 2.0 Qualifications and Experience

- 2.1 My name is Christopher Raper and I am a Consultant practising through Arbconsultants Limited, which is an Arboricultural Consultancy Practice based at Myerscough College, Preston, Lancashire. The Practice Specialises in Arboriculture, Urban Forestry, Biological Sciences and Project Management.
- 2.2 I am a Consultant specialising in tree failure, hazard evaluation, risk assessment related to trees, planning and development where trees are involved and insurance claims where tree failure is involved and/or building damage occurs which may be attributed to the activity of trees. I have received extensive training in relation to trees, clay soils and subsidence of low-rise buildings. I am a specialist in the field of trees/vegetation and special construction engineering methodologies. I am familiar with different Tree Hazard Evaluation systems and conversant in Visual Tree Assessments (VTA) techniques.
- 2.3 I have a 1st class honours degree in Arboriculture awarded by Myerscough College in conjunction with the University of Central Lancashire. I have 10 years experience in the Arboricultural industry ranging from Tree Officer with a Local Authority through to Senior Consulting level with Europe's largest specialist Arboricultural Consultancy. I have provided guest lectures on Arboricultural Consultancy to the MSc course on Arboriculture and Urban Forestry run by the University of Central Lancashire and Myerscough College. I have attended formal and informal public inquiries and have supplied consultancy advice as part of design, project management and consultant/legal teams.

### 3.0 Summary

- 3.1 The survey was carried out on the accessible land within the curtilage of Buguleys Garden Centre, Blackpool and the pastureland to the north. The trees that were surveyed on site could be generally defined as of a very poor quality and the general age demographic would be considered early mature to over mature, the hedgerows along some of the boundaries of the site and are to the north west boundary, unmanaged but of generally good quality and the hedgerow to the north east boundary is well managed and is again of good quality. Both hedgerows offer some screening to the site and a softening of the landscape.
- 3.2 We have not been supplied with detailed drawings showing foundation types therefore we have made certain assumptions and have supplied method statements that will cover most contingencies whereby the development may impact upon the trees. If necessary these method statements can be modified once full technical drawings have been produced.

#### 4.0 BS: 5837:2012 'Trees in relation to construction - Recommendations'

4.1 The trees on site have been surveyed in accordance with BS5837:2012 'Trees in relation to construction - Recommendations'.

4.2 The survey lists all the trees or groups of trees (excluding those trees already scheduled for removal) that may be impacted upon by the development and will include the following information.

- Reference number (to be recorded on the tree survey plan)
- Species
- Height in metres.
- Stem diameter at 1.5m above adjacent ground level (on sloping ground to be taken on the upslope side of the tree base) as per annex D of the Standard or
  - a) For trees with two to five stems, the combined stem diameter should be calculated as follows:  $\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 + (\text{stem diameter } 5)^2}$
  - b) For trees with more than five stems (not illustrated in Annex C), the combined stem diameter should be calculated as follows:  
 $\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$
- Branch spread in meters taken at the four cardinal points to derive an accurate representation of the crown (to be recorded on the tree survey plan).
- Existing height above ground level of first significant branch and direction of growth (e.g. 2.4-N) of the canopy, to inform on ground clearance, crown/stem ratio and shading;
- Life stage (e.g. young, semi-mature, early mature, mature, over-mature).
- General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and

physical defect), and/or preliminary management recommendations;

- Estimated remaining contribution, in years (<10, 10+, 20+, 40+).
- Category U or A to C grading (see 4.5 and Tables 1 and 2), to be recorded on the tree survey plan.

4.3 The survey is attached at **Appendix 2** of this report.

4.4 The British Standard at 5.5.6 states that the following factors need to be considered –

- a) site construction access; this will be from Midgeland Road and will use the current entrance to the Garden Centre..
- b) the intensity and nature of the construction activity; the construction will be of a medium to high intensity but will be of a highly sustainable nature if as expected the site is replanted with more appropriate specimens in mitigation for the tree losses. The site compound could be situated either on the tarmac car park or within the area of pasture as shown on the tree protection plan.
- c) contractors' car parking; Contractors will be expected to use off-street parking spaces within the development site outside of any tree protection areas.
- d) phasing of construction works; all tree works will be completed and protective barriers will be in place prior to any construction work –



## 5.0 Grading category and Recommended Tree Works

- 5.1 Trees that have the potential to be affected by the development have been classified according to BS5837:2012.
- 5.2 Category “A” Trees are classified as high quality and value in such condition as to make a substantial contribution for a minimum of 40 years. There are no trees on site that could be categorised as class A.
- 5.3 Category “B” i.e. those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested). Category B Trees are defined as trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage). All trees/ hedgerows defined as category B are within the site boundary and will not impose any constraint on this development.
- 5.4 The trees that have been classified as Category “C” i.e. those of lower quality and value are defined as currently in adequate condition which could if necessary remain until new planting is established, trees present in groups or woodlands, but without this conferring on them significantly greater landscape value. Within the site there are high numbers of C category trees that due to their position (i.e. the Poplar screen) which once the category U trees are removed would leave them unoptimised for their environment by the loss of the companion shelter and therefore prone to wind damage / throw. Additionally the C class Cypress hedge would serve little purpose once the Garden Centre shop is demolished as it would not be a screen any longer and has very little amenity value.
- 5.5 Category “C” trees may **not** be retained where they would impose a significant constraint on development and consequently taking the section 5.4 into account some trees designated category C would be felled to facilitate development.
- 5.6 Category “U” trees are those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management. Examples include..

- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other R category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning).
  - Trees that are dead or showing signs of significant, immediate, and irreversible overall decline.
  - Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality.
- 5.7 There are significant number of trees that were inspected that would fall into the U category.
- 5.9 The trees that may be impacted upon by the development on site consist mainly of Poplar, Cypress and Willow.
- 5.10 Permissions: Under no circumstances is any tree work to be instigated without having first checked with the Local Planning Authority that no statutory controls apply in respect of the trees. All tree workers shall have the relevant NPTC qualifications and shall submit completed risk assessments to the project manager prior to commencement of tree-work.
- 5.11 All pruning shall be done in accordance with the principles of 'Natural Target Pruning' and in accordance with the current relevant British Standard, **BS3998: 2010** 'Recommendations for Tree Work'. All pruned sections shall be lowered to the ground in a controlled manner such that no damage is done to other trees or vegetation and structures beneath. The implication of tree works must have regard to the presence of any nesting Birds or Bats and their roosts, which are protected under the Wildlife and Countryside Act 1981.

## 6.0 Tree Constraints – Calculated Root Protection Area (RPA)

- 6.1 BS5837 (2012) requires that the root protection area is calculated for each of the retained trees on the development. The root protection area is the minimum area in m<sup>2</sup> which should be left undisturbed around each retained tree. The RPA should be calculated using Annex D of the Standard as an area equivalent to a circle with a radius 12 times the diameter calculated for the stem of the tree.
- 6.2 The standard calculated RPA's and the protection zone radii are detailed at Appendix 6 of this report. The RPA for groups and hedges is based upon the surveyors experience.
- 6.3 The RPA, for each tree as determined in Table 2, should be plotted on the Tree Constraints Plan taking full account of the following factors, as assessed by an arboriculturalist, which may change its shape but not reduce its area whilst still providing adequate protection for the root system.
- a) The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age and condition and presence of other trees.
  - b) The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services).
  - c) The soil type and structure.
  - d) Topography and drainage.

## **7.0 Arboricultural Method Statement – Tree Protection Plan (TPP) Barriers**

- 7.1 The exclusion zones as defined in this report will be protected with fencing. The fencing is to be strong enough to resist impacts and suitable to the degree of construction activity on the site and to be in accordance with that specified of BS5837:2012.
- 7.2 All fencing will be in place prior to any other development work (with the exception of necessary tree works) commencing on site. Such fencing will therefore be erected before any materials or machinery is brought onto site. Once erected the fences will not be moved or altered in any way without prior consultation with the Local Planning Authority other than for operations detailed in this report. If the fencing is damaged in any way it will be re-instated to its original condition before construction work can recommence. Notices will be erected on the fencing stating Protected Area – No Operations within Fenced Area. Protective fences shall be maintained in situ until all equipment, machinery and surplus materials have been removed from the site. Nothing will be stored or placed in any area fenced in accordance with this condition and the ground levels within those areas shall not be altered, nor shall any excavation be made other than those detailed in this report, without the written consent of the Local Planning Authority.
- 7.3 The total exclusion zones are marked on the accompanying drawing in Appendix 5 (Tree Protection Plan). British Standard 5837:2012 (Appendix 2) indicates the recommended areas for the Root Protection Areas (RPA) which should be enforced with protective fencing. Specifications within BS5837:2012 inform our recommendations for both the fencing type as detailed below in figure 2 and the location of this fencing. As detailed in section 6.2.3.1 of the standard it is acceptable for the barriers to be set back and ground protection to be put in place.
- 7.4 All protective fencing is to be constructed in accordance with BS: 5837 (2012) – Figures 2 and 3 specification reproduced below.

Figure 2 Default specification for protective barrier

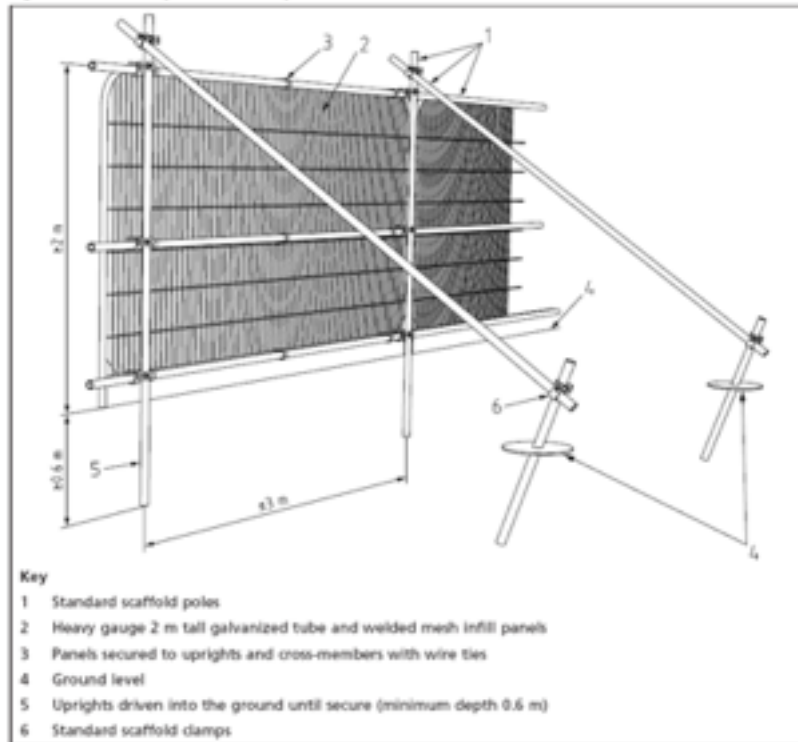
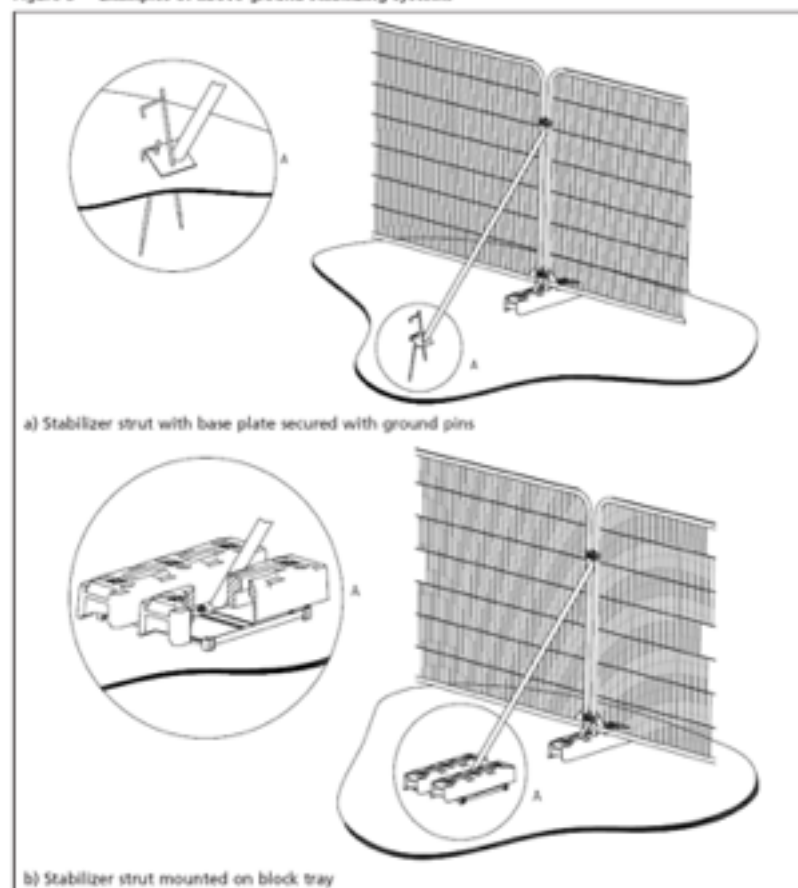


Figure 3 Examples of above-ground stabilizing systems



## 8.0 Installation of Services (Underground and above ground services)

- 8.1 Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of the tree. For this reason particular care should be taken in the routing and methods of installation of underground services and where possible routing the services outside the specified RPA's
- 8.2 At all times where services are to pass within any RPA, detailed plans showing the proposed routing should be drawn up in conjunction with an Arboriculturist. Such plans should also show the levels and access space needed for installing the services and be accompanied by arboricultural method statements (AMS).

Table 3 Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy	Bore dia. <sup>A)</sup>	Max. sub. <sup>B)</sup> length	Applications	Not suitable for
	mm	mm	m		
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1 200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers <sup>C)</sup>
Pipe ramming	≈150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling <sup>D)</sup>	≈50 <sup>E)</sup>	30 to 180 <sup>F)</sup>	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

- 8.3 In this instance it is envisaged that services could be routed outside of all RPA's if it is found that services need to run through any RPA the use of a mole where the entry and retrieval pits being sited outside the RPA will be utilised.
- 8.4 Consideration will need to be given to the routing of above ground services in order to avoid the need for detrimental and repetitive pruning. In this regard the current and future crown size of the tree should be assessed.
- ## 8.5 Cellular Confinement System
- 8.6 It is envisaged that access to the proposed development should not pass within the RPA of any retained tree but if it is found that if any path or access road should pass through a RPA this will

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require a cellular confinement construction to protect the roots. The use of this system avoids the requirement for digging into the soil and damaging existing roots. Using this technology will avoid damaging the soil structure through compaction. Soil damage of this nature may disrupt the efficient exchange of water and gasses in and out of the soil and inhibit root growth. Mature and over-mature trees are more vulnerable to disturbance of this nature when compared to younger trees. The use of a cellular confinement system reduces the bearing pressure on the subsoil by stabilising aggregate surfaces against rutting under pressure loads. Even one pass over soil by a vehicle compacts the soil. It is therefore crucial that the area that is to be covered with a cellular confinement system is protected from the beginning of construction works. As this surface will need to support regular vehicles and potentially fire engines a 150mm thick (minimum) cellular confinement system will be required. The following methodology is to be applied:

- The surface needs to be laid on flat ground and so first any debris, mulch and vegetation will need to be removed from the soil surface. Any major protrusions such as rocks should be carefully removed. This is to be done using hand tools only. Stumps are to be excavated out to just below ground level, again, using hand tools. Undertake pruning works as required.
- Any roots which are to be left exposed for more than three hours should be covered in damp straw and/or hessian covers. Also note that if temperatures exceed 16c this time should be reduced to one hour before roots should be protected.
- No pruning of roots over a diameter of 25mm should be undertaken unless permission of the Local Authority tree officer is given. Any damaged roots should be cleaned and pruned back to an appropriate place
- Apply translocated herbicide to area for driveway and remove dead vegetation with hand tools. The existing surface and top soil is to be retained. Any voids or depressions (including those formed by stump removal) within the ground surface are to be filled with sharp sand (not builders sand) to maintain levels.
- Once the surface is flat the area must be covered with a non woven geo-textile separation filtration layer over

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area for driveway and hard landscape that will prevent different mineral materials mixing while allowing water to pass through. If several sheets are required ensure that they overlap by at least 30cm;

- Install cellular confinement mats over the area. Expand the Cellweb or other proprietary brand panels to the full length. Trim to desired width with a craft knife. Pin the Cellweb panels with staking pins to anchor open the cells and staple adjacent panels together to create a continuous mattress. Increase number of staking pins from 10 per panel to 20 on any downward side of mattress to provide greater support for the section of the hard surface subject to camber. Install treated timber boarding for lateral support secured by robust stakes for both sides
- Infill the Cellweb with a clean no fines angular granular fill of size 40–20mm within This material is then compacted with the use of a smooth wheeled roller.
- Install second layer of geo textile separation filtration layer.
- Finally a surface layer is applied; this must be porous and in this instance it will be porous tarmac or block paving.

## **8.7 Demolition / Removal of existing surfaces**

8.8 Where it is intended to undertake demolition or construction operations within the root protection area (removal of glass houses and outbuildings) precautions should be taken to maintain the condition and health of any roots that may be found by reference to:

- a) Preventing physical damage to any roots that may be present during demolition or construction (such as by soil compaction or severing);
- b) Make provision for water and oxygen to reach the roots;

8.9 All plant and vehicles engaged in demolition works will either operate outside the RPA, or will run on a temporary surface designed to protect the underlying soil structure. Where such



ground protection is required, it will be installed prior to commencement of operations.

8.10 Should the level of dust build-up on trees become significant, the advice of an Arboriculturist must be sought. If considered appropriate by the attending Arboriculturist the affected trees will be hosed down immediately.

8.11 Where an existing hard surface is scheduled for removal, care will be taken not to disturb tree roots that may be present beneath it. Hand held tools or appropriate machinery will be used (under arboricultural supervision) to remove the existing surface. Tree roots exposed by such operations will be treated in accordance with details in 8.12.

8.12 Any excavations which have to be undertaken within the root protection area will be carried out carefully using air-spade technology, avoiding damage to the protective bark covering larger roots. Roots, whilst exposed, will be wrapped in dry, clean Hessian sacking to prevent desiccation and to protect from rapid temperature changes. Roots smaller than 25 mm diameter may be pruned back, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or handsaws. Roots larger than 25 mm will only be severed following consultation with an Arboriculturist, as they may be essential to the tree's health and stability. Prior to backfilling, any Hessian wrapping will be removed and retained roots should be surrounded with sharp sand (builders' sand will not be used because of its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other material is replaced. This material will be free of contaminants and other foreign objects potentially injurious to tree roots.

### **8.13 Access Facilitation Pruning:**

8.14 In some circumstances, it may be necessary to prune certain trees to allow for either construction or demolition. This is known as 'access facilitation pruning'. Access facilitation pruning shall be kept to the barest minimum necessary to facilitate the development and shall be carried out strictly in accordance with The British Standard 'Recommendations for Tree Work', BS 3998:2010. It shall only be undertaken by suitably qualified and experienced professional Arborists, working according to a specification prepared by the Project Arboriculturist. Under no circumstances shall construction personnel undertake any tree pruning operations.

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### 8.15 Additional precautions outside the exclusion zone :-

8.16 Once the exclusion zone has been protected by barriers and/or security fencing , construction work can commence. All weather notices should be erected on the barriers with words such as: “Construction exclusion zone — Keep out”.

8.17 In addition the following should be addressed or avoided.

- a) Care should be taken when planning site operations to ensure that wide or tall loads, or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banks-man to ensure that adequate clearance from trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning.
- b) Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10 metres of the tree stem.
- c) Fires should not be lit in a position where their flames can extend to within 5 m of foliage, branches of trunk. This will depend on the size of the fire and the wind direction.
- d) Notice boards, telephone cables or other services should not be attached to any part of the tree.
- e) It is essential that allowance should be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.

## 9.0 Conclusion and Impact Statement

- 9.1 Trees within and adjacent to the proposed site and compliant with the scope of the development have been assessed in accordance with BS:5837:2012. and as per 4.4.2.3 of the standard trees growing as groups or woodland have been identified and assessed as such where the arboriculturist has determined that this is appropriate. However, an assessment of significant individuals within the groups has also been undertaken due to the need to differentiate between them, e.g. in order to highlight significant variation in attributes (including physiological or structural condition).
- 9.2 The hedges on the boundaries of the proposed site afford some amenity through their function as a screen and a softening of the hard landscape and should be retained.
- 9.3 A large number of trees have been assessed in response to the proposed development. It is anticipated that all U category trees and a significant number of C category trees will be removed from this site some to facilitate development but a notable quantity of trees should be removed for sound arboricultural reasons.
- 9.4 It is suggested that appropriate new trees are planted to replace any losses so as to ensure that there will be a stable future arboricultural population with the amenity that it provides. It is our recommendation that a planting plan for shrub masses and trees is drawn up once locations for buildings are firmly established.
- 9.5 The impact of the proposed development has been assessed and in our professional opinion provided that the works take place in accordance with the method statements specified and the site is replanted appropriately the works will not be detrimental to the retained trees.
- 9.6 No work shall commence on site until such time as this method statement has been submitted to and approved in writing by the Local Planning Authority. All retained trees on the site shall be protected from damage as a result of the works on site, to the satisfaction of the Local Planning Authority in accordance with its guidance notes and relevant British Standards (e.g. BS5837:2005) or the duration of the development. In the event that trees become damaged during construction, the Local Planning Authority shall be notified and remedial action agreed and

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implemented. In the event that any tree(s) dies or is removed without the prior consent of the Local Planning Authority, it shall be replaced within the first available planting season, in accordance with details agreed with the Local Planning Authority.

- 9.7 All technical issues relating to arboriculture should be addressed to Arbconsultants Ltd in the first instance. Arbconsultants Ltd will liaise between the Local Planning Authority and any interested parties. It is suggested that the development proceeds in accordance with the above recommendations.

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# Appendix 1 Site Location

## Appendix 2 Tree Survey Data Tables

# Appendix 3 Tree Survey

## Appendix 4 Tree Constraints Plan (TCP)



# Appendix 5

## Tree Protection Plan (TPP)

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## Appendix 6 Root Protection Area (RPA) Calculations