



Arboricultural Survey & Report

Implication Assessment & Method Statement in Support of Development

BS5837:2012 Trees in Relation to Design, demolition and construction – Recommendations

CLIENT:	Hebburn Properties Limited
SITE REF:	Land off Waterside Park, Hebburn, NE31 1RS
MWA REF:	DEV151127-87
MWA CONSULTANT:	David Williams M.Arbor.A
REPORT DATE:	04.12.2015

Contents

1.0 Introduction

- (i) Components of Report
- (ii) Technical Synopsis

2.0 Scope and objectives

3.0 Site description

4.0 Development Proposal

5.0 BS 5837:2012 Tree Survey

6.0 Arboricultural Impact Assessment (AIA)

7.0 Potential Incursions into the Root Protection Area (RPA)

8.0 Arboricultural Method Statements (AMS)

- (i) Additional precautions outside the exclusion zone
- (ii) Tree Protection
- (iii) Ground Protection
- (iv) Tree Pruning enabling works
- (v) Sequencing of Works & Supervision
- (vi) Air spade re profiling of levels with the RPA

9.0 Conclusion and recommendations

Tables

- 1 Tree Survey Schedule

Plans

- MWA 001 Tree Protection Plan

1.0 Introduction

1.1 We are instructed by Mr. Paul Pattinson to undertake a tree survey in accordance with BS 5837:2012 'Trees in relation to design, demolition and construction- Recommendations'. The report is to support a Planning Application relating to the development on a vacant plot off Waterside Park, Hebburn, NE31 1RS.

1.2 The proposed development consists of the construction of 3no two storey detached dwellings with associated vehicular access. The following plans and documents have been supplied by the client:

- Existing and Proposed block plans
- Topographical Survey
- Previous arboricultural survey and report (2007)

1.3 The site survey was undertaken on the 28th November 2015 and the following report is based upon the findings of that visit and the conditions found on that day.

1.4 We have been provided with digital files of the existing site and the proposed development.

1.5 Tree position was triangulated using a minimum of two reference points where necessary.

1.6 Components of Report

This report comprises the following elements:

- Baseline tree survey of trees that may be impacted by proposals
- Arboricultural Implication Assessment (AIA)
- Arboricultural Method Statement (AMS)
- Tree Protection Plan (TPP)

1.7 Technical Synopsis

We have recorded 10no individual trees and 1no tree groups requiring material consideration in relation to the proposed extension all of which can be successfully retained with a minimum of impact on their long-term health and condition. The main implications concern the root systems and rooting environment of the trees and mitigation measures have been specified to ensure any impact is restricted to an acceptable degree.

2.0 Scope & Objectives

- 2.1 This report has been commissioned by Mr. Paul Pattinson and the scope of the report reflects his instructions.
- 2.2 The scope of this report is limited to an appraisal of the existing trees on (and/or adjoining) the site and identification of the implications of development on retained trees.
- 2.3 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 design, demolition and construction - Recommendations'.
- 2.4 To prepare clear recommendations supported by relevant plans and data in order to facilitate consideration of the Arboricultural implications by the Local Planning Authority.
- 2.5 To consider the development proposals, identify areas where there are arboricultural issues and to recommend possible solutions.
- 2.6 To consider additional information supplied, to identify arboricultural issues arising from this information and to recommend possible solutions.
- 2.7 This report is not a Tree Risk Management Report or a Hazard Analysis Report and its use as such is invalid.
- 2.8 The trees have been assessed from ground level only. Assessment of condition is based on a visual tree assessment (VTA). No detailed inspection of the upper crown has been carried out. No decay detection equipment (destructive or non-destructive) has been used to further assess the condition of the trees, which is beyond the scope of the survey. Any dangerous trees requiring further assessment on safety grounds will be identified.
- 2.9 Due to the changing nature of trees and other site circumstances this report and any recommendations made are limited to a 5-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.
- 2.10 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.
- 2.11 A lack of recommended work does not imply that a tree is safe and likewise it should not be implied that a tree will be made safe following the completion of any recommended work.
- 2.12 Tree dimensions were measured using a combination of a Trupulse 200 Laser Range Finder, a Leica Disto Laser Rangefinder and a Richter Diameter tape. All instruments were used in accordance with appropriate user guides.
- 2.13 No soil samples were taken and no soils analysis was undertaken.
- 2.14 Any legal description or information given to MWA Arboriculture Ltd is believed to be accurate.

- 2.15 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.
- 2.16 No responsibility is assumed by MWA Arboriculture 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.
- 2.17 Any alteration or deletion from this report shall invalidate it as a whole.

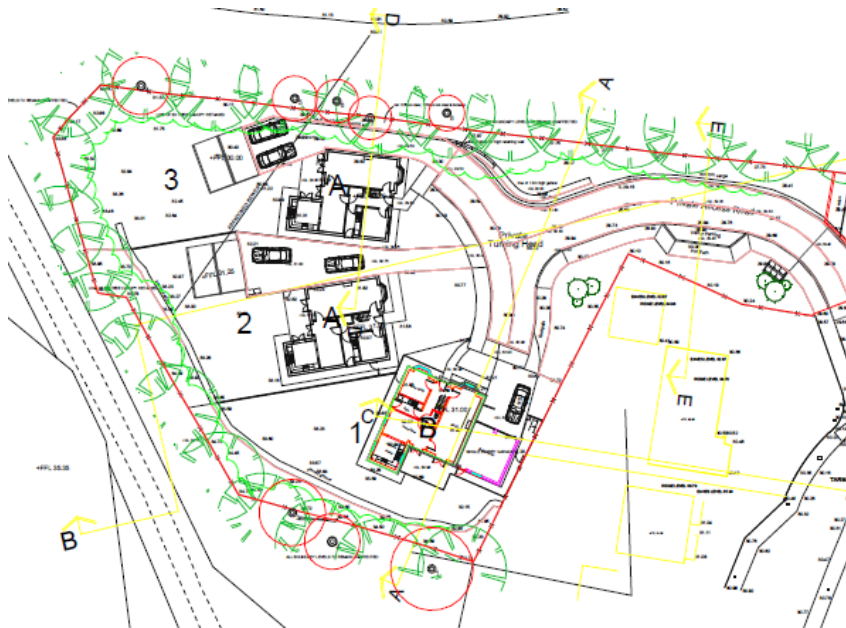
3.0 Site Description

3.1 The subject property comprises a vacant plot off Waterside Park, Hebburn, NE31 1RS.



4.0 Development Proposal

- 4.1 The proposed development consists of the construction of 3no two storey detached dwellings with associated vehicular access.



5.0 Tree Survey

- 5.1 The survey of the trees was carried out on the 28th November 2015. Tree data is recorded in Table 1 with locations indicated on plans attached to this report.

Table 1 – Tree Survey Schedule

Tree No.	Species	Ht (m)	Dia at 1.5m (mm)	No of stems	C.S N (m)	C.S E (m)	C.S S (m)	C.S W (m)	Crown Ht (m)	ERCY (Yrs)	Age Class	Description & Recommendations	RPA m (Radial)	BS Cat
T1	Italian Alder	*14.0	390 360	2	4.5	4.5	4.0	4.0	3.0	40+	M	Bifurcated from 0.4m to co-dominant stems. No significant defects. No recent management No works	5.3	C1
T2	Italian Alder	11.0	320	1	2.5	2.0	2.0	2.5	5.0	20+	EM	Dead wood in lower crown. No significant defects No recent management. No works	3.8	C1
T3	Whitebeam	10.0	490	1	4.5	3.5	4.0	3.0	0.5	20+	M	No significant defects. No recent management. No works	5.9	C1
T4	Italian Alder	16.0	430	1	5.0	7.0	3.0	1.5	3.5	20-40	M	Dead wood in lower crown. Lean to N.E Remove deadwood	5.2	C1
T5	Italian Alder	20.0	360	1	3.6	7.0	4.0	1.5	5.0	20-40	M	Lean to East. Die back in lower crown. Asymmetrical crown. Remove Deadwood and crown lift to 6.0m	4.3	C1
T6	Italian Alder	20.0	370	1	5.0	6.0	2.5	1.5	6.0	20-40	EM	Dead wood in lower crown. Lean to East. Asymmetrical crown. No significant defects. Remove deadwood and crown lift as necessary.	4.4	C1

Tree No.	Species	Ht (m)	Dia at 1.5m (mm)	No of stems	C.S N (m)	C.S E (m)	C.S S (m)	C.S W (m)	Crown Ht (m)	ERCY (Yrs)	Age Class	Description & Recommendations	RPA m (Radial)	BS Cat
T7	Swedish Whitebeam	10.0	250	1	2.0	4.5	1.0	3.0	1.0	20-40	EM	Crown Lifted. Asymmetrical crown. Dense crown structure. No significant defects. Crown lifting to 6.0m	3.0	C1
T8	Italian Alder	19.0	340	1	5.0	6.0	4.0	1.5	2.0	20-40	M	Dead wood in lower crown. Lean to East. Asymmetrical crown. No significant defects. Remove deadwood & crown lift to 6.0m	4.0	C1
T9	Alder x 2	11.0	160 210	1 *2	2.5	7.0	3.0	1.0	1.5	20+	SM	Swept and leaning stems to east. Asymmetrical crowns. No significant defects. Consider removal due to unbalanced form	2.6	C1
T10	Scots Pine	9.0	220	1	1.5	4.0	4.0	0.5	2	30+	SM	Asymmetrical crown. Lean to East. Dead wood in lower crown. No significant defects. No recent management. Prune as necessary or remove to facilitate development.	2.5	C1
G1	Ash, Oak, Maple, Hornbeam.	11.0	200 - 300	MS	5.0	4.0	5.0	4.0	0.5	20+	SM	Screen planting. No significant defects. No recent management. Prune lower branches back to boundaries.	3.6	C1

Headings and Abbreviations:

No.	Allocated sequential reference number - Tree ('T'), Group ('G'), Woodland ('W') or Hedge ('H') reference number - refer to plan and to numbered tags where applicable
Species:	Common name
Height:	In metres, to half nearest metre – where possible approximately 80% are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement listed is that of the highest tree
Stem Diam.:	Stem diameter in millimetres, to nearest 10mm - measured and calculated as per Annex C of BS5837:2012. MS = multi-stemmed, TS = twin-stemmed
Branch Spread:	Crown radius measured (or estimated where considered appropriate) from the four cardinal points (north, east, south and west) to give an accurate visual representation of the crown
Crown Height:	Existing height above ground level, in metres, of first significant branch and direction of growth (e.g. 2.5-N) and of canopy at lowest point – to inform on crown to height ratio, potential for shading, etc.
Age Class:	Estimated age class - Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature
ERCY:	Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)
BS Cat::	Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1
RPA Radius (m):	Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection
* (Estimated Dimensions):	Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a “#” symbol

6.0 Arboricultural Impact Assessment

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 m² which should be left undisturbed around each retained tree. The standard calculated RPA's and the protection zone radii are detailed in the Tree Survey Schedule (Table 1) above.

6.2 For single stem trees, the RPA has been calculated as an area equivalent to a circle with a radius 12 times the stem diameter. For trees with more than one stem, one of the two calculation methods below has been used.

6.3 For trees with multiple stems the following rules apply.

a) For trees with two to five stems, the combined stem diameter has been calculated as follows:

$$\sqrt{(\text{stem diameter } 1)^2 + (\text{stem diameter } 2)^2 \dots + (\text{stem diameter } 5)^2}$$

b) For trees with more than five stems, the combined stem diameter is calculated as follows:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

6.4 The RPA for each tree is plotted as a circle centred on the base of the stem.

6.5 The calculated RPA for each tree has been capped to 707 m².

6.6 Where pre-existing site conditions or other factors suggest that rooting has occurred asymmetrically, a polygon of equivalent area has been produced.

6.7 Where modifications to the shape of the RPA have been specified they reflect a soundly based arboricultural assessment of likely root distribution. Any deviation in the RPA from the original circular plot takes account of the following factors whilst still providing adequate protection for the root system:

- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
- b) topography and drainage;
- c) the soil type and structure;
- d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.'

6.8 The proposed development (footprint) does not encroach into the RPA's of existing trees although access road/driveway construction plus gabion installation does result in some implications covered below:

- 6.9 The installation of ground protection (ply boards overlaid with compressible layer of wood chip) is recommended to protect the root environment where construction activity encroaches into the RPA's of trees T5-T8 inclusive.
- 6.10 Threat from direct damage can be addressed through the installation of a physical barrier where appropriate (see TPP). In terms of trees T5-T8 inclusive, a physical barrier is neither practicable nor necessary due to the trees being off-site and limitations on space to work on the driveway access and piled retaining wall.
- 6.11 The installation of the driveway serving the western unit (3) should be undertaken in accordance with the AMS where it encroaches into the RPA's of trees T5-T8 inclusive. The careful adjustment of levels using an air spade and use of a permeable wearing layer would be sufficient mitigation.
- 6.12 Pre construction tree pruning works will be required to T5-t8 inclusive and this will take the form of judicious crown lifting to provide space for construction activity below and adjacent.
- 6.13 The proposal includes the construction of the gabions where level changes necessitate support for slopes and these encroach slightly in respect of trees T1, T2, T3 and G1; however, so long as the physical barrier remains in place as per the TPP, root loss/disturbance will not be sufficiently significant to warrant detailed working covered by an AMS.
- 6.14 The removal of a group (G3 on TPP) of low value trees (self set alder and ash) will be required to facilitate the development. The loss of these trees will have no significant impact on character and appearance in localised or wider landscape terms. A small off-site group (G2) offers no constraint to development.
- 6.15 BS 5837 2012 describes the extent and form of the root system as; the roots are highly branched within a short distance of the stem, so as to form a network of small-diameter woody roots, which can extend radially for a distance much greater than the height of the tree, except where impeded by unfavourable conditions. The installation of the driveway and gabions will not have any significant long-term impact on the welfare of the nearby trees because all possess sufficient vigour to quickly compensate for the loss of small diameter roots.

7.0 Potential incursions in to the RPA (Root Protection Area)

- 7.1 The proposed development will involve incursions into the RPA as detailed above and also potentially for access during the construction phase. Where it has been defined during the design stage, and shown on the tree protection plan, that vehicular or pedestrian access for the construction operation is required within the root protection area (RPA), the possible effects of construction activity will be addressed by a combination of barriers and ground protection. The position of the barrier is shown within the RPA at the edge of the agreed working zone but the soil structure beyond the barrier to the edge of the RPA will be protected with ground protection.
- 7.2 Storage of materials, the site compound and welfare facilities should be set-up using a location outside the RPA within the driveway or outside the protective fencing to the rear.

8.1 Additional precautions outside the exclusion zone

- 8.2 Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence. All weather notices should be erected on the barrier with words such as: “Construction exclusion zone — Keep out”.
- 8.3 Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees.
- 8.4 Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in 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. Access facilitation pruning should be undertaken where necessary to maintain this clearance. NOTE In some instances, local planning authority consent for pruning might be required.
- 8.5 Fires on sites should be avoided if possible. Where they are unavoidable, they should not be lit in a position where heat could affect foliage or branches. The potential size of a fire and the wind direction should be taken into account when determining its location and it should be attended at all times until safe enough to leave. NOTE Local environmental health authorities might have specific restrictions.
- 8.6 Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA. 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.

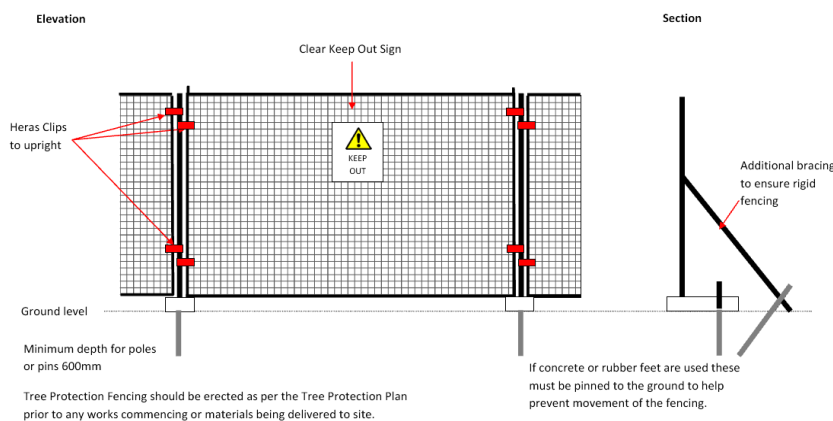
8.7 Arboricultural Method Statement (preliminary) - Tree Protection

- 8.8 The exclusion zones as defined in this report will be protected with fencing. The site is open and we do not believe that protection of the entire site is necessary. We have indicated on the Tree Protection plan (Plan 002) where we believe *Heras style fencing* should be installed. In other areas the trees are protected by existing fencing defining field boundaries and in our opinion this will be sufficient to protect the trees on site. Where additional fencing has been specified 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 within BS5837:2012.
- 8.9 Where hard surfacing exists within the RPA and where it is to remain, protective barriers will be erected at the edge of the hard surface and the space may be utilised for operational purposes.
- 8.10 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 re-commence 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.

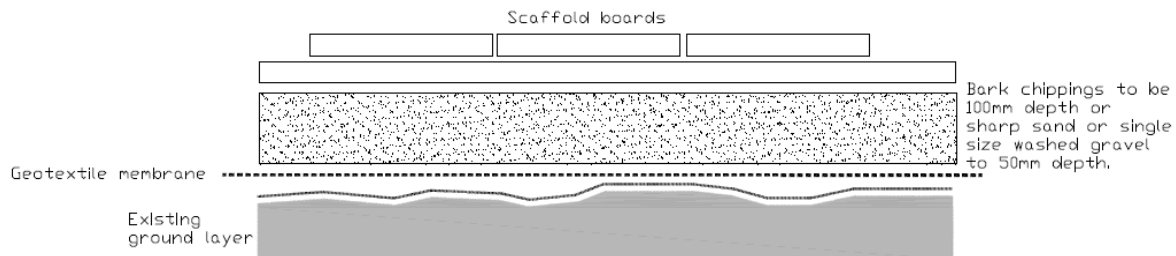
- 8.11 The total exclusion zones are marked on the accompanying drawing. British Standard 5837:2012 indicates the recommended areas for the Root Protection Areas (RPA) which should be enforced with protective fencing. Specifications within BS5837:2012 inform our recommendations for both the fencing type as detailed below in figure 2 and the location of this fencing which given the works within the RPA is located at the point where works within the RPA stop.
- 8.12 All protective fencing (except where specified above) is to be constructed in accordance with BS:5837 (2012) – specification reproduced below:

Tree Protection Fencing Specification



8.13 Arboricultural Method Statement – Ground Protection

- 8.14 To protect the RPA of retained trees from the movements of heavy plant and machinery – Ground Protection (M) on TPP, 18mm ply boards should be laid onto a geo-textile membrane and overlaid with a compressible layer (100mm), which in this case should be wood chippings.
- 8.15 To protect against pedestrian movements only - Ground Protection (P) should comprise 18mm ply boards laid onto a geo textile membrane.
- 8.16 Ground protection should be installed prior to any construction activity on the site and remain in place until practical completion of the development.



8.17 Arboricultural Method Statement – Tree Pruning enabling works

8.18 Judicious pruning to raise the crowns of T5-T8 inclusive will be required prior to construction activity on the site and the scope of this work should be agreed, in detail, with the project arboriculturalist, during the pre construction meeting.

8.19 Tree pruning should accord with BS3998: 2010 'Tree Works'.

8.20 Arboricultural Method Statement (preliminary) – Sequencing of works & supervision

8.21 The sequencing of arboricultural mitigation measures should be planned in advance of the start of construction and can be summarised as follows:

1. Tree protection mitigation measures installed by main contractor.
2. Tree pruning completed prior to start of construction phase after meeting with project arboriculturalist.
3. Monitoring of tree protection mitigation – where justified.
4. Removal of tree protection only once practical completion has been reached.

8.22 Arboricultural Method Statement – (preliminary) – Air spade re profiling of levels with the RPA

8.23 The adjustment of levels the facilitate the installation of the driveway/access to the east of T5-T8 inclusive should involve the use of an Air spade should a reduction of levels >150mm be required.

We propose that:

1. Excavation should be undertaken using an AirSpade to avoid damage to roots enabling arboricultural assessment and pruning where appropriate.

2. Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.
3. Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in lumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability.
4. The interface between pruned roots and the new driveway (subbase/surface) should be sealed with a geo textile membrane (Root block) to encourage roots to develop downwards into available substratum where water, oxygen and nutrients can be exploited.

9.0 Conclusion and recommendations

- 9.1 There are trees within the site which fall within the constraints of BS5837 (2012).
- 9.2 In total, 10no individual trees and 1no tree groups were recorded all of which can be successfully retained along with their contribution to the character and appearance of the locality.
- 9.3 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 in this report the works will not be detrimental to the retained trees.
- 9.4 All technical issues relating to arboriculture should be addressed to MWA Arboriculture Ltd in the first instance. MWA Arboriculture Ltd will liaise between the Local Planning Authority and any interested parties.
- 9.5 It is suggested that the development proceeds in accordance with the above recommendations with the use of condition(s) where appropriate.