Tree Assessment Report

Gilman House

Town End Lane

Swinscoe, Ashbourne

Derbyshire

Date: 16th November 2012

Arbormasters Ltd

Woodhouses
Blore
Ashbourne
Derbyshire

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1.0 Introduction

1.1 This report has been prepared by Arbormasters Ltd on behalf of Mr and Mrs Trevarthen, to survey and assess the arboricultural quality of the tree stock present within the parameters of Gilman House, Town End Lane, Swinscoe, near Ashbourne, Derbyshire (hereafter referred to as the 'assessment site').

1.2 The walk over survey was undertaken by Callum Throw of Arbormasters Ltd on the 14th October 2011 and included all the trees present within the proposed development area, identified on 'Figure 1- Site Location Plan'.

1.3 The purpose of the report is to ascertain the current quality of the trees present within the assessment site and make an assessment of their relative importance in light of redevelopment proposals and in accordance *with B.S. 5837 Trees In Relation To Construction- Recommendations (2005).* The survey has focused on the major trees within the site that would be directly affected by the proposed redevelopment of the current lawn area to accommodate a new access road off Town End Lane leading to a proposed double storey purpose built Garage.

1.4 It is being proposed to re-develop the current layout of the garden surrounding Gilman House to incorporate a double-storey purpose built garage and workshop which is to be accessed by a new entrance and access road off Town End Lane, Swinscoe. The proposed development shall seek to alter the current ground level to accommodate a level surface in which the garage is proposed for construction. It is proposed that the change in ground level shall be achieved through constructing retaining stone walls. As a result of alterations to the ground level, it is being proposed that a set of steps are constructed to link the property (set a higher level to the east) with the proposed garage. Furthermore an additional set of steps to the north-west corner of the proposed garage are to be constructed to provide access to the remaining areas of the assessment site. The proposed development shall maintain the current boundary stone wall, removing a small section to create a new access road through a gated entrance. It is anticipated that the proposed development shall incorporate associated infrastructure such as new footpaths/walkways and aesthetic planting schemes.

1.5 Should remedial works be required to appease the proposed development it is recommended suitably qualified and insured contractors undertake such works. All work should be carried out in accordance with *British Standard 3998- Recommendations for Tree Work.*

1.6 The report relates only to the conditions prevailing on the dates of inspection, namely 14th October 2011. On the day of inspection the weather conditions were dry and sunny with light to minimal strength winds.

2.0 Site Information

2.1 The trees inspected are located on land within the ownership of Mr and Mrs Trevarthen are set within the parameters of the assessment site, as identified in Figure 1 'Site Location Plan'.

2.2 The assessment site is situated adjacent to Town End Lane, Swinscoe, Nr. Ashbourne, set to the south-west of the main 'A52- Swinscoe Hill'. The assessment site is bound by a stone wall and ornate post and rail fencing, which separates the outer boundaries from Town End Lane and the surrounding arable farmland to the east and west. The property sits at a higher ground level to the remainder of the garden which gradually slopes away to the west.

2.3 At current access into the site is located to the north east corner of the assessment site and incorporates a small tarmac drive through a set of double gates which are directly linked to Town End Lane. The current driveway provides access to the front of the house and is bounded by several small ornate shrub/flower beds and associated walkways. The property is surrounded to the rear (south, south east and south west) by a large garden area which predominantly comprises lawn, shrub/flower beds and mature trees which are anticipated to be relics of an old hedge line or field boundary.

2.4 The assessment site at current is typical of a post-war modern family dwelling comprising a large area of hard standing to the front and a medium to large garden comprising ornate flower beds to the rear. The Garden has been relatively undeveloped (i.e. landscaped) and the current access off the main road is overdue redevelopment.

3.0 Methodology

3.1 Trees have been broadly assessed based on guidance set out within the British Standard BS 5837: (2005) Trees In Relation to Construction Recommendations. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development (including demolition) is to occur, the standard provides guidance on the approach needed to decide which trees during the development are appropriate for retention, on the means for protecting these trees during the development (including demolition and construction work) and on the means of incorporating trees into the developed landscape.

3.2 Trees have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or R (Section 4.3 of BS 5837). This gives an indication as to the tree's importance in relation to the site and the local landscape and, also, the value and quality of the existing trees on site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below). Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values.

3.3 Category R trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are for this reason not considered in the planning process. In assigning trees to A, B or C categories, the presence of any serious disease or tree related hazards are taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as R, even if they are otherwise of considerable value.

3.4 Category A (Light Green): are trees whose retention is most desirable and which are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

(i) Trees which are particularly good examples of their species especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);

(ii) Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups);

(iii) Trees or groups or woodlands of significant conservation, historical or commemorative or other value (e.g. Veteran or wood-pasture trees).

3.5 Category B (Blue): are trees whose retention is considered desirable and which are of moderate quality and value. These trees are considered to be in such condition as to make a significant contribution (a minimum of 20 years) and may comprise:

(i) Trees that may be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;

(ii) Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the site and have little visual impact beyond their site;

(iii) Trees with clearly identifiable conservation or other cultural benefits.

3.6 Category C (Grey): are trees that could be retained and which are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150mm and may comprise:

(i) Trees not qualifying in higher categories

(ii) Trees present in groups or woodlands, but without this conferring on them significantly greatly landscape value and or trees offering low or only temporary screening benefit;

(iii) Trees with very limited conservation or other cultural benefits.

3.7 Category R (Red): Trees for removal are those trees 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. Trees within this category are:

(i) Trees that have a serious irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other Category R trees;

(ii) Trees that are dead or are showing signs of significant, immediate or irreversible overall decline;

(iii) Trees infected with pathogens of significance to the health and/or safety of other trees nearby trees or very low quality trees suppressing adjacent trees of better quality.

3.8 Species have been recorded by common and botanical name. Height has been estimated in metres and stem diameter measured at 1.5 metres in centimetres.

3.9 In the assessment particular consideration has been given to:

(a) the health, vigour and condition of each tree;

(b) the presence of any structural defects in each tree and its life expectancy;

(c) the size and form of each tree and its suitability within the contexts of the proposed scheme;

(d) the location of each tree relative to existing site features e.g. its value as a screen or as a skyline feature.

3.10 Age class is assessed according to the age class categories referred to in BS 5837.

YNG: Young trees age less than 1/3 life expectancy

SM: Middle age trees 1/3 to 2/3 life expectancy

M: Mature trees over 2/3 life expectancy

OM: Over mature declining or moribund trees of low vigour

3.11 The overall condition of the tree, or groups of trees, has been referred to as one of the following. A more detailed description of condition has been noted in the Tree Schedule and discussed in the Tree Assessment Report (Results and Discussion).

G Good: A sound tree, trees, needing little, if any, attention

F Fair: A tree, trees, with minor but rectifiable defects or in the early stages of stress, from which it may recover

P Poor: A tree, trees, with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain

D Dead: A tree, trees, no longer alive. This may also apply to trees in such a state that they show little signs of recovery or eventual structural failure

3.12 Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branches: Up to 5cm diameter

Minor dead wood: 5cm to 10cm diameter

Major dead wood: 10cm and above in diameter

3.13 The survey was completed from ground level only and from within the curtilage of the assessment site. Aerial inspection was not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

Site Plan and Tree Schedules

3.14 The individual positions of trees and groups of trees recorded in the Tree Assessment Report have been shown on the Tree Location, Quality and Constraints Plan. The tree quality element shows the relevant BS 5837 (2005) categories for retention considered for each tree and groups of trees. The positions of trees are based on topographical/ land survey supplied for the purpose. The root protection areas (RPA) for each tree and group of trees are shown on the Tree Location, Quality and Constraints Plan.

Root Protection Area (RPA)

3.15 Below ground constraints to development are represented by the root plate around a tree which needs protecting in order for the tree to be incorporated into a proposed scheme, without adverse harm to the tree or structural integrity of buildings. This area is illustrated by the Root Protection Area (RPA) and is calculated according to the formula set out in Clause 5, BS 5837 (2005). The area is equilivant to a circle with a radius 12x the stem diameter for single stem trees and 10x the basal diameter for trees with more than one stem arising less than 1.5 metres above ground level.

Table 1: Calculating Root Protection Area

RPA (m2) = (Stem diameter (mm) x 12/1000) 2 x 3.142

This figure should be capped to 707m2, that is, equivalent to a circle with a radius of 15m or a square with approximately 26m sides

4.0 Tree Survey Results

4.1 Across the assessment site there were a high number of semi-mature to mature tree specimens, namely Silver birch *Betula pendula,* Common ash *Fraxinus excelsior,* Bird cherry *Prunus padus* and Rowan *Sorbus aucuparia*. In total 8 individual tree specimens have been surveyed.

4.2 Overall the arboricultural quality of the majority of the trees observed on the assessment site were considered to be of a moderate to good condition and were, in general, free from major structural defects or characteristic signs/symptoms associated with ill-health. Several individual trees and groups of trees, namely T3 and T4 demonstrated poor structural conditions and symptoms of ill-health or overall decline and as a result their potential for successful longevity has been reduced. The majority of the larger, mature trees surveyed within the assessment site appeared to be of moderate health and vigour.

Individual Trees

4.3 T1 was a mature Common ash *Fraxinus excelsior* of moderate quality. Considered typical of the species, T1 had formed an asymmetrical crown to the north, east and west due to its close proximity to neighbouring trees. The crown comprised dead wood of varying length and overall proportion, with one large dead branch positioned at 3.5 metres above ground level to the south side of the tree. As a result of previous pruning, dense and sporadic epicormic growth had formed along the main stem and lower lateral branches. As a result the overall aesthetic value and long term useful life expectancy of T1 is considered to have been reduced. Several large pruning wounds were evident along the main stem and lower crown; these wounds demonstrated a strong response to wounding and were predominantly fully occluded. As a result of the survey, T1 has been considered as a Category B (Moderate quality) tree specimen.

4.4 T2, a semi-mature Bird cherry *Prunus padus,* was considered to be typical of its species comprising a dense and compact crown formed of crossing and rubbing branches with tight unions, a low crown height of 0.5 to 1 metre above ground level and epicormic growth. The tree had been previously pruned over the road and demonstrated a strong response to wounding through callus growth. At the time of inspection T2 was free from major structural defect. As a result of the trees overall condition and aesthetic/wildlife value, T2 has been considered as a Category B (Moderate quality) tree specimen.

4.5 T3 was a mature common ash *Fraxinus excelsior* which exhibited a moderate vigour and overall condition at the time of inspection. The tree had formed a small and spreading asymmetrical (north-west) crown which comprised minor dead wood throughout, as well as sporadic epicormic growth and several large pruning wounds which demonstrated a strong response to wounding through callus growth and healthy occlusions. The tree was free from obvious major structural defects at the time of inspection. T3 has been considered as a Category B (Moderate quality) tree specimen.

4.6 T4, a young *Sorbus aucuparia* Rowan was considered to be typical of the species comprising a small and compact crown with multiple leaders, minor crossing/rubbing branches and tight branch unions. The tree presented no obvious major structural defects at the time of inspection and as a result has been considered as a Category B (Moderate quality) tree specimen.

4.7 T5 was a semi-mature common ash *Fraxinus excelsior* which exhibited a moderate overall condition at the time of inspection. Formed of a bifurcate stem from 2.5 metres above ground level, T5 comprised a dense crown of epicormic growth as a result of past pruning in which the tree was heavily reduced and several minor dead branches. This tree has been considered as a Category C (Low quality) specimen.

4.8 T6 was a semi-mature Sycamore *Acer pseudoplatanus* which had developed a tall and drawn slender form comprising a small and squat crown as a result of suppression from neighbouring trees to the east and west. Along the main stem there was evidence of previous pruning, in the form of pruning wounds, to which the tree has been crown lifted. T6 has been considered as Category C (Low quality) tree specimen.

4.9 T7 was a mature common ash *Fraxinus excelsior* considered to be of a mature age and in a moderate condition at the time of inspection. The tree was formed of a single stem to a high crown which exhibited strong form despite some previous management in which several encroaching branches had been reduced or removed. The tree was free from obvious major structural defects. As a result of the survey T7 has been considered as a Category B (Moderate quality) tree specimen.

4.10 T8 was a mature Common ash *Fraxinus excelsior* of 13 metres in height. Situated on a raised level of mounded ground within the remnants of an old hedgeline, T8 demonstrated a moderate overall condition at the time of inspection. T8 has received past Arboriculturasl management in the form of crown lifting and the selective cut back of lower limbs extending to the north, east and south of the crown, evident through numerous branch socket cavities and several occluded wounds. As a result of pruning, the crown comprised sporadic epicormic re-growth located along the lower stem and limbs. Throughout the upper crown there were several minor and major dead branches. As a result of the survey this tree has been considered as a Category B (Moderate quality) tree specimen.

4.11 T9 was a semi-mature silver birch *Betula pendula* which comprised a single stem with a low, small and compact crown. Throughout the crown there was epicormic growth, considered to be typical of the species, and minor crossing and rubbing branches. Along the lower stem, toward the base of the tree, there was a small wound to which the outer cambium had been damaged and the heartwood left exposed. These wounds were considered minor and appear to have had little effect on the overall structural integrity of the tree. This tree has been considered as a Category B (Moderate quality) specimen.

4.12 T10 was a young Common Hawthorn *Crataegus monogyna* situated along the northern boundary of the assessment site. T10 was considered to be typical of its species through developing a small and squat form comprising multiple stems from a height of 0.5 metres above ground level. These stems had all formed with tight unions and as result many of the branches within the crown were crossing and/or rubbing. There were several minor pruning wounds situated to the south side of the trees lower stem. At the time of inspection there were no obvious major structural defects and as a result T10 has been considered as a Category C (Low Quality) tree specimen.

4.13 T11 was a young *Prunus spp.* Situated along the northern boundary of the assessment site in close proximity to an existing boundary fence. T11 was 2.5-3 metres in height and had developed with a bifurcate stem at 15 cm above ground level. Along the lower stem there was evidence of rabbit/strimmer damage as well as a small wound at 1 metre above ground level on the northern side of the stem as a result of rubbing against the boundary fence. The wound was considered minor and is not thought to have had, at the time of inspection, a detrimental affect on the trees overall health and vigour. Considered typical of the species, T11 comprised crossing and rubbing branches and tight stem and branch unions. There were no obvious major structural defects at the time of inspection. T11 has been considered as a Category R (Remove) to accommodate development proposals.

5.0 Discussion and Recommendations

5.1 It is understood that the proposed development seeks to modify the current garden lawn area to the west of Gilman House to accommodate a double-storey garage and workshop with appropriate access road/ driveway off Town End Lane, as well as areas of hard standing for parking and associated infrastructure including footpaths/walkways and amenity tree and shrub planting. The proposed development shall include the alteration of the current ground level to provide a level and flat surface to which the garage shall be constructed. The Ground level alteration shall see the construction of several retaining walls to hold the soil in place at a higher gradient.

5.2 Overall the results of the survey can be summarised as the following:

5.3 There is one individual tree/s considered as a Category R (Remove) namely T11. This tree specimen has been considered for removal to accommodate current development proposals. It is anticipated that any tree removals to occur should be mitigated for under an agreement to carry out replanting in a suitable area of the assessment site.

5.4 There were three individual tree specimens surveyed within the assessment site considered as Category C (Low quality) tree specimens, namely T5, T6 and T10. These trees would be considered suitable for short term retention, however are considered of low quality and value and/or have a limited useful life expectancy as a result of past management. At current T5, T6 and T10 are in an adequate condition to remain until new planting becomes established.

5.5 Seven of the individual trees were considered as Category B (Moderate Quality) namely T1, T2, T3, T4, T7, T8 and T9. In accordance with the British Standard, Category B specimens are trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and that may have been placed in the higher category but due to their slightly impaired condition e.g. known defects or past management, are downgraded from Category A (High Quality).

T8, a mature common ash, is currently situated within close proximity to the proposed area of development. It is anticipated that this area is to involve the main intensity of construction works and would require a strict works specification and Arboricultural Method Statement in order to ensure the trees safe and long term retention upon completion.

5.6 There were no individual tree specimens or groups of trees surveyed within the assessment site considered worthy of Category A (High Quality) classification. Trees worthy of Category A are considered most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years).

5.7 Within the scope of the development proposals it has been identified that certain tree losses are to occur in order to implement the proposals. It has been considered necessary to remove the following trees; T10 and T11.

5.8 T10 and T11 consist of two young tree specimens which were considered typical of their species. Both tree specimens were free from major structural defect at the time of inspection. Within the context of development proposals both trees are positioned within the new entrance of the proposed access road linking Town End Lane to the double-storey garages. It is anticipated that proposed position of the new entrance/access road is unlikely to be re-modified to such an extent that both trees could be retained without causing damage or impairing the overall condition, health and vigour of the tree specimens. Therefore it is recommended that both T10 and T11 are removed prior to construction works commencing and that there loss is mitigated for with new tree planting.

5.9 Within the contexts of the development proposals, it is anticipated that both T1 and T8 (Common ash) are to be affected by the construction of the proposed garages and/or proposed access road as well as the construction of a retaining wall and access steps. The retaining wall is designed to hold back the ground at a higher level to prevent it subsiding/sliding and will provide a place for the excess soil removed during the alteration of the current ground level.

5.10 At current it is being proposed that the ground to the south-east corner of T1's rooting area is to be subjected to ground alterations to accommodate the construction of a new driveway. The change in depth is to involve grading the soil to a depth of no more then 300 mm. Tree roots are generally positioned within the first 600 mm of ground level and spread from the base of the tree to a distance greater than the spread/drip line of the trees crown. They are an integral component of a tree providing water, nutrients, minerals and anchorage/stability. Changes in ground level (Trenches, Mounds and soil strips) result in a loss of water or reduction in water levels, asphyxiation of roots or direct damage to roots through cutting or removal. The construction of water drains or run-offs and a change in base material, such as Tarmac and Asphalt, in areas of previously permeable ground can impede water flow which may result in anaerobic conditions and eventual death.

5.11 It is therefore recommended that any works carried out in this area are done so under a specific Arboriculture Method Statement and under the supervision of a suitably qualified Arboriculturalist. In order to minimise damage a limitation should be placed on the use of mechanical equipment in this area, adopting hand-digging techniques or the use of an AirSpade. Tree roots of no more then 25 mm in diameter should be severed. Any roots unintentionally severed should be pruned appropriately. No roots over 250 mm diameter should be removed in order to prevent/reduce the risk of root heave due to decreased tree root anchorage. Furthermore damaging major tree roots places increased stresses on the tree thus reducing its overall vigour and placing it in a weakened state. This in turn may result in overall decline of the tree and eventual death.

5.12 It is anticipated that during these works access shall be required within the RPA of T1. It is considered appropriate to allow access within the RPA during these works. However, it is recommended construction materials, waste or hazardous chemicals are not stored within the RPA at any point and that once works are completed the appropriate protective fencing is re-erected. No works at all should be carried out within one metre of the trees base.

5.13 It is understood that T1 is positioned within close proximity to the proposed main entrance of the development and therefore vehicular movement is to be anticipated as unavoidable within this area. It is firstly recommended that T1 is subjected to facilitation pruning in which the lower branches within the crown should be removed to prevent unnecessary damage occurring through the unloading and loading of equipment and building materials. Furthermore it is recommended that a geo-textile membrane comprised of loose granular materials or 'Breedon Gravel' is laid as a temporary surface during the construction. These membranes minimise compaction and as such provide a degree of protection to the each of the trees.

5.14 Overall It is being recommended that any proposed alteration to the ground level around and within the rooting area of T1 is, where possible, kept to a minimum and that following the construction works a suitably qualified arboriculture specialist assesses the rooting area and the tree at regular periods to monitor any onset of decline and provide suitable recommendations for remedial works as and where necessary.

5.15 T8 presented a mature common ash *Fraxinus excelsior* of moderate condition and overall quality (Category B Tree Specimen) and therefore worthy of long-term retention within the context of development proposals. It is considered that T8 is situated within the more intensified area of the proposed development and any construction works provide a high risk of damage to the tree above and below ground. At current the crown of T8 is likely to encroach and in turn impede the construction of the garages. It is therefore recommended that prior to works commencing several limbs extending to the east of the crown are removed and/or reduced to facilitate the proposed development. The undertaking of this work should be carried out sympathetically to prevent unbalancing the tree.

5.16 As previously stated any alterations to ground level in this area is likely to impede and impact the trees rooting area and at all times any works in this area should be carried out under the guidelines set in the Arboriculture Method Statement and under the supervision of a suitably qualified Arboriculturalist.

5.17 It has been considered that at times works within the protected rooting area may be unavoidable. It is recommended that the calculated area of T8's RPA is off-set by 20% to the west (in accordance with the guidelines outlined in *B.S. 5837- Trees In Relation To Construction*). This would afford more room to manoeuvre and is considered to be advantageous to both the development proposal and the overall safe and long-term retention of T8. No works at all should be carried out within one metre of the trees base.

5.18 As previously stated, a sympathetic method of work must be agreed in writing with the Planning Authority in advance of commencing works. No works at all should be carried out within one metre of the trees base.

5.19 Following the completion of construction works it is recommended that an appropriately qualified Arboriculture specialist/consultant assesses the level of compaction and alteration within and around both T1 and T8. It may be advised that the ground is de-compacted and vertical mulched using a compressed air gun, such as the 'AirSpade'. This would alleviate any ground compaction and stimulate regenerative growth.

5.20 Overall across the assessment site it is recommended that a limitation is placed on the use of tracked/heavy plant machinery during construction and minimum dig techniques are utilised, where possible.

5.21 It is being proposed that the new drive way/access road linking the proposed garages to 'Town End Lane' are constructed using Tarmac. Tarmac is a flexible material which is subject to displacement and cracking as a result of root growth and development. It is advised that anti-compaction granular materials, such as 'Breedon Gravel' are considered as a more "Tree-friendly" alternative. Furthermore the laying of any proposed surface material should ideally be placed over a 'Cell-webbing' like membrane. These surfaces minimise compaction and in turn reduce the risk of damage to tree roots.

5.22 During the installation of footings, foundations or retaining walls in close proximity to trees and tree roots it is recommended that hand-tools are used and that construction works are carried out under the observation of a suitably qualified Arboriculture consultant. It would be advised to consider using a root barrier when installing such structures. A Root barrier deflects roots away from structures thus preventing/reducing the risk of structural damage occurring in the future.

5.23 During the construction it is recommended that any tree roots exposed following soil alterations or the digging of trenches etc should be wrapped in Hessian Sack to reduce the loss of moisture and prevent them drying out.

5.24 The individual tree specimens included within this report should all be appropriately protected during the proposed construction. The trees should be protected using purpose built Tree Protective Fencing. This fencing should not be moved and must remain in place until works are completed. Details of adequate Tree Protective Fencing can be found in 'Section 9- The Construction Exclusion Zone: Barriers and Ground Protection- *BS 5837 (2005)'.*

5.25 The layout of the proposed development has considered the location of the prominent trees across the assessment site to avoid un-necessary damage occurring whilst carrying out the construction works. The layout of the site has also sympathetically considered an area where tree losses can be kept to a minimum.

5.24 New tree planting should be established to mitigate the loss of trees across the assessment site. It is recommended that these specimens, within two years from completion of proposed redevelopment works, are subjected to post planting maintenance to correct and train young specimens to develop into highly arboricultural significant trees. A number of tree losses often occur as a result of trees developing poor forms or significant structural defects as a result of poor training when young. It is highly advised that post planting maintenance is considered.

6.0 Arboricultural Method Statement for Trenching Close to Mature Trees, Footpath Construction and Ground Level Alterations

6.1 Any trenching operations and ground excavation works should be carried out in accordance with guidance contained within NJUG 10 Guidelines for the Planning, Installation and Maintenance of Utility Services in proximity to Trees (April 1995). This guidance has been produced by the National Joint Utilities Group.

6.2 Set out below is a set of summary statements taken from the above guidelines, and should be adhered to during any works.

6.3 The protected or 'Precautionary Zone' in which the following operations will apply is described as the entire crown spread area beneath the crowns of the existing mature trees along the route of any proposed lighting/electricity cable installations.

6.4 Any trenching required beneath the crown spread of trees is to be hand dug, using hand tools only. Excavation of open trenches within the crown spread of any existing mature specimen by machines will be totally unacceptable.

6.5 No roots over 25 mm to be severed, unless agreed by a suitably qualified Arboriculturalist.

6.6 Any roots approved having been given approval to cut to be done so using clean and sharp tools, such as secateurs and hand saws. The cut will be made cleanly and to a suitable growth point/ junction. As small a wound as possible will be created.

6.7 The trenches are not to remain open for long periods of time as it will cause the roots to dry out and be damaged. Therefore backfilling is top happen as soon as the installation works are completed, thus reducing the length of time the roots will be exposed.

6.8 Fill material is to be inert (i.e. as to not upset the balance of acids and alkaline in the existing soil), preferably with the material that has been excavated and care is to be taken when compacting the fill around the tree roots to avoid damaging the roots.

6.9 Any heavy machinery is to be avoided within the 'Precautionary Zone' as to prevent creation of compacted soil conditions.

6.10 No material or equipment to be stored within the 'Precautionary Zone' as this could cause compaction and run-off into the soil.

6.11 The existing trees have low crown growth in certain cases and therefore tree surgery is to be carried out to raise the crowns to the required height to allow access and safe passage of pedestrians and vehicles entering the proposed new access/ drive way. All tree is to be carried out in accordance with *British Standard 3998 (1989) Recommendations for Tree Work.*

6.12 Potentially the proposed new footpaths will be constructed beneath tree canopies. It is therefore strongly recommended that a "no-dig" method of construction as specified within *Arboricultural Advisory and Information Service, Arboricultural Practice Note No. 1- Driveways Close to Trees (1996)* is followed. A brief outline of this construction method is described in the flowing paragraph.

6.13 The construction of the footpaths and driveway could be made on top of the existing ground level and built up, as to avoid any root damage within the 'Precautionary Zone'. A geogrid should be laid directly on the soil, onto which will be placed a layer of aggregate to form a sub-base. The design of the geogrid allows the aggregate to penetrate the mesh but not pass through, thus creating a reinforced platform and efficient load spreading to form the base of a footpath/driveway. The sub-base can be lightly compacted to ensure binding of the material. The final surface material should comprise a permeable material to allow gaseous diffusion through to the roots.

7.0 Tree Protection Measures

7.1 General Information

7.2 All trees retained on site should be protected by barriers or ground protection around the calculated Root Protection Area (RPA) and as indicated on the Tree Location, Quality and Constraints plan, that has been produced in association with the British Standard (Clauses 5 and 7 of *BS 5837*).

7.3 Fencing should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up, all fences should not be removed or altered without prior consultation with the arboricultural advisor.

7.4 Arrangements should be made for an arboriculturalist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points.

7.5 Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority.

7.6 Any trees that are not retained should be felled prior to the erection of protective fencing. Particular attention needs to be given by approved contractors to minimise damage or disturbance to retained specimens (following good industry practice at all times).

7.7 All tree works should follow best practice procedures as se out in *BS 3998 (1989).* All trees should be maintained in good condition on site and be regularly inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.

Barriers

7.8 Fencing should be strong and suitable for the location, type and proximity of construction activity. Barriers must remain rigid and complete.

7.9 In most situations fencing should comprise a scaffold framework comprising a vertical and horizontal framework. For particular areas where construction activity is anticipated to be intense higher fencing may be necessary.

7.10 It may be appropriate on some sites to use temporary site offices as components of the protection barriers.

Ground Protection

7.11 Where agreed, construction access may take place within the RPA if suitable ground protection measures are in place. This may comprise single scaffold boards over a compressible layer laid into geo-textile membranes for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems.

Protection Outside the Exclusion Zone

7.12 Once the areas around the tree have been protected by the fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on the fencing to indicate that operations are not permitted within the fenced area.

7.13 Wide or tall loads should not come into contact with retained trees. Banksman should supervise transit of all vehicles, jibs, booms etc where this is in close proximity to retained trees.

7.14 Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10m of a tree bole. Allowance should be made for the slope of ground to prevent materials running toward the tree/s.

7.15 Notice boards, telephone cables or other services should not be attached to any part of a retained tree.

7.16 Any trees which need to be felled adjacent to or are present within continuous canopy of retained trees must be removed with due care.

Protection For Aerial Parts of Retained Trees

7.17 Where it is deemed necessary to operate a wide or tall load, plan bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs of retained trees within the RPA fencing, it is best advise that appropriate but limited tree surgery be carried out beforehand to remove any problem branches. This is classed as 'Facilitation Pruning', *BS 5837 (2005) 9.4.2 and 11.2.1.*

7.18 In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with *BS 3998 (1989) Recommendations for Tree Work,* to correct the damage.

7.19 Al of the above precautionary measures should be applied to minimise the effect of any damage to long term tree health and safety.

Table 1: Tree, Group and Woodland Survey Schedule

Figure 2: Site Location Plan

Figure 3: Tree Location, Quality and Constraints Plan