



AllAboutTrees

Arboricultural & Ecological Consultancy
Chartered Arboriculturalists & Environmentalists

Arboricultural Impact Assessment

For Trees At

The Former School Kitchens, North Road,

Boldon Colliery




For

Blake Hopkinson Architecture



Document Verification



| | |
|----------------|--|
| Document Title | <ul style="list-style-type: none">• Arboricultural Impact Assessment For Trees At The Former School Kitchens, North Road, Boldon Colliery• For Blake Hopkinson Architecture |
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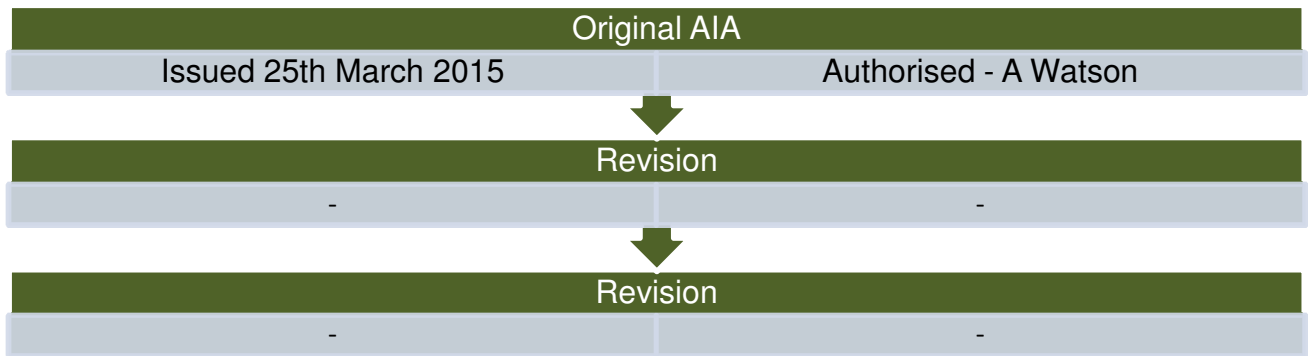


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1. Introduction

1.1 We are instructed by Blake Hopkinson Architecture to provide an Arboricultural Impact Assessment (AIA) for the significant trees located at the former school kitchens, North Road, Boldon Colliery.

1.2 This report is produced to evaluate the proposed construction of a 9 unit residential development with associated infrastructure. The developments juxtaposition with the existing trees is considered.

1.3 We were provided with the following documents:

- Existing plan in digital AutoCAD format
- Proposed development plans in digital AutoCAD format

1.4 This assessment is concerned with recording the species, size and condition of the trees. Recommendations are made where appropriate to establish acceptable levels of safety for the site and also to establish a higher level of arboricultural management.

1.5 The trees are also evaluated for the purposes of British Standard 5837–2012 Trees in relation to design, demolition & construction, with regard to their quality and value. The type and size of the root protection area is calculated and the position of the protective barriers is determined. The remaining contribution or safe useful life expectancy is estimated as an indication of the trees period of retention.

1.6 All observations were from ground level without detailed investigation.

1.7 Trees are living organisms whose health and condition may change rapidly and all observations are based on the status of the tree at the time of inspection.

2. Protected Status Of Trees

2.1 Trees may be legally protected, this may either be in the form of a Tree Preservation Order (TPO) or that the trees are located within a Conservation area.

2.2 Potentially large penalties may be enforced for illegally carrying out works on protected trees. It is recommended that checks are made before any works are undertaken and no work should commence until permission has been granted. Please note that there are a number of exemptions from the requirement to obtain a felling licence including land on which full

planning permission has been granted by the local authority, however this exemption does not cover land where only outline planning permission has been granted, or on land which has been allocated for residential development within local authority urban and local development plans.

2.3 AllAboutTrees has been able to ascertain with South Tyneside Council (the Local Planning Authority) on Wednesday 25th March 2015 there are no some restrictions protecting the trees on the site. The site is not within a Conservation area and there are no TPOs imposed on any trees within the site.

3. Site Visit & Description

Site location – N 54° 56' 44.74 W 01° 27' 35.75
O/S Grid reference- NZ 346 613 GB Grid



Figure 1 - The study area is indicated by the red boundary line as shown on the above image.

3.1 A site visit was undertaken on Friday 3rd September by Tim Archment. The weather was fine with no visibility constraints.

3.2 The study area is located in Boldon Colliery, adjacent to Lawson Court. The A19 motorway is a short distance away facilitating easy travel.

3.3 For descriptive purposes, the site is best split in two halves, east and west.

3.3.1 The west half of the site is currently grassed with a number of self set trees, primarily hawthorn and elder. There is an old privet hedge towards the east of the western half which presumably marked an old boundary. An old concrete footing can be found in the western half of the site, a possible remnant from an old buildings.

3.3.2 The eastern half of the site had buildings, which aerial photography shows to have been demolished between 2001 and 2005. Following demolition of the buildings this half of the site has been planted and today presents itself as an impenetrable tangle of scrub. The boundary fence, presumably associated with the old buildings, has been left in situ. There is an amount of accumulated litter in the group, resulting from the adjacent path on East View. There has been some illicit (and poor quality) tree pruning on the northern boundary of this area by adjacent residents.

3.4 The site slopes gently downhill to the south. Parts of the site, towards the west, were slightly waterlogged at the time of the survey.

4. Appraisal

4.1 The trees have been surveyed on site and plotted on the site plan. Their positions are considered accurate given the provision of a detailed topographical survey.

4.2 All significant trees have been inspected and some of the smaller specimens have been included for accuracy. Individual recommendations are included within Appendix 1 of this report.

4.3 Root Protection Areas (RPAs)

4.3.1 The British Standard Root Protection Areas (RPAs) are indicated by the red circles surrounding the trunk position of the trees on the associated plans. These indicative circles do not take into consideration site specific conditions such as the presence of buildings, roads, footpaths, topography, underground utility services etc. and are representative of typical root morphology where said structures are not encountered.

4.4 Tree Removals

4.4.1 It will be necessary to remove some of the existing trees to facilitate the proposed development.

- Trees 1-21, hedge 1 & 2, and group 1 and part of group 2 will need to be removed to facilitate the construction of the new buildings and associated infrastructure.

4.4.2 A breakdown of recommended removals, alongside their BS5837 category rating is provided in the table below. For further information regarding the BS5837 quality categorisation system please refer to Appendix 2 (II).

| Tree Category Rating | Remove To Facilitate The Development |
|------------------------------|--|
| A – High | - |
| B – Moderate | 3, 5, 13, 15, 17 and 20 |
| C – Low | 1-2, 4, 6-12, 14, 16, 18-19 & 21 Hedge 1 & 2 Groups 1 Part of group 2 |
| U – Unsuitable For Retention | - |

4.4.3 To mitigate the above removals new planting should take place throughout the site. Careful consideration should be given to all new planting positions to ensure the trees can grow fully into maturity without requiring major or regular pruning works. New specimens should not be positioned in close proximity to buildings, windows or utility services.

4.5 Retained Trees

4.5.1 Protective barriers as per section 5.1 of this report should be erected around all retained trees in the position indicated by the blue line on the Tree Protection Plan prior to any works on site. Signs should also be attached stating that the area is a protected zone and should not be entered.

4.6 Wildlife Habitats

4.6.1 As part of the survey the significant trees were inspected from ground level with the use of binoculars for signs of wildlife habitation, in particular birds and bats.

Bats

4.6.2 All UK bats and their roosts are protected by law. The legislation protecting bats are:

- The Wildlife & Countryside Act 1981 (WCA)
- Conservation of Habitats and Species Regulations 2010

4.6.3 For all countries of the UK, the legal protection for bats and their roosts may be summarised as follows:

You will be committing a criminal offence if you:

1. Deliberately* capture, injure or kill a bat

2. Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
4. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
5. Intentionally or recklessly obstruct access to a bat roost

**In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence his/her action will most likely have.)*

4.6.4 Penalties on conviction - the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

4.6.5 No visual signs were found to indicate the presence of bats in the surveyed trees.

4.6.6 When carrying out tree works it is essential that the contractor or other competent person carries out a specific 'bats in trees risk assessment' which can be obtained from the 'Arboricultural Association' or the 'Bat Conservation Trust' (BCT). If evidence of bats is found work must stop immediately and Natural England Batline contacted (0845 1300 228). A further inspection may well be required by a licensed bat handler or roost visitor.

Birds

4.6.7 In the UK, all wild birds, their nests and their eggs are protected by law.

4.6.8 In England, Scotland and Wales the legislation that protects wild birds is:

- The Wildlife and Countryside Act 1981
- The Countryside (or CRoW) Act 2000

4.6.9 No nesting birds were present at the time of inspection though signs of past nesting activity were evident and as such caution must be exercised.

4.6.10 As with bats the contractor has an obligation to carry out visual checks prior to works. Where possible tree works should be carried out in

the period from August to the end of February in order to avoid the bird nesting season.

5. Tree Protection Measures

5.1 Root Protection Area & Barrier Specification

5.1.1 Trees on development sites are prone to damage during the course of demolition and construction works. Retained trees need to be protected in line with British Standard 5837–2012 Trees in relation to design, demolition & construction.

5.1.2 This usually involves identifying a construction exclusion zone around the tree which should remain undisturbed with appropriate protective barriers preventing access to this Root Protection Area for the duration of the project.

5.1.3 The minimum root protection areas (measured in a radius from the centre of the tree to the protective barrier) are outlined for each individual tree and the barrier layout is indicated on the plan.

5.1.4 The exact root spread of an individual tree is difficult to quantify, but in general, the bulk of a trees roots are situated in the upper 600mm of the soil with the finer absorbing roots prevalent in the upper 250mm.

5.1.5 Dependant on soil conditions and the species of the tree, the root plate may extend radially for distances in excess of the height of the tree.

5.1.6 In the case of development sites, the root protection area is designed to prevent any significant long term damage to the tree by protecting the root plate and to some extent the lower branches of the tree.

5.1.7 The barriers should be erected prior to work commencing on site and should remain until construction activities have been completed. The root protection area should be considered essential and should not be removed or altered without prior recommendation by an Arboriculturalist and approval of the local planning authority.

5.1.8 The barrier should consist of a vertical and horizontal framework of scaffold tubing which is adequately braced to resist impacts. The vertical scaffold tubes need to be placed at a distance not exceeding 3m apart and driven securely into the ground for a minimum depth of 0.6m. Care should be taken when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid any structural roots. The weldmesh or Heras panels need to be a minimum 2.0m tall and are securely attached to the scaffold framework with wire or scaffold clamps. The wire or scaffold clamps should be secured on the inside of the barrier to avoid easy dismantling. Panels on rubber or concrete feet are not resistant to impact and should not be used.

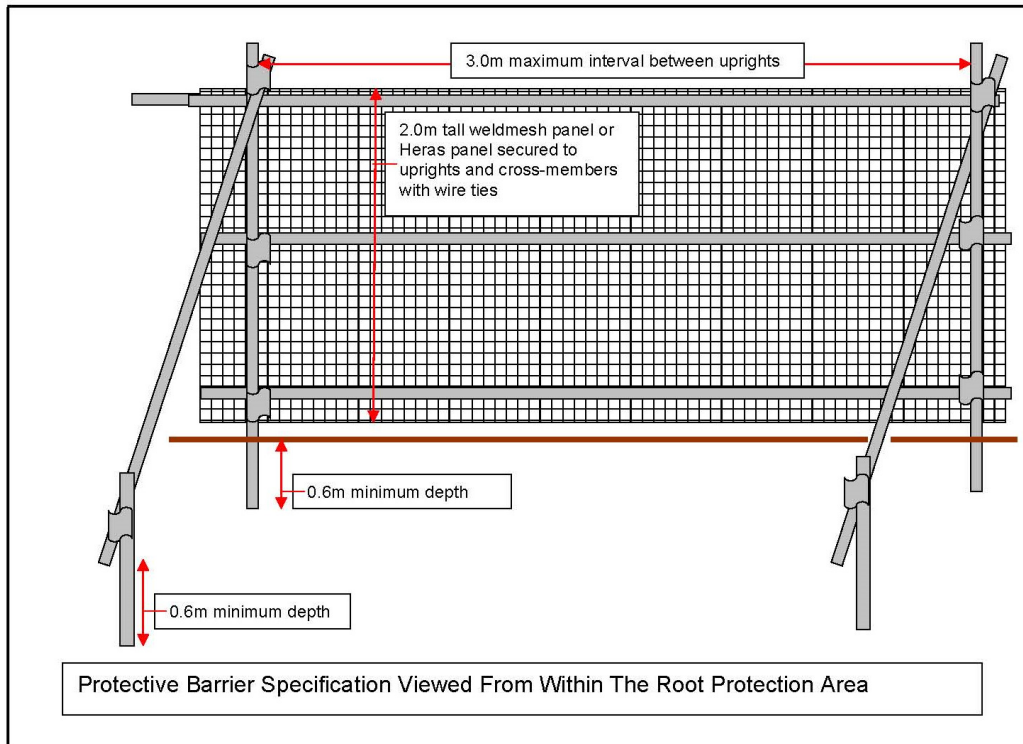


Figure 2 - Protective barrier specification



Figure 3 - Example of a barrier erected on a site

5.1.9 No fixing shall be made to any tree and all possible care must be taken to prevent damage to tree roots when locating the posts.

5.1.10 All types of barriers must be firmly attached to prevent movement by site personnel or vehicles and all weather signs with the wording "Construction exclusion zone- keep out" should be attached.

5.2 Service Runs

5.2.1 It is assumed that the existing service runs will be exploited where possible, but if new works are required it is important that they comply with the National Joint Utilities Group (NJUG) 'Guidelines for the planning, installation, and maintenance of utility services in proximity to trees' and BS 5837:2012. The excavation of open trenches by machine will be unacceptable within the protective zone of any of the retained trees.

5.2.2 Acceptable techniques (fuller details in the appendices) for the laying of services in order of preference are:

- **Trenchless-** by using thrust boring or similar techniques
- **Broken Trench-** to be dug by hand
- **Continuous trench-** to be dug by hand

5.2.3 Wherever possible, services should be routed outside of any retained trees RPA. When this is not possible apparatus should be routed together in a common duct and any inspection chambers sited outside the RPA.

5.2.4 When underground apparatus is to pass within the RPA of a retained tree, trenchless insertion methods should be used (see table below) with entry and retrieval pits sited outside the RPA.

5.2.5 Shallow services runs may be dug with hand tools if appropriate and preferably by compressed air soil displacement. 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.

| Trenchless Solutions For Installation Of Underground Services | | | | | |
|---|--------------------|-----------------------------------|---------------------------------|--|--|
| Method | Accuracy (MM) | Bore ^(A) diameter (MM) | Maximum subterranean length (M) | Applications | Not suitable for |
| Microtunnelling | <20 | 100 to 300 | 40 | Gravity-fall pipes, deep apparatus, watercourse/ roadway under crossings | Low-cost projects due to relative expense |
| Surface-launched directional drilling | ≈100 | 25 to 1200 | 150 | Pressure popes, cables including fibre optic | Gravity fall pipes, e.g. drains and sewers ^(B) |
| Pipe ramming | ≈150 | 150 to 2000 | 70 | Any large-bore pipes and ducts | Rocky and other heavily obstructed soils |
| Impact moling ^(C) | ≈50 ^(D) | 30 to 180 ^(E) | 40 | Gas, water and cable connections, e.g. from street to property | Any application that requires accuracy over distances in excess of 5m. |

- (A) Dependant upon strata encountered
- (B) Pit-launched directional drilling can be used for gravity fall pipes up to 20m in subterranean length
- (C) Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.
- (D) Substantial inverse relationship between accuracy and distance
- (E) Figures given relate to single pass: up to 300mm bore achievable with multiple passes

6. Conclusion

6.1 As with any construction exercise near trees, there are potential areas of conflict where damage could be caused to retained trees.

6.2 By using the protective elements dictated by British Standard 5837, no significant damage should take place during the construction phase and the tree cover should flourish in the longer term.

6.3 It is anticipated that all of the retained trees can be incorporated into the site design; however, it is vital that the ultimate size and spread of the trees should be considered when retaining trees near to the building and that shading and light penetration should also be considered when positioning the windows in the building.

6.4 All tree works must conform rigorously to BS 3998 (2010) 'Recommendations for Tree Work'.

For and on behalf of
AllAboutTrees Ltd

Andrew Watson FLS MICFor CBiol MSB FARborA CEnv LCGI
-Chartered Arboriculturalist & Registered Consultant

Appendix 1

| Tree No. | Species Common Name <i>Latin Name</i> | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|--|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|-------------------------|---|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| 1 | Ash <i>Fraxinus excelsior</i> | 7 | 1.5 | 2 | 1.5 | 1.5 | 140 | 1 | 1 | 1 S | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 13 | A |
| 2 | Ash <i>Fraxinus excelsior</i> | 6.5 | 2 | 2 | 2 | 2 | 140 | 1 | 1 | 1 NW | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 12 | A |
| 3 | Ash <i>Fraxinus excelsior</i> | 7 | 3 | 2 | 2 | 2.5 | 170 | 1 | 1 | 1 N | Young | Fair | Fair | 2 | 40+ | B - Moderate | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 11 | A |
| 4 | Ash <i>Fraxinus excelsior</i> | 6.5 | 2.5 | 1.5 | 3 | 1.5 | 140 | 1 | 1 | 1 N | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 5 | Highclere Holly <i>Ilex x altaclarensis</i> | 4.5 | 3 | 3 | 4.5 | 2.5 | 300 | 1 | 0.5 | 0.5 SW | Mature | Fair | Fair | 3.6 | 20-40 | B - Moderate | Multiple stems below 1.5m. Crossing/ rubbing branches. Asymmetric crown spread. Some dimensions estimated due to access constraints. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 9 | A |
| 6 | Wild Cherry | 5.5 | 2.5 | 3 | 3 | 2.5 | 150 | 1 | 1.5 | 1.5 | Middle | Fair | Fair | 1.8 | 40+ | C - Low | No major visible defects. | This tree conflicts | None | 16 | 10 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|--------------------------------------|------------|------------------|---|-----|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|------------------------------------|---|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>Prunus avium</i> | | | | | | | | SW | aged | | | | | | Broken/ hanging branches in crown. | with the proposed design layout and will need to be removed to facilitate the development. | | | | | |
| 7 | Ash <i>Fraxinus excelsior</i> | 6.5 | 1.5 | 2 | 2 | 1.5 | 110 | 1 | 1.5 | 1.5 W | Young | Fair | Fair | 1.3 | 40+ | C - Low | No major visible defects. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 8 | Ash <i>Fraxinus excelsior</i> | 6 | 2 | 2 | 2 | 1.5 | 120 | 1 | 1.5 | 1.5 S | Young | Fair | Fair | 1.4 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 9 | Ash <i>Fraxinus excelsior</i> | 5.5 | 2 | 2 | 2 | 2.5 | 140 | 1 | 0.5 | 1 S | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 10 | Ash <i>Fraxinus excelsior</i> | 5.5 | 1 | 2 | 2 | 2 | 100 | 1 | 1.5 | 1.5 W | Young | Fair | Fair | 1.2 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 11 | Elder <i>Sambucus nigra</i> | 3 | 1 | 2 | 2.5 | 1.5 | 200 | 1 | 0 | 0 E | Mature | Fair | Poor | 2.4 | 10-20 | C - Low | Multiple stems at ground level. Broken/ hanging branches in crown. Deadwood retained in canopy. Asymmetric crown spread; canopy distorted due to | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 6 | 6 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---------------------------------------|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|-------------------------|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | group pressure. | | | | | | |
| 12 | Elder <i>Sambucus nigra</i> | 4.5 | 1.5 | 1 | 2.5 | 1 | 219 | 2 | 1.5 | 1.5 NE | Mature | Fair | Poor | 2.6 | 10-20 | C - Low | Stem divides below 1.5m. Minor/ small diameter deadwood retained in canopy. Areas of stem decay. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 6 | 5 | A |
| 13 | Hawthorn <i>Crataegus monogyna</i> | 4.5 | 2.5 | 3 | 0.5 | 3 | 180 | 1 | 0 | 0.5 SW | Mature | Fair | Fair | 2.2 | 20-40 | B - Moderate | Stem divides below 1.5m. Crossing/ rubbing branches. Asymmetric crown spread; canopy distorted due to group pressure. Slight lean west. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 7 | A |
| 14 | Elder <i>Sambucus nigra</i> | 4.5 | 2.5 | 2.5 | 2.5 | 2.5 | 170 | 2 | 0 | 0 S | Middle aged | Fair | Fair | 2 | 10-20 | C - Low | No major visible defects. Stem divides at ground level. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 7 | 7 | A |
| 15 | Hawthorn <i>Crataegus monogyna</i> | 6 | 3 | 2 | 2.5 | 2 | 220 | 1 | 0.5 | 0.5 S | Middle aged | Fair | Fair | 2.6 | 20-40 | B - Moderate | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. Crown distorted due to group pressure. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 7 | A |
| 16 | Hawthorn <i>Crataegus</i> | 4.5 | 2 | 2 | 2.5 | 1 | 150 | 1 | 0 | 0 E | Middle aged | Fair | Fair | 1.8 | 20-40 | C - Low | Some dimensions estimated due to access constraints. | This tree conflicts with the proposed design layout and will | None | 8 | 8 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---------------------------------------|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|---|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>monogyna</i> | | | | | | | | | | | | | | | No major visible defects. Multiple stems below 1.5m. Crown distorted due to group pressure. | need to be removed to facilitate the development. | | | | | |
| 17 | Hawthorn <i>Crataegus monogyna</i> | 6 | 2.5 | 3 | 2.5 | 3 | 220 | 1 | 0 | 0.5 SE | Middle aged | Fair | Fair | 2.6 | 40+ | B - Moderate | Stem diameter estimated as single value. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. Old nest in canopy. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 8 | A |
| 18 | Hawthorn <i>Crataegus monogyna</i> | 5 | 2.5 | 0.5 | 1.5 | 2 | 150 | 1 | 0.5 | 0.5 E | Middle aged | Fair | Fair | 1.8 | 40+ | C - Low | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems at ground level. Asymmetric crown spread; canopy distorted due to group pressure. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 7 | A |
| 19 | Hawthorn <i>Crataegus monogyna</i> | 4 | 2 | 1.5 | 1.5 | 1.5 | 160 | 1 | 0 | 0 E | Middle aged | Fair | Fair | 1.9 | 20-40 | C - Low | No major visible defects. Multiple stems at ground level. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 7 | A |
| 20 | Hawthorn | 5 | 3 | 3 | 3.5 | 2.5 | 350 | 1 | 1.5 | 1 E | Mature | Fair | Fair | 4.2 | 20-40 | B - Moderate | Some dimensions estimated due to access | This tree conflicts with the proposed | None | 8 | 8 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|--------------------|--|------------|------------------|-----|---|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|--|--|---|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>Crataegus monogyna</i> | | | | | | | | | | | | | | | constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. | design layout and will need to be removed to facilitate the development. | | | | | |
| 21 | Hawthorn <i>Crataegus monogyna</i> | 5 | 3 | 2.5 | 3 | 2.5 | 400 | 1 | 0 | 1 E | Mature | Fair | Fair | 4.8 | 10-20 | C - Low | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 8 | A |
| Tree Groups | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Elder Hawthorn Blackthorn Hazel English Oak Wild Cherry <i>Sambucus nigra</i> , <i>Crataegus monogyna</i> , <i>Prunus spinosa</i> , <i>Corylus avellana</i> , <i>Quercus robur</i> , <i>Prunus avium</i> | 6 | - | - | - | - | 150 | 1 | - | - | Young | Fair | Fair | 1.8 | 20-40 | C - Low | Messy, overgrown and unmanaged group resulting from lack of management following demolition of old buildings. Group forms dense, impenetrable thicket. Number of planted trees in group from old land scaping. Lots of rubbish in group, especially on eastern extremity adjacent to path. Some illicit tree pruning on trees to northern boundary | This group conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 20 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|------------------|--|------------|------------------|---|---|---|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|---|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | by adjacent residents. Metal railing fence encapsulates group. Good ecological value for small birds and mammals. | | | | | | |
| 2 | Elder <i>Sambucus nigra</i> | 5.5 | - | - | - | - | 300 | 1 | - | - | Mature | Fair | Poor | 3.6 | 10-20 | C - Low | Messy group of unmanaged elder on site boundary, extends into adjacent field. Lots of tipped rubbish in group from adjacent allotments. Extends into site by up to 8.5m. Approximately x10 trees. Number have already collapsed. | Sections of this group, inside the study area, conflict with the proposed design and will need to be removed to facilitate the development. The remainder of the group, outside of the study area, is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. | None | 10 | 10 | A |
| Hedgerows | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Privet <i>Ligustrum ovalifolium</i> | 3 | - | - | - | - | 200 | 1 | - | - | Middle aged | Fair | Fair | 2.4 | 20-40 | C - Low | Stem diameter estimated as single value. Multiple stems at ground level. Privet hedgerow on site boundary. Tall but still maintained. | This hedgerow conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 7 | 7 | A |
| 2 | Privet <i>Ligustrum ovalifolium</i> | 4 | - | - | - | - | 200 | 1 | - | - | Middle aged | Fair | Fair | 2.4 | 20-40 | C - Low | Stem diameter estimated as single value. Multiple stems at ground | This hedgerow conflicts with the proposed design layout and will need | None | 7 | 7 | A |

| Tree No. | Species Common Name <i>Latin Name</i> | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---|------------|------------------|---|---|---|----------------|--------------|----------------------------|----------------------------------|-----|-------------------------|----------------------|--------------------------|--|---|--|-------------|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | level. Privet hedgerow internal to site. Tall, overgrown and unmanaged. | to be removed to facilitate the development. | | | | | |

Appendix 2(1)

Glossary of Terms

- 1 Reference number:** An individual identifying number
- 2 Species:** Species identification is based on visual field observations and lists the common name. In some cases the botanical name will be used where there is no common alternative. On in-depth surveys the botanical name only may be used
- 3 Height:** Height is estimated to the nearest metre. On computerised surveys this may be within a range of heights. When measured height is required, a clinometer is used to measure to the nearest metre
- 4 Diameter:** Trunk diameter measured at 1.5 metres from ground level and recorded in millimetres. In some surveys this is indicated as a range
- 5 Spread:** Measurement of canopy from the trunk to the nearest metre in four directions, North, South, East, and West in metres
- 6 Lower crown Clearance:** Height in metres of crown clearance above adjacent ground level
- 7 Age:**

Either an estimate (or statement if accurately known) of the age of the tree, classified as:

 - Y** = Young tree, established tree usually up to one third of expected ultimate height & spread
 - MA** = middle aged, usually between one third and two thirds of ultimate height & spread
 - M** = Mature, more or less at full height but still increasing in girth & spread
 - OM** = Over mature, grown to full size and becoming senescent,
 - V** = Veteran tree, individuals surviving beyond the typical age range for the species
- 8 Physiological Condition:**

Good = Healthy tree with good vitality,
Fair = Moderate health and vitality normal or slightly less for species and age
Poor = Poor shape or form - signs of decline in crown, may have structural weakness.
Dead = dead or dying tree
- 9 Structural Condition:**

Good = No visible structural defects
Fair = Only minor structural defects
Poor = Defects which may need to be rectified or regularly monitored
Remove = Severe defects which may result in imminent failure or collapse
- 10 Management Recommendations:** General comments on the condition of the tree or group and any action required. potential for wildlife habitats
- 11 Estimated Remaining Contribution:** Safe Useful Life Expectancy (SULE): in some cases the age ranges are modified
Short: 0 – 10years Medium: 10– 20 Years
Intermediate: 20-40 Long: 40 + years
- 12 Tree Quality:** Assessment of tree quality see following cascade chart for details
- 13 Priority:**

A - Works to achieve an acceptable level of safety or required to facilitate the development
B - Works to achieve higher levels of arboricultural management.
C - To improve the aesthetic appearance.
- 14 Ultimate Size:** Based on site specific features and the individual specimen in its surroundings. Measured to nearest metre (m)
- 15 Root Protection Area:** The distance at which the protective barrier should be erected measured in a radii from the centre of the trunk in metres.
- 16 Pruning:** Pruning shall be defined as the removal of living or dead parts of a plant by the Contractor. Such parts may be soft growth, twigs, branches, limbs or sections of the tree trunk. The cut material may vary from small to large in size.

- 17 Crown Cleaning:** Cleaning out is defined as the removal of dead, dying or diseased branchwood, broken branches or stubs left from previous tree surgery operations (see also 16 Deadwooding) together with all unwanted objects, which may include ivy (if specified) and/or other climbing plants, nails, redundant cable bracing, rope swings, tree houses and windblown rubbish from the tree, and any such debris from any cavities within the tree.
- 18 Deadwood Removal:** Dead-wooding shall be defined as the removal of all dead and dying branches and limbs from the tree.
- 19 Crown Lifting:** Crown lifting shall be defined as the removal of all soft growth and branches or parts thereof which are below or which extend below the height specified in the tender documents. It is recognised that the resultant canopy base might not be one single level but might be stepped to allow for different clearances, for example where a tree overhangs both the footway and the road where different height clearances are required.
- 20 Crown Reduction:** Crown reduction shall be defined as the reduction of the complete outline dimension of the canopy, from the tips of limbs and branches to the main trunk, by pruning growth to an acceptable branch, twig or but to leave a flowing silhouette.

Appendix 2(11) Cascade Chart For Assessing Tree Quality

| Category and definition Trees to be considered for retention | Criteria – Subcategories | | | Identification on plan |
|--|---|---|--|------------------------|
| | 1. Mainly arboricultural values | 2. Mainly landscape values | 3. Mainly cultural values, including conservation | |
| <p><u>Category High = A</u></p> <p>Trees of high quality with an estimated remaining life expectancy of at least 40 years</p> | Trees that are particularly good examples of their species, especially, if rare or unusual, or those that are essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue) | Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features | Trees, groups or woodlands of significant conservation historical, commemorative or other value (e.g. veteran trees or wood – pasture) | Green |
| <p><u>Category Moderate = B</u></p> <p>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</p> | Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation | Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality | Trees with material conservation or other cultural value | Blue |
| <p><u>Category Low = C</u></p> <p>Trees of low quality with an estimated remaining life expectancy of at least 10 years; or young trees with a stem diameter below 150mm</p> | Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories | Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/ or trees offering low or only temporary/transient landscape benefits | Trees with no material conservation or other cultural benefits | Yellow |
| <p><u>Category = U Trees unsuitable for retention</u></p> <p>Those of such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years</p> | <p>NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation</p> <ul style="list-style-type: none"> • 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 U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are 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 • Habitat reinstatement may be appropriate (e.g. U category trees used as a bat roost- installation of bat box in nearby tree) | | | Red |

Appendix 2(111)
Guidelines for the Planning, installation and
Maintenance of utility services in proximity to trees-
Based on information from National Joint Utilities
Group (NJUG)

Ideally all services should be placed outside of the trees root protection area, but in some situations this is not feasible due to the confines of the site. If services must be laid within the root protection area acceptable techniques are detailed below in order of preference.

- **Trenchless-** by use of thrust boring or similar techniques. The pit excavations for starting and receiving the machinery should be located outside of the root protection area.
To avoid root damage, the mole should run at a depth of at least 600mm.
Use of external lubricants on the mole other than water (e.g. oil or bentonite) should be avoided.
- **Broken trench-** by using hand dug trench sections together with trenchless techniques. It should be limited to practical access and installation around or below the roots. The trench must be dug by hand (see following comments re continuous trenching) and only be long enough to allow access for linking to the next section. The open sections should be kept as short as possible.
- **Continuous trench-** the trench is excavated by hand and retains as many roots as possible. The surface layer is removed carefully and hand digging of the trench takes place. No roots over 2.5cm diameter or clumps of smaller roots (including fibrous) should be severed. The bark surrounding the roots must be maintained. Cutting of roots over 2.5cm diameter should not be attempted without the advice of a qualified Arboriculturalist.
If roots have to be cut, a sharp tool (defined as spade, narrow spade, fork, breaker bar, secateurs, handsaw, post hole shoveller, hand trowel) should be used.

Backfilling

Reinstatement of street works must comply with the code of practice New Roads and Streetworks Act 1991 (Specification for the reinstatement of openings in highways), but where tree roots are involved backfilling should be carefully carried out to avoid direct damage to retained roots and excessive compaction of the soil around them.

The backfill should incorporate an inert granular material mixed with top soil or sharp sand (not builder's sand) around the retained roots. This will allow a measure of compaction for resurfacing whilst creating an aerated zone around the roots.

Roots and in particular fine roots, are vulnerable to desiccation on exposure to air. The roots are at greatest risk when there are rapid fluctuations in the air temperature around them (especially winter diurnal temperatures). It is vitally important that the roots are covered with sacking whilst the trench is open. The sacking should be removed once the trench is backfilled.

Planning of services

When laying new or replacement services it is wise to plan ahead to prevent future direct damage to the services from root growth by placing the services within a duct.

If roots have grown into a drain or duct and proliferated to cause a blockage, removal of the root mass will only have a temporary affect and the root will regrow. The fault is in the pipe or duct, not the tree roots and the only answer is to repair or replace the damaged area. Particular problems occur with old salt glazed pipes where clay has been used to seal the joints and has subsequently dried out leaving a gap for the roots to infiltrate.

A popular myth has arisen that tree roots are attracted to water or nutrients within piped systems, this is not so. Roots are adventitious and grow in all directions proliferating in areas where moisture or nutrients are present. They tend to grow near to the pipe to make use of the condensation or moisture build up on the outside of the pipe but will enter the pipe through any crack or damaged joint. They are not capable of breaking into sound pipes.



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Arboricultural Impact Assessment

For Trees At

The Former School Kitchens, North Road,

Boldon Colliery




For

Blake Hopkinson Architecture



Document Verification



| | |
|----------------|--|
| Document Title | <ul style="list-style-type: none">• Arboricultural Impact Assessment For Trees At The Former School Kitchens, North Road, Boldon Colliery• For Blake Hopkinson Architecture |
| Prepared By | <ul style="list-style-type: none">• T Archment ND HND Arb Tech. Arbor A |
| Authorised By | <ul style="list-style-type: none">• Andrew Watson FLS MICFor CBiol MSB FARborA CEnv LCGI |

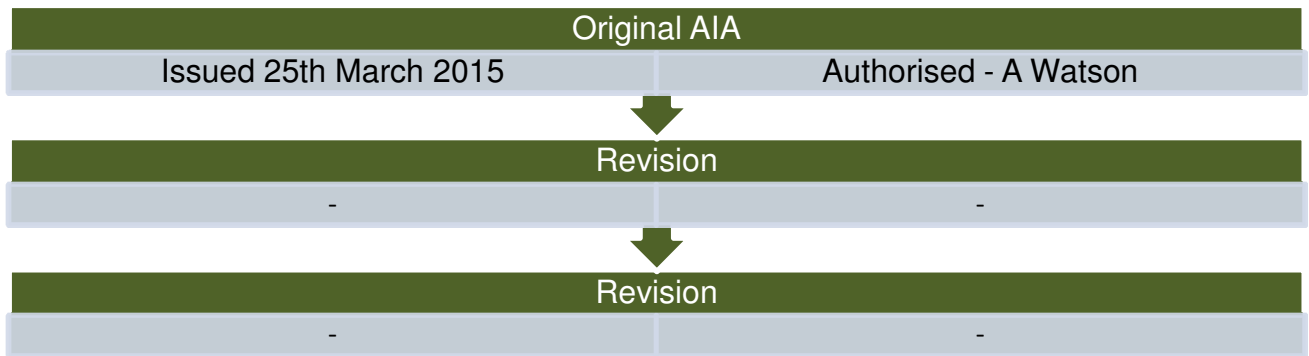


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Appendices

- 1. Tree Survey**
- 2. Glossary of Terms**
- 3. Site Plans**
 - **Existing Trees Shown On Existing Layout**
 - **Retained Trees Shown On Proposed Layout With Protective Measures Indicated**
-Tree Protection Plan (TPP)

1. Introduction

1.1 We are instructed by Blake Hopkinson Architecture to provide an Arboricultural Impact Assessment (AIA) for the significant trees located at the former school kitchens, North Road, Boldon Colliery.

1.2 This report is produced to evaluate the proposed construction of a 9 unit residential development with associated infrastructure. The developments juxtaposition with the existing trees is considered.

1.3 We were provided with the following documents:

- Existing plan in digital AutoCAD format
- Proposed development plans in digital AutoCAD format

1.4 This assessment is concerned with recording the species, size and condition of the trees. Recommendations are made where appropriate to establish acceptable levels of safety for the site and also to establish a higher level of arboricultural management.

1.5 The trees are also evaluated for the purposes of British Standard 5837–2012 Trees in relation to design, demolition & construction, with regard to their quality and value. The type and size of the root protection area is calculated and the position of the protective barriers is determined. The remaining contribution or safe useful life expectancy is estimated as an indication of the trees period of retention.

1.6 All observations were from ground level without detailed investigation.

1.7 Trees are living organisms whose health and condition may change rapidly and all observations are based on the status of the tree at the time of inspection.

2. Protected Status Of Trees

2.1 Trees may be legally protected, this may either be in the form of a Tree Preservation Order (TPO) or that the trees are located within a Conservation area.

2.2 Potentially large penalties may be enforced for illegally carrying out works on protected trees. It is recommended that checks are made before any works are undertaken and no work should commence until permission has been granted. Please note that there are a number of exemptions from the requirement to obtain a felling licence including land on which full

planning permission has been granted by the local authority, however this exemption does not cover land where only outline planning permission has been granted, or on land which has been allocated for residential development within local authority urban and local development plans.

2.3 AllAboutTrees has been able to ascertain with South Tyneside Council (the Local Planning Authority) on Wednesday 25th March 2015 there are no some restrictions protecting the trees on the site. The site is not within a Conservation area and there are no TPOs imposed on any trees within the site.

3. Site Visit & Description

Site location – N 54° 56' 44.74 W 01° 27' 35.75
O/S Grid reference- NZ 346 613 GB Grid



Figure 1 - The study area is indicated by the red boundary line as shown on the above image.

3.1 A site visit was undertaken on Friday 3rd September by Tim Archment. The weather was fine with no visibility constraints.

3.2 The study area is located in Boldon Colliery, adjacent to Lawson Court. The A19 motorway is a short distance away facilitating easy travel.

3.3 For descriptive purposes, the site is best split in two halves, east and west.

3.3.1 The west half of the site is currently grassed with a number of self set trees, primarily hawthorn and elder. There is an old privet hedge towards the east of the western half which presumably marked an old boundary. An old concrete footing can be found in the western half of the site, a possible remnant from an old buildings.

3.3.2 The eastern half of the site had buildings, which aerial photography shows to have been demolished between 2001 and 2005. Following demolition of the buildings this half of the site has been planted and today presents itself as an impenetrable tangle of scrub. The boundary fence, presumably associated with the old buildings, has been left in situ. There is an amount of accumulated litter in the group, resulting from the adjacent path on East View. There has been some illicit (and poor quality) tree pruning on the northern boundary of this area by adjacent residents.

3.4 The site slopes gently downhill to the south. Parts of the site, towards the west, were slightly waterlogged at the time of the survey.

4. Appraisal

4.1 The trees have been surveyed on site and plotted on the site plan. Their positions are considered accurate given the provision of a detailed topographical survey.

4.2 All significant trees have been inspected and some of the smaller specimens have been included for accuracy. Individual recommendations are included within Appendix 1 of this report.

4.3 Root Protection Areas (RPAs)

4.3.1 The British Standard Root Protection Areas (RPAs) are indicated by the red circles surrounding the trunk position of the trees on the associated plans. These indicative circles do not take into consideration site specific conditions such as the presence of buildings, roads, footpaths, topography, underground utility services etc. and are representative of typical root morphology where said structures are not encountered.

4.4 Tree Removals

4.4.1 It will be necessary to remove some of the existing trees to facilitate the proposed development.

- Trees 1-21, hedge 1 & 2, and group 1 and part of group 2 will need to be removed to facilitate the construction of the new buildings and associated infrastructure.

4.4.2 A breakdown of recommended removals, alongside their BS5837 category rating is provided in the table below. For further information regarding the BS5837 quality categorisation system please refer to Appendix 2 (II).

| Tree Category Rating | Remove To Facilitate The Development |
|------------------------------|--|
| A – High | - |
| B – Moderate | 3, 5, 13, 15, 17 and 20 |
| C – Low | 1-2, 4, 6-12, 14, 16, 18-19 & 21 Hedge 1 & 2 Groups 1 Part of group 2 |
| U – Unsuitable For Retention | - |

4.4.3 To mitigate the above removals new planting should take place throughout the site. Careful consideration should be given to all new planting positions to ensure the trees can grow fully into maturity without requiring major or regular pruning works. New specimens should not be positioned in close proximity to buildings, windows or utility services.

4.5 Retained Trees

4.5.1 Protective barriers as per section 5.1 of this report should be erected around all retained trees in the position indicated by the blue line on the Tree Protection Plan prior to any works on site. Signs should also be attached stating that the area is a protected zone and should not be entered.

4.6 Wildlife Habitats

4.6.1 As part of the survey the significant trees were inspected from ground level with the use of binoculars for signs of wildlife habitation, in particular birds and bats.

Bats

4.6.2 All UK bats and their roosts are protected by law. The legislation protecting bats are:

- The Wildlife & Countryside Act 1981 (WCA)
- Conservation of Habitats and Species Regulations 2010

4.6.3 For all countries of the UK, the legal protection for bats and their roosts may be summarised as follows:

You will be committing a criminal offence if you:

1. Deliberately* capture, injure or kill a bat

2. Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
3. Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
4. Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
5. Intentionally or recklessly obstruct access to a bat roost

**In a court, 'deliberately' will probably be interpreted as someone who, although not intending to capture/injure or kill a bat, performed the relevant action, being sufficiently informed and aware of the consequence his/her action will most likely have.)*

4.6.4 Penalties on conviction - the maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

4.6.5 No visual signs were found to indicate the presence of bats in the surveyed trees.

4.6.6 When carrying out tree works it is essential that the contractor or other competent person carries out a specific 'bats in trees risk assessment' which can be obtained from the 'Arboricultural Association' or the 'Bat Conservation Trust' (BCT). If evidence of bats is found work must stop immediately and Natural England Batline contacted (0845 1300 228). A further inspection may well be required by a licensed bat handler or roost visitor.

Birds

4.6.7 In the UK, all wild birds, their nests and their eggs are protected by law.

4.6.8 In England, Scotland and Wales the legislation that protects wild birds is:

- The Wildlife and Countryside Act 1981
- The Countryside (or CRoW) Act 2000

4.6.9 No nesting birds were present at the time of inspection though signs of past nesting activity were evident and as such caution must be exercised.

4.6.10 As with bats the contractor has an obligation to carry out visual checks prior to works. Where possible tree works should be carried out in

the period from August to the end of February in order to avoid the bird nesting season.

5. Tree Protection Measures

5.1 Root Protection Area & Barrier Specification

5.1.1 Trees on development sites are prone to damage during the course of demolition and construction works. Retained trees need to be protected in line with British Standard 5837–2012 Trees in relation to design, demolition & construction.

5.1.2 This usually involves identifying a construction exclusion zone around the tree which should remain undisturbed with appropriate protective barriers preventing access to this Root Protection Area for the duration of the project.

5.1.3 The minimum root protection areas (measured in a radius from the centre of the tree to the protective barrier) are outlined for each individual tree and the barrier layout is indicated on the plan.

5.1.4 The exact root spread of an individual tree is difficult to quantify, but in general, the bulk of a trees roots are situated in the upper 600mm of the soil with the finer absorbing roots prevalent in the upper 250mm.

5.1.5 Dependant on soil conditions and the species of the tree, the root plate may extend radially for distances in excess of the height of the tree.

5.1.6 In the case of development sites, the root protection area is designed to prevent any significant long term damage to the tree by protecting the root plate and to some extent the lower branches of the tree.

5.1.7 The barriers should be erected prior to work commencing on site and should remain until construction activities have been completed. The root protection area should be considered essential and should not be removed or altered without prior recommendation by an Arboriculturalist and approval of the local planning authority.

5.1.8 The barrier should consist of a vertical and horizontal framework of scaffold tubing which is adequately braced to resist impacts. The vertical scaffold tubes need to be placed at a distance not exceeding 3m apart and driven securely into the ground for a minimum depth of 0.6m. Care should be taken when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid any structural roots. The weldmesh or Heras panels need to be a minimum 2.0m tall and are securely attached to the scaffold framework with wire or scaffold clamps. The wire or scaffold clamps should be secured on the inside of the barrier to avoid easy dismantling. Panels on rubber or concrete feet are not resistant to impact and should not be used.

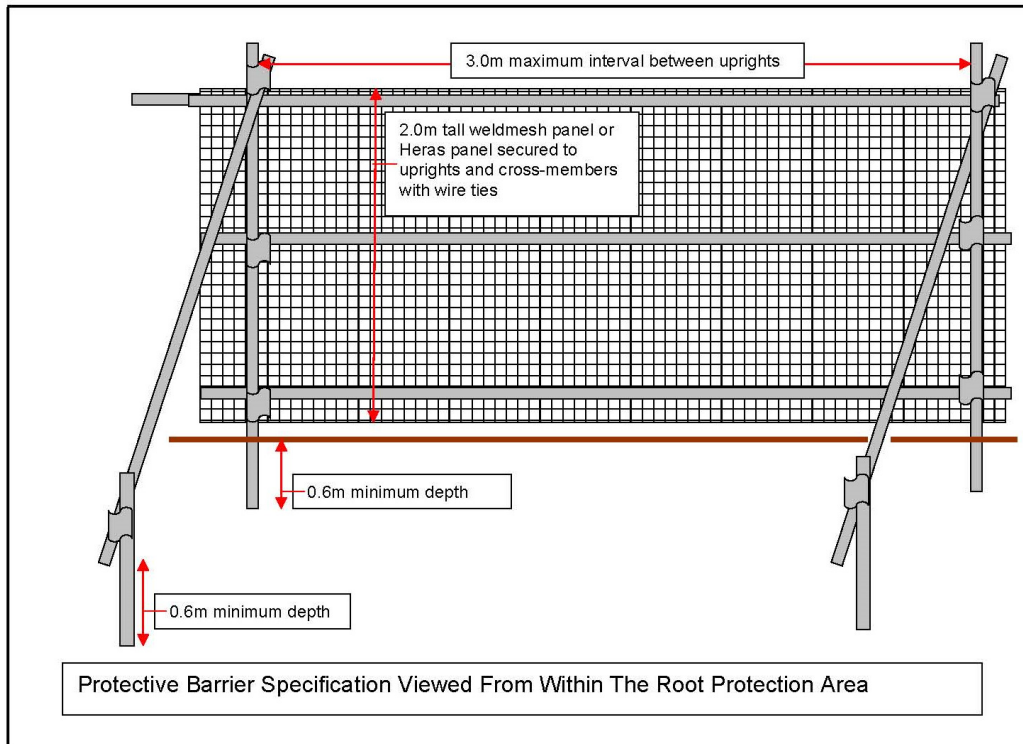


Figure 2 - Protective barrier specification



Figure 3 - Example of a barrier erected on a site

5.1.9 No fixing shall be made to any tree and all possible care must be taken to prevent damage to tree roots when locating the posts.

5.1.10 All types of barriers must be firmly attached to prevent movement by site personnel or vehicles and all weather signs with the wording "Construction exclusion zone- keep out" should be attached.

5.2 Service Runs

5.2.1 It is assumed that the existing service runs will be exploited where possible, but if new works are required it is important that they comply with the National Joint Utilities Group (NJUG) 'Guidelines for the planning, installation, and maintenance of utility services in proximity to trees' and BS 5837:2012. The excavation of open trenches by machine will be unacceptable within the protective zone of any of the retained trees.

5.2.2 Acceptable techniques (fuller details in the appendices) for the laying of services in order of preference are:

- **Trenchless-** by using thrust boring or similar techniques
- **Broken Trench-** to be dug by hand
- **Continuous trench-** to be dug by hand

5.2.3 Wherever possible, services should be routed outside of any retained trees RPA. When this is not possible apparatus should be routed together in a common duct and any inspection chambers sited outside the RPA.

5.2.4 When underground apparatus is to pass within the RPA of a retained tree, trenchless insertion methods should be used (see table below) with entry and retrieval pits sited outside the RPA.

5.2.5 Shallow services runs may be dug with hand tools if appropriate and preferably by compressed air soil displacement. 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.

| Trenchless Solutions For Installation Of Underground Services | | | | | |
|---|--------------------|-----------------------------------|---------------------------------|--|--|
| Method | Accuracy (MM) | Bore ^(A) diameter (MM) | Maximum subterranean length (M) | Applications | Not suitable for |
| Microtunnelling | <20 | 100 to 300 | 40 | Gravity-fall pipes, deep apparatus, watercourse/ roadway under crossings | Low-cost projects due to relative expense |
| Surface-launched directional drilling | ≈100 | 25 to 1200 | 150 | Pressure popes, cables including fibre optic | Gravity fall pipes, e.g. drains and sewers ^(B) |
| Pipe ramming | ≈150 | 150 to 2000 | 70 | Any large-bore pipes and ducts | Rocky and other heavily obstructed soils |
| Impact moling ^(C) | ≈50 ^(D) | 30 to 180 ^(E) | 40 | Gas, water and cable connections, e.g. from street to property | Any application that requires accuracy over distances in excess of 5m. |

- (A) Dependant upon strata encountered
- (B) Pit-launched directional drilling can be used for gravity fall pipes up to 20m in subterranean length
- (C) Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.
- (D) Substantial inverse relationship between accuracy and distance
- (E) Figures given relate to single pass: up to 300mm bore achievable with multiple passes

6. Conclusion

6.1 As with any construction exercise near trees, there are potential areas of conflict where damage could be caused to retained trees.

6.2 By using the protective elements dictated by British Standard 5837, no significant damage should take place during the construction phase and the tree cover should flourish in the longer term.

6.3 It is anticipated that all of the retained trees can be incorporated into the site design; however, it is vital that the ultimate size and spread of the trees should be considered when retaining trees near to the building and that shading and light penetration should also be considered when positioning the windows in the building.

6.4 All tree works must conform rigorously to BS 3998 (2010) 'Recommendations for Tree Work'.

For and on behalf of
AllAboutTrees Ltd

Andrew Watson FLS MICFor CBiol MSB FARborA CEnv LCGI
-Chartered Arboriculturalist & Registered Consultant

Appendix 1

| Tree No. | Species Common Name <i>Latin Name</i> | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|--|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|-------------------------|---|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| 1 | Ash <i>Fraxinus excelsior</i> | 7 | 1.5 | 2 | 1.5 | 1.5 | 140 | 1 | 1 | 1 S | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 13 | A |
| 2 | Ash <i>Fraxinus excelsior</i> | 6.5 | 2 | 2 | 2 | 2 | 140 | 1 | 1 | 1 NW | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 12 | A |
| 3 | Ash <i>Fraxinus excelsior</i> | 7 | 3 | 2 | 2 | 2.5 | 170 | 1 | 1 | 1 N | Young | Fair | Fair | 2 | 40+ | B - Moderate | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 11 | A |
| 4 | Ash <i>Fraxinus excelsior</i> | 6.5 | 2.5 | 1.5 | 3 | 1.5 | 140 | 1 | 1 | 1 N | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 5 | Highclere Holly <i>Ilex x altaclarensis</i> | 4.5 | 3 | 3 | 4.5 | 2.5 | 300 | 1 | 0.5 | 0.5 SW | Mature | Fair | Fair | 3.6 | 20-40 | B - Moderate | Multiple stems below 1.5m. Crossing/ rubbing branches. Asymmetric crown spread. Some dimensions estimated due to access constraints. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 9 | A |
| 6 | Wild Cherry | 5.5 | 2.5 | 3 | 3 | 2.5 | 150 | 1 | 1.5 | 1.5 | Middle | Fair | Fair | 1.8 | 40+ | C - Low | No major visible defects. | This tree conflicts | None | 16 | 10 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|--------------------------------------|------------|------------------|---|-----|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|------------------------------------|---|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>Prunus avium</i> | | | | | | | | SW | aged | | | | | | Broken/ hanging branches in crown. | with the proposed design layout and will need to be removed to facilitate the development. | | | | | |
| 7 | Ash <i>Fraxinus excelsior</i> | 6.5 | 1.5 | 2 | 2 | 1.5 | 110 | 1 | 1.5 | 1.5 W | Young | Fair | Fair | 1.3 | 40+ | C - Low | No major visible defects. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 8 | Ash <i>Fraxinus excelsior</i> | 6 | 2 | 2 | 2 | 1.5 | 120 | 1 | 1.5 | 1.5 S | Young | Fair | Fair | 1.4 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 9 | Ash <i>Fraxinus excelsior</i> | 5.5 | 2 | 2 | 2 | 2.5 | 140 | 1 | 0.5 | 1 S | Young | Fair | Fair | 1.7 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 10 | Ash <i>Fraxinus excelsior</i> | 5.5 | 1 | 2 | 2 | 2 | 100 | 1 | 1.5 | 1.5 W | Young | Fair | Fair | 1.2 | 40+ | C - Low | No major visible defects. Stem divides above 1.5m. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 10 | A |
| 11 | Elder <i>Sambucus nigra</i> | 3 | 1 | 2 | 2.5 | 1.5 | 200 | 1 | 0 | 0 E | Mature | Fair | Poor | 2.4 | 10-20 | C - Low | Multiple stems at ground level. Broken/ hanging branches in crown. Deadwood retained in canopy. Asymmetric crown spread; canopy distorted due to | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 6 | 6 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---------------------------------------|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|-------------------------|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | group pressure. | | | | | | |
| 12 | Elder <i>Sambucus nigra</i> | 4.5 | 1.5 | 1 | 2.5 | 1 | 219 | 2 | 1.5 | 1.5 NE | Mature | Fair | Poor | 2.6 | 10-20 | C - Low | Stem divides below 1.5m. Minor/ small diameter deadwood retained in canopy. Areas of stem decay. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 6 | 5 | A |
| 13 | Hawthorn <i>Crataegus monogyna</i> | 4.5 | 2.5 | 3 | 0.5 | 3 | 180 | 1 | 0 | 0.5 SW | Mature | Fair | Fair | 2.2 | 20-40 | B - Moderate | Stem divides below 1.5m. Crossing/ rubbing branches. Asymmetric crown spread; canopy distorted due to group pressure. Slight lean west. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 7 | A |
| 14 | Elder <i>Sambucus nigra</i> | 4.5 | 2.5 | 2.5 | 2.5 | 2.5 | 170 | 2 | 0 | 0 S | Middle aged | Fair | Fair | 2 | 10-20 | C - Low | No major visible defects. Stem divides at ground level. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 7 | 7 | A |
| 15 | Hawthorn <i>Crataegus monogyna</i> | 6 | 3 | 2 | 2.5 | 2 | 220 | 1 | 0.5 | 0.5 S | Middle aged | Fair | Fair | 2.6 | 20-40 | B - Moderate | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. Crown distorted due to group pressure. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 7 | A |
| 16 | Hawthorn <i>Crataegus</i> | 4.5 | 2 | 2 | 2.5 | 1 | 150 | 1 | 0 | 0 E | Middle aged | Fair | Fair | 1.8 | 20-40 | C - Low | Some dimensions estimated due to access constraints. | This tree conflicts with the proposed design layout and will | None | 8 | 8 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---------------------------------------|------------|------------------|-----|-----|-----|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|---|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>monogyna</i> | | | | | | | | | | | | | | | No major visible defects. Multiple stems below 1.5m. Crown distorted due to group pressure. | need to be removed to facilitate the development. | | | | | |
| 17 | Hawthorn <i>Crataegus monogyna</i> | 6 | 2.5 | 3 | 2.5 | 3 | 220 | 1 | 0 | 0.5 SE | Middle aged | Fair | Fair | 2.6 | 40+ | B - Moderate | Stem diameter estimated as single value. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. Old nest in canopy. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 8 | A |
| 18 | Hawthorn <i>Crataegus monogyna</i> | 5 | 2.5 | 0.5 | 1.5 | 2 | 150 | 1 | 0.5 | 0.5 E | Middle aged | Fair | Fair | 1.8 | 40+ | C - Low | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems at ground level. Asymmetric crown spread; canopy distorted due to group pressure. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 10 | 7 | A |
| 19 | Hawthorn <i>Crataegus monogyna</i> | 4 | 2 | 1.5 | 1.5 | 1.5 | 160 | 1 | 0 | 0 E | Middle aged | Fair | Fair | 1.9 | 20-40 | C - Low | No major visible defects. Multiple stems at ground level. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 7 | A |
| 20 | Hawthorn | 5 | 3 | 3 | 3.5 | 2.5 | 350 | 1 | 1.5 | 1 E | Mature | Fair | Fair | 4.2 | 20-40 | B - Moderate | Some dimensions estimated due to access | This tree conflicts with the proposed | None | 8 | 8 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|--------------------|--|------------|------------------|-----|---|-----|----------------|--------------|----------------------------|----------------------------------|--------|-------------------------|----------------------|--------------------------|--|--|--|---|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | <i>Crataegus monogyna</i> | | | | | | | | | | | | | | | constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. | design layout and will need to be removed to facilitate the development. | | | | | |
| 21 | Hawthorn <i>Crataegus monogyna</i> | 5 | 3 | 2.5 | 3 | 2.5 | 400 | 1 | 0 | 1 E | Mature | Fair | Fair | 4.8 | 10-20 | C - Low | Some dimensions estimated due to access constraints. No major visible defects. Multiple stems below 1.5m. Crossing/ rubbing branches. | This tree conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 8 | 8 | A |
| Tree Groups | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Elder Hawthorn Blackthorn Hazel English Oak Wild Cherry <i>Sambucus nigra</i> , <i>Crataegus monogyna</i> , <i>Prunus spinosa</i> , <i>Corylus avellana</i> , <i>Quercus robur</i> , <i>Prunus avium</i> | 6 | - | - | - | - | 150 | 1 | - | - | Young | Fair | Fair | 1.8 | 20-40 | C - Low | Messy, overgrown and unmanaged group resulting from lack of management following demolition of old buildings. Group forms dense, impenetrable thicket. Number of planted trees in group from old land scaping. Lots of rubbish in group, especially on eastern extremity adjacent to path. Some illicit tree pruning on trees to northern boundary | This group conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 18 | 20 | A |

| Tree No. | Species Common Name Latin Name | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|------------------|--|------------|------------------|---|---|---|----------------|--------------|----------------------------|----------------------------------|-------------|-------------------------|----------------------|--------------------------|--|---|--|--|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | by adjacent residents. Metal railing fence encapsulates group. Good ecological value for small birds and mammals. | | | | | | |
| 2 | Elder <i>Sambucus nigra</i> | 5.5 | - | - | - | - | 300 | 1 | - | - | Mature | Fair | Poor | 3.6 | 10-20 | C - Low | Messy group of unmanaged elder on site boundary, extends into adjacent field. Lots of tipped rubbish in group from adjacent allotments. Extends into site by up to 8.5m. Approximately x10 trees. Number have already collapsed. | Sections of this group, inside the study area, conflict with the proposed design and will need to be removed to facilitate the development. The remainder of the group, outside of the study area, is retainable and will be adequately protected by the position of the protective barrier as indicated by the blue line on the TPP. | None | 10 | 10 | A |
| Hedgerows | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Privet <i>Ligustrum ovalifolium</i> | 3 | - | - | - | - | 200 | 1 | - | - | Middle aged | Fair | Fair | 2.4 | 20-40 | C - Low | Stem diameter estimated as single value. Multiple stems at ground level. Privet hedgerow on site boundary. Tall but still maintained. | This hedgerow conflicts with the proposed design layout and will need to be removed to facilitate the development. | None | 7 | 7 | A |
| 2 | Privet <i>Ligustrum ovalifolium</i> | 4 | - | - | - | - | 200 | 1 | - | - | Middle aged | Fair | Fair | 2.4 | 20-40 | C - Low | Stem diameter estimated as single value. Multiple stems at ground | This hedgerow conflicts with the proposed design layout and will need | None | 7 | 7 | A |

| Tree No. | Species Common Name <i>Latin Name</i> | Height (M) | Crown Spread (M) | | | | Trunk Dia (MM) | No. Of Stems | Height Of Lower Canopy (M) | First Sign Branch (M) (Position) | Age | Physiological Condition | Structural Condition | Root Prot Area Radii (M) | Estimated Remaining Contribution (Years) | Tree Quality Assessment | Comments | Maintenance | Bat Roost Potential | Ultimate Size For Species (M) | | Priority |
|----------|---|------------|------------------|---|---|---|----------------|--------------|----------------------------|----------------------------------|-----|-------------------------|----------------------|--------------------------|--|---|--|-------------|---------------------|-------------------------------|--------|----------|
| | | | N | S | E | W | | | | | | | | | | | | | | Height | Spread | |
| | | | | | | | | | | | | | | | | level. Privet hedgerow internal to site. Tall, overgrown and unmanaged. | to be removed to facilitate the development. | | | | | |

Appendix 2(1)

Glossary of Terms

- 1 Reference number:** An individual identifying number
- 2 Species:** Species identification is based on visual field observations and lists the common name. In some cases the botanical name will be used where there is no common alternative. On in-depth surveys the botanical name only may be used
- 3 Height:** Height is estimated to the nearest metre. On computerised surveys this may be within a range of heights. When measured height is required, a clinometer is used to measure to the nearest metre
- 4 Diameter:** Trunk diameter measured at 1.5 metres from ground level and recorded in millimetres. In some surveys this is indicated as a range
- 5 Spread:** Measurement of canopy from the trunk to the nearest metre in four directions, North, South, East, and West in metres
- 6 Lower crown Clearance:** Height in metres of crown clearance above adjacent ground level
- 7 Age:** Either an estimate (or statement if accurately known) of the age of the tree, classified as:
 - Y** = Young tree, established tree usually up to one third of expected ultimate height & spread
 - MA** = middle aged, usually between one third and two thirds of ultimate height & spread
 - M** = Mature, more or less at full height but still increasing in girth & spread
 - OM** = Over mature, grown to full size and becoming senescent,
 - V** = Veteran tree, individuals surviving beyond the typical age range for the species
- 8 Physiological Condition:** Good = Healthy tree with good vitality,
Fair = Moderate health and vitality normal or slightly less for species and age
Poor = Poor shape or form - signs of decline in crown, may have structural weakness.
Dead = dead or dying tree
- 9 Structural Condition:** Good = No visible structural defects
Fair = Only minor structural defects
Poor = Defects which may need to be rectified or regularly monitored
Remove = Severe defects which may result in imminent failure or collapse
- 10 Management Recommendations:** General comments on the condition of the tree or group and any action required. potential for wildlife habitats
- 11 Estimated Remaining Contribution:** Safe Useful Life Expectancy (SULE): in some cases the age ranges are modified
Short: 0 – 10years Medium: 10– 20 Years
Intermediate: 20-40 Long: 40 + years
- 12 Tree Quality:** Assessment of tree quality see following cascade chart for details
- 13 Priority:** A - Works to achieve an acceptable level of safety or required to facilitate the development
B - Works to achieve higher levels of arboricultural management.
C - To improve the aesthetic appearance.
- 14 Ultimate Size:** Based on site specific features and the individual specimen in its surroundings. Measured to nearest metre (m)
- 15 Root Protection Area:** The distance at which the protective barrier should be erected measured in a radii from the centre of the trunk in metres.
- 16 Pruning:** Pruning shall be defined as the removal of living or dead parts of a plant by the Contractor. Such parts may be soft growth, twigs, branches, limbs or sections of the tree trunk. The cut material may vary from small to large in size.

- 17 Crown Cleaning:** Cleaning out is defined as the removal of dead, dying or diseased branchwood, broken branches or stubs left from previous tree surgery operations (see also 16 Deadwooding) together with all unwanted objects, which may include ivy (if specified) and/or other climbing plants, nails, redundant cable bracing, rope swings, tree houses and windblown rubbish from the tree, and any such debris from any cavities within the tree.
- 18 Deadwood Removal:** Dead-wooding shall be defined as the removal of all dead and dying branches and limbs from the tree.
- 19 Crown Lifting:** Crown lifting shall be defined as the removal of all soft growth and branches or parts thereof which are below or which extend below the height specified in the tender documents. It is recognised that the resultant canopy base might not be one single level but might be stepped to allow for different clearances, for example where a tree overhangs both the footway and the road where different height clearances are required.
- 20 Crown Reduction:** Crown reduction shall be defined as the reduction of the complete outline dimension of the canopy, from the tips of limbs and branches to the main trunk, by pruning growth to an acceptable branch, twig or but to leave a flowing silhouette.

Appendix 2(11) Cascade Chart For Assessing Tree Quality

| Category and definition Trees to be considered for retention | Criteria – Subcategories | | | Identification on plan |
|--|---|---|--|------------------------|
| | 1. Mainly arboricultural values | 2. Mainly landscape values | 3. Mainly cultural values, including conservation | |
| <p><u>Category High = A</u></p> <p>Trees of high quality with an estimated remaining life expectancy of at least 40 years</p> | Trees that are particularly good examples of their species, especially, if rare or unusual, or those that are essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue) | Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features | Trees, groups or woodlands of significant conservation historical, commemorative or other value (e.g. veteran trees or wood – pasture) | Green |
| <p><u>Category Moderate = B</u></p> <p>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years</p> | Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation | Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality | Trees with material conservation or other cultural value | Blue |
| <p><u>Category Low = C</u></p> <p>Trees of low quality with an estimated remaining life expectancy of at least 10 years; or young trees with a stem diameter below 150mm</p> | Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories | Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/ or trees offering low or only temporary/transient landscape benefits | Trees with no material conservation or other cultural benefits | Yellow |
| <p><u>Category = U Trees unsuitable for retention</u></p> <p>Those of such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years</p> | <p>NOTE Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation</p> <ul style="list-style-type: none"> • 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 U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are 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 • Habitat reinstatement may be appropriate (e.g. U category trees used as a bat roost- installation of bat box in nearby tree) | | | Red |

Appendix 2(111)

Guidelines for the Planning, installation and Maintenance of utility services in proximity to trees- Based on information from National Joint Utilities Group (NJUG)

Ideally all services should be placed outside of the trees root protection area, but in some situations this is not feasible due to the confines of the site. If services must be laid within the root protection area acceptable techniques are detailed below in order of preference.

- **Trenchless-** by use of thrust boring or similar techniques. The pit excavations for starting and receiving the machinery should be located outside of the root protection area.
To avoid root damage, the mole should run at a depth of at least 600mm.
Use of external lubricants on the mole other than water (e.g. oil or bentonite) should be avoided.
- **Broken trench-** by using hand dug trench sections together with trenchless techniques. It should be limited to practical access and installation around or below the roots. The trench must be dug by hand (see following comments re continuous trenching) and only be long enough to allow access for linking to the next section. The open sections should be kept as short as possible.
- **Continuous trench-** the trench is excavated by hand and retains as many roots as possible. The surface layer is removed carefully and hand digging of the trench takes place. No roots over 2.5cm diameter or clumps of smaller roots (including fibrous) should be severed. The bark surrounding the roots must be maintained. Cutting of roots over 2.5cm diameter should not be attempted without the advice of a qualified Arboriculturalist.
If roots have to be cut, a sharp tool (defined as spade, narrow spade, fork, breaker bar, secateurs, handsaw, post hole shoveller, hand trowel) should be used.

Backfilling

Reinstatement of street works must comply with the code of practice New Roads and Streetworks Act 1991 (Specification for the reinstatement of openings in highways), but where tree roots are involved backfilling should be carefully carried out to avoid direct damage to retained roots and excessive compaction of the soil around them.

The backfill should incorporate an inert granular material mixed with top soil or sharp sand (not builder's sand) around the retained roots. This will allow a measure of compaction for resurfacing whilst creating an aerated zone around the roots.

Roots and in particular fine roots, are vulnerable to desiccation on exposure to air. The roots are at greatest risk when there are rapid fluctuations in the air temperature around them (especially winter diurnal temperatures). It is vitally important that the roots are covered with sacking whilst the trench is open. The sacking should be removed once the trench is backfilled.

Planning of services

When laying new or replacement services it is wise to plan ahead to prevent future direct damage to the services from root growth by placing the services within a duct.

If roots have grown into a drain or duct and proliferated to cause a blockage, removal of the root mass will only have a temporary affect and the root will regrow. The fault is in the pipe or duct, not the tree roots and the only answer is to repair or replace the damaged area. Particular problems occur with old salt glazed pipes where clay has been used to seal the joints and has subsequently dried out leaving a gap for the roots to infiltrate.

A popular myth has arisen that tree roots are attracted to water or nutrients within piped systems, this is not so. Roots are adventitious and grow in all directions proliferating in areas where moisture or nutrients are present. They tend to grow near to the pipe to make use of the condensation or moisture build up on the outside of the pipe but will enter the pipe through any crack or damaged joint. They are not capable of breaking into sound pipes.



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