Billingley View,

Bolton on Dearne

- BS 5837:2012 Tree Survey, Arboricultural Impact Assessment and Arboricultural Method Statement

NPS Barnsley

Report prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 266 9292

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Ecus Ltd

Report to:	**Barnsley Metropolitan Borough Council,** **1 Westgate,** **Western Street,** **Barnsley,** **S70 2DR**
Report Title:	**Billingley View, Bolton on Dearne** **BS 5837:2012 Tree Survey, Arboricultural Impact Assessment and Arboricultural Method Statement**
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Originated By:

Tom Planner, FdSc
Graduate Arboriculturist Date: July 2019

Reviewed By:

Peter Simpson
Senior Consultant Arboriculturist Date: July 2019

Approved By:

Hannah Page
Regional Manager

Date: July 2019

Prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 2669292

Executive Summary

On behalf of Barnsley Metropolitan Borough Council (the Client), Ecus Limited (Ecus) have carried out a tree survey to BS 5837:2012 '*Trees In Relation To Design, Demolition and Construction- Recommendations'* in July 2019 at Billingley View, Bolton on Dearne. The survey has formed the basis of an assessment of the impact development proposals may have on existing trees and any methodologies to be adopted to protect any retained trees.

The survey records all trees within the site and all those which may be affected by any development proposals within the site boundary, recording a number of parameters including species, crown spread and Root Protection Area (RPA).

The RPA of any given tree is the area of ground around that tree which should not be disturbed by excavation, compaction, changes in level or other construction/demolition operations. The extent of the RPA is calculated in accordance with BS 5837:2012, and is an important part of the methodologies described in this report.

The survey recorded eight tree groups and 24 individual trees.

None of the trees are protected by Barnsley Metropolitan Borough Council Tree Preservation Orders. The site is not located within a Conservation Area.

The Client proposes construction of 16 new dwellings on the site. This will require the removal of 11 trees and five group, but may also have an impact on above and below ground parts of retained trees unless adequate protection of these trees is provided.

This report details the arboricultural impact and offers a range of protection measures that should be put in place prior to works starting on site as well as construction methodologies which should be adopted. These measures as described in detail in Chapter 5 will prevent accidental damage and other adverse effects on the health of retained trees and cover:

- Protective fencing;
- Installation of utilities and services within RPA;
- Construction within RPA
  Permanent buildings, fencing, street furniture, level changes, surfacing.

This report also makes further recommendations for any measures to mitigate or compensate the loss of trees within the site and the likely impact on the site and the local landscape. These include:

- Replacement tree planting to compensate the loss of trees.
- Planting of non-native and ornamental species to improve the amenity of the site.

For ready reference, Figure 1.1 (Chapter 1) is a simplified version of the 'Design and Construction Process and Tree Care' table outlined in BS 5837:2012. The table clearly identifies processes and obligations expected at the various stages of the construction project. BS 5837:2012 is considered an iterative process, and as such the project arboriculturist's advice should be ongoing.

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List of Figures and Tables

1. Introduction

1.1 Context of this document in the Planning System

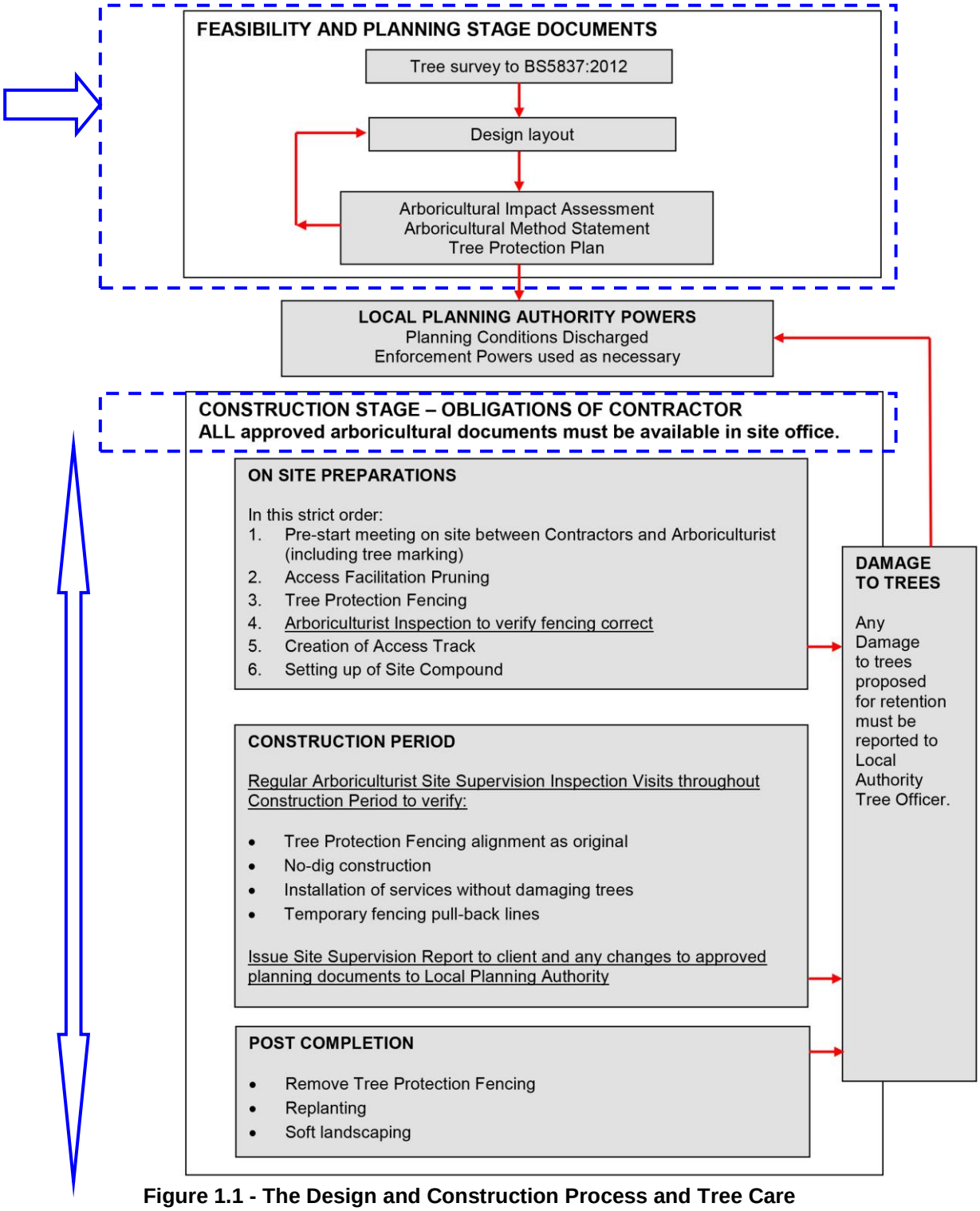

Figure 1.1 - The Design and Construction Process and Tree Care

1.1.1 This document has been prepared at the feasibility and planning stage of a project.

1.1.2 If it becomes an approved Planning Arboricultural Method Statement of tree protection measures and/or Tree Protection Plan, **a copy should be to hand in the Site Office at all times during the Construction Stage**.

1.2 Location

1.2.1 Ecus Limited (Ecus) were commissioned by Barnsley Metropolitan Borough Council (the Client) to undertake a tree survey of the site at Billingley View, Bolton on Dearne, nearest postcode S63 8ES, UK grid reference SE446030. The site location is shown on Figure 1.2.

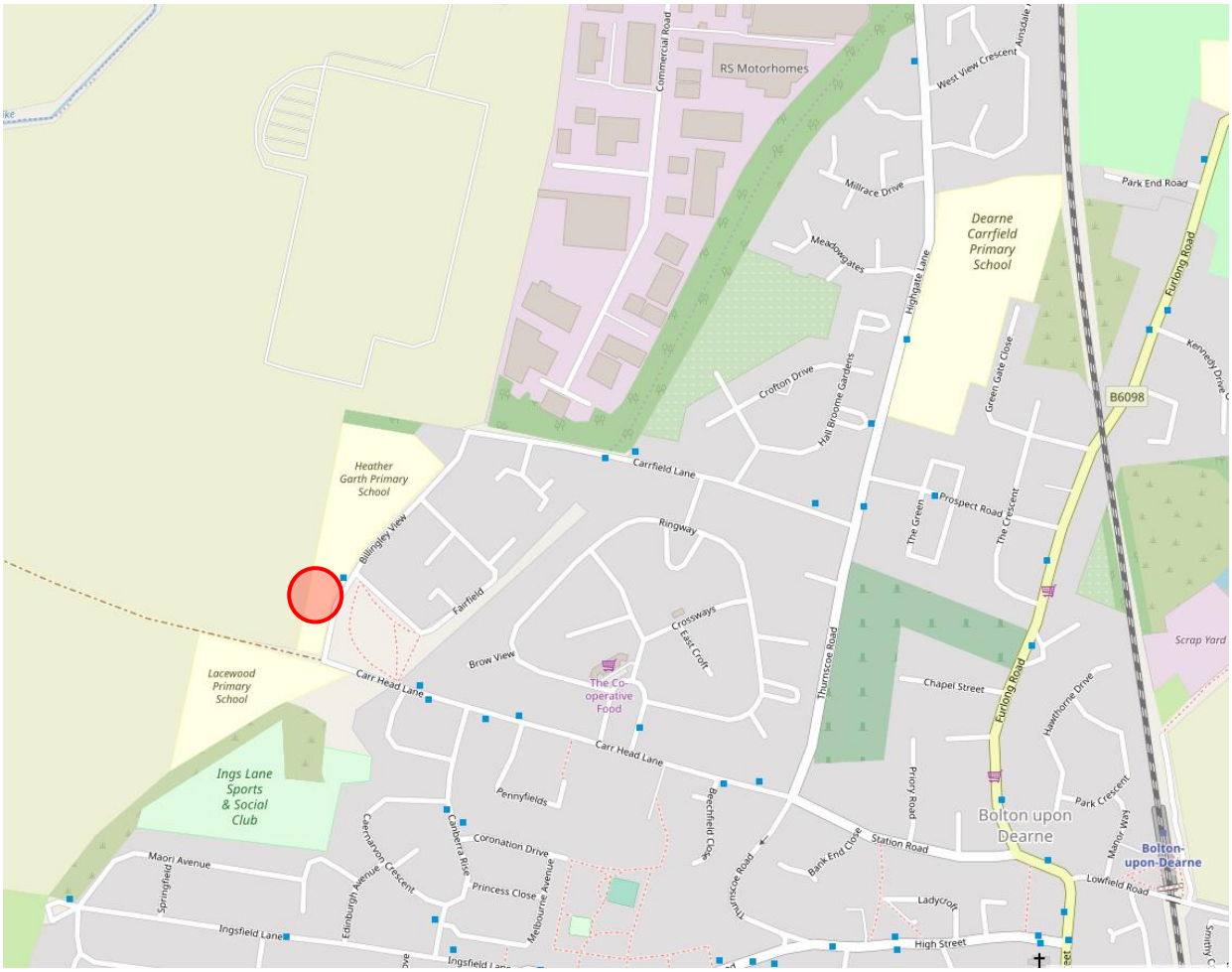

Figure 1.2 – Location Plan
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1.2.2 The survey was carried out in accordance with BS 5837:2012 '*Trees In Relation To Design, Demolition and Construction- Recommendations*'. This report sets out the findings of the survey and recommendations have been made for preliminary tree work that may be required.

1.3 Tree Designations

1.3.1 The survey included identification of any existing designations affecting trees on site such as Tree Preservation Orders (TPO) and Conservation Area status by checking the map information available on Barnsley Metropolitan Borough Council website www.barnsley.gov.uk.

1.3.1 This check confirmed that there are no TPOs on any of the trees surveyed. The site is

not within a Conservation Area.

2. Tree Survey Methodology

2.1 Site survey

2.1.1 Ecus carried out the tree survey in July 2019 when the trees were in leaf. The tree survey was a ground based visual inspection carried out by a suitably qualified arboriculturalist. The trees were not tagged as part of the survey.

2.1.2 The inspection of the trees, the site and the immediate surrounding area was carried out by Tom Planner, FdSc.

2.1.3 Weather on the day of the survey was clear and sunny allowing for a thorough inspection of the trees.

2.1.2 The following characteristics were recorded:

- Species
- Stem diameter at 1.5 m above ground level (mm).
- Estimated height (m)
- Approximate crown spread (m) as North, South, East and West measurements.
- An estimate of the number of years that the tree is likely to remain suitable for retention.
    - <10 = less than 10 years;
    - 10+ = 10 - 20 years;
    - 20+ = 20 - 40 years; or
    - 40+ = more than 40 years
- Age class
    - YNG = Young and recently established trees;
    - SM = Semi-mature trees age less than 1/3 life expectancy;
    - EM = Middle age trees 1/3 – 2/3 life expectancy;
    - M = Mature trees over 2/3 life expectancy; and
    - OM = Over mature – declining or moribund trees of low vigour.
- Condition category in accordance with BS 5837:2012 ‘Trees In Relation To Design, Demolition and Construction- Recommendations’. The categories listed are defined as per BS 5837:2012 and briefly are:
    - Category U = Those in 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;
    - Category A = Those of high quality and value, best trees with a long expected safe life;
    - Category B = Those of moderate quality and value; and
    - Category C = Those of low quality and value and trees less than 15cm diameter.
- Value subcategories in accordance with BS 5837:2012. The subcategories listed are defined as per BS 5837:2012 and briefly are:
    - 1 = Mainly arboricultural values
    - 2 = Mainly landscape values
    - 3 = Mainly cultural values, including conservation

- General notes about physiological and structural condition and any management recommendations.

2.1.4 The survey recorded all trees on site with a stem diameter of 75 mm or more at 1.5 m height and includes all trees outside the site boundary which may be affected by any future development of the site, either by their crown overhanging the site or their Root Protection Area (RPA) potentially extending into the site.

2.1.5 A full topographic survey of the site was provided; this was used as the basis for producing the tree survey plan. The topographic survey did not pick up all of the tree locations within or outside the development site and therefore some tree locations were estimated. These trees are marked with a cross on Figure 3.1.

2.1.6 Estimated tree locations are plotted with the internal GPS of a handheld data collection device, and an accuracy of +/- 2 m should be assumed.

2.1.7 At the time of carrying out a site survey it is not always possible to know which trees will be in conflict with development proposals. Therefore, when proposals are confirmed, it may be that arrangements are made to check measurements on site, especially where development is proposed very close to existing trees.

2.1.8 Trees are living organisms that change over time. The condition of all trees described by this survey must be checked by a qualified arboriculturalist or tree surgeon before works commence, especially if there have been any storm events or 12 months or more have passed since the survey was carried out.

2.2 Calculation of Root Protection Area (RPA)

2.2.1 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 any proposed foundation structures. This area is illustrated by the RPA and is calculated according to the formulae set out in BS 5837:2012 clause 4.6.1.

2.2.2 Any deviation in the RPA from the original circular plot should take account of physical site conditions that influence the disposition of tree roots, e.g. streams, building foundations and retaining walls.

3. Tree Survey Results

3.1 General Site Description

3.1.1 The site is currently an open field that was previously used for grazing and is now vacant. On the northern boundary of the site is a metal fence that separates it from Heather Garth primary school. There are several trees growing within the school grounds that are within 12 m of the proposed development site and so would need to be considered for protection of their roots under BS5837:2012.. The main highway of Billingley View runs along the eastern border of the site, becoming Carr Head Lane that borders the southern edge of the site. The western boundary is bordered by an arable field. A ditch that is approximately 1 m wide and 1 m deep has already been dug out along this boundary.

3.1.2 The trees surveyed during the site visit are located on the boundaries of the site.

3.1.3 There is no public right of way on or adjacent to the site except for the main highways of Billingley View and Carr Head Lane. There are overhead power lines cutting across the northwest corner of the site.

3.1.4 The site is currently visible from the highways of Billingley View and Carr Head Lane. It can also be seen by Lacewood primary school to the south and the residential properties to the east. The site is currently screened from Heather Garth primary school by the trees found within the school grounds along the northern boundary of the site.

3.2 Results of Tree Survey

3.2.1 The Tree Survey Schedule in Table 3.1 (Appendix 1) describes the results of the tree survey and includes preliminary management recommendations. The table should be read in conjunction with Figure 3.1 Tree Survey and Tree Constraints Plan (Appendix 3). This drawing illustrates the location of the trees surveyed, the extent of their canopies as well as the RPA of each tree and tree group.

3.2.2 Eight tree groups and 24 individual trees have been recorded during the survey. A full survey to BS 5837:2012 was carried out for those trees, including the recording of the stem diameter to determine the RPA of the trees.

3.2.3 There are a significant number of mature trees growing on the Heather Garth primary school's grounds neighbouring the development site. These trees are predominantly sessile oak (*Quercus petraea*) and ash (*Fraxinus excelsior*). T005 and T011 are the largest of the sessile oak and are mature trees in good health. T002, T006, T007 and T012 are the largest of the ash and are in good health without any obvious signs of ash dieback (*Hymenoscyphus fraxineus*). T008 is a wild cherry (*Prunus avium*) that has grown very tall for the stem diameter due to the neighbouring ash tree and is in bad health and displays poor form, however it is not necessary to consider its removal at this time. T010 is a silver birch (*Betula pendula*) that has very similar characteristics to the cherry T008. The rest of the vegetation cover here is made up of elder (*Sambucus nigra*) and blackthorn (*Prunus spinosa*) that are typical of shrub layer trees.

3.2.4 Overhead power lines cross above G004 close to the canopy of T005. These trees are all within the schools grounds but future pruning should be considered when designing the proposed developments requirements for these services.

3.2.5 Within the trees on the school grounds there are two dead trees. T001 is an ash that has completely died back and T009 is a silver birch that is also completely dead. Both

trees could be considered for removal if they will be close to any development.

3.2.6 Along the eastern boundary there are several groups and individual trees that are typical of a field edge. The species found along the boundary are mostly crab apple (*Malus sylvestris*) and hawthorn (*Crataegus monogyna*) with a single elder (T018) and a small group (G015) of goat willow (*Salix caprea*).

3.2.7 T021 is a large hawthorn that is growing slightly within the boundary of the site. It is early mature and has a large crown spread. It is typical of a hawthorn found near a field margin.

3.2.8 T022 is a mature silver birch that is found on the southern edge of the site. It is an established tree that currently provides some interest from the highway and Lacewood primary school. Whilst it could be considered for retention it has limited remaining contribution and is not of significant arboricultural importance.

3.2.9 The western boundary has a similar appearance to the others, formed of mostly hawthorn and elder that are typical of field margins. These trees and groups are on the outside edge of the ditch that has already been dug. G025 is a group of elder where a few roots appear to have been disturbed by these earthworks but it does not appear to have caused much damage. The roots of the other groups remain undisturbed by the ditch.

3.2.10 Near the western boundary is a single elder, T027, that has been grazed by horses and is in very poor condition. It has been rated as a U category tree as it will be of no benefit to the development if it is retained.

3.2.11 In the northwest corner of the site is a group of larger, more mature elder and hawthorn that connects with the trees on the school grounds.

3.2.12 T030 is a mature sessile oak that is found just outside of the site boundary. It has a large open canopy that extends over the proposed development site. It is situated alongside an overhead power line and may require future works or removal depending on the proposals requirements for these services.

3.3 Tree Constraints and General Design Advice

3.3.1 None of the trees surveyed were classed above category C and as such there is no need to retain any specific trees as part of the design plan.

3.3.2 T030 could be considered for removal due to the proximity to the overhead power lines as any future works that may be required would be made more difficult due to the proposed development.

3.3.3 As the RPA of the trees along the northern boundary extends beyond the school fence it will be necessary to place a protective barrier during the construction phase to prevent ground compaction and other damage to these trees.

3.3.4 T027 should be removed as it is of no arboricultural value and falls within one of the gardens shown in the proposed layout. Therefore it has been placed in the U category.

4. Arboricultural Impact Assessment (AIA)

4.1 Development Proposals

4.1.1 An Arboricultural Impact Assessment of the proposed site plan has been undertaken to assess the likely impact of the development on existing trees and tree groups. This assessment is based on the development plan provided by NPS Property Consultants Limited (ref: NPS Group 19-1-1080 02 dated 25/3/2019).

4.1.2 The client proposes the construction of 16 new dwellings accessed via the main highway of Billingley View.

4.2 Arboricultural Impact Assessment

Direct Impact from Development

4.2.1 The development plan indicates that ten trees and five groups within the red line site boundary will need to be removed to accommodate the new development, including new buildings, new roads and drives as well as new hard landscape.

4.2.1 A total of ten Category C trees and five groups will have to be removed to facilitate the development. T014 – T019, G015 and G020 are all located along the eastern boundary alongside the highway, where the fronts and driveways of the new homes will connect to the highway. T024 – T031, G025, G026 and G032 are all located on the western boundary and will be removed to allow for the erection of new fences. The loss of these trees is of no significance to the landscape. Those trees that are to be removed are of limited arboricultural value.

Removal of Trees for Amenity and Safety Reasons

4.2.2 One tree (T027) has been assessed as being “unsuitable for retention”. Unless otherwise agreed with the developer, this tree should be removed to improve the amenity spaces within the site. This heavily grazed elder would be a poor tree to be left inside of a new garden.

4.3 Recommendations

4.3.1 As the development proposals assume the removal of 11 trees and five groups growing within the site, no protection measures will be required for those trees.

4.3.2 Chapter 5, Arboricultural Method Statement, describes measures to protect the retained trees during the development, and operations within the RPA of retained trees including:

- Protective fencing;
- Installation of power supply services;
- Construction within RPA
    - Permanent buildings, fencing, street furniture, level changes, surfacing.

4.3.3 It is recommended that replacement tree planting is carried out along the highway of Billingley View to improve the amenity of the development and replace the trees that are to be removed. The trees should be planted at minimum 12-14 cm standard size. Proposed tree species should be suitable for roadside amenity, within a small front garden. Recommended tree species include ornamental crab apple (*Malus Rudolph,*

Malus Mokum, Malus Golden Hornet); silver birch (*Betula pendula*); whitebeam (*Sorbus aria*); and rowan (*Sorbus aucuparia*). The same species could also be planted in the small area of land that is not being developed as it will help to increase the biodiversity and habitats in the area, compensating for some of the trees that are being removed along the western boundary.

4.3.4 Tree planting and establishment should be carried out in accordance with BS 8545:2014 '*Trees: From Nursery to Independence in the Landscape – Recommendations'.*

4.3.5 It is recommended that tree planting follows 5 – 10 – 20 - 30 formula (i.e. No more than 5% of any one cultivar, no more than 10% of any one species, no more than 20% of any one genus, and no more than 30% of any one family.) This gives any new tree population maximum resilience against pests and diseases.

4.3.6 The layout proposes the construction of a new drive that passes over the RPA of T012. T012 is an ash that is found in the neighbouring school grounds. It is extremely unlikely that excavations in this area would cause any damage to these trees as the overlap is less than 5% of the RPA. It is unreasonable to expect the development to change the layout or invest in a no-dig solution to accommodate this small risk of damage to the tree so the construction should continue as normal.

5. Arboricultural Method Statement (AMS)

5.1 Important Founding Principle of BS 5837:2012

5.1.1 The most important and effective process, in terms of preventing damage to trees on a construction site, is the timely erection of tree protection fencing. **This must be erected as the first operation on site**, for example, before access track construction, before Contractors site cabins, and before trenching for service runs.

5.1.2 The founding principle of BS 5837:2012 '*Trees In Relation To Design, Demolition And Construction- Recommendations*' is that the protective fencing is erected before any other operation. However, it is noted that the fencing provides an unnecessary and potentially dangerous restriction to essential tree works and therefore tree works can be carried out before fencing is erected.

5.1.3 The following paragraphs are laid out in sequence of chronological order of operations on site.

5.2 General

5.2.1 The Arboricultural Method Statement should be read in conjunction with Figure 5.1 Tree Protection Plan in Appendix 3. The Arboricultural Method Statement (AMS) paragraphs below are written in the chronological sequence they are to be carried out:

5.3 Pre-Commencement

5.3.1 It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery on site. The meeting will firstly highlight the potential for damage occurring to tree crowns, but thereafter ensure that extra care is applied when manoeuvring any machinery within close proximity of retained trees to prevent any contact with the tree and consequent damage to crown, stem or roots.

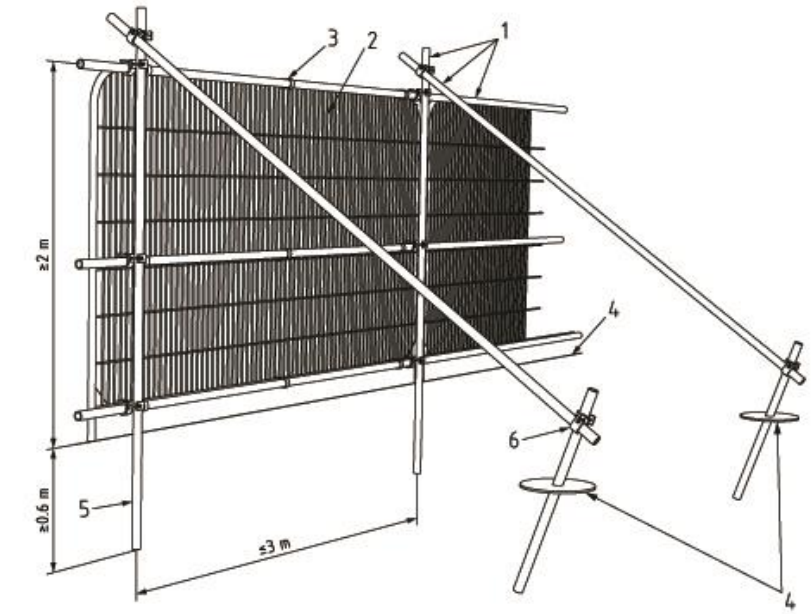
5.3.2 For clarity, prior to any construction or development work proceeding, the alignment of the protective fencing (Section 5.4) and the RPAs of any individual trees to be retained which are not able to be protected by fencing should be marked out using the distances provided in the table within the tree survey report. Marking out should be completed or approved by a person with arboricultural expertise as individual trees will have root zones that may be affected by local conditions and allowances will need to be made to accommodate this. This may be done prior to, or during, the Pre-Commencement Site Meeting.

5.4 Protective Barrier/Tree Protection Fencing

5.4.1 The development design prepared for the site indicates that there are several trees off site but within 12 m of the site boundary. All these trees need to be protected from all construction operations by a protective barrier (fencing to BS 5837:2012 which creates a sacrosanct Construction Exclusion Zone (CEZ).

5.4.2 The alignment of the protective barrier is based on the calculated extent of the RPA in accordance with BS 5837:2012. The detailed alignment is shown in Figure 5.1 Tree Protection Plan in Appendix 3.

5.4.3 In principle, protective fencing should be erected before any construction operations start on site and should be removed only on completion of all construction works on site.



Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 5.2: Default Specification for Protective Barrier to BS 5837:2012

5.4.4 The default specification for protective barrier is shown in Figure 5.2 above. Site hoarding is an acceptable alternative. It may be appropriate on some sites to use temporary site offices as components of the protection barriers, on the understanding that they will remain *in situ* for the duration of the construction/demolition works and their removal will be planned to ensure the Contractor's co-ordinated withdrawal from site away from the trees rather than towards them.

5.4.5 BS 5837:2012 clause 6.2.2.3 specifies an alternative protective barrier where site circumstances and associated risk of damage incursion into the RPA do not necessitate the default level of protection. This can include 2 m tall welded mesh panels (e.g. Heras fencing) on rubber or concrete feet to protect from cars, vans, pedestrians and manually operated plant. The alternative specification for the protective barrier should only be used if and where agreed with the Local Planning Authority.

5.4.6 All weather notices should be placed on fencing to indicate that operations are not permitted within the fenced area, for example "CONSTRUCTION EXCLUSION ZONE – NO ACCESS" or similar.

5.4.7 Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.

5.4.8 The presence of long grass and other vegetation in the 'Construction Exclusion Zone' is a welcome indicator that the protected area has been left undisturbed. However, on occasion, and certainly towards the end of the project, it is acceptable to cut the vegetation by hand held strimmer or scythe taking care not to work within 300 mm of the tree trunk (to avoid damaging the bark). Vegetation within 300 mm of the trunk can be cut with non-mechanised shears.

5.5 Installation of power supply and services

5.5.1 There are currently no proposals to route services or utilities through the RPA of any retained trees. If this changes at a later stage of the project, proposals should be submitted to the Local Planning Authority Tree Officer for approval.

5.5.2 As guidance only, it is noted here that any underground power supply and services routed through the RPA should be installed in accordance with BS 5837:2012 clause 7.7.2 and National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

5.6 Construction within RPA

Changes of level within RPAs

5.6.1 Generally, the levels within the RPA or protected area should not be changed. Tree roots are considered to be, in the main, within the top 600 mm of the soil. Obviously, any excavation into this will remove part of the root system and potentially affect the vigour or stability of the tree. Conversely, any additional material built up above ground level will compact the soil beneath it, potentially compacting all the air pores in the 600 mm depth of soil that most roots are in, effectively suffocating the roots and thus affecting the vigour or stability of the tree.

5.6.2 On occasion, additional soil may be gently spread by hand within the RPA/protected area, for example, to marry levels in small areas between raised levels of no-dig construction and the existing levels. The maximum depth of this would be to 150 mm, reducing to nil. However, it is not generally acceptable, in large areas of the RPA/protected area to raise the level as a blanket. Any areas which will need to be raised are to be agreed Local Planning Authority prior to construction. Specifically there will be no mechanical equipment within the RPA/protected area to spread, compact, or level out soil levels as this would compact the soil.

5.7 Removal of Protective Fencing

5.7.1 The fencing should not be removed until the completion of the project.

5.8 Excavations for soft landscaping

5.8.1 Where soft landscaping is proposed within the RPA of retained trees, excavations should be kept to the minimum required to provide adequate conditions for the establishment of new shrubs and trees. Excavations should be carried out carefully and by hand, avoiding the severance of any roots larger than 25 mm diameter.

6. Tree Management

6.1.1 The following section provides guidance as to how retained trees will best be protected during construction. More detailed guidelines for tree protection during construction are given in BS 5837:2012 'Trees In Relation To Design, Demolition and Construction-Recommendations'.

6.1.2 Any tree roots severed during site clearance works will be wrapped or covered with hessian sheets (wet in summer, dry in winter) as an immediate protection measure against desiccation and rapid temperature changes. This will be removed prior to backfilling which should be carried out as soon as possible. In addition the advice of an arboriculturalist, or the Tree Officer of the Local Planning Authority, will be sought as soon as possible on the potential effect of the root damage on the tree's stability, vitality and legal implications.

6.1.3 All tree works will follow best practice procedures as set out in BS 3998:2010. All trees should be maintained in good condition on site and be inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.

6.1.4 The best practice principles have been broadly summarised below:

- Once areas around trees have been protected by fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas;
- Wide or tall loads etc. will not come into contact with retained trees. Banksman will supervise transit of vehicles, jibs, booms etc. where this is in close proximity to retained trees;
- Oil, bitumen, cement or other material that is potentially injurious to trees will not be stacked or discharged within 10 m of a tree bole. No concrete mixing will be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree;
- No fires will be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire;
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree; and
- In the event of having caused any branch or limb damage to retained trees, the advice of an arboriculturalist will be sought on what tree surgery can be carried out, in accordance with BS 3998:2010, to correct the damage, and the best timescale for that tree surgery which will be determined by season, species, gravity of damage and legal status of the tree (Tree Preservation Order/ Conservation Area/nesting birds/roosting bats).

6.1.5 All of the above precautionary measures will be applied to minimise the effect of any damage to long-term tree health and safety.

6.1.6 It is recommended that any trees that require removal or significant canopy works should be checked in advance of works by an ecologist to ensure there is no possibility of any disturbance to nesting birds or roosting bats.

7. References

Books and Papers

BS 3998:2010 *Tree Work – Recommendations*. ISBN 978 0 580 53777 6

BS 5837:2012 *Trees In Relation To Design, Demolition and Construction – Recommendations*. ISBN 978 0 580 69917 7

BS 8545:2014 *Trees: From Nursery to Independence in the Landscape – Recommendations.*

Volume 4 NJUG *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*, Volume 4: Issue 2: 16/11/2007, www.njug.org.uk

Appendix 1 – Tables

Table 3.1 – BS 5837:2012 Tree Survey Schedule

Key:	Measurements	Age – Class	Overall Condition	BS 5837 2012 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG – Young Mature	G – Good	A – High	**<** = less than
	Ht - Height in metres	SM – Semi-mature	F – Fair	B – Moderate	**~** = approximately
	Stem – Stem Diameter at 1.5m in mm	EM – Early mature	P – Poor	C – Low	**>** = greater than
	Crown – Crown spread in metres	M – Mature	D - Dead	U – Unsuitable for retention	
	TD - Trunk division (height in metres)	OM – Over mature		**Sub-categories:**	
		Est Yrs – estimate of years remaining (40+ years; 20+ years; 10+ years, <10 years)		**1** = mainly arboricultural values **2** = mainly landscape values **3** = mainly cultural values.	
RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter of single stem trees or 12 x the notional stem diameter of multi stemmed trees as per BS 5837:2012 clause 4.6). This will be capped to 707m² for trees with a stem diameter larger than 1.25m.					

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T001	Ash, Common (*Fraxinus excelsior*)	8	280	3	3	3	3	2	Dead	Dead	Dead	In school, estimated	In school grounds and unlikely to fail and affect the development.	U	0	0
T002	Ash, Common (*Fraxinus excelsior*)	8	280	3	3	3	3	1	Mature	10+ Years	Fair	In school, estimated	-	C2	3.36	36
T003	Oak, sessile (*Quercus petraea*)	5	80	2	2	2	2	0	Semi Mature	20+ Years	Fair	In school, estimated	-	C2	0.96	3

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
G004	Group of Blackthorn (*Prunus spinosa*) one Ash, Common (*Fraxinus excelsior*) Elder (*Sambucus nigra*) and two Cherry, wild (*Prunus avium*)	3	260	As per drawing				0	Young	20+ Years	Fair	In school, estimated. Cherry and Ash roughly 150mm stems. Others less than 100mm.	-	C2	0	47
T005	Oak, sessile (*Quercus petraea*)	10	180	3	3	3	3	2		20+ Years	Good	In school, estimated	-	C2	2.16	15
T006	Ash, Common (*Fraxinus excelsior*)	10	180	3	3	3	3	2	Mature	20+ Years	Fair	In school, estimated	-	C2	2.16	15
T007	Ash, Common (*Fraxinus excelsior*)	11	250	3	3	3	3	2	Mature	20+ Years	Fair	In school, estimated	-	C2	3	28

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T008	Cherry, wild (*Prunus avium*)	10	200	2	3	3	3	2	Mature	20+ Years	Poor	In school, estimated	-	C2	2.4	18
T009	Birch, Silver (*Betula pendula*)	10	150	1	1	1	1	2	Dead	20+ Years	Dead	In school, estimated	In school grounds and unlikely to fail and affect the development.	U	0	0
T010	Birch, Silver (*Betula pendula*)	8	150	1	1	1	1	2	Mature	20+ Years	Poor	In school, estimated	-	C2	1.8	10
T011	Oak, sessile (*Quercus petraea*)	10	150	1	2	3	1	2	Early Mature	20+ Years	Fair	In school, estmated	-	C2	1.8	10
T012	Ash, Common (*Fraxinus excelsior*)	10	250	2	2	2	2	2	Early Mature	20+ Years	Fair	In school, estmated	-	C2	3	28
G013	Group of Maple, Field (*Acer campestre*) and Dogwood, Common (*Cornus sanguinea*)	4	249	As per drawing				0	Young	20+ Years	Poor	Small shrubs all less than 75mm.	-	C2	0	24

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T014	Apple, Crab (*Malus sylvestris*)	3	130	2	2	2	1	0	Early Mature	10+ Years	Poor	-	***Remove for development***	C2	1.56	8
G015	Group of Willow, Goat (*Salix caprea*)	3	237	As per drawing				0	Young	20+ Years	Poor	Several mutlistem goat willows. Stems 100 – 150mm	***Remove for development***	C2	0	39
T016	Apple, Crab (*Malus sylvestris*)	4	219	2	1	3	3	0	Mature	20+ Years	Poor	-	***Remove for development***	C2	2.628	21
T017	Hawthorn, Common (*Crataegus monogyna*)	4	150	3	2	3	2	0	Semi Mature	20+ Years	Poor	-	***Remove for development***	C2	1.8	10
T018	Elder (*Sambucus nigra*)	4	151	1	2	2	1	0	Early Mature	20+ Years	Poor	-	***Remove for development***	C2	1.812	10
T019	Apple, Crab (*Malus sylvestris*)	3	139	2	0.5	3	1	0	Early Mature	20+ Years	Poor	-	***Remove for development***	C2	1.668	9
G020	Group of three Hawthorn, Common (*Crataegus monogyna*)	4	156	As per drawing				0	Early Mature	20+ Years	Poor	Multistem hawthorns 100 – 150mm stems.	***Remove for development***	C2	0	38

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T021	Hawthorn, Common (*Crataegus monogyna*)	5	271	3	2.5	3	3	0	Early Mature	20+ Years	Fair	-	-	C2	3.252	34
T022	Birch, Silver (*Betula pendula*)	10	220	3	2.5	2.5	2	2	Early Mature	20+ Years	Fair	-	-	C2	2.64	21
G023	Group of three Hawthorn, Common (*Crataegus monogyna*)	3	173	As per drawing				0	Early Mature	20+ Years	Poor	Small multistem hawthorns of 100mm stem.	-	C2	0	13
T024	Hawthorn, Common (*Crataegus monogyna*)	3	75	2.5	1	2.5	2	0	Early Mature	20+ Years	Poor	No roots showing in ditch	***Remove for development***	C2	0.9	3
G025	Group of Elder (*Sambucus nigra*)	3	212	As per drawing				0	Mature	<10 years	Poor	Some roots disturbed by ditch. Stems less than 100mm.	***Remove for development***	C2	0	14
G026	Group of Hawthorn, Common (*Crataegus monogyna*)	2	130	As per drawing				0	Semi Mature	20+ Years	Poor	Small multistem hawthorns of 100mm stem.Roots not affected by ditch	***Remove for development***	C2	0	25

Tree No	Species	Ht (m)	Stem Diam @ 1.5 m (mm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *incl. Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T027	Elder (*Sambucus nigra*)	3	179	0.5	1	2	0.5	0	Over Mature	<10 years	Poor	-	***Remove before works***	U	2.148	14
T028	Hawthorn, Common (*Crataegus monogyna*)	6	162	3	3	2	2	0	Mature	10+ Years	Poor	-	***Remove for development***	C2	1.944	11
T029	Elder (*Sambucus nigra*)	6	173	3	3	2	2	0	Mature	10+ Years	Poor	-	***Remove for development***	C2	2.076	14
T030	Oak, Sessile (Quercus petrea)	10	250	3	5	5	2	1	Mature	20+ Years	Fair	-	***Remove for development***	C2	3	28
T031	Elder (*Sambucus nigra*)	5	139	1	2	2.5	2	0	Mature	<10 years	Poor	-	***Remove for development***	C2	1.668	9
G032	Group of Hawthorn, Common (*Crataegus monogyna*) and Elder (*Sambucus nigra*)	4	225	As per drawing				0	Early Mature	10+ Years	Fair	Elder stems 75mm to 100mm. Hawthorn 100mm to 150mm.	***Remove for development***	C2	0	44

Appendix 2 – Site Photographs

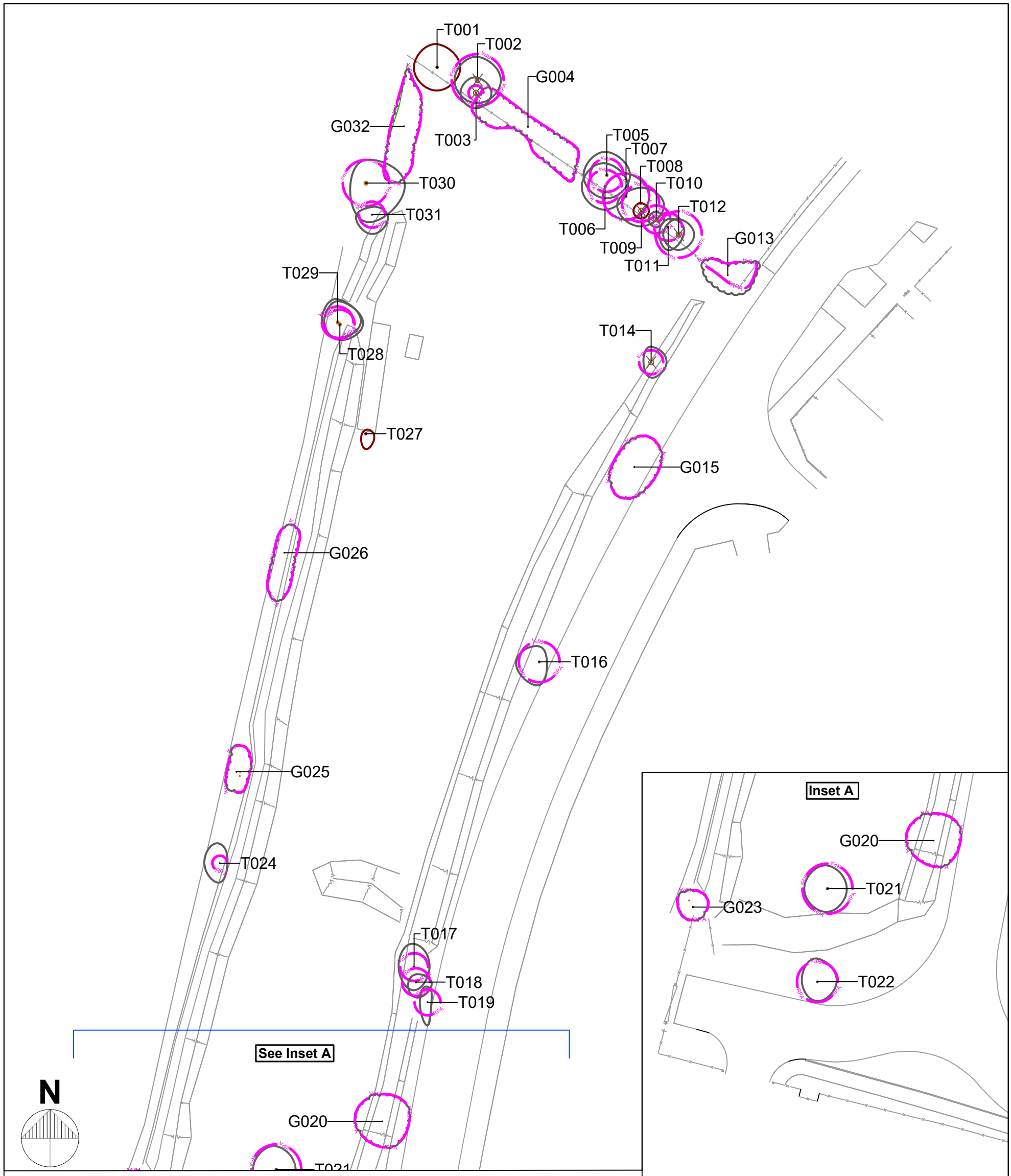
Plate 1: **Dead ash tree T001**

Plate 2: **Silver birch T022 in the southern end of the site**

Plate 3: **View looking west, showing the trees overhanging the school boundary fence.**

Plate 4: **Large crab apple on eastern boundary.**

Appendix 3 – Figures



The original version of the drawing was produced in colour. Monochrome copies should not be relied upon.

0m 10m 20m 50m

SCALE BAR 1:500

REV	DATE	DRAWN BY	CHECKED BY	REVISION COMMENT
A	08.07.19	TP	Ecus	Preliminary

DRAWING STATUS: For planning

GENERAL NOTES - TREE SURVEY

- Drawing for Planning purposes only.
- Refer to arboricultural report produced by Ecus Ltd titled 13024 Billingley View, Bolton on Dearne - BS5837:2012 Tree Survey.
- Based on topographic survey provided by Haycock and Todd dated June 2019.
- Check all dimensions on site.
- Do not scale from this drawing.
- Report any discrepancies and omissions to Ecus Ltd.
- This drawing is Copyright.

3RD-PARTY INFORMATION

NB This drawing includes information provided by independent surveyors and / or consultants, to whom all queries shall be made. Ecus Ltd can accept no liability for its context or accuracy.

KEY

Trunk location from topographic survey

Trunk location approximated by ECUS

Tree categories (BS 5837:2012)

Category A Trees

Category B Trees

Category C Trees

Category U Trees

RPA Root Protection Area (RPA) of category A, B and C trees

ecus ENVIRONMENTAL CONSULTANTS

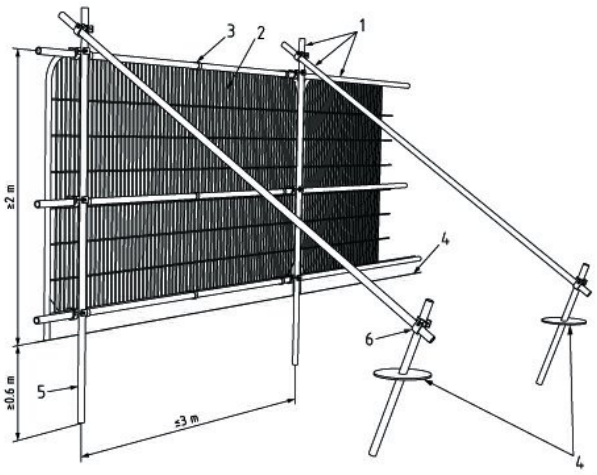
Brook Holt
Blackburn Road
Sheffield S61 2DW
Tel. (0114) 2669292
www.ecusltd.co.uk

Job
Billingley View, Bolton on Dearne

Title
Figure 3.1
Tree Survey and Tree Constraints Plan

By	Date	Scale @ A3	Drg. no.
TP	**July 2019**	**1:500**	**13024-ARB-01**

BS5837 (2012) Tree Protective Fencing Standard Detail.



Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

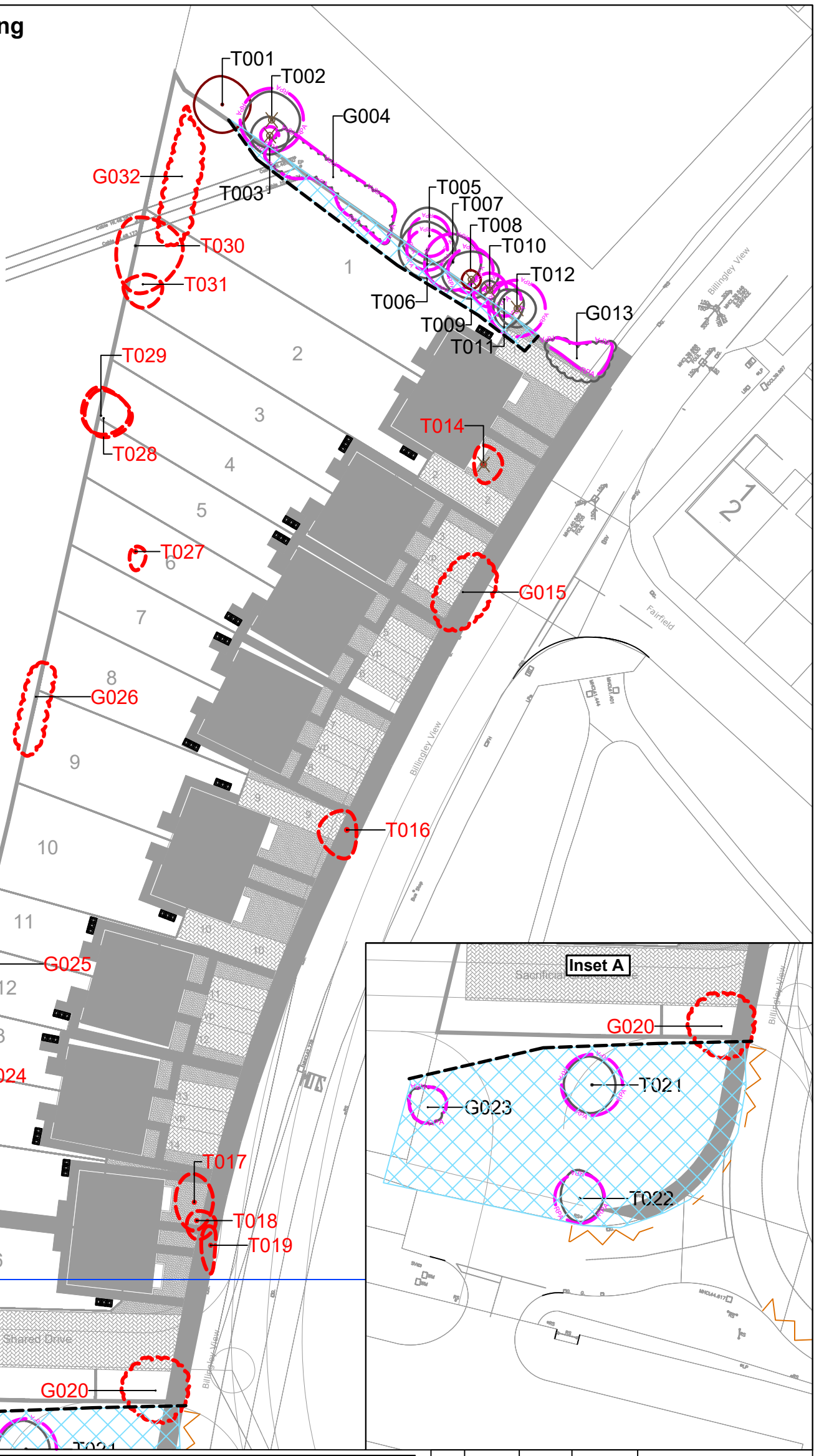
NOTES

Protective Barrier/Fencing

This must be erected before commencement of any other demolition or construction operations on site including construction of site access track. In order to protect the root zone and the tree canopy, behind the fencing/barrier is a sacrosanct construction-free zone which should remain clear of materials, vehicles and all construction/demolition operations. Long grass behind the fencing is a good indication that this area has not been disturbed, it may be strimmed but by hand held tools only, and ensuring a trunk protector is used to prevent strimming damage to the trunk. Unless otherwise agreed with the Project Arboriculturalist and written on this drawing, there will be no spreading of soil or topsoil in this area.

3RD-PARTY INFORMATION

NB This drawing includes information provided by independent surveyors and / or consultants, to whom all queries shall be made. Ecus Ltd can accept no liability for its context or accuracy.



The original version of the drawing was produced in colour. Monochrome copies should not be relied upon.

0m 10m 20m 50m

SCALE BAR 1:500

REV	DATE	DRAWN BY	CHECKED BY	REVISION COMMENT
A	10.07.19	TP	Ecus	Preliminary

DRAWING STATUS: For planning

GENERAL NOTES - TREE PROTECTION PLAN

- Drawing for Planning purposes only .
- Refer to arboricultural report produced by Ecus Ltd titled 13024 Billingley View, Bolton on Dearne - BS5837:2012 Tree Survey.
- Based on topographic survey provided by Haycock and Todd dated June 2019.
- Building layout and masterplan provided by NPS Property Consultants Ltd. on drawing number 19-1-1080 02.
- Refer to Engineer's details for level and drainage information.
- Check all dimensions on site.
- Do not scale from this drawing.
- Report any discrepancies and omissions to Ecus Ltd.
- This drawing is Copyright.

KEY

Trunk location from topographic survey

Trunk location approximated by ECUS

Tree categories (BS 5837:2012)

Category A Trees

Category B Trees

Category C Trees

Existing tree to be removed

Root Protection Area (RPA) of category A, B and C trees

Protective Barrier* - BS5837 (2012), clause 6.2.2

Construction Exclusion Zone

***See note on drawing about Protective Fencing and No-dig construction.**

ecus ENVIRONMENTAL CONSULTANTS

Brook Holt
Blackburn Road
Sheffield S61 2DW
Tel. (0114) 2669292
www.ecusltd.co.uk

Job
Billingley View, Bolton on Dearne

Title
Figure 5.1
Tree Protection Plan

By	Date	Scale @ A3	Drg. no.
TP	July 2019	1:500	13024-ARB-02