Pitt Street, Wombwell

Arboricultural Impact Assessment and Arboricultural Method Statement

Barratt David Wilson Homes

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Executive Summary

On behalf of Barratt David Wilson Homes (the Client), Ecus Limited (Ecus) has carried out an Arboricultural Impact Assessment and produced an Arboricultural Method Statement, to BS 5837:2012 '*Trees in Relation to Design, Demolition and Construction- Recommendations',* for the site at Pitt Street, Wombwell, Barnsley S73 8FE.

Ecus has been asked to prepare this report based on a tree survey carried out by a third party (Enzygo Ltd), which was completed in October 2019. Ecus was not commissioned to verify the validity of this data on site, nor check the reliance of the client on the detail contained within the report. Ecus has not attended site, and any questions regarding inaccuracies or omissions of the baseline dataset should be directed to the client who provided the report, (Client), or the originator of the report (Verena Meyer).

The survey recorded all trees within the site and all those which may be affected by any development proposals within 12 m of the site boundary, recording a number of parameters including species, crown spread and Root Protection Area (RPA).

The RPA is the area of ground around a 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 Client proposes the construction of 104 new dwellings, which comprises of new buildings, roads and drives as well as new hard and soft landscape. This will require the removal of two groups, two trees and a section of one hedge and 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, in addition to construction methodologies which should be adopted. The following measures, described in detail in Chapter 5, will prevent accidental damage and other adverse affects on the health of retained trees:

- Access facilitation pruning;
- Protective fencing;
- Installation of utilities and services within RPA;
- Construction within RPA; Permanent buildings, fencing, street furniture, level changes, surfacing.
- Level changes within RPA;
- Soft landscaping and planting within RPA;

This report 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;

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 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 arboriculturalist's advice should be ongoing.

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1. Introduction

1.1 Context of this document in the planning system

1.1.1 Figure 1.1 provides a simplified version of the 'Design and Construction Process and Tree Care' table outlined in BS 5837:2012. This identifies processes and obligations expected at the various stages of the construction project.

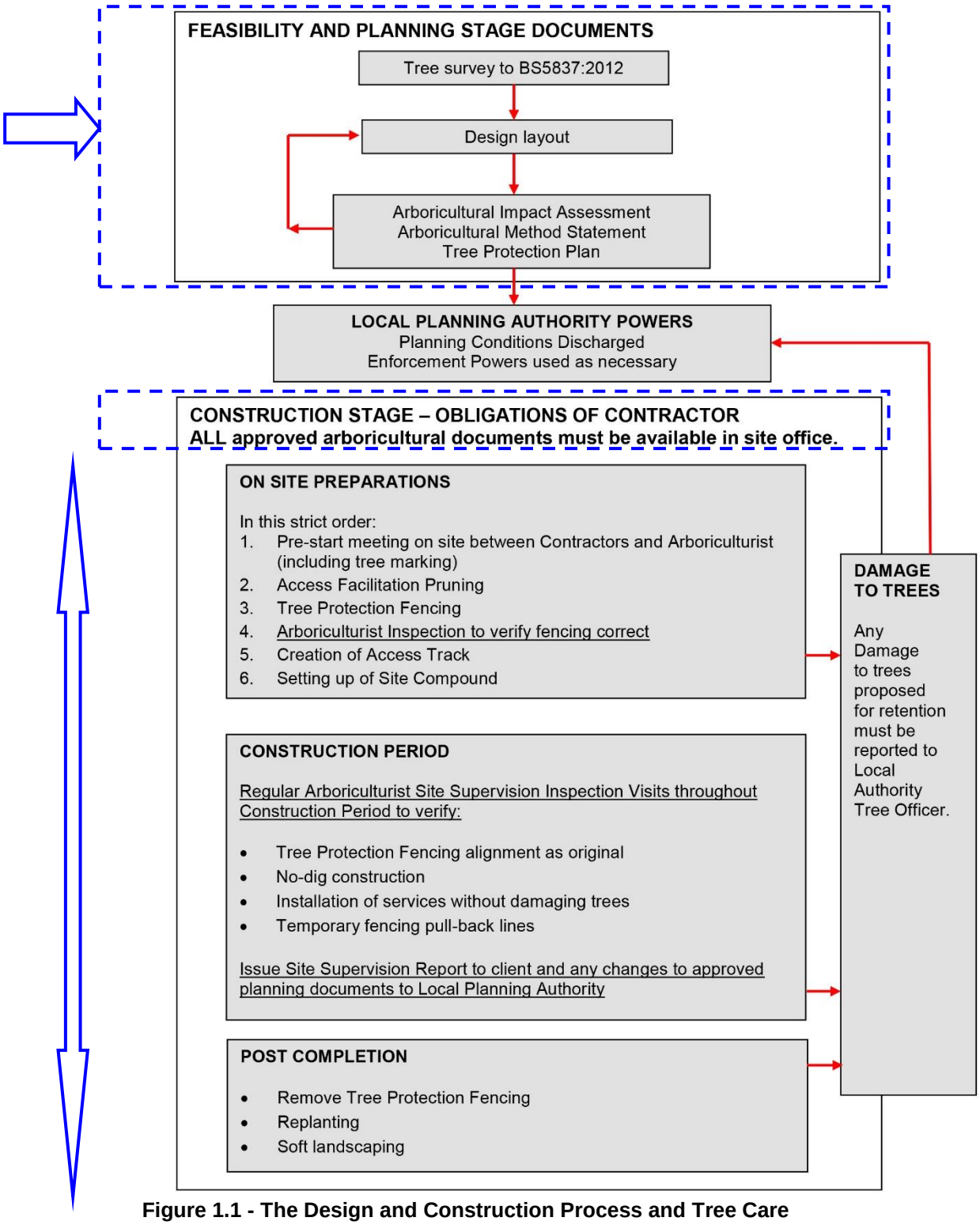


Figure 1.1 - The Design and Construction Process and Tree Care

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

1.1.3 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) was commissioned by Barratt David Wilson Homes (the Client) to undertake an Arboricultural Impact Assessment and Arboricultural Method Statement to BS 5837:2012 'Trees In Relation To Design, Demolition And Construction-Recommendations', following a Tree Survey Report carried out by Enzygo Ltd in October 2019 (Ref.BS 5837:2012 Arboricultural Survey-Pitt Street, Wombwell for Hartwood Estates Limited CRM.1122.003.Ar.R.001), for the site at Pitt Street, Wombwell, Barnsley S73 8FE, UK Grid Reference SE 40520 04107. The site location is shown on Figure 1.2.

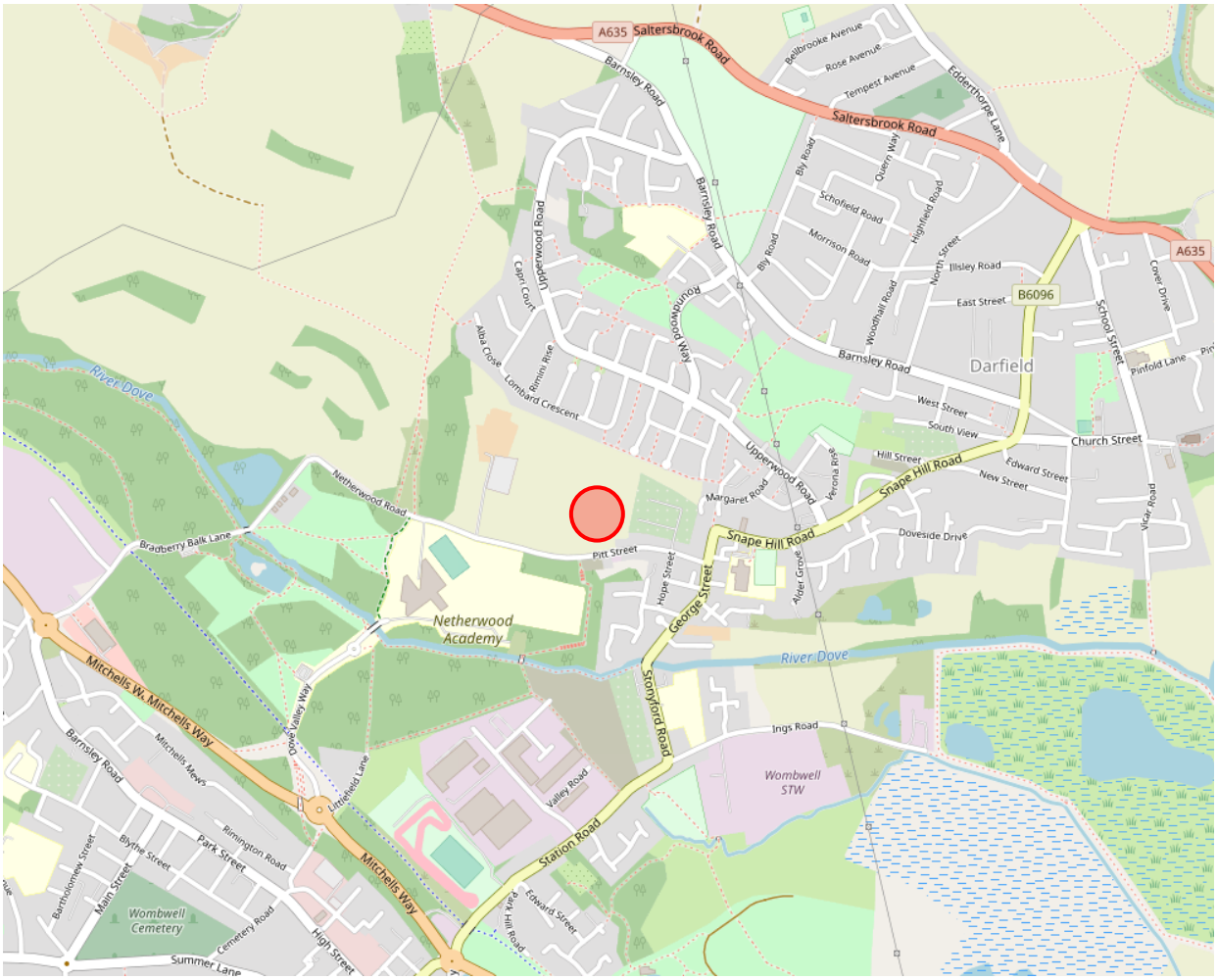


Figure 1.2 – Location Plan
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1.3 General Site Description

1.3.1 The site is located approximately 6km south-west of Barnsley in a sub-urban location. Pitt Street lies to the South of the site, with allotments to the East, residential properties to the North and paddocks to the West. The site falls within the Barnsley Metropolitan District.

1.3.2 The application boundary for the site is approximately 29,000m² [2.9 hectares]. It is a flat area of grassland enclosed by fences and low stone walls to all sides but with an informal path crossing the site from the South-West to the North-East.

1.3.3 Five groups, four individual trees and one hedgerow were recorded during the site survey by Enzygo Ltd in October 2019. They are concentrated along the north-western and south-eastern site boundaries.

1.3.4 The site is visible from Pitt Street to the south and neighbouring residential dwellings bounded to the east and north.

1.4 Limitations

1.4.1 The recommendations presented in this report are based on the available information reviewed when compiling the Arboricultural Impact Assessment and Arboricultural Method Statement.

1.4.2 Ecus cannot be held responsible for any recommendations or conclusions based on the published information if it is later proven to be inaccurate.

1.4.3 There may be other conditions prevailing on the site which are not disclosed by the available information and, therefore, could not be taken into account when writing this report. Ecus cannot be responsible for unrecorded information.

1.4.4 The conclusions and recommendations of this report cannot be guaranteed to gain regulatory approval. This report should be passed to the relevant regulatory authorities for their comment and approval prior to undertaking any works on site, if it is required as part of a planning application.

1.5 Tree Designations

1.5.1 The survey included identification of any existing designations affecting trees on site, such as Tree Preservation Orders (TPOs) and Conservation Area status through a review of map information available on Barnsley Metropolitan Borough Council website www.barnsley.gov.uk

1.5.2 This check confirmed that there are no TPOs on any of the trees surveyed, and the site is not within a Conservation Area.

Felling Licence

1.5.3 The felling of trees is regulated in England by the Forestry Act 1967 (the Act). The Forestry Commission is the government regulator that enforces the provisions of the Act.

1.5.4 The felling of growing trees in England is restricted under section 9 of the Act. It requires that felling is either authorised by a felling licence issued by the FC or the felling activity is excepted from the need for a licence.

1.5.5 There are many exceptions to the need for a licence, based on the type of the tree, the location of the tree, the size of the tree, the nature and scope of the felling activity and the person responsible for the felling. These are primarily set out in section 9 of the Act as well as the Forestry (Exceptions from Restriction of Felling) Regulations 1979.

1.5.6 The most relevant exemption is;

'Section 9 - Requirement of licence for felling (1) A felling licence granted by the appropriate forestry authority shall be required for the felling of growing trees, except in a case where by or under the following provisions of this Part of this Act this subsection is expressed not to apply…

(d) is immediately required for the purpose of carrying out development authorised by planning permission granted or deemed to be granted under the Town and Country

Planning Act 1990 or the enactments replaced by that Act, or under the Town and Country Planning (Scotland) Act 1997.

1.5.7 Advice from a suitably qualified arboricultralist should be sought before any felling takes place onsite.

1.5.8 The granting of permission to remove trees covered by a TPO by the Local Planning Authority does not remove the need to obtain a felling licence from FLS if more than 5 m^3 of timber are to be felled in a calendar quarter and none of the exemptions apply.

1.6 Development Proposals

1.6.1 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 the Client (ref: JRP Associates Ltd (drawing number 20542901) dated 1st March 2021). Tree Schedule of results can be found in Table 1.1 Appendix 1.

2. Arboricultural Impact Assessment

2.1 Introduction

2.1.1 A BS5837:2012 Arboricultural Impact Assessment (AIA) has been carried out for trees present across the Site. This methodology evaluates the direct and indirect effects of the Proposed Development and where necessary recommends mitigation. The British standard states, "*The assessment takes account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the impact of the permanent works, account has been taken of the buildability of the scheme in terms of access, adequate working space and provision for the storage of materials, including topsoil*."

2.1.2 As well as an evaluation of the extent of the impact on existing trees, the AIA assessment should include where necessary:

a) the tree survey; (Ref.*BS 5837:2012 Arboricultural Survey-Pitt Street, Wombwell for Hartwood Estates Limited CRM.1122.003.Ar.R.001 by Enzygo Limited*)

b) trees selected for retention, clearly identified and marked on a plan with a continuous outline; (16623-ARB-01)

c) trees to be removed, also clearly identified and marked on a plan with a dashed outline or similar; (16623-ARB-01)

d) trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or listed as appropriate; (Table 2.1 – BS 5837:2012 Tree Survey Schedule)

e) areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged;

f) evaluation of impact of proposed tree losses;

g) evaluation of tree constraints and draft tree protection plan;

h) issues to be addressed by an arboricultural method statement, where necessary in conjunction with input from other specialists.

2.1.3 To ensure clarity and consistency Ecus has adopted a similar approach to evaluating impacts on the tree as would be used in undertaking an Environmental Impact Assessments (EIA). The methodology used assesses the sensitivity of the receptor and the magnitude of change to give a significance of any affect. The detailed methodology is outlined in Appendix 2.

2.2 Arboricultural Impact Assessment

2.2.1 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 the Client (ref: JRP Associates Ltd 20542901 dated 01/03/2021). The data provided for the tree survey was taken from *BS 5837:2012 Arboricultural Survey-Pitt Street, Wombwell for Hartwood Estates Limited CRM.1122.003.Ar.R.001 by Enzygo Limited* and this Tree Schedule of results can be found in Table 2.1 Appendix 1.

2.2.2 The client proposes the construction of 104 residential dwellings with associated hard and soft landscaping.

Direct Impact from Development

2.2.3 The development plan indicates that two trees, two groups and one section of hedge will need to be removed to accommodate the new development, which comprises new buildings, roads and drives as well as new hard and soft landscape.

2.2.4 Individual trees T2 and T10 and Groups G5 and G7 are all recorded as category C. A section of hawthorn hedge (H6) is recorded as category B. These trees, groups and hedges will need to be removed to facilitate the construction of the proposed residential dwellings with associated soft and hard landscaping.

2.2.5 The removal of category C trees T2 and T10 equates to 50% of the individual recorded trees within the red line boundary of the site to accommodate the proposed layout.

2.2.6 The proposed development requires the removal of two category C groups G5 and G7. This represents an area of 145 m^2 (0.0145 ha) tree cover within the site, which will need to be removed.

2.2.7 The overall sensitivity of the site to arboricultural impact is negligible as the site is predominantly open grassland with limited tree cover. As the proposed construction is removing the majority low value category C trees and groups with only a section of hedge being of category B value. The removal of 50% of individual trees and 145 m^2 (0.0145 ha) tree group cover within the site is considered to be of a negligible magnitude as the reduction in the tree population at a site level is predominately low category C value.

2.2.8 The overall significance of the effect of the proposed tree removal on the site is considered negligible. The impact of the tree removal will be short term and with a strong replanting plan, as detailed in the proposed site plans, there will be a significant increase in tree cover and diversity of tree species. This will ultimately have an overall positive gain to the site and surrounding area. Details and recommendations for replanting can be found in Section 4.4.

2.2.9 Table 2.1 below summarises the impact the proposed development may have on existing trees:

Table 2.1: Summary of Tree removals

Category A	Category B	Category C	Category U
-	H6 - Section of hawthorn hedge to be removed	T2- Oak T10- Hawthorn G5- Mixed Group G7- Apple	-
Total **0**	**Total** **1 hedge (section of)**	**Total** **2 Trees** **2 Groups**	**Total** **0**

2.3 Recommendations

2.3.1 As the development proposals assume the removal of trees T2, T10, groups G5 and G7 and a section of hedge growing within the site, no protection measures will be required for those trees or groups.

2.3.2 Chapter 3 Arboricultural Method Statement describes measures to protect the retained trees during the development, and operations within the RPA of retained trees including:

- Access Facilitation Pruning Works;
- Protective fencing;
- Installation of power supply services; and

- Excavation for soft landscaping;

2.3.3 It is recommended that replacement tree planting is carried out in suitable locations within the new development. The trees should be planted at minimum 12-14 cm standard size. Proposed tree species should be suitable for the spatial constraints imposed by their location. Recommended tree species include silver lime 'Brabant' (*Tilia tomentosa 'Brabant'*), whitebeam (*Sorbus aria*) and rowans such as Cardinal Royal (*Sorbus aucuparia* '*Cardinal Royal'*).

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

2.3.5 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.

2.3.6 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.

3. Arboricultural Method Statement

3.1 Important Founding Principle of BS 5837:2012

3.1.1 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.

3.1.2 The founding principle of BS 5837:2012 *Trees In Relation To Construction,* is that 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, therefore, tree works can be carried out before fencing is erected.

3.2 General

3.2.1 The Arboricultural Method Statement should be read in conjunction with the Tree Protection Plans (see Figure 3.1, Appendix 3). The paragraphs below are written in the chronological sequence they are to be carried out.

3.3 Pre-Commencement

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

3.3.2 For clarity, prior to any construction or development work proceeding, the alignment of the protective fencing (Section 3.5) 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.

3.4 Access Facilitation Pruning (T1, T4 and G3)

3.4.1 Any operation of wide or tall loads, plant bearing booms, jibs and counterweights or other such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within or without the RPA fencing. Therefore, it is advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837:2012.

3.4.2 The Facilitation Pruning Works may be required for T1, T4 and G3. The specification shall be prepared by an arboriculturalist and submitted to the LPA for approval, before construction, demolition or fencing operations commence on site.

Table 3.1: Access facilitation pruning

Tree number	Tree work required	Reason
T1	Cherry to be pruned back to site boundary	To allow further easement access
T4	Partial crown reduction to eastern canopy. Reduce back by 1 to 2 meters from growing tips to a suitable growing point	This may be required to prevent any future encroachment of the eastern crown on the subsequent structure.

G3	Section of hedge to be cut back to site boundary.	To allow further easement access.

3.4.3 All tree works should be carried out in accordance with BS 3998:2010 'Tree Works-Recommendations'.

3.4.4 Facilitation Pruning should be carried out on site by a suitably qualified and experienced tree surgeon prior to construction or demolition operations commencing on site. Facilitation Pruning can run concurrent with operations to erect tree protection fencing, provided this can be co-ordinated such that neither presents a hazard to the other.

3.4.5 Trees on site which are not to be retained can be removed as part of the Facilitation Pruning (or earlier if the appropriate planning consent is confirmed). To avoid mistakes, the individual trees to be removed should be identified and marked by a person with arboricultural expertise.

3.4.6 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.

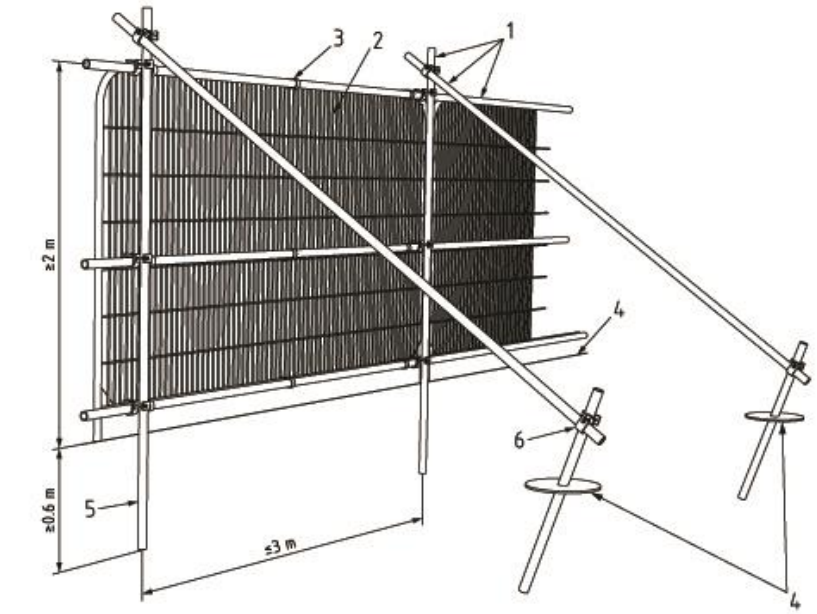
3.5 Protective Barrier/Tree Protection Fencing

3.5.1 The development design prepared for the site indicates that two trees (T1 and T4) three groups (G3, G8 and G9 and a section of hedge (H6) are to be retained. All of these trees must be protected from all demolition and construction operations by a protective barrier (fencing to BS 5837:2012 which creates a sacrosanct Construction Exclusion Zone (CEZ).

3.5.2 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 the Tree Protection Plans (See Figure 3.1, Appendix 3).

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

3.5.4 The default specification for protective barrier is shown in Figure 3.2. 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.



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 3.2: Default Specification for Protective Barrier to BS 5837:2012

3.5.5 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 LPA.

3.5.6 Due to the nature of the site with a long stretch of Hawthorn hedge (H6) situated on the eastern boundary; large stretches of tree fencing to BS 5837:2012, or a lesser fence of Heras panels on rubber blocks is felt to be unworkable and inappropriate. If correctly installed and maintained, orange site netting is a viewed as an acceptable alternative as it creates a clear visual barrier around any RPAs

3.5.7 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 3.1 Tree Protection Plan in Appendix 3.

3.5.8 In principle, protective fencing should be erected before any construction/demolition operations start on site and should be removed only on completion of all construction/demolition works on site. During the construction of the construction corridor stock fencing great care should be taken to avoid operating machinery within the RPAs of retained trees.



Figure 3.3: 1 m Orange site netting on metal spikes

3.5.9 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.

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

3.5.11 The presence of long grass and other vegetation in the CEZ 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.

3.6 Installation of Power Supply and Services

3.6.1 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 LPA Tree Officer for approval.

3.6.2 For guidance only, any underground power supply and services routed through the RPA should be installed in accordance with BS 5837:2012 clause 7.7.2 and NJUG *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*.

Fence Construction within RPAS

3.6.3 Where fence posts need to be installed within RPAs, excavations should be minimal and carried out using hand held tools. Fence posts should be erected at least 1 m from trees, and using metal post support spikes. Alternatively, if using concrete mix, post holes should be lined with an impermeable membrane, to prevent contact between tree roots and potentially damaging chemicals in the concrete.

3.6.4 The proposed fence alignment should allow for a minimum distance of 500 mm between the tree stems and the fence, providing sufficient room for the future increase of the stem diameter, and minimising the risk of potential conflicts between the fence structure and the tree stem.

Formation of Shed Bases within RPAS

3.6.5 Where a slab for a minor structure (shed base) is to be formed within the RPA, it should bear on existing ground level, and should not exceed an area greater than 20% of the existing unsurfaced ground.

Changes of Level within RPAS

3.6.6 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. 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.

3.6.7 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 to raise the level as a blanket, in large areas of the RPA/protected area. Any areas which will need to be raised must be agreed LPA 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.

3.7 Excavations for soft landscaping

3.7.1 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.

3.8 Soil Improvements and Mulching

3.8.1 To compensate for root damage and stress caused by construction activities, retained trees onsite should be mulched. The materials that may be used for mulching include coarsely divided plant matter, such as wood chip, pulverized bark, or leaf mould, any of which may be combined with well-rotted animal manure. The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of an organic mulch should not be so much as to inhibit aeration of the root system or to cause overheating of uncomposted material (normally no more than 80 mm to 100 mm). The mulch should be periodically replenished as it decomposes, so that it does not become depleted.

4. Tree Management

4.1.1 This section provides guidance as to how retained trees will best be protected during construction. More detailed guidelines for tree protection during construction are provided in *BS 5837:2012 'Trees In Relation to the Design, Demolition and Construction Recommendations'.*

4.1.2 Any tree roots severed during site clearance works must 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 must be carried out as soon as possible. In addition, the advice of an arboriculturalist, or the LPA Tree Officer, must be sought as soon as possible on the potential effect of the root damage on the tree's stability, vitality and legal implications.

4.1.3 All tree works will follow best practice procedures as set out in BS 3998:2010. All trees will 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.

4.1.4 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. must not come into contact with retained trees. A banks-person 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 will 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 should be carried out to correct the damage, in accordance with *BS 3998:2010 'Tree Work – Recommendations'*. The most appropriate timescale for tree surgery will be determined by season, species, gravity of damage and legal status of the tree (TPO/ Conservation Area/nesting birds/roosting bats).

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

4.1.6 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.

5. 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 2.1 – BS 5837:2012 Tree Survey Schedule

Survey schedule of results was taken from (*Ref.BS 5837:2012 Arboricultural Survey-Pitt Street, Wombwell for Hartwood Estates Limited CRM.1122.003.Ar.R.001) 6.0 Appendix 1 – Arboricultural Survey Schedule pages 12-13.*

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 **Est Yrs –** estimate of years remaining (40+ years; 20+ years; 10+ years, <10 years)	ADB – Ash Die Back DED – Dutch Elm Disease	**Sub-categories:** **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**	**BS 5837 Category**	**RPA Radius (m)**	**RPA (m²)**
T1	Wild cherry *(Prunus avium)*	6	150	2	3	2	1.5	1.8	SM	20+	Fair	Unbalanced crown due to overgrown hawthorn group to the west.	***Access Facilitation Pruning may be required as per Table 3.1: Access facilitation pruning*** Partial crown reduction may be required to eastern canopy. Reduce back by 1 to 2 meters from growing tips to a suitable growing point	C1	1.80	10.18
T2	Pedunculate oak *(Quercus robur)*	4	100	2	2	2	2	0.5	YNG	40+	Good	-	***Remove for development***	C1	1.20	4.52

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	BS 5837 Category	RPA Radius (m)	RPA (m^2)
G3	Hawthorn *(Crataegus monogyna)*	5	100	See Plan				0	M	40+	Fair	Overgrown hedge.	***Access Facilitation Pruning may be required as per Table 3.1: Access facilitation pruning*** Cutting back to site boundary may be required	C1	1.20	4.52
T4	Field maple *(Acer campestre)*	18	250	6	6	6	6	0	M	40+	Good	Attractive tree in corner of site, no access due to dense undergrowth, exact location to be confirmed.	***Access Facilitation Pruning may be required as per Table 3.1: Access facilitation pruning*** Partial crown reduction may be required to eastern canopy. Reduce back by 1 to 2 meters from growing tips to a suitable growing point	B2	4.20	55.42
G5	Mixed group	2	80	2	2	2	2	0	YNG	20+	Good	Young trees scattered across northern part of the site, including goat willow, rowan, hawthorn, apple, dog rose and field maple.	***Remove for development***	C1	0.96	2.90

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	BS 5837 Category	RPA Radius (m)	RPA (m^2)
H6	Hawthorn hedgerow *(Cratagues monogyna)*	4	150	See Plan				0	M	40+	Good	Unmanaged, mature hedgerow with some scattered elder.	***Remove section of hedge for access/development.***	B2	1.80	10.18
G7	Apple *(Malus domestica)*	4	150	2	4	2	4	0	M	20+	Good	-	***Remove for development***	C1	1.80	10.18
G8	Lombardy poplar *(Populus nigra 'Italica')*	12	220	See Plan				1.5	SM	20+	Good	Three trees on site boundary, multi-stemmed, collapsed timber and wire fences leaning on stems.	No works required	B2	2.64	21.90
G9	Lombardy poplar *(Populus nigra 'Italica')*	10	220	See Plan				1.5	SM	20+	Good	Multi-stemmed, collapsed timber and wire fences leaning on stems.	No works required	B2	2.64	21.90
T10	Hawthorn *(Crataegus monogyna)*	6	150	2.5	2.5	2.5	2.5	0	M	20+	Good	-	***Remove for development***	C1	1.80	21.90

Appendix 2 – Arboricultural Impact Assessment Methodology

5.1 Introduction

5.1.1 A BS5837 arboricultural impact assessment has been carried out for trees present across the Site. This methodology evaluates the direct and indirect effects of the Proposed Development and where necessary recommends mitigation. The standard states, "*The assessment takes account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the impact of the permanent works, account has been taken of the buildability of the scheme in terms of access, adequate working space and provision for the storage of materials, including topsoil*."

5.1.2 There are no published criteria, guidance or methodologies for the assessment of effects of development on forestry, trees or woodland. The Forestry Commission published 'Environmental Impact Assessment For Forestry Projects' in February 2019 however this is concerned with forestry operations and is not relevant to trees on development sites. As a result, the assessment of effects is made based on professional judgement, with reference to:

- the sensitivity of the tree population present in the study area taking account of the degree and rate of change in the tree population, both in the recent past and that anticipated in the near future, and therefore the susceptibility/vulnerability of the tree population to change; the quality of the tree population (based on the categorisation method outline in BS5837:2012 broadly based on amenity value and useful life expectancy) and the extent to which it is rare or distinctive, the value attributed to the tree population through designations;
- magnitude of change and extent of tree removal, impact of proposed development on retained trees and impact of any required tree work;
- duration and reversibility - timescale of effect (days/weeks/months/years) until recovery. Permanent effects are described as such, and likelihood of recovery is detailed where appropriate; and
- adverse/beneficial - if the effect will be beneficial or detrimental to the feature.

5.1.3 The effect of tree removal is normally considered to be of an adverse nature; however indirect beneficial effects in some areas may arise where the introduction of a proposed development allows for the removal of ecologically habitat-poor or discretionary trees. This may be followed up by detailed landscape masterplans, ecological and woodland management plans or schemes of compensatory planting to replace lost trees with more beneficial individuals.

5.1.4 Baseline survey methodologies and data sources used to inform this assessment, including the BS5837:2012 tree surveys.

5.1.5 BS5837:2012 is the accepted standard for the management of trees on development sites. The standard offers advice on the assessment of impacts of a scheme on trees, based on a tree survey carried out to the same BS5837 specifications.

5.1.6 As well as an evaluation of the extent of the impact on existing trees, the arboricultural impact assessment has included:

a) the tree survey;

b) trees selected for retention, clearly identified (e.g. by number) and marked on a plan with a continuous outline;

c) trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or similar;

d) trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or listed as appropriate;

e) areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged;

f) evaluation of impact of proposed tree losses;

g) evaluation of tree constraints and draft tree protection plan;

h) issues to be addressed by an arboricultural method statement, where necessary in conjunction with input from other specialists.

5.2 Sensitivity of Receptors

5.2.1 Four categories of sensitivity are defined in Table 7.1:

Table 7.2: Definitions of Sensitivity Levels of Trees/Woodland/Forestry

Value	Definition
Very High	Receptor has little or no ability to absorb change without altering its present character, is of very high environmental value, or of international importance.
High	- Highly valued, subject of national designation e.g. Ancient Woodland Category, veteran and heritage trees - Particularly rare or distinctive in a national context; or - Considered susceptible to small changes.
Medium	- Valued more locally, subject to local designation; - Mainly B and C category trees - Rare or distinctive in a regional context; and/or - Are tolerant of moderate levels of change
Low	- Generally, more commonplace, not designated; - Mainly C category trees - Considered potentially tolerant of noticeable change; or - Undergoing substantial development such that their character is one of change.
Negligible	- Low quality, insignificant trees, mainly C and U category - Considered tolerant of noticeable change; or - Having undergone substantial development such that their character is one of change.

5.3 Magnitude of Change

5.3.1 The magnitude of change has been assessed with reference to the four categories defined in Table 7.2:

Table 7.2: Definitions of Magnitude of Change Levels

Magnitude	Definition
High	A noticeable change to the tree population over a wide area or an intensive change over a limited area.
Medium	Small changes to the tree population over a wide area or noticeable change over a limited area.
Low	Very small changes to the tree population over a wide area or small changes over a limited area.

Negligible	No discernible change to the tree population.

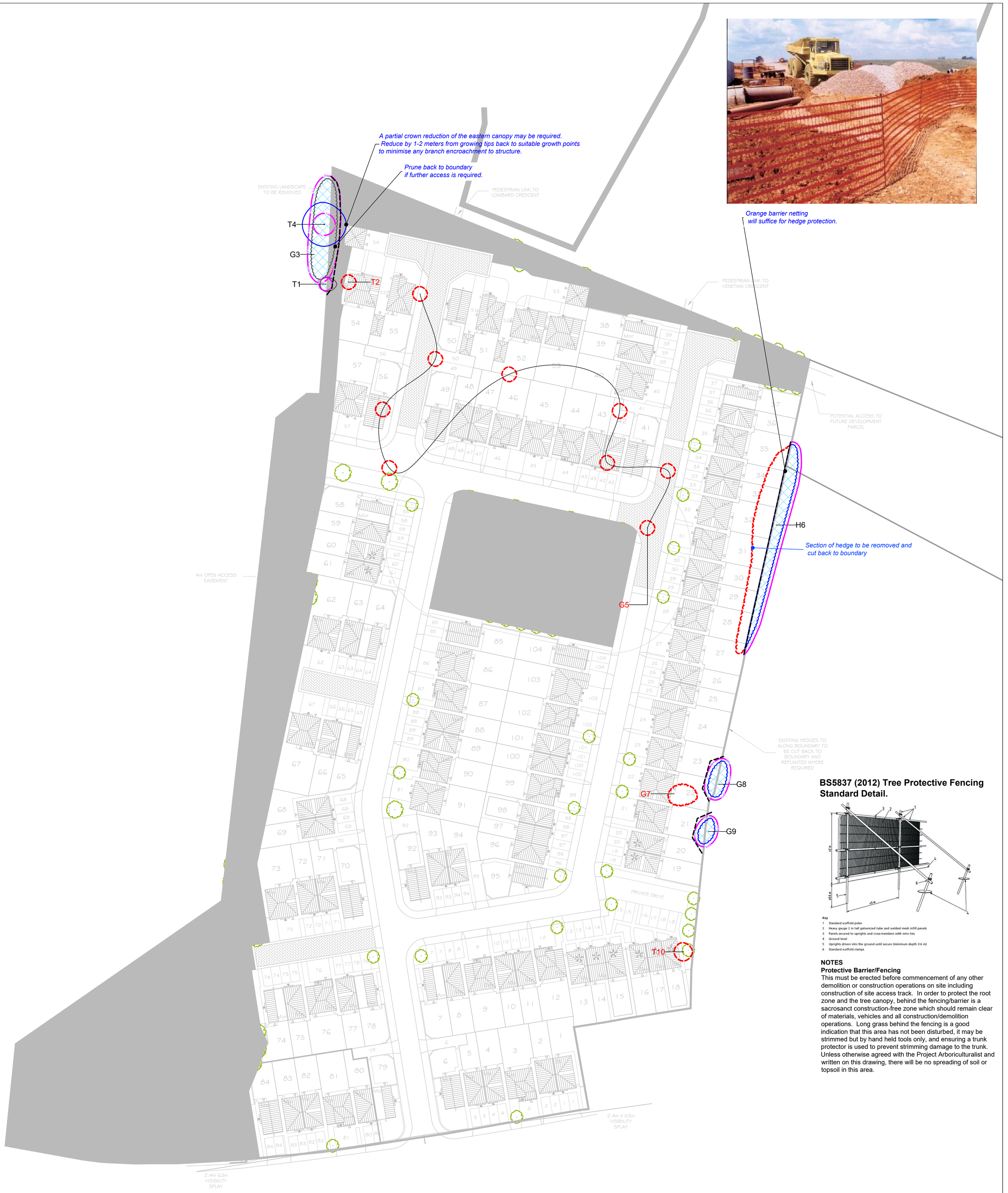
5.4 Significance of Effect

5.4.1 The significance of the effect is calculated by combining the sensitivity of the receptor (Table 7.1) with the magnitude of change (Table 7.2) in Table 7.3 below.

Table 7.3: Framework for Assessment of the Significance of Effect

Magnitude of Change	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

Appendix 3 – Figures



Orange barrier netting will suffice for hedge protection.

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.

GENERAL NOTES - TREE PROTECTION PLAN

- Drawing for Planning purposes only.
- Refer to arboricultural report produced by ECUS Ltd titled Pitt Street, Wombwell - Arboricultural Impact Assessment and Arboricultural Method Statement
- Building layout and masterplan provided by JRP Associates Limited on drawing number 205429001.
- 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.

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

Existing tree to be removed

Root Protection Area (RPA) of trees to be retained

Protective Barrier/Fencing* - BS5837 (2012), clause 6.2.2

Construction Exclusion Zone

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

N

0m 10m 20m 50m

SCALE BAR 1:500

REV	DATE	DRAWN BY	CHECKED BY	REVISION COMMENT
A	04.03.21	DL	TP	Preliminary

DRAWING STATUS: For Planning

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Job
Pitt Street, Wombwell

Title
Figure 3.1
Tree Protection Plan

By	Date	Scale @ A1	Drg. no.
DL	Mar 2021	1:500	16623-ARB-01