



Land at White Horse Business Park, Trowbridge, BA14 0XA.

Castlewood Residential Application

Arboricultural Impact Assessment (AIA)

Feb 2020

Greenman Environmental Management

Heather Farm, Landsdown Lane, Bath, BA1 4NA

Client Name: Turley Associates Ltd (on behalf of Castlewood Property Ventures Ltd)

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Quality Assurance – Approval Status

This document has been prepared and checked in accordance with GMEM policy

Issue No.	Date	Prepared by	Checked by	Approved By
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Comments

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1. INTRODUCTION

1.1 Instruction

1.1.1 Greenman Environmental Management (GMEM) was instructed by Clara Millar of Turley (on behalf of Castlewood Property Ventures Ltd), via email on the 17th October 2019, to inspect the trees that could affect or be affected by the development proposal for the land at White Horse Business Park, Trowbridge, Wiltshire, BA14 0XA.

1.1.2 This report, in compliance with *BS5837:2012 'Trees in relation to design, demolition and construction - recommendations'* is required to accompany the submission of a planning application for the construction of up to 100 residential units and up to a 64 bed care home . My instruction is to prepare the following information:

- A schedule of the relevant trees including tree data and condition assessment.
- A tree constraints plan.
- An arboricultural impact appraisal.
- An arboricultural method statement.
- A tree protection plan.

1.2 Documents provided

1.2.1 Drawings 191113-WHBP-TCP-AM.pdf (tree constraints plan/ TCP), 200219-WHBP-AIA-AM.pdf (arboricultural impact assessment/ AIA) and WHBP-TPP-PJ.pdf (tree protection plan/TPP) are derived from the following drawings:

- North Bradley survey.dwg - supplied by Cat White of Turley
- CASR3002_4001.01E_Sketch Layout with retained water main - Standard.dwg - supplied by Niamh Hession

1.3 Limitations

1.3.1 My survey was a preliminary assessment undertaken from ground level and observations have been made solely from visual inspections for the purposes of assessment in terms relevant to planning and development.

Only binoculars, mallet and a probe have been used to aid tree assessment. No invasive or non-invasive internal decay detection devices have been used in assessing tree condition.

- 1.3.2 The recommendations and conclusions in this report relate only to the conditions found on this site at the time of the site visit and inspection. The recommendations contained within this report are valid for a period of 12 months from the date of this report.
- 1.3.3 Any significant alteration to the site that may affect the trees that are present or have planning implications (level changes, additional tree works, post extreme weather events, hydrological changes) will necessitate a re-assessment of the trees and the site.
- 1.3.4 The tree survey that forms part of this report is not a tree safety inspection. The survey has been carried out in order to inform the planning process. Where obvious risks have been observed they have been addressed in the 'preliminary management recommendations' (see Appendix 1 – Tree Schedule). Potential hazards and levels of risk are likely to change as the site usage changes during and post development.

1.4 Ecological Constraints

- 1.4.1 The Wildlife and Countryside Act 1981 and amendments made within and subsequent to the Countryside and Rights of Way act 2000 provides statutory protection to bats, birds and other species that inhabit or use trees. The protection afforded to these species could impose significant constraints on the use of a particular site as well as significantly restrict the timing of any works that may be necessary.
- 1.4.2 Any restrictions are in addition to the tree restriction highlighted in this report. Whilst I have some working knowledge of these potential issues they are outside my area of expertise and you must seek advice from a qualified ecologist to ascertain if any further restrictions apply.

1.5 Tree Preservation Orders and/or Conservation Area protection

- 1.5.1 Contact has been made with Wiltshire Council to enquire whether trees at the address are subject to a Tree Preservation Order (TPO); via their on-line interactive service, and it has been determined that the site has two trees covered by TPO (W/06/00011/MIXED), labelled T44 and T45 in this tree survey, however it does **not** lie within the limits of a Conservation Area. An additional off site tree may be covered by a TPO, T57. T44 and T45 are both high/good quality hedgerow grown maiden oaks and are intended to be retained and protected during construction as valuable amenity landscape and ecological assets. WC has not been asked for further details of this TPO at this time¹. The same TPO appear to have been made predominantly for trees in the domestic gardens of numbers 2 – 16 Woodmarsh. These will not be affected by these proposals.
- 1.5.2 Any tree works recommended for trees subject to a TPO or within a Conservation Area may need to be applied for (or notified to the council in the case of a conservation area) separately unless full planning permission is granted and this report constitutes an approved document with the main planning application.

2. SITE VISIT AND DATA COLLECTION

2.1 Site Visit:

- 2.1.1 A site visit was carried out on the 7th November 2019 by Phil Johnson of GMEM. All observations were made from ground level (aided by the Visual Tree Assessment method – Mattheck and Breloer, 1994) and all measurements except stem diameter were estimated unless otherwise stated in the tree schedules.

2.2 Site Description

- 2.2.1 The site is located to the southeast of Trowbridge; the northeast of North Bradley and just to the west of the White Horse Business Park. The current

¹ The TPO is likely to be a mixture of individual and group designations under the W/06/00011/MIXED code.

land use is agricultural and made up of four parcels of land with hedgerows and trees separating the different fields.

2.2.2 Access to the site will be from the A363 which runs along the northern boundary of the site. The topography of the site is flat with no exposure to prevailing winds.

2.2.3 The site is visible to the residential properties along Woodmarsh to the west and the commercial properties at Spitfire Retail Park to the north.

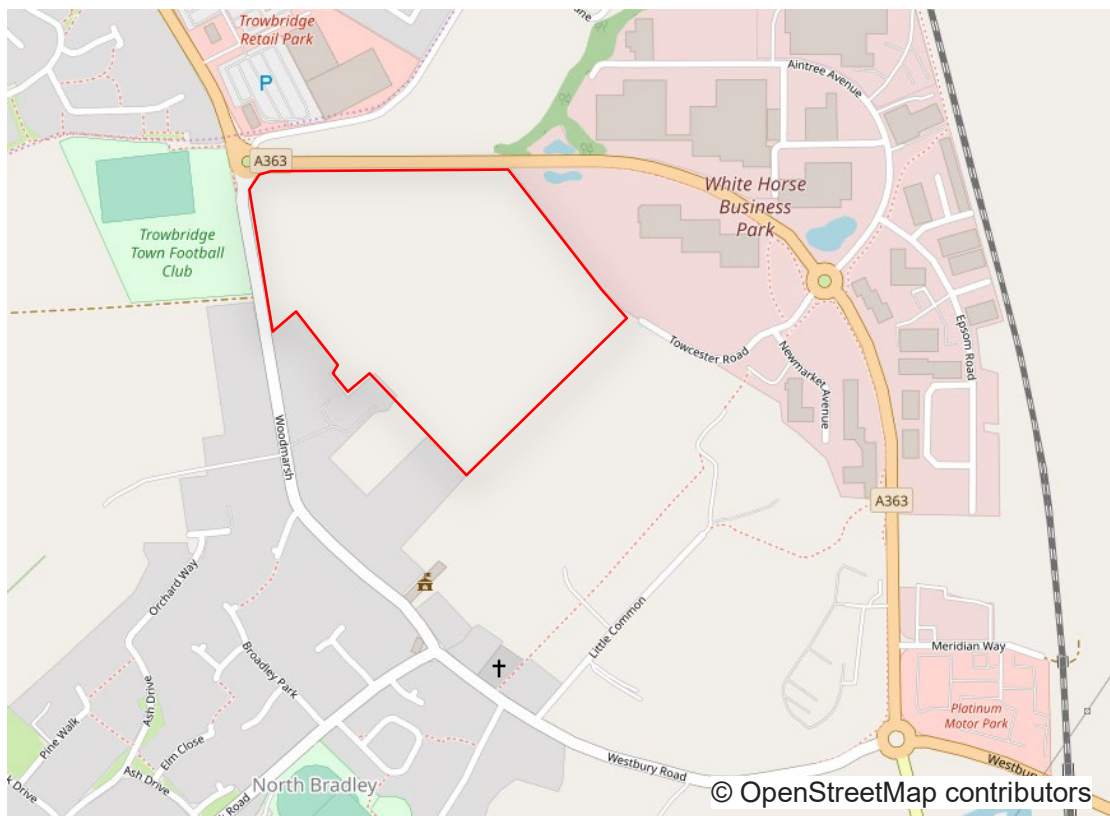


Figure 1: Site location with approximate site boundary shown in red.

2.3 Data collection:

2.3.1 Each tree or group was inspected and allocated an identification number as indicated in the tree schedule (appendix 1) and tree survey plan. For each tree the following information was collected:

- Species
- Height (m)
- Stem diameter (mm)
- Average radius of crown to 4 cardinal points (m)

- Average height of canopy clearance
- Life stage
- Observations regarding condition
- Preliminary management recommendations
- Safe Useful Life Expectancy (SULE)

2.3.2 As encouraged in BS5837:2012, each tree or group was allocated to one of four categories (A, B, C or U), which reflects its suitability for retention in context of the development. Please see table 1 for a summarised explanation of the criteria for tree categorisation and Appendix 3 for more details.

Category	Description	Colour used on plans
A	High quality trees whose retention is most desirable.	LIGHT GREEN
B	Moderate quality trees whose retention is desirable.	MID BLUE
C	Low quality trees which could be retained but should not significantly constrain the proposal.	GREY
U	Very poor quality trees that should be removed unless they have high conservation value.	DARK RED

Table 1: summary of BS5837 (2012) categories

2.4 Interpretation of data

2.4.1 Section 4.6 of BS5837:2012 recommends that the trunk diameter measurement is used to calculate the RPA which can then be interpreted to identify the design constraints of a particular site. Once the design principal has been established the construction exclusion zone and location of protective measures can be identified.

3. ARBORICULTURAL IMPACT APPRAISAL

3.1 General

3.1.1 In total 59 trees, 4 groups, 13 hedges and one woodland area were surveyed and considered to be potentially affected by the proposals. The woodland area (W77) is outside of the site boundary and owned by a third party.

3.1.2 The tree constraints plan that accompanies this report shows the above ground constraints (branch spread and shading if appropriate) and the below ground constraints, i.e. the anticipated extent of tree roots based on a calculation using the stem diameter and consideration of any site conditions which may affect root growth.

3.1.3 Root protection areas (RPAs) are shown as a circle centred on the base of the stem unless site conditions such as nearby structures indicate that the shape of the rooting area deviates from this format.

3.1.4 There is a group of trees (T3- G33) to the north west of the site near the roundabout for the A363. The group made up of mixed broadleaves of differing ages and species, predominantly lime trees (*Tilia sp.*) with an understorey of apple trees (*Malus sp.*).



Image 1: Group of trees on northwest corner, near roundabout of A363

- 3.1.5 T44 is a Category A oak tree (*Quercus robur*) and T45 is a Category B oak with high wildlife value and are the largest trees on site. These two trees are right in the middle of the development and proposed to be retained.



Image 2: T44 Category A oak



Image 3: T45 Category B oak

- 3.1.6 T6, T26, T31 and T46 have all been recommended for removal. This is to improve the tree stock in the group to the northwest boundary of the site. T3, T4 and T5 have been recommended for a crown lift and cutback to clear the lamp column and achieve a 3m clearance over the footpath.
- 3.1.7 The multiple hedgerows (H34, H40-H43, H47, H48 H51, H54, H66 and H74-H76) are important wildlife corridors and provide essential habitat and navigation channels.

3.2 Below ground constraints

- 3.2.1 Below ground constraints refer to tree roots. These are easily overlooked during construction operations as they are unseen and often little is understood about their importance. It is essential to ensure that roots are not damaged during building operations as they are the life blood of each tree, providing structural stability by anchoring the tree to the ground and providing transportation of water and nutrients from the soil to the foliage.

- 3.2.2 The tree constraints plan which accompanies this report shows the calculated root protection area (RPA) as a red circle centred on the tree stem (see Appendix B). It is quite possible, depending on soil conditions and tree species characteristics that roots extend beyond this zone so the RPA around each tree should be carefully protected during the planning and execution of construction work.
- 3.2.3 In reality the spread of roots for trees will rarely be distributed in a perfect circle as the environment below ground level is highly variable. The presence of structural foundations, pipes, impermeable surface coverings and differing soil conditions mean that tree roots will extend in to areas that offer a preferential environment; where water is most available and the soil is least compacted.
- 3.2.4 There is an incursion into the RPA of T44 (Cat A1) for a footpath that links the two side of the development and T45 (Cat B1) for a new tarmac surface. Given the extent of the incursion and the remaining available below ground space for root penetration it is unlikely this incursion will have a significant negative impact on the health and vitality of T44 and T45. It is recommended that any excavation works in these RPAs are carried out under the supervision of an Arboricultural Clerk of Works (ACoW).
- 3.2.5 H47 and H48 will need to be removed to facilitate this proposal. They are situated in the exact location of new houses and gardens and their retention will not be possible with the current design.
- 3.2.6 H42, H43, H51 and H54 will require the removal of a section of the hedgerow for footpaths and roads (see Appendix C AIA).

3.3 Above ground constraints

- 3.3.1 Trees in close proximity to buildings can provide some constraints, both actual and perceived. Actual constraints may be where low branches conflict with new elevations either at the time of building or in the future. Future growth of young trees should be accommodated in building design. Other constraints include shade, leaf litter and damage from falling branches.

3.3.2 Large tree canopies close to buildings can also cause 'post-development pressure' by way of requests for tree removal or pruning as a result of resident anxiety.

3.3.3 There are no above ground constraints associated with this development. The only crown related issues are with the low branches along the footpath near the roundabout to the A363 (see Appendix 1 Tree Data Schedule).

3.4 Trees to be retained

3.4.1 Of the 59 trees, 4 groups, 13 hedges and one woodland area surveyed, 53 trees, 3 groups and 11 hedges are proposed to be retained.

3.4.2 Tree protection on development sites is of paramount importance if trees are to be retained successfully. The inevitable stress caused by development near an existing tree can, if provision for adequate protection is not made, be a strain that can severely damage the trees or even result in their premature death. Although the trees appear healthy during and on completion of the development, the full effects may not become apparent for up to five or more years after works have finished.

3.4.3 Access to the development area during the demolition and construction phase must be carefully managed to protect the existing trees to be retained. If there is not sufficient space for construction vehicles between the protective fencing, alternative arrangements must be made. These changes must be approved by Wiltshire District Councils assigned Tree Officer.

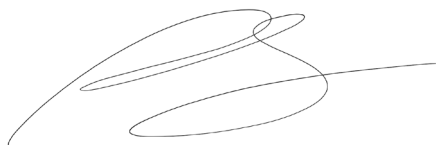
3.5 Trees to be removed

3.5.1 5 trees, 1 group and 2 hedges are proposed for removal as a result of this development.

Retention category	Proposed for removal due to development	Proposed for removal due to poor condition	Total number of removals
A	N/A	N/A	0
B	H47, H48	N/A	2
C	N/A	N/A	0
U	N/A	T6, T26, T31, G39, T46, T65	6
Totals	2	6	8

4 CONCLUSIONS

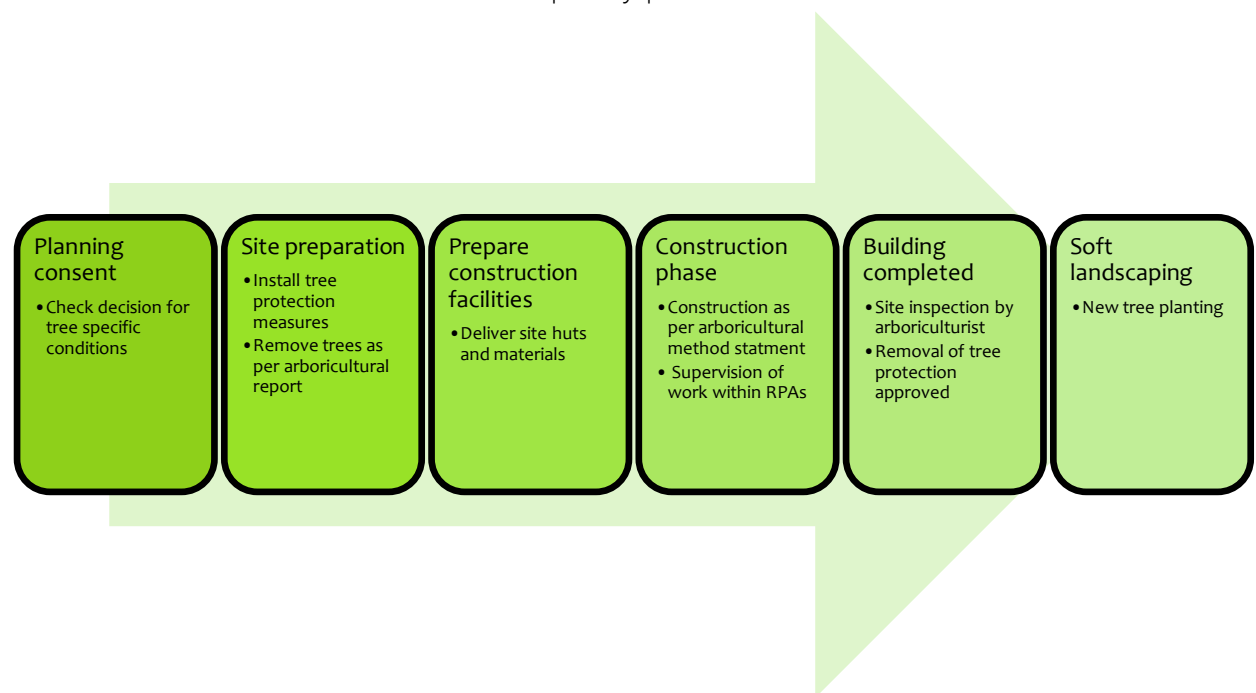
- 4.1 The design proposals for the development for the land at White Horse Business Park, Trowbridge, Wiltshire, BA14 0XA have been assessed broadly in accordance with BS5837:2012 "Trees in Relation to Design, Demolition and Construction – Recommendations".
- 4.2 It is our opinion that the trees identified for retention can be afforded due respect and provided adequate protection, ensuring their safe and healthy retention during the development process and post development.
- 4.3 A total of 53 trees, 3 groups of trees, 11 hedges and one woodland area can be retained as detailed within this report. There are two hedges that will need to be removed to facilitate the proposed design layout. The 5 trees and one group have been recommended for removal due to their poor condition.
- 4.4 It is our opinion that the loss of 5 trees, 1 group and 2 hedges will not have a detrimental effect on the local visual amenity or significantly alter the visual treed character of the local area.
- 4.5 Provided a robust scheme of Tree Protection is provided GMEM believes the trees highlighted for retention within this report can be retained without undue stress on their long-term health.



Phil Johnson
L4 DipArb, TechArborA

5.0 ARBORICULTURAL METHOD STATEMENT

- 5.0.1 Suggested/recommended control measures for construction works in or near to the root protection zone are discussed in this chapter.
- 5.0.2 The flow diagram below sets out a simple schedule of works that should be followed to ensure trees are adequately protected:



5.1 Tree works prior to construction

- 5.1.1 Following the approval of Wiltshire Council's appointed Tree officer, all tree works should be carried out to BS3998:2010 "Tree Work - Recommendations" or BS5837:2012 "Trees in relation to design, demolition and construction - Recommendations" or as modified by more recent research. Tree works should be undertaken before commencement of any other site operations.

5.2 Protective fencing

- 5.2.1 Before the commencement of any works on site protective fencing shall be erected to the dimensions shown on the accompanying drawing 'tree protection plan'. Individual root protection areas at the measured m² will be erected for the duration of the development around retained trees. Although these protection measures will be in place for the duration of the

development on site monitoring will allow for the successful retention of the subject trees.

5.2.2 Tree Protection Fencing should be constructed to the specification as set out in Appendix F of this report. It is imperative that the fencing is constructed in such a way that it cannot be easily moved or opened during construction work.

5.2.3 Signs should be affixed to the fencing to inform on-site contractors of the importance of the fencing barriers (see Appendix G).

5.2.4 The root protection areas (RPAs) should be treated as sacrosanct and the following guidelines should be followed:

- NO mechanised excavations
- NO movement of construction traffic or parking of vehicles
- NO storage of building materials
- NO storage of chemicals or fuels
- NO fires to be lit in close proximity to trees

5.2.5 Fences must only be removed following a site visit from the Local Authority officer to confirm on-site construction activity has been completed.

5.3 Site access

5.3.1 The site shall be accessed via the A363 from the north of the site.

5.4 Contractors car parking

5.4.1 No vehicles shall be parked on un-surfaced ground within the RPA of retained trees.

5.5 Site huts and storage

5.5.1 Any storage required for materials, spoil, plant or welfare facilities shall be positioned on existing hard standing and not within the RPA of retained trees.

5.6 Demolition

5.6.1 No demolition works have been proposed for this development.

5.7 Service installation

5.7.1 I have not been supplied with details of the routing of underground services that may affect the trees on site. Should the routing of services cause conflict with the specified RPAs, arboricultural advice should be sought.

5.8 Ground level changes

5.8.1 No information regarding any level changes near trees proposed for retention has been supplied.

5.9 Ground protection

5.9.1 Where it is not possible to avoid construction activity within the RPAs of retained trees appropriate ground protection must be installed (i.e. a cellular confine system). This is to avoid the significant negative impacts on tree health that can result from soil compaction and cause premature tree death (See Figure 2 below).

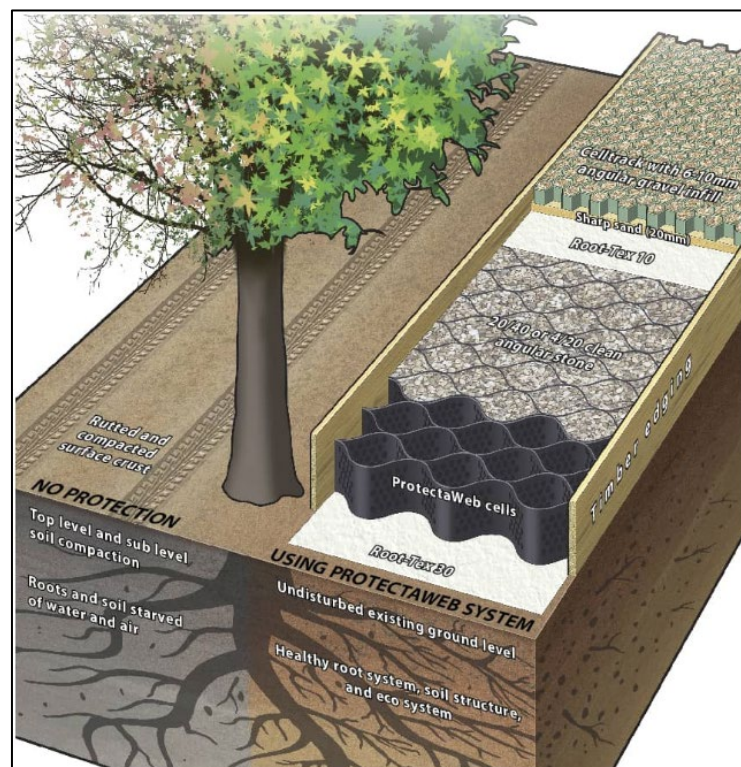


Figure 2: Importance of ground protection for future tree health

5.9.2 Temporary ground protection will not be required to facilitate this proposal.

5.10 Foundations within Root Protection Areas

5.10.1 There are no foundations proposed within the RPA of any retained trees on site.

5.11 Hard surfaces within Root Protection Areas

5.11.1 There is a footpath proposed in the RPA for T44 but it is only a minor incursion. It is recommended that any excavations are carried out under ACoW supervision and any roots encountered below 25mm are pruned using appropriate sharp cutting tools such as secateurs or loppers.

5.12 Soft landscaping within exclusion zones

5.12.1 Soft landscaping must respect the rooting areas of retained trees. Removal of spoil and the import of materials should be outside the specified RPAs.

5.12.2 If extensive works need to be undertaken within the RPA, hand tools only will be permitted in this area.

5.12.3 Any replacement planting must be in accordance with **BS8454:2014 Trees: from nursery to independence in the landscape - Recommendations**. There must also be a maintenance and aftercare program to ensure the newly planted trees become established.

5.13 Responsibilities

5.13.1 It will be the responsibility of the main contractor to ensure that any planning conditions attached to planning consent are adhered to at all times and that a monitoring regime in regards to tree protection is adopted on site.

5.13.2 The main contractor will be responsible for contacting the Local Planning Authority (LPA) at any time issues are raised related to the trees on site.

5.13.3 If at any time pruning works are required permission must be sought from the LPA first and then carried out in accordance with BS3998:2010 Tree works - recommendations

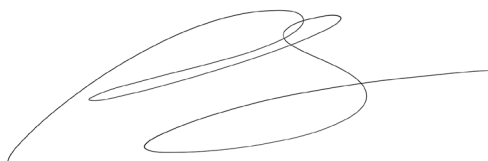
5.13.4 The main contractor will ensure the build sequence is appropriate to ensure that no damage occurs to the trees during the construction processes. Protective fences will remain in position until completion of ALL construction works on the site.

5.13.5 The fencing and signs must be maintained in position at all times and checked on a regular basis by an onsite person designated that responsibility.

5.14 Arboricultural Monitoring and Supervision

5.14.1 It is recommended a number of short inspections of the subject trees should be undertaken by a consultant arboriculturist familiar with **BS5837:2012** operations during the extent of the project. This inspection will ascertain the extent, if any, of stress and damage caused by construction works within the RPAs and to ensure the protection measures are still suitably in place.

5.14.2 Any works undertaken within the RPA should be supervised by the Project Arboriculturalist.



Phil Johnson
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APPENDIX A: TREE SURVEY SCHEDULE

Tag Number	Tree Species	Height (m)	Number of Stems	Stem or Base ø (mm)	Crown Clearance	N - Radius (m)	S - Radius (m)	E - Radius (m)	W - Radius (m)	Age Class	ULE (Years)	Tree Condition	Work Recommendations	Category	Root Protection Radius (m)	Root Protection Area (m ²)
T1	Elder (<i>Sambucus nigra</i>)	5	5	150	1	2	2	2	2	EM	40+	Tree growing through boundary fence.	No work required.	C1	4.02	50.78
T2	Hawthorn (<i>Crataegus monoqyna</i>)	5	5	100	2	2	2	2	2	EM	40+	Growing through fence.	No work required.	C1	2.69	22.74
T3	Large-leaved Lime (<i>Tilia platyphyllos</i>)	12	1	500	2	6	7	7	3	EM	40+	Included bark present in fork. Low branches over road/footpath. Branches restricting highway light.	Crown lift to 3m over footpath. Prune tree clear of road light.	B1	6	113.11
T4	Large-leaved Lime (<i>Tilia platyphyllos</i>)	13	1	330	1	6	3	5	2	EM	40+	Cavity on stem. Low branches over road/footpath. Branches restricting highway light.	Crown lift to 3m. Prune tree clear of road light.	B1	3.96	49.27
T5	Large-leaved Lime (<i>Tilia platyphyllos</i>)	13	1	400	2	5	3	4	5	EM	40+	Epicormics on stem. Low branches over road/footpath.	Crown lift to 3m over footpath.	B1	4.8	72.39
T6	Horse Chestnut (<i>Aesculus hippocastanum</i>)	7	1	300	2	4	2	3	3	SM	<10	Low vitality. Declining. Dieback in crown. Major deadwood in crown.	Remove tree and retain root.	U	3.6	40.72
T7	Large-leaved Lime (<i>Tilia platyphyllos</i>)	13	1	450	3	4	5	6	5	EM	40+	Epicormics on stem. Included bark present in fork.	No work required.	B1	5.4	91.62
T8	Apple (<i>Malus sp.</i>)	7	1	250	2	0	1	3	2	M	10+	Poor shape & form. Leaning South. Ivy on tree. Crown distorted due to group pressure.	No work required.	C1	3	28.28
T9	Apple (<i>Malus sp.</i>)	3	1	200	1	1	4	4	2	M	10+	Poor shape & form. Multiple stems above 1.5m. Crown distorted due to group pressure. Crown grows over fence into site.	No work required.	C3	2.4	18.1
T10	Apple (<i>Malus sp.</i>)	2	1	100	1	1	1	2	2	EM	10+	Poor shape & form. Cavity on stem. Crown distorted due to group pressure.	No work required.	C3	1.2	4.52
T11	Apple (<i>Malus sp.</i>)	8	1	150	3	1	2	2	1	EM	10+	Poor shape & form. Crown distorted due to group pressure.	No work required.	C1	1.8	10.18
T12	Apple (<i>Malus sp.</i>)	5	1	200	2	1	3	4	2	EM	10+	Poor shape & form. Crown distorted due to group pressure.	No work required.	C3	2.4	18.1

Tag Number	Tree Species	Height (m)	Number of Stems	Stem or Base ø (mm)	Crown Clearance	N - Radius (m)	S - Radius (m)	E - Radius (m)	W - Radius (m)	Age Class	ULE (Years)	Tree Condition	Work Recommendations	Category	Root Protection Radius (m)	Root Protection Area (m ²)
T13	Apple (<i>Malus sp.</i>)	3	1	100	1	2	2	4	2	EM	10+	Poor shape & form. Crown distorted due to group pressure.	No work required.	C3	1.2	4.52
T14	Large-leaved Lime (<i>Tilia platyphyllos</i>)	11	1	260	2	1	3	5	4	EM	40+	Crown distorted due to group pressure.	No work required.	B1	3.12	30.59
T15	Large-leaved Lime (<i>Tilia platyphyllos</i>)	12	1	430	1	5	5	5	5	EM	40+	No significant visible defects.	No work required.	B1	5.16	83.66
T16	Apple (<i>Malus sp.</i>)	7	1	350	1	3	4	5	3	M	40+	Dead. Crown distorted due to group pressure.	No work required.	B1	4.2	55.42
T17	Common Alder (<i>Alnus glutinosa</i>)	7	1	100	4	1	1	2	2	Y	20+	Poor shape & form. Crown distorted due to group pressure.	No work required.	C1	1.2	4.52
T18	Common Alder (<i>Alnus glutinosa</i>)	7	1	100	3	1	3	3	2	Y	20+	Poor shape & form.	No work required.	C1	1.2	4.52
T19	Horse Chestnut (<i>Aesculus hippocastanum</i>)	9	1	400	2	4	4	6	4	EM	10+	Dieback in crown. Crown distorted due to group pressure. Leaf miner, canker and fungal infection present.	No work required.	C1	4.8	72.39
T20	Field Maple (<i>Acer campestre</i>)	4	2	150	1	2	2	1	2	SM	20+	Unbalanced crown shape.	No work required.	C1	2.54	20.27
T21	Large-leaved Lime (<i>Tilia platyphyllos</i>)	13	1	450	1	6	5	6	7	EM	40+	No significant visible defects.	No work required.	B1	5.4	91.62
T22	Large-leaved Lime (<i>Tilia platyphyllos</i>)	11	1	150	2	1	4	4	1	SM	40+	Crown distorted due to group pressure.	No work required.	C1	1.8	10.18
T23	Apple (<i>Malus sp.</i>)	5	2	100	1	2	2	2	2	SM	10+	Crown distorted due to group pressure.	No work required.	C1	1.69	8.97
T24	Field Maple (<i>Acer campestre</i>)	10	1	250	2	4	4	3	3	SM	40+	Crown distorted due to group pressure.	No work required.	B1	3	28.28
T25	Field Maple (<i>Acer campestre</i>)	11	1	300	1	5	4	2	4	SM	40+	Crown distorted due to group pressure.	No work required.	B1	3.6	40.72
T26	Horse Chestnut (<i>Aesculus hippocastanum</i>)	9	1	200	2	2	2	2	2	SM	<10	Dead.	Remove tree and retain root.	U	2.4	18.1

Tag Number	Tree Species	Height (m)	Number of Stems	Stem or Base ø (mm)	Crown Clearance	N - Radius (m)	S - Radius (m)	E - Radius (m)	W - Radius (m)	Age Class	ULE (Years)	Tree Condition	Work Recommendations	Category	Root Protection Radius (m)	Root Protection Area (m ²)
T27	Horse Chestnut (<i>Aesculus hippocastanum</i>)	8	1	300	1	3	3	3	3	SM	10+	Low vitality. Declining.	No work required.	C1	3.6	40.72
T28	Large-leaved Lime (<i>Tilia platyphyllos</i>)	9	1	350	2	4	4	3	4	SM	40+	Epicormics on stem.	No work required.	B1	4.2	55.42
T29	Large-leaved Lime (<i>Tilia platyphyllos</i>)	9	1	270	1	3	3	3	3	SM	40+	Epicormics on stem. Crown distorted due to group pressure.	No work required.	B1	3.24	32.98
T30	Large-leaved Lime (<i>Tilia platyphyllos</i>)	9	1	300	1	5	3	5	5	SM	40+	Crown distorted due to group pressure.	No work required.	B1	3.6	40.72
T31	Rowan (<i>Sorbus aucuparia</i>)	4	1	100	1	1	1	1	1	Y	<10	Low vitality. Major bark wounding on stem.	Remove tree and retain root.	U	1.2	4.52
T32	Large-leaved Lime (<i>Tilia platyphyllos</i>)	9	4	150	1	4	4	4	4	SM	20+	Stem divides at ground level. Included bark present in fork.	No work required.	B1	3.6	40.72
G33	Apple (<i>Malus sp.</i>)	5	1	200	1	5	5	5	5	EM	40+	Group of 6no apple trees.	No work required.	B3	2.4	18.1
H34	Hawthorn (<i>Crataegus monogyna</i>)	3	1	100	0	2	2	2	2	EM	40+	Boundary hedge of Ash, bramble and hawthorn.	No work required.	B3	1.2	4.52
T35	Ash (<i>Fraxinus excelsior</i>)	9	1	200	2	3	3	3	3	SM	10+	Unable to inspect stem due to Ivy.	No work required.	C1	2.4	18.1
T36	Ash (<i>Fraxinus excelsior</i>)	5	1	100	1	2	2	2	2	SM	10+	Growing in hedgerow.	No work required.	C1	1.2	4.52
T37	Ash (<i>Fraxinus excelsior</i>)	6	10	100	1	3	3	3	3	SM	10+	Multiple stems at ground level.	No work required.	C1	3.79	45.13
T38	Ash (<i>Fraxinus excelsior</i>)	6	10	100	1	3	3	3	3	SM	10+	Multiple stems at ground level.Growing in hedgerow.	No work required.	C1	3.79	45.13
G39	English Elm (<i>Ulmus procera</i>)	6	10	100	1	3	3	3	3	EM	<10	Group of dead elms.	No work required.	U	3.79	45.13
H40	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
H41	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
H42	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
H43	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13

Tag Number	Tree Species	Height (m)	Number of Stems	Stem or Base ø (mm)	Crown Clearance	N - Radius (m)	S - Radius (m)	E - Radius (m)	W - Radius (m)	Age Class	ULE (Years)	Tree Condition	Work Recommendations	Category	Root Protection Radius (m)	Root Protection Area (m ²)
T44	Common Oak (<i>Quercus robur</i>)	16	1	1200	5	9	9	9	9	M	40+	Major deadwood in crown.	No work required.	A1	14.4	651.53
T45	Common Oak (<i>Quercus robur</i>)	15	1	800	2	8	8	8	6	M	40+	Minor deadwood in crown.	No work required.	B1	9.6	289.57
T46	English Elm (<i>Ulmus procera</i>)	10	1	200	0	2	2	2	2	EM	<10	Dead.	Remove tree and retain root.	U	2.4	18.1
H47	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
H48	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
T49	Field Maple (<i>Acer campestre</i>)	8	1	300	3	4	4	4	4	SM	40+	Off site.	No work required.	B1	3.6	40.72
T50	Field Maple (<i>Acer campestre</i>)	8	1	300	1	4	4	4	4	SM	40+	Off site.	No work required.	B1	3.6	40.72
H51	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
T52	Field Maple (<i>Acer campestre</i>)	8	10	150	2	4	4	4	4	SM	40+	Growing in hedgerow.	No work required.	B3	5.69	101.73
T53	Hawthorn (<i>Crataegus monogyna</i>)	7	1	250	1	3	3	3	3	M	40+	No significant visible defects.	No work required.	B1	3	28.28
H54	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
T55	Hornbeam (<i>Carpinus betulus</i>)	9	1	200	3	4	4	4	4	SM	40+	Off site.	No work required.	B1	2.4	18.1
T56	Ash (<i>Fraxinus excelsior</i>)	10	1	300	3	4	4	4	4	SM	10+		No work required.	C1	3.6	40.72
T57	Ash (<i>Fraxinus excelsior</i>)	16	1	500	4	7	7	7	7	EM	10+	Off site.	No work required.	C1	6	113.11
T58	Ash (<i>Fraxinus excelsior</i>)	8	1	300	2	3	3	3	3	SM	10+	Off site.	No work required.	C1	3.6	40.72
T59	White Willow (<i>Salix alba</i>)	12	1	300	2	4	4	4	4	SM	40+	Off site in private residence rear garden. No one home at time of survey.	None	B1	3.6	40.72
T60	White Willow (<i>Salix alba</i>)	9	1	300	2	5	5	5	5	SM	40+	Off site in rear garden.	None	B1	3.6	40.72

Tag Number	Tree Species	Height (m)	Number of Stems	Stem or Base ø (mm)	Crown Clearance	N - Radius (m)	S - Radius (m)	E - Radius (m)	W - Radius (m)	Age Class	ULE (Years)	Tree Condition	Work Recommendations	Category	Root Protection Radius (m)	Root Protection Area (m ²)
T61	Rowan (<i>Sorbus aucuparia</i>)	5	1	150	1	2	2	2	2	Y	40+	Off site.	No work required.	C1	1.8	10.18
T62	Ash (<i>Fraxinus excelsior</i>)	12	1	300	3	4	4	4	4	SM	10+	Off site.	No work required.	C1	3.6	40.72
G63	Hawthorn (<i>Crataegus monogyna</i>)	3	1	100	0	6	6	6	6	SM	40+	Patch of scrubland with bramble and thorn.	None.	C3	1.2	4.52
T64	Common Oak (<i>Quercus robur</i>)	17	1	1100	2	5	7	9	7	M	40+	No significant visible defects.	No work required.	A1	13.2	547.46
T65	Ash (<i>Fraxinus excelsior</i>)	5	2	100	3	2	2	2	2	Y	10+	Major bark wounding on stem.	None.	U	1.69	8.97
H66	Hawthorn (<i>Crataegus monogyna</i>)	6	10	100	0	2	2	2	2	SM		Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
G67	Beech (<i>Fagus sylvatica</i>)	8	3	200	3	3	3	3	3	SM	40+	Off site in rear garden.	No work required.	B3	4.15	54.11
T68	Ash (<i>Fraxinus excelsior</i>)	8	4	150	2	4	4	4	4	SM	10+	Off site.	No work required.	C1	3.6	40.72
T69	Ash (<i>Fraxinus excelsior</i>)	11	1	600	4	5	5	5	5	EM	10+	Off site.	None	C1	7.2	162.88
T70	Lombardy Poplar (<i>Populus nigra</i> 'Italica')	18	1	700	3	3	3	3	3	EM	40+	Off site.	No work required.	B1	8.4	221.7
T71	Ash (<i>Fraxinus excelsior</i>)	9	3	250	3	4	4	4	4	EM	10+	Off site.	None	C1	5.2	84.96
T72	Ash (<i>Fraxinus excelsior</i>)	9	1	450	3	3	3	3	3	EM	10+	Off site.	None.	C1	5.4	91.62
T73	Apple (<i>Malus</i> sp.)	6	1	250	2	3	3	3	3	M	20+	Off site.	None.	B1	3	28.28
H74	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
H75	Hawthorn (<i>Crataegus monogyna</i>)	5	10	150	1	2	2	2	2	EM	40+	Mixed boundary trees of ash, thorn and elder.	None.	B3	5.69	101.73
H76	Hawthorn (<i>Crataegus monogyna</i>)	3	10	100	1	2	2	2	2	SM	20+	Mixed hedge of dead elms, thorn and bramble.	No work required.	B3	3.79	45.13
W77	Field Maple (<i>Acer campestre</i>)	10	10	250	2	6	6	6	6	EM	40+	Woodland group outside site boundary.	None.	B3	9.49	282.97

Tree Schedule - KEY

Tree Number	Height (metres)	Crown Clearance (metres)	SULE (Years)
Trees are tagged with metal tags where feasible. Where this has not been feasible, or desirable tree numbers relate to those marked on the Tree Constraints Plan and Tree Protection Plan drawings	All heights are estimated. Where feasible height estimation is carried out with the aid of a clinometer or similar device.	Distance above ground level of crown periphery to inform access beneath crowns.	Safe Useful Life Expectancy. Anticipated future contribution to amenity.
Single or Group	Number of Stems	Crown Spread Radius – N, S, E, W (metres)	Notes and Recommendations
One tree in a group may be tagged to identify trees of a relatively uniform arboricultural or landscape feature.	1 indicates single stem, >1 indicates multi-stemmed tree.	The crown radius from bole to crown limit identified at four cardinal points. This will allow presentation of above ground constraints on Tree Constraints Plan. Measurements are approximate and depend on clear access about crown.	Tree structural condition. Site notes/description. Long term management recommendations.
Number in Group	Stem or base diameter (metres)	Age Class	Immediate Recommendations
Number of trees (irrespective of species) within a group.	Stems are measured in accordance with BS5837:2012. Stem diameters are measured at 1.5m with a diameter tape or calipers. All measurements are rounded down to the nearest cm. All measurements in bold are estimates either due to restricted access or climbing plant growth about the stem.	Young, Semi-Mature, Mature, Ancient, Veteran.	Remedial tree works required to manage risks requiring attention within six months.
Species		Physiological Condition	Category
Scientific name. Groups – scientific names together with number of this species within group.		Good, Fair, Poor, Dead.	BS5837-2012 A - High quality B - Moderate quality C - Low quality U - Unsuitable for retention*

APPENDIX B: TREE CONSTRAINTS PLAN

APPENDIX C: ARBORICULTURAL IMPACT ASSESSMENT



Symbol Guide

Category — Crown Spread
Root Protection Area — Tree Number
Category

NOTE: Tree group numbers marked with an * have approximate locations.

BS5837:2012 - Tree Category

Category A Trees High Quality	Category C Trees Low Quality
Category B Trees Moderate Quality	Category U Trees Poor Quality/Remove

NOTE: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

GREENMAN
Environmental Management

Project Name:
WHBP Linden

Drawing Title:
Arbicultural Impact Assessment

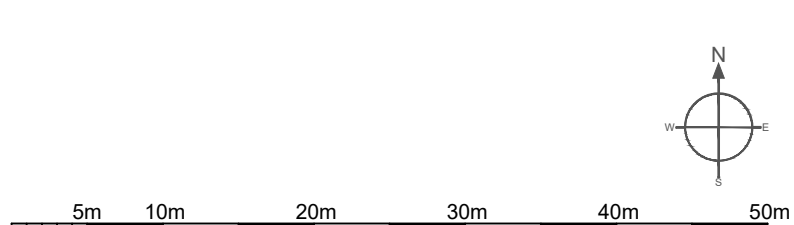
Drawing Number:
200420-WHBPL-AIA-Rev A-AM

Client:
-

Agent:
-

Date:
April 2020

Scale:
1:500@A0



APPENDIX D: TREE PROTECTION PLAN

Greenman Environmental Management

Heather Farm, Lansdown Lane, Bath, BA1 4NA

E: info@gmem.org.uk Tel: 01225 466 663

Tree Protection Plan

SCALE :

1 : 2500 @ A4

DATE :

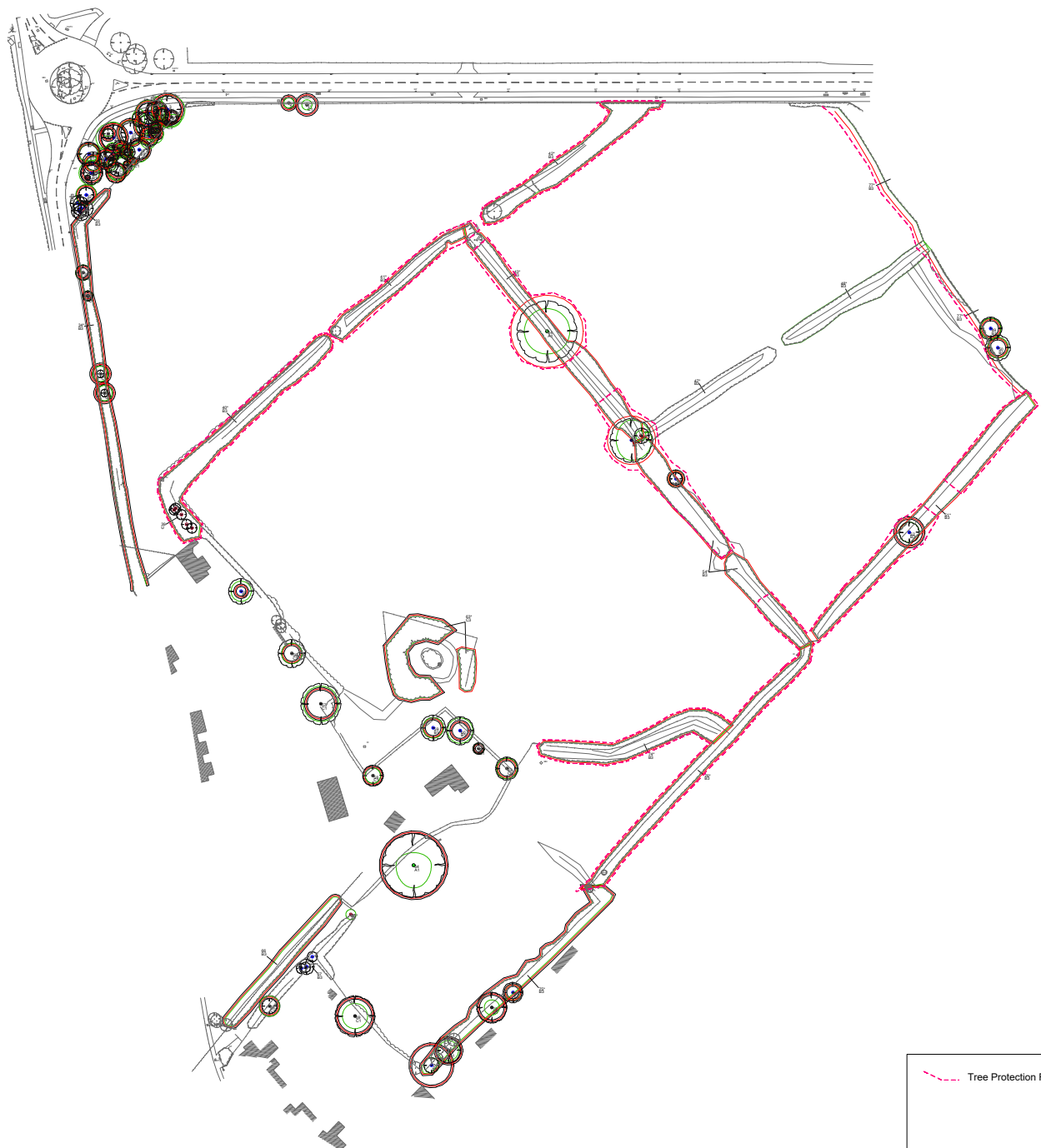
20/04/2020



MAP FILENAME :

WHBP_TPP_PJ_v3

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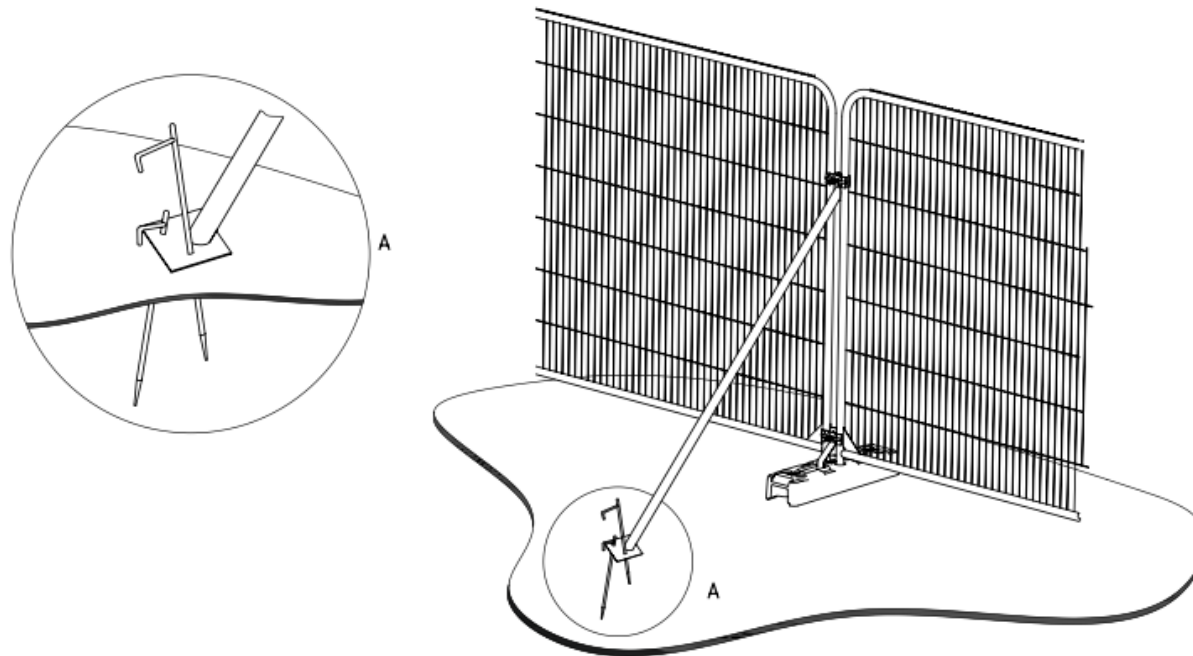
Tree Protection Fencing

APPENDIX E: CATEGORY RATINGS (CASCADE CHART)

Category & definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention				
Category U Trees in such a condition that they cannot realistically be retained as living trees in the context of current land use for >10 yrs	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees - Trees that are dead or showing signs of significant, immediate and irreversible decline - Trees infected with significant pathogens affecting health or safety, or very low quality trees suppressing trees of better quality <i>NOTE: these trees can have existing or potential conservation value making retention desirable</i>			DARK RED
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values incl conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of >40 yrs	Particularly good examples of their species, esp if rare or unusual. Those that are essential components of groups or formal or semi-formal arboricultural features	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	LIGHT GREEN
Category B Trees of moderate quality with an estimated remaining life expectancy of >20 yrs	Trees that might be included in category A but are downgraded because of impaired condition such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit 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. Trees occurring as collectives but situated so as to make little visual contribution to the area.	Trees with material conservation or other cultural value	MID BLUE
Category C Trees of low quality with an estimated remaining life expectancy of >10 years, or young trees with a stem diameter <150mm	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 landscape benefits.	Trees with no material conservation or other cultural value.	GREY

APPENDIX F: TREE PROTECTION FENCING

APPENDIX F: TREE PROTECTION FENCING (SOURCE: BS5837:2012)



a) Stabilizer strut with base plate secured with ground pins

APPENDIX G: TREE PROTECTION SIGNAGE

APPENDIX G: TREE PROTECTION FENCING SIGNAGE



References

1. BS5837:2012. *Trees in relation to design, demolition and construction – Recommendations*. Published by BSI Standards Ltd.
2. BS3998 2010 *Tree Work - Recommendations*. Published by BSI Standards Ltd.
3. Urban, J., (2008). *Up By Roots. Healthy Soils and Trees in the Built Environment*. Published by the International Society of Arboriculture.
4. BS8454:2014 *Trees: from nursery to independence in the landscape - Recommendations*. Published by BSI Standards Ltd

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