

ARBORICULTURAL REPORT

Land at Wings Nursery, Lidsey
Road, Woodgate

Prepared by

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January 2021



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Beechdown ref: B/0300/21

Wings Nursery – BS 5837 tree survey/report – January 2021

SUMMARY

- **The quality of 36 trees within influence of a development proposal was assessed.**
- **An arboricultural impact assessment of the development proposal was prepared.**
- **The proposal is the construction of 81 new dwellings with associated access, drainage, open space and landscaping requirements.**

1.0 INTRODUCTION

1.1 I have received instruction from Thakeham Client Limited, on behalf of Southern Housing Group Limited, to provide arboricultural consultancy services in relation to a development proposal at Wings Nursery, Lidsey Road, Woodgate, Chichester PO20 3SU.

1.2 The purpose of the instruction was to:

- **Assess the quality of any trees that could be affected by the proposed development.**
- **Prepare an arboricultural impact assessment evaluating the effects of the development proposal.**
- **Prepare a method statement and tree protection plan.**

1.3 The survey was conducted and the report prepared with reference to the guidelines detailed in BS 5837:2012 "Trees in relation to design, demolition and construction – Recommendations" and according to good arboricultural practice.

1.4 Contents of the report are exclusively for the use of Thakeham Client Limited, on behalf of Southern Housing Group Limited; liability does not extend to any third party without our written consent.

2.0 DOCUMENTS PROVIDED

2.1 Plans provided by MH Architects.

19-121 0003 Rev.1

Proposed block plan

1:500@A1

3.0 SURVEY FORMAT

- 3.1 Trees included in the survey were individuals or groups with a stem diameter, at 1.5m high, greater than 75mm. The trees were inspected from the ground only and no specialist decay detection was undertaken. Trees were assessed from within the site or from public areas.
- 3.2 The tree identification numbers used are for the purpose of this report and may not reflect numbering used in previous surveys or Tree Preservation Orders.
- 3.3 Data was recorded on a handheld computer, the trees plotted via GPS and their positions marked on the 1:1250 @ A4 tree survey plan (Appendix 4).
- 3.4 A detailed tree survey sheet is shown at Appendix 1 with an explanation of the terms and categories covered as Appendix 2.
- 3.5 The extent of the survey was limited to collecting sufficient data to inform upon the feasibility of the proposed development, it was not a detailed tree hazard or risk assessment and, unless specified, no guarantee, expressed or implied, can be given regarding the safety of the trees or their suitability for safe long-term retention.

4.0 GRADING CATEGORIES

- 4.1 The quality of the surveyed trees was assessed and they were categorised to reflect the criteria recommended in Table 1 of BS 5837:2012 as detailed at Appendix 3.
- 4.2 The following is a breakdown of the number of trees in each BS category:

Category U	1 tree
Category A	4 trees
Category B	16 trees
Category C	15 trees

5.0 STATUTORY CONTROLS

- 5.1 Consultation with the Local Planning Authority confirmed that the surveyed trees are not within a Conservation Area but that the English oaks T1, T15, T19, T20, T21, T22, T24, T25 and T26 are subject to Tree Preservation Order number **TPO/AL/1/18**.

- 5.2 Under Part 1 of the Wildlife and Countryside Act (1981), with only a few exceptions, it is an offence to intentionally take, damage or destroy the nest of any wild bird while the nest is in use or being built. Bat species are protected under Section 39 of the 1994 Conservation (Natural Habitats etc.) Regulations (as amended), the 1981 Wildlife and Countryside Act (as amended) and the 2000 Countryside and Rights of Way Act. It is illegal to damage or destroy any bat roost, whether occupied or not, or disturb or harm a bat. Further specialist investigation may be required before undertaking any recommended works.

6.0 DEVELOPMENT PROPOSAL

- 6.1 The development proposal is for the construction of 71 new dwellings with associated access, drainage, open space and landscaping requirements.

7.0 SITE DESCRIPTION

- 7.1 The land at Wings Nursery (**Fig.1**) consists of around 2.6 ha of broadly level grounds. The detached two-storey dwelling, glasshouses and an area of hardstanding occupy the south-east corner of the site with the remaining area predominantly rough grassland with localised overgrown areas of nettles, brambles and thistles. Access to the site is via farm gates from Lidsey Road at the north-east and south-east corners with a third entrance immediately to the south of Wings. A 1.2m high stock-proof fence extends along the north, west and south boundaries with a post and rail fence along the southern section of the eastern boundary.
- 7.2 The wider landscape is semi-rural with individual trees or small groups as roadside planting, in domestic settings and hedgerows.
- 7.3 The site geology is London Clay Formation clay, silt and sand sedimentary bedrock while the superficial geology is described by the National Soils Resources Institute as a loamy soil with naturally high groundwater. No detailed analysis of the soil structure, composition or pH was undertaken and details from this report should **not** be used for calculating foundation depth. Foundation depth should be determined by the architect or a structural engineer and with reference to NHBC Chapter 4.2 – Building near trees.



Fig. 1– Image courtesy of Google Maps (map data © 2020 Google)

8.0 TREE SURVEY

8.1 Surveyed trees consisted of 26 within the site and 10 beyond the site perimeter. Leyland cypress hedges, marked as Group 1 and 2 on the survey plan, were recorded and are detailed below. Trees and hedgerows too small to be recorded or beyond influence of the site included a small group of coppiced field maple, elder and grey willow between T20 and T21 and a hedgerow of ivy-covered field maple, hawthorn, blackthorn and elder in the grounds of Stockhearn and Stockhearn House to the south.

- ♦ **Group 1 (category C)** – Leyland cypress hedge; height 8m; 4m-5m wide; average stem ø 150mm.
- ♦ **Group 2 (category C)** – Leyland cypress hedge; height 4-5m; 4m-5m wide; average stem ø 200mm.

9.0 TREE APPRAISAL

9.1 Individual tree details and comments are listed in the appended BS 5837 survey schedule. Details of the trees that I consider require further explanation or comment are noted below.

- **T1 to T11 (mixed category U, B and C)** – trees recorded included oak, ash, hawthorn and coppiced hazel amongst a mixed species native hedgerow of 4m-6m tall coppiced hazel, hawthorn, field maple and elder in dense bramble cover on both sides of the ditch. Maintenance of the mixed hedgerow has lapsed with partially collapsed trees identified and low branches extending across the grass verge towards the pavement.
- **T16 to T24 (mixed category A, B and C)** – a linear group of well-spaced mature oak, two Lombardy poplar and one small coppiced goat willow. One dead tree to the north of T18 was noted but the trees are beyond the western boundary and their management is the responsibility of others.
- **T21 (category B)** – a mature English oak with veteran characteristics. Extensive heartwood decay was identified but failure of the tree represents a low risk at present. The tree is prominent within the site and careful pruning may allow its long-term retention as a relatively low risk tree with good habitat potential.

10.0 BELOW GROUND CONSTRAINTS – ROOT PROTECTION AREA (RPA)

- 10.1 Section 3.7 of BS 5837: 2012 states that – *“The Root Protection Area (RPA) is a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. ”*
- 10.2 The RPA calculations have been produced using the information gathered from the tree survey and section 4.6.1 of BS 5837:2012. This indicates the RPA in m² and the minimum required all round radial distances for rooting zone protection and allows a view to be taken as to whether the trees can be retained safely without undue damage to their root systems. The RPA calculations are detailed in the appended tree survey and the initial dimensions marked on the 1:1250 @ A4 RPA and shade plan (**Appendix 5**).
- 10.3 Tree root morphology can be affected by numerous factors; availability of water, aeration, soil type, temperature and structure, compacted or impervious surfaces and proximity to buildings and other structures all affect the way roots develop and although the RPAs are marked on the plan as uniform polygons the actual root systems will be far more irregular. Root mapping or hand excavation under arboricultural supervision could determine whether significant roots extend beyond the RPAs and require greater protection in relation to construction or whether it may be possible to develop within the RPA without a negative impact on the rooting environment.
- 10.4 The majority of the recorded trees are growing in unsurfaced ground and I think it unlikely that their nominal RPAs vary hugely from those indicated at **Appendix 5**; however, proximity of the English oaks (T25 & T26) to the access drive to Willows means their rooting pattern is likely to be more extensive in the open ground to the north. The extent of existing hard-surfacing at the base of the English oaks (T1 & T15), shown in purple at **Fig. 2** below, will have had some impact on root morphology but while the impervious surface will reduce rainfall infiltration and limit available water, it is possible that condensation of moisture, due to temperature differentiation, on the underside of the asphalt has allowed the development of fine moisture-absorbing roots so the nominal RPA depicted is probably a reasonable representation.

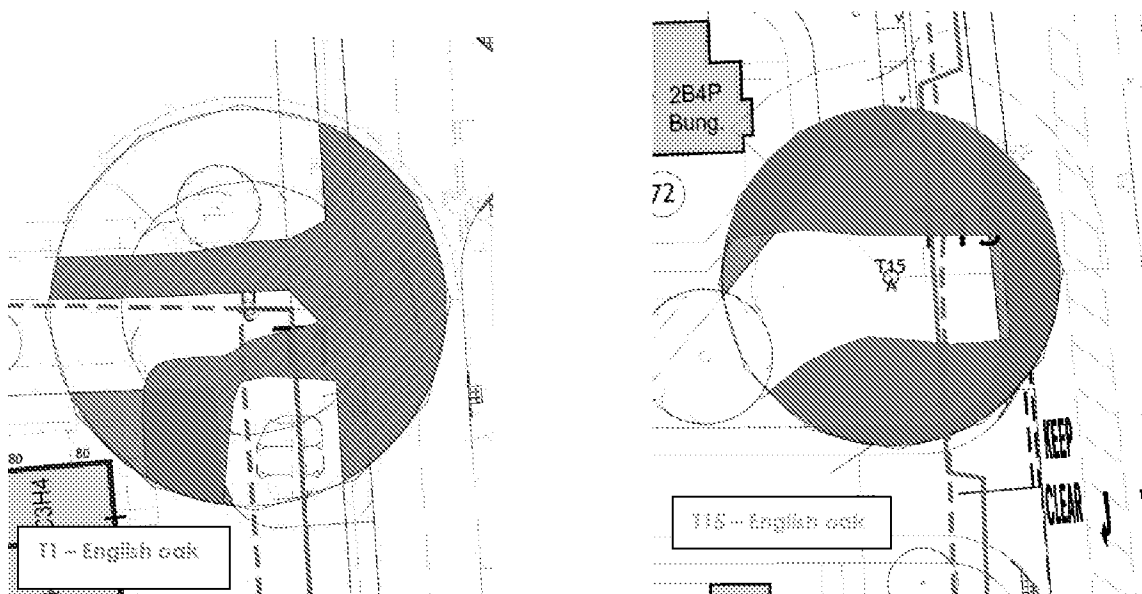


Fig.2 – Existing hard-surfacing within RPA shown in purple

11.0 ABOVE GROUND CONSTRAINTS

11.1 Consideration should be given to the effects that the current tree size, future growth potential, shade levels and leaf and fruit nuisance may have on the proposed development. Tree height and crown spread measurements are detailed in the appended tree survey; the crown spread of the trees and the shadow pattern through the main part of the day is indicated on the 1:1250 @ A4 RPA and shade plan (Appendix 5).

12.0 COMMENT

12.1 The 1:1250 @ A4 development proposal plan (Appendix 6) shows that implementation of the development takes place beyond the RPA of the mature English oak (T21), in the centre of the site, and all third-party trees to the north, south and west of the site.

12.2 Site layout impacts directly on, and will require the removal of, the **Category U** Leyland cypress (T3); **Category C** oak (T2), spruce (T27), Lawson cypress (T32), holly (T33) and western red cedar (T36); and **Category B** ash (T4), oaks (T12&T13), cedar (T30), and gum (T34). Development will also require the removal of the **Category C** Leyland cypress hedges recorded as Group 1 and Group 2.

12.3 The majority of the recorded roadside trees, and dense understorey of bramble-covered hazel, hawthorn and elder, between the English oaks (T1&T15), shown at **Fig. 3** below, are not directly affected by the development proposal; however, management of this group has lapsed and while it currently provides good habitat and screening,

work to clear and improve the ditches/culverts and accessibility to pavements and verges will result in the loss of the majority of the low-level cover and retention of just individual trees of relatively poor form with increased exposure and greater potential for failure.



Fig. 3 – Image courtesy of Google Maps (map data © 2020 Google)

- 12.4 Construction of the private driveway and parking spaces to plot 71 impacts on around 3% of the unsurfaced RPA of the English oak (T1), shown in orange at **Fig. 2**, while proposed pedestrian access, also shown in orange at **Fig.2** extends over just 2% of T15's RPA. The southern end of the proposed access drive also extends into the RPA of T15 but only into existing hard-surfaces.

13.0 CONCLUSION

- 13.1 With appropriate precautionary measures I consider the development proposal at Wings Nursery is feasible, in relation to the surveyed trees, for the following reasons:

- ◆ **Although initial losses of some of the roadside trees and low-level cover between the English oaks (T1 & T15), the eucalyptus (T34), conifer hedges and smaller ornamentals around the dwelling at Wings will have an immediate impact on the arboricultural characteristics of the site, a planting scheme that incorporates mixed native-species hedging and individual standards throughout the site, rather than limited to the north-east corner, and managed carefully will result in a greater level of tree cover.**

• I believe that site layout will have a minimal impact on T1 and that ultimately an increase in unsurfaced ground within the RPA of T15, along with the use of no-dig surfacing for footpath construction, means that protective measures, supervision and monitoring will be effective in preventing a negative impact on the RPA.
• I do not consider the current or future growth of the retained trees to have a detrimental impact on the development proposal or to lead to future pressure for removal or unsympathetic pruning; however, regular inspections to assess the structural integrity of the English oak (T21) should be undertaken to determine the risk it poses and advise on management.
• The use of protective barriers, precautionary measures and arboricultural supervision and monitoring will prevent damage and potentially negative effects on the current and long-term health of the trees.

14.0 DETAILS

- 14.1 Date of survey - 17th March 2020
- 14.2 Present at site visits - Jonathan Rodwell Cert Arb L4(ABC);TechArborA
- 14.3 Date of report - 22nd January 2021
- 14.4 Contact details:

CONTACT	NAME	DETAILS
Local Planning Authority	Arun District Council	Tel - 01903 737756 Email – Planning@arun.gov.uk
Architects	MHA	Tel - 01243 774748 Email – admin@mharchitects.co.uk
Arboricultural Consultants	Beechdown Arboriculture Ltd	Tel – 01243 814740 Email – jonathan.rodwell@beechdown.com

References

Roberts, J. Jackson, N. Smith, M. (2006). *Tree Roots in the Built Environment*. The Stationery Office

BSI British Standards (2012) *BS 5837:2012 Trees in relation to demolition and construction – Recommendations, Fourth (Present) Edition*. BSI

Barrell Tree Consultancy (2018) *Manual for managing trees on development sites v2.1 – site guidance notes 2: Fencing protected trees, 4: Pollution control, 8: Removing surfacing & structures in root protection areas, 9: Installing and upgrading surfacing in root protection areas, 11: Installing services in root protection areas*

Jonathan Rodwell Cert Arb L4(ABC); TechArborA
Beechdown Arboriculture Ltd

20th January 2021

ARBORICULTURAL METHOD STATEMENT

The arboricultural method statement includes the following plans:

Appendix 7	1:1250@A4	Tree protection plan showing position of: • protective barriers. • trees to be retained with a continuous outline. • Trees to be removed with a broken outline.
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15.0 PROTECTIVE BARRIERS AND CONSTRUCTION EXCLUSION ZONE.

- 15.1 Prior to the commencement of construction work and before any machinery or materials are brought onto the site, protective barriers, marked as a light purple dotted line on the tree protection plan (Appendix 7), must be erected, around the vulnerable Root Protection Area (RPA) to create a construction exclusion zone beyond the working area.
- 15.2 The construction exclusion zone, shown as light green horizontal hatching on the tree protection plan, will be afforded protection at all times during the development process; strictly no access, construction activities, mixing materials or storage will be allowed.
- 15.3 The barriers will have weather proof signs attached stating that it is protecting a **construction exclusion zone** and that **no works are permitted** beyond the barrier; the protective barrier should remain in place for the duration of the development process.
- 15.4 The protective barriers should be positioned in accordance with the tree protection plan (Appendix 7) and would typically be constructed as per figure 2 of BS 5837:2012 (shown at Appendix 8) and consist of a vertical and horizontal scaffold framework, well braced to resist impacts. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground. Onto this, weld mesh panels should be fixed with wire or scaffold clamps.
- 15.5 In this case it is proposed that the protective barriers, along with site security fencing, will be weld mesh panels fitted securely to concreted vertical wooden posts (**Fig. 4**) – which I consider to be an appropriate alternative to the above. While the existing hard-surfacing around the English oaks (T1&T15) remains *in situ* above ground stabilising using struts mounted on a block tray, constructed as per figure 3 b) of BS 5837:2012 may be used.



Fig. 4 – alternative protective barriers.

15.6 Site guidance notes 2: *Fencing protected trees* provided by Barrell Tree Consultancy and shown at Appendix 11 details methods for tree protection on construction sites.

16.0 DEMOLITION

16.1 Demolition of the existing dwelling at Wings and removal of the areas of hard-standing will take place in two stages. The dwelling will be demolished first with all hard surfaces within RPAs retained as ground protection.

16.2 Demolition of the dwelling will take place from beyond the vulnerable RPA and construction exclusion zone.

16.3 Arboricultural supervision of the demolition process will manage any risk of damage to the trees. If the demolition is undertaken during the summer months it may be necessary to hose down the trees if there is an accumulation of dust on the foliage.

16.4 Removal of the hard-standing should wait until there is no further need for ground protection during site activity. Where tree roots may be present the removal should be undertaken using hand tools or plant,

under arboricultural supervision, working backwards and using the remaining hardstanding as ground protection.

- 16.5 Site guidance notes 8: *Removing surfacing & structures in root protection areas* provided by Barrell Tree Consultancy and shown at **Appendix 11** outlines different techniques for safely removing structures and surfaces within root protection areas.

17.0 FOUNDATION CONSTRUCTION

- 17.1 Foundation depth should be determined by the architect or a structural engineer and with reference to NHBC Chapter 4.2 – Building near trees.
- 17.2 Excavation and construction of foundations takes place beyond the RPA of any retained trees and should not require arboricultural supervision; however, if roots are encountered during excavation -
- ✦ Careful use of hand tools will avoid bark damage of retained roots at the edge of the foundation if present;
 - ✦ exposed roots or fibrous root masses that are to be retained should be immediately covered – with hessian or similar - to prevent drying;
 - ✦ individual roots less than 25mm diameter that need to be removed should be cleanly severed, with secateurs or a pruning saw, far enough back from the edge of the foundation (>100mm) that the effects of uncured cement do not impact tree health;
 - ✦ the project arboriculturalist will determine whether it is possible to sever roots greater than 25mm diameter or whether the pad should be repositioned;
 - ✦ use of impermeable membranes to line the excavations before the concrete is poured will help prevent damage by the alkaline properties of cement.

18.0 CONSTRUCTION OF PEDESTRIAN ACCESS WITHIN RPA

- 18.1 Further investigation will determine whether construction of the short sections of pedestrian access/path extending through the unsurfaced RPA of **T15** and **T21** will require a no-dig construction.
- 18.2 If significant root development is encountered a no-dig specification with a porous and permeable base layer and surface finish should be used. **Appendix 12** provides a detailed installation guide for the Geoweb® tree root protection no-dig Three-Dimensional Cellular Confinement System as summarised below:
- ✦ Existing surface vegetation to be removed by hand or treated with herbicide as agreed with Local Planning Authority (LPA).

- ✦ Create a level subgrade by filling any hollows with permeable material, i.e. clean stone or sharp sand rather than removing or grading humps that may contain roots.
- ✦ To help prevent pollution contamination of the RPA a non-woven geotextile should be laid on the level subgrade.
- ✦ The new access across common land will be formed from single Geoweb panels (6.6m x 2.6m) placed on the geotextile and joined end to end.
- ✦ The Geoweb panels will be filled with porous, no-fines 4-20mm clean angular stone and using the already filled panels as the working platform.
- ✦ Pinned sleepers, gabions or non-invasive haunch kerbing may provide suitable edging.
- ✦ The finished surface must be permeable to moisture penetration and agreed with the LPA.

18.3 Site guidance notes 9: *Installing/upgrading surfacing in root protection areas* provided by Barrell Tree Consultancy and shown at Appendix 11 provides additional generic information.

19.0 INFRASTRUCTURE REQUIREMENTS

19.1 Undisclosed siting of service runs, above ground services, CCTV cameras, electrical sub-stations, refuse stores, lighting and other infrastructure requirements can lead to unnecessary tree pruning or root loss during or post development. Should any infrastructure requirements become necessary post planning their design should be discussed with the project arboriculturalist and, if necessary, the permission of the local planning authority obtained. Further guidance is given at Site guidance notes 11: *Installing services in root protection areas* provided by Barrell Tree Consultancy and shown at Appendix 11.

20.0 ADDITIONAL PRECAUTIONS

- 20.1 No storage or mixing of materials to take place within the construction exclusion zone or in the ground protected RPA.
- 20.2 No storage or mixing of materials will take place in any location where they may leak into the construction exclusion zone or RPA.
- 20.3 Materials which may contaminate the soil will not be discharged within 10m of the tree stems or mixed in any location where gradients allow contaminants to run towards RPAs.
- 20.4 Site guidance note 4: *Pollution control* provided by Barrell Tree Consultancy and shown at Appendix 11 details several methods for

reducing the risk that the mixing, pouring and cleaning of harmful substances may represent to retained trees.

21.0 SUPERVISION AND MONITORING

- 21.1 It will be the responsibility of the main contractor to ensure that any conditions attached to the planning consent are adhered to at all times and that a monitoring regime with regard to tree protection on site is adopted.
- 21.2 An arboriculturalist should be appointed to monitor tree protection measures and address any arboricultural issues that may arise.
- 21.3 The project arboriculturalist should mark the positions of the protective barriers and inspect them once erected and prior to site work commencing.
- 21.4 In addition to the scheduled supervision regular site visits to inspect the protective barriers may be required. Frequency of the visits is dependent on the progress of the development but should take place every two to four weeks of continuous site activity.
- 21.5 A copy of a site visit and arboricultural supervision record is shown at **Appendix 9**.
- 21.6 A copy of an arboricultural monitoring record is shown at **Appendix 10**.
- 21.7 The main contractor will be responsible for ensuring subcontractors comply with the arboricultural method statement and do not undertake any operation that is likely to impact adversely upon any tree on site.
- 21.8 The main contractor will ensure that the build sequence is appropriate to ensure that no damage occurs to the trees during the development process.

22.0 SEQUENCE OF EVENTS

- 22.1 Sequence of tree protection measures in relation to phases of development.

Site meeting	Project arboriculturalist to discuss tree protection measures with architect/developer and local authority arboricultural officer.
Protective barriers	Installation of protective barriers prior to construction.

Monitoring	Arboricultural monitoring every two to four weeks of continuous site activity.
Protective barriers	Removal of protective barriers on completion of development proposal.

- 22.2 Should circumstances arise where unscheduled work may impact upon trees or tree protection the work should cease until the project arboriculturalist has been consulted and the local planning authority arboricultural officer informed.

BS5837:2012 Tree Survey

Beechdown Arboriculture Ltd

Client: Thakeham Client Ltd on behalf of Southern Housing Group Ltd
 Project: Wings Nursery
 Survey Date: 17/03/2020
 Surveyor: Jonathan Rodwell

Club Cottage, Top Road
 Slindon
 Arundel
 West Sussex
 BN18 0RP

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment		
T1												
English oak <i>Quercus robur</i>	15	2	1173 (Eq)	N	6	3	M	A: 622.4 R: 14.07	Fair	C: Poor S: Fair B: Fair	Evidence of historic crown reduction; major deadwood in crown; bark wounds and exposed tissue noted.	C.1.2.3
T2												
English oak <i>Quercus robur</i>	11	1	560	N	4	0.5	M	A: 141.9 R: 6.72	Poor	C: Poor S: Ivy B: Poor		C.2.3 >40 yrs
T3												
Leyland Cypress <i>X Cupressocyparis leylandii</i>	5	1	480	N	0	0	M	A: 104.2 R: 5.75	Decline	C: Poor S: Poor B: Poor	Stump of a felled tree with some low, live branches retained.	U.2 <10 yrs
T4												
Ash <i>Fraxinus excelsior</i>	12	2	347 (Eq)	N	3	5	SM	A: 54.4 R: 4.16	Good	C: Fair S: Ivy B: Fair		B.2 >40 yrs
Age Classifications:	N Y SM	Newly planted Young Semi-mature	EM M OM	Early Mature Mature Over Mature	Condition:		C S B	Crown Stem Basal area	Stems:	Ø Diameter (Eq) Equivalent stem diameter using BS5837:2012 definition	ERC:	Estimated Remaining Contributio

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations			Cat ERC
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment			
T5														
A Group	7	10	253	(Eq)	N	3	0.5	A: 29	Fair	C: Fair				C.2
--					E	5	0.5	R: 3.03		S: Fair	Multi-stemmed group of coppiced hazel and hawthorn.			>40 yrs
					S	4	0.5			B: Fair				
					W	3	0.5							
T6														
Hawthorn	8	10	253	(Eq)	N	4	0.5	M A: 29	Good	C: Fair				C.2
<i>Crataegus monogyna</i>					E	2	0.5	R: 3.03		S: Fair				
					S	1	0.5			B: Fair				
					W	4	0.5							
T7														
Ash	10	1	320		N	2	4	SM A: 46.3	Fair	C: Fair				C.2
<i>Fraxinus excelsior</i>					E	6	4	R: 3.83		S: Fair	Coppiced hazel at base of tree.			20 to 40 yrs
					S	2	6			B: Fair				
					W	1	6							
T8														
Hazel	8	10	221	(Eq)	N	3	0.5	M A: 22.2	Fair	C: Fair				C.2
<i>Corylus avellana</i>					E	4	0.5	R: 2.65		S: Fair				>40 yrs
					S	2	0.5			B: Fair				
					W	1	0.5							
T9														
Hawthorn	5	10	253	(Eq)	N	2	0.5	M A: 29	Fair	C: Poor				C.2
<i>Crataegus monogyna</i>					E	7	0.5	R: 3.03		S: Poor				20 to 40 yrs
					S	1	0.5			B: Fair				
					W	1	0.5							
T10														
Hawthorn	6	3	474	(Eq)	N	4	0.5	Veteran A: 101.6 R: 5.68	Fair	C: Fair				B.1.2.3
<i>Crataegus monogyna</i>					E	4	0.5			S: Ivy				>40 yrs
					S	6	0.5			B: Fair				
					W	5	0.5							
Age Classifications: N Newly planted EM Early Mature Condition: C Crown Y Young M Mature S Stem SM Semi-mature OM Over Mature B Basal area Stems: Ø Diameter (Eq) Equivalent stem diameter using BS5837:2012 definition ERC: Estimated Remaining Contributio														

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC	
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment			
T11														
Ash	13	1	330	N	4	6	M	A: 49.3	Fair	C: Fair			B.1.2	
Fraxinus excelsior				E	4	4		R: 3.96		S: Fair			>40 yrs	
				S	3	4				B: Fair				
				W	4	5								
T12												Estimated Measurements		
English oak	10	1	290	N	3	1	Y	A: 38.1	Good	C: Good			B.1	
Quercus robur				E	3	1		R: 3.48		S: Fair			>40 yrs	
				S	3	1				B: Good				
				W	3	1								
T13														
English oak	8	1	285	N	3	1	Y	A: 36.8	Good	C: Good			B.1	
Quercus robur				E	4	1		R: 3.42		S: Good			>40 yrs	
				S	4	0.5				B: Good				
				W	3	0.5								
T14												Estimated Measurements		
Ash	15	1	350	N	5	4	M	A: 55.4	Fair	C: Fair			B.1	
Fraxinus excelsior				E	6	5		R: 4.19		S: Ivy			>40 yrs	
				S	6	5				B:				
				W	5	6								
T15														
English oak	16	1	1030	N	9	4	M	A: 480	Good	C: Good			A.1	
Quercus robur				E	8	2		R: 12.36		S: Ivy			>40 yrs	
				S	6	2				B: Good				
				W	8	3								
T16												Estimated Measurements		
Field Maple	9	1	380	N	6	4	M	A: 65.3	Good	C: Fair			B.1.3	
Acer campestre				E	5	4		R: 4.55		S: Ivy			>40 yrs	
				S	6	3				B:				
Age Classifications:		N	Newly planted	EM	Early Mature		Condition:		C	Crown	Stems:		Ø	Diameter
		Y	Young	M	Mature				S	Stem			(Eq)	Equivalent stem diameter using BS5837:2012 definition
		SM	Semi-mature	OM	Over Mature				B	Basal area	ERC:		Estimated Remaining Contributio	

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment		
T17											Estimated Measurements		
Lombardy Poplar <i>Populus nigra 'Italica'</i>		29	1	600	N	2	6	M	A: 162.9 R: 7.2	Good	C: Fair S: Ivy B:	4.5 m from fence	B.1 20 to 40 yrs
T18											Estimated Measurements		
Lombardy Poplar <i>Populus nigra 'Italica'</i>		29	1	500	N	2	5	M	A: 113.1 R: 6	Fair	C: Fair S: Ivy B:	Ivy-covered dead tree to north.	B.1 20 to 40 yrs
T19											Estimated Measurements		
English oak <i>Quercus robur</i>		18	1	650	N	5	2	M	A: 191.2 R: 7.8	Good	C: Good S: Ivy B:	5m from fence	B.1.3 >40 yrs
T20											Estimated Measurements		
English oak <i>Quercus robur</i>		17	3	877 (Eq)	N	9	3	M	A: 348.4 R: 10.53	Good	C: Fair S: Fair B:	2.2m from fence	A.1.2.3 >40 yrs
T21											Estimated Measurements		
English oak <i>Quercus robur</i>		16	1	1480	N	9	2	M	A: 707 R: 15	Fair	C: Fair S: Poor B: Poor	Extensive heartwood decay and multiple fungal fruiting bodies; potentially valuable habitat tree with veteran characteristics.	B.1.3 >40 yrs
T22											Estimated Measurements		
English oak <i>Quercus robur</i>		18	2	814 (Eq)	N	10	3	M	A: 299.7 R: 9.76	Good	C: Fair S: Fair B:	4m from fence	A.1.2.3 >40 yrs
Age Classifications:		N	Newly planted	EM	Early Mature		Condition:		C	Crown	Stems:	Ø	Diameter
		Y	Young	M	Mature				S	Stem		(Eq)	Equivalent stem diameter using BS5837:2012 definition
		SM	Semi-mature	OM	Over Mature				B	Basal area	ERC:		Estimated Remaining Contributio

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations			Cat ERC
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment			
T23												Estimated Measurements		
Goat Willow <i>Salix caprea</i>		8	10	190 (Eq)	N	4	2	SM	A: 16.3 R: 2.27	Good	C: Fair S: Fair B: Fair	C.1 20 to 40 yrs		
T24												Estimated Measurements		
English oak <i>Quercus robur</i>		9	1	550	N	7	4	M	A: 136.9 R: 6.6	Good	C: Fair S: Ivy B:	4m from fence	B.1.2 >40 yrs	
T25												Estimated Measurements		
English oak <i>Quercus robur</i>		19	1	700	E	12	4	M	A: 221.7 R: 8.4	Good	C: Fair S: B:	8m from the fence.	A.1.2.3 >40 yrs	
T26												Estimated Measurements		
English oak <i>Quercus robur</i>		17	1	500	E	6	5	M	A: 113.1 R: 6	Good	C: Good S: Ivy B:	7m from fence	B.1.2 >40 yrs	
T27												Estimated Measurements		
Colorado Blue Spruce <i>Picea pungens var glauca</i>		6	1	120	N	1	0.5	SM	A: 6.5 R: 1.43	Fair	C: Fair S: Fair B: Fair	C.1 20 to 40 yrs		
T28												Estimated Measurements		
Hawthorn <i>Crataegus monogyna</i>		7	2	234 (Eq)	N	2	3	M	A: 24.8 R: 2.8	Fair	C: Poor S: Ivy B: Fair	C.1 10 to 20 yrs		
Age Classifications:		N	Newly planted	EM	Early Mature		Condition:		C	Crown	Stems:		Ø	Diameter
		Y	Young	M	Mature				S	Stem			(Eq)	Equivalent stem diameter using BS5837:2012 definition
		SM	Semi-mature	OM	Over Mature				B	Basal area	ERC:		Estimated Remaining Contributio	

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC	
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment			
T29														
English oak <i>Quercus robur</i>		11	2	450 (Eq)	N	2	3	SM	A: 91.6 R: 5.39	Good	C: Fair S: Ivy B: Fair		B.1 >40 yrs	
T30														
Atlas Cedar <i>Cedrus atlantica</i>		12	1	380	N	5	1	SM	A: 65.3 R: 4.55	Good	C: Good S: Good B: Good		B.1 20 to 40 yrs	
T31														
Leyland Cypress <i>X Cupressocyparis leylandii</i>		11	1	300	N	3	0.5	M	A: 40.7 R: 3.59	Good	C: Fair S: Fair B: Fair	Individual lapsed stem within clipped hedge	C.1 10 to 20 yrs	
T32														
Lawson Cypress <i>Chamaecyparis lawsoniana</i>		7.5	6	220 (Eq)	N	1.5	0.1	SM	A: 22 R: 2.64	Good	C: Good S: Good B: Good		C.1 20 to 40 yrs	
T33														
Holly 'Golden King' <i>Ilex x altaclarensis 'Golden King'</i>		3.6	2	103 (Eq)	N	1	0.5	SM	A: 4.8 R: 1.23	Good	C: Good S: Fair B: Good		C.1 20 to 40 yrs	
T34														
Blue Gum <i>Eucalyptus globulus</i>		18.5	1	810	N	7	2.5	M	A: 296.9 R: 9.72	Good	C: Good S: Fair B: Fair	Typical swept lower stem; some root lifting may indicate historic partial windthrow.	B.1 20 to 40 yrs	
Age Classifications:		N	Newly planted	EM	Early Mature		Condition:		C	Crown	Stems:		Ø	Diameter
		Y	Young	M	Mature				S	Stem			(Eq)	Equivalent stem diameter using BS5837:2012 definition
		SM	Semi-mature	OM	Over Mature				B	Basal area	ERC:		Estimated Remaining Contributio	

Appendix 2 – tree survey definition of terms

<u>Category</u>	<u>Definition</u>
Tree ID/tag	Identification number and/or tree tag number.
Species	Common and/or scientific name.
Height	To the nearest 0.5m below 10m; to the nearest 1m above 10m.
Ø/No. of stems	Stem diameter measured at 1.5m or equivalent with reference to Annex C of BS5837:2012.
First branch	Height above ground level and direction of first significant branch.
Crown spread	Measured at the cardinal points in metres.
Canopy height/clearance	Crown clearance in metres above ground level at the cardinal points.
RPA	Root protection area (m ²) and length of radial protection (m).
Age class	Young Less than approximately 10 years old.
	Semi-mature Less than 1/5 of typical life expectancy.
	Mature Between 1/5 and 5/5 of typical life expectancy.
	Over-mature Tree having reached its maximum life span and declining in health and size.
	Veteran A tree that is of interest biologically, aesthetically or culturally because of its age, size or condition.
Structural/physiological condition	General condition of tree crown, stem and basal area structure and form - assessed as:
	Good Good form, structure and vitality; no apparent signs of decay, structural weakness, decline in health, pests or diseases.
	Fair Moderate form and structure.

Appendix 2 – tree survey definition of terms

	Poor	Poor form or structure; significant decay, structural weakness or decline in vitality.
BS 5837 category (Cat)	BS grading category described in detail at appendix 3.	
ERC	Estimated remaining contribution.	

Trees unsuitable for retention

Category	Definition
Category U	Trees 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 – shown in dark red on plans.

Trees to be considered for retention

Category	Definition
Category A	Trees of high quality with an estimated remaining life expectancy of at least 40 years - shown in light green on plans. <u>1 - Mainly arboricultural qualities</u> – trees that are good examples of their species, especially if rare or unusual; or those that are essential components of groups, formal or semi-formal arboricultural features. <u>2 - Mainly landscape qualities</u> – trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features. <u>3 - Mainly cultural values, including conservation</u> – trees, groups or woodlands of significant conservation, historical, commemorative or other value.
Category B	Trees of moderate quality with an estimated life expectancy of at least 20 years - shown in mid blue on plans. <u>1 - Mainly arboricultural qualities</u> – trees that might be included in category A but are downgraded because of impaired condition (e.g. presence of significant but remediable defects) to the extent that they are unlikely to be suitable for retention beyond 40 years; or trees lacking the particular quality necessary for category A designation. <u>2 - Mainly landscape qualities</u> – trees present in numbers, usually growing as groups or woodlands, that attract a higher collective rating than they might as individuals; or groups of trees situated so as to make little visual contribution to the wider locality.

Appendix 3 – BS 5837 grading categories

	<u>3 - Mainly cultural values, including conservation</u> – trees with material conservation or other cultural values.
Category C	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter under 150mm - shown in grey on plans.
	<u>1 - Mainly arboricultural qualities</u> – unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
	<u>2 - Mainly landscape qualities</u> – 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.
	<u>3 - Mainly cultural values, including conservation</u> – trees with no material conservation or other cultural values.

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Wings Nursery Appendix 4 - tree survey plan

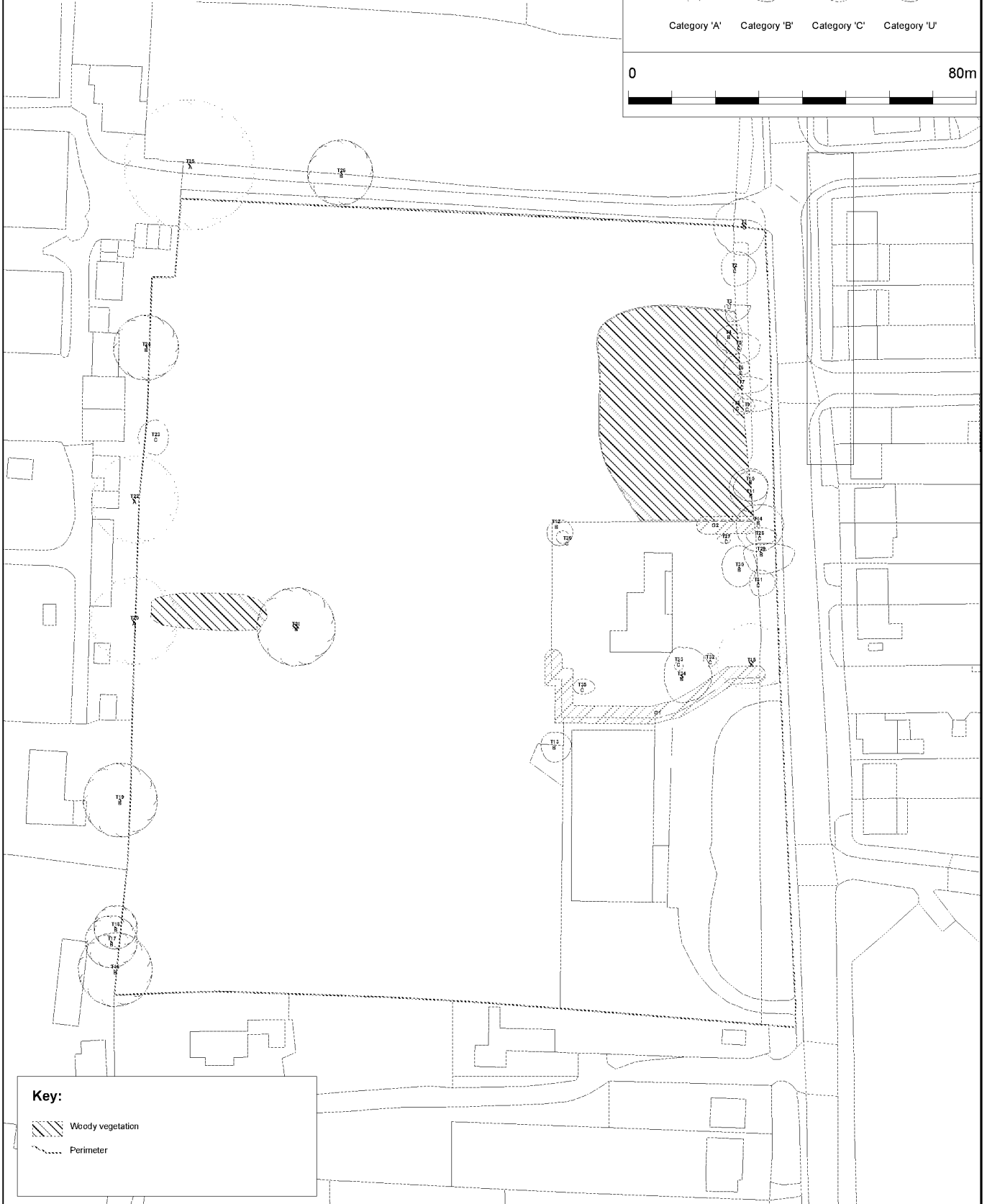
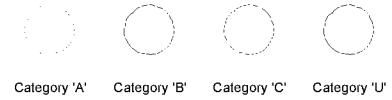
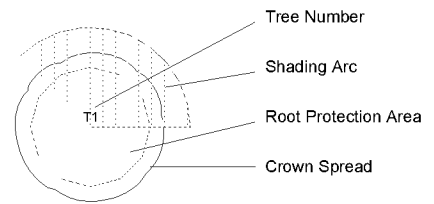
SCALE :
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DATE :
22/01/2021



Beechdown ref: B/0300/21
Wings Nursery - BS 5837 tree survey/report January 2021

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Key:

- Woody vegetation
- Perimeter

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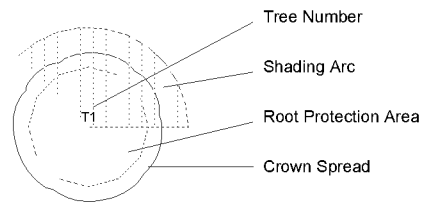
Wings Nursery Appendix 5- RPA & shade plan

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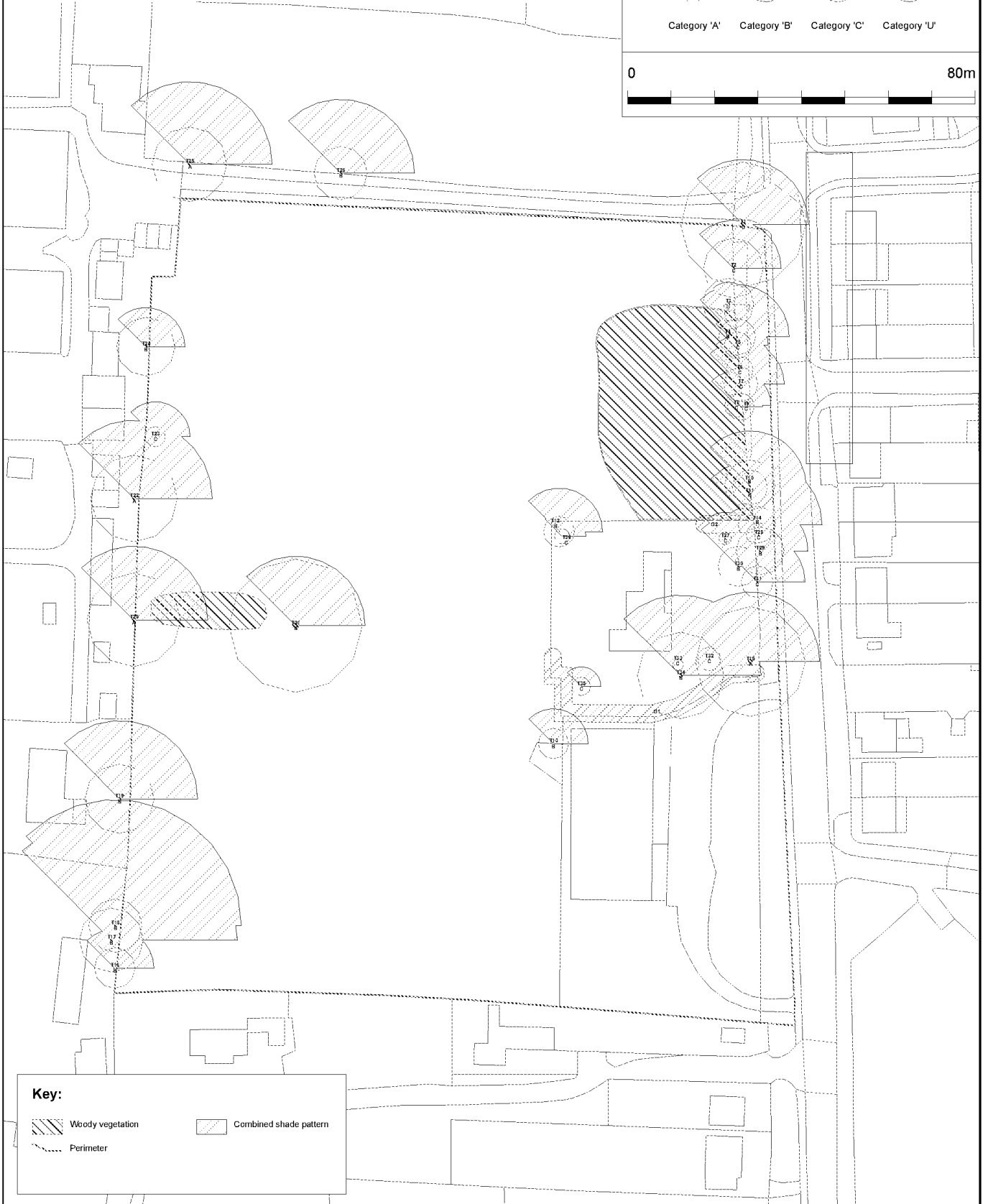
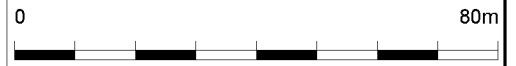
DATE :
22/01/2021

Beechdown ref: B/0300/21
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Category 'A' Category 'B' Category 'C' Category 'U'



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Wings Nursery Appendix 6 - development proposal plan

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Key:

 Combined RPA

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Wings Nursery Appendix 7 - tree protection plan

SCALE :
1 : 1250

DATE :
22/01/2021



Beechdown ref: B/0300/21
Wings Nursery - BS 5837 tree survey/report January 2021

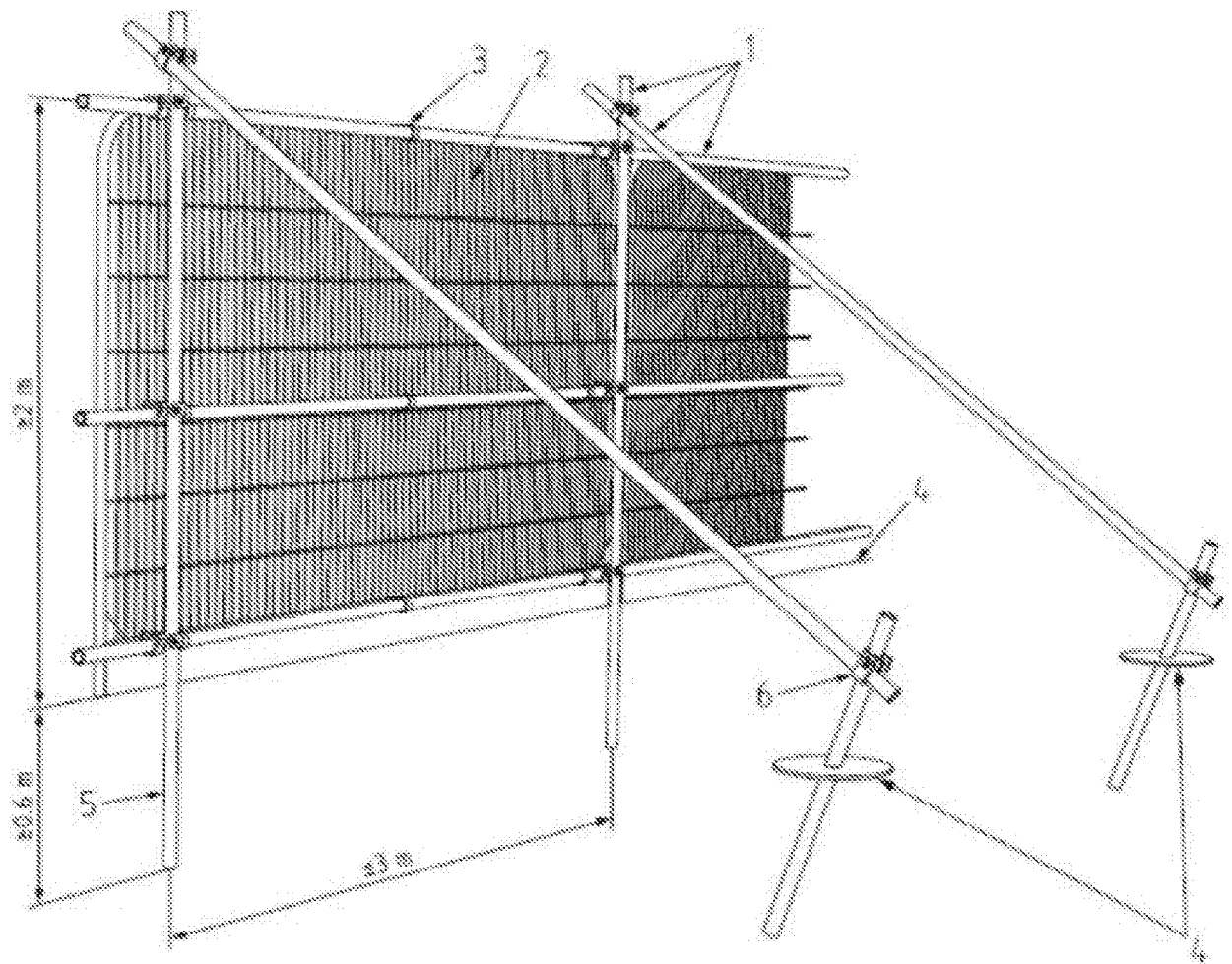
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Key:

- Construction exclusion zone
- Protective barrier
- Category C removed
- Category B removed
- Category U removed

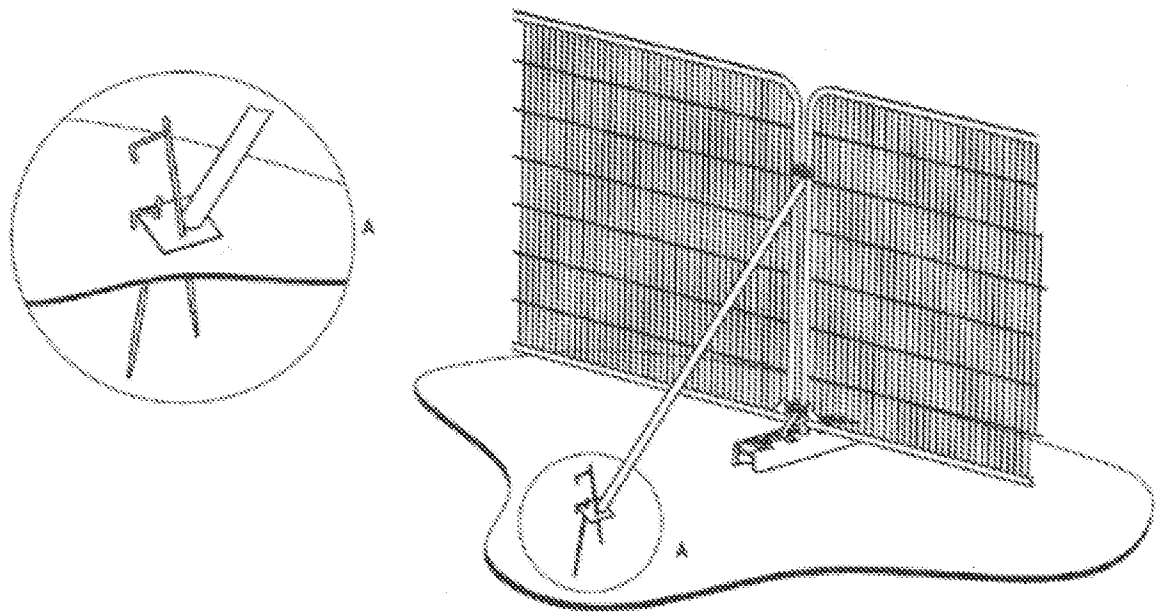
Appendix 8 – Protective Barrier



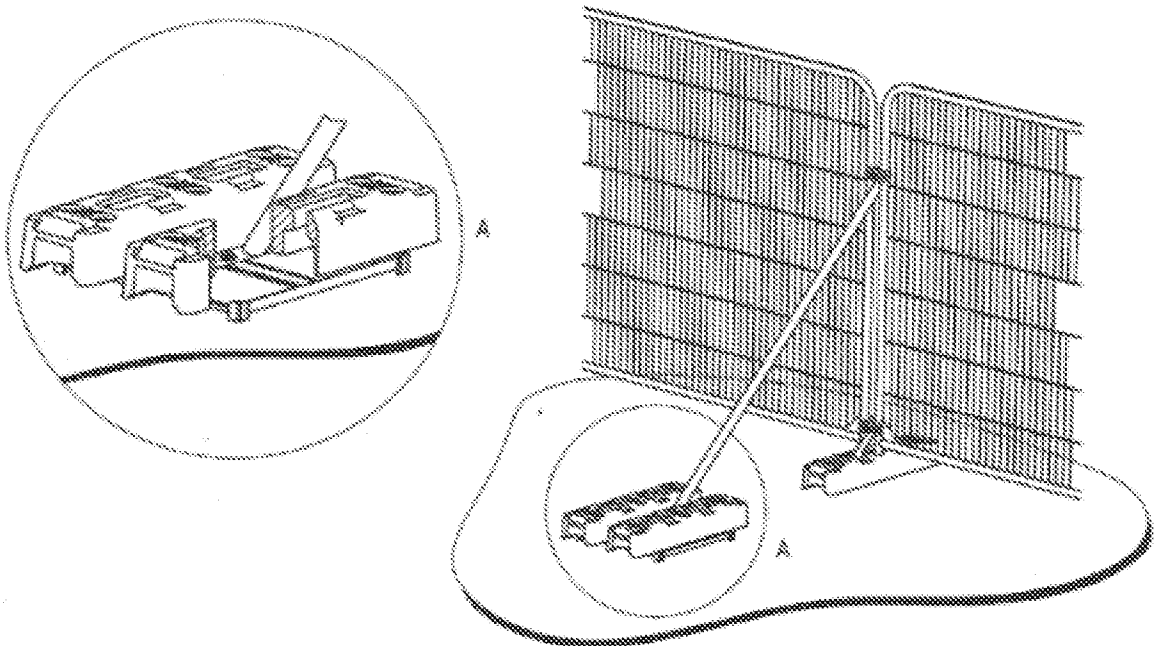
Key

- 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

Default specification for protective barrier as per Figure 2 of BS 5837:2012 *Trees in relation to demolition and construction – Recommendations, Fourth (Present) Edition*. BSI



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Examples of above-ground stabilising systems as per Figure 3 of BS 5837:2012 *Trees in relation to demolition and construction – Recommendations, Fourth (Present) Edition*. BSI

Appendix 9 – Record of Site Visits and Arboricultural Supervision

Client	Thakeham Client Ltd, on behalf of Southern Housing Group Ltd	Location	Wings Nursery, Lidsey Road, Woodgate, Chichester PO20 3SU
Local planning authority	Arun District Council		
Planning application	-		
Development	Construction of 71 new dwellings with associated access, drainage, open space and landscaping requirements		

Stage of development	Action required
Pre-construction	Mark position of protective barrier forming construction exclusion zone.

Notes	
--------------	--

Arboriculturalist	
Signed	
Date	

NOTE - COPY OF COMPLETED FORM TO BE SCANNED AND SENT TO LPA ARBORICULTURAL OFFICER

Beechdown ref: B/0300/21
Wings Nursery – BS 5837 tree survey/report – January 2021

Appendix 9 – Record of Site Visits and Arboricultural Supervision

Client	Thakeham Client Ltd, on behalf of Southern Housing Group Ltd	Location	Wings Nursery, Lidsey Road, Woodgate, Chichester PO20 3SU
Local planning authority	Arun District Council		
Planning application	-		
Development	Construction of 71 new dwellings with associated access, drainage, open space and landscaping requirements		

Stage of development	Action required
Pre-construction	Site visit to check position of protective barrier prior to construction activity.

Notes	
--------------	--

Arboriculturalist	
Signed	
Date	

NOTE - COPY OF COMPLETED FORM TO BE SCANNED AND SENT TO LPA ARBORICULTURAL OFFICER

Beechdown ref: B/0300/21
Wings Nursery – BS 5837 tree survey/report – January 2021

Appendix 10 - Arboricultural Monitoring Form

Client	Thakeham Client Ltd, on behalf of Southern Housing Group Ltd	Location	Wings Nursery, Lidsey Road, Woodgate, Chichester PO20 3SU
Local planning authority	Arun District Council		
Planning application	-		
Development	Construction of 71 new dwellings with associated access, drainage, open space and landscaping requirements		

Area inspected	Comments	Action required
Protective barriers		
Construction exclusion zone		
Site storage/material mixing		
Other		
Additional Comments		

Arboriculturalist	
Signed	
Date	

NOTE - COPY OF COMPLETED FORM TO BE SCANNED AND SENT TO LPA ARBORICULTURAL OFFICER

Beechdown ref: B/0300/21
Wings Nursery – BS 5837 tree survey/report – January 2021



Site Guidance Note 2: Fencing protected trees

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SGN 2: Summary guidance for site operatives

Administration

1. Unauthorised damage to protected trees is a criminal offence and could lead to enforcement action.
2. Work under the normal site risk assessment procedures and comply with the wider site safety rules.
3. Brief operatives entering root protection areas (RPAs) by the supervising arboriculturist before work starts.

Other relevant SGNs

4. Monitor works in RPAs by the supervising arboriculturist (See SGN 1 Monitoring tree protection).

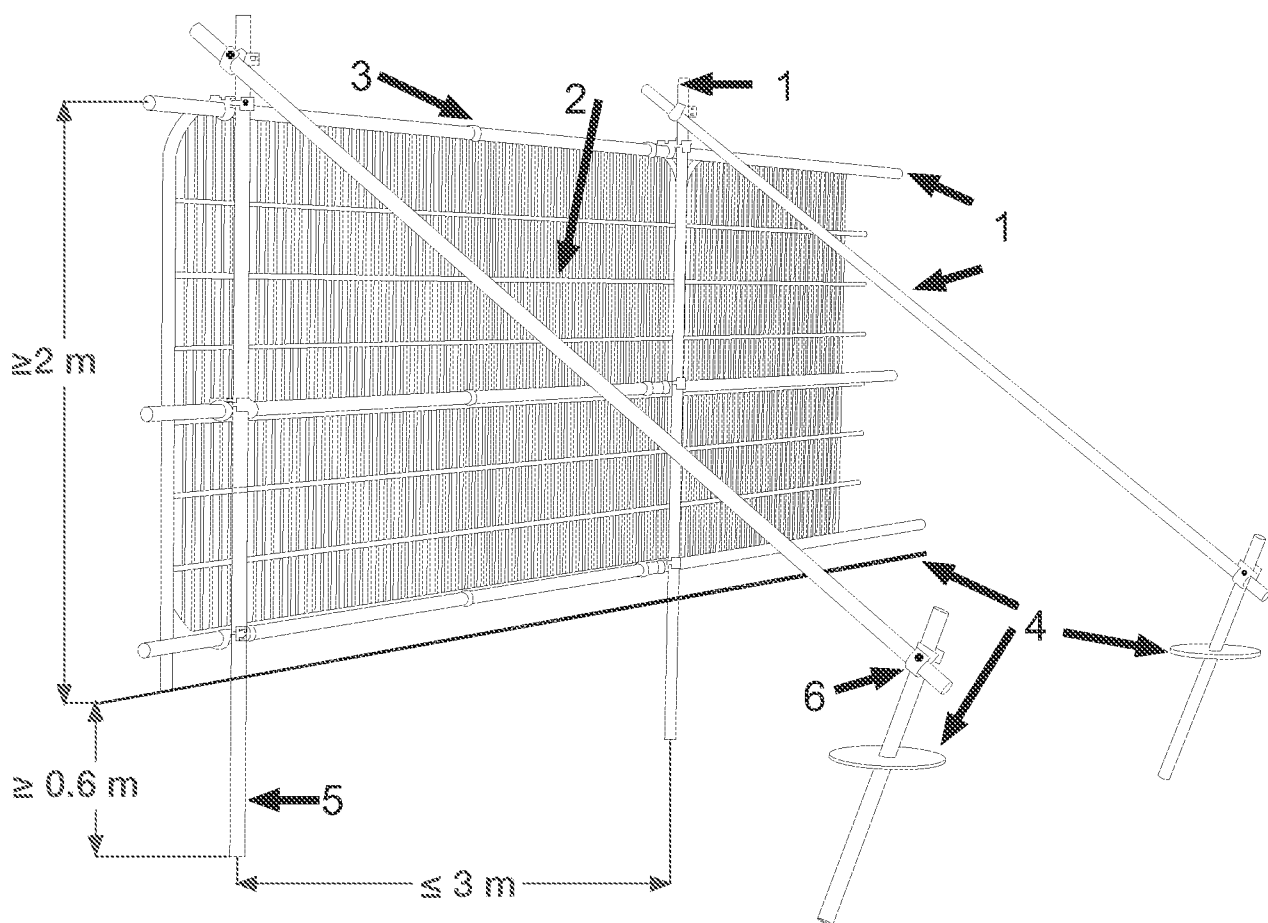
Important reminders

5. Fencing will be fit for purpose, i.e. prevent unauthorised incursions and activities within RPAs.
6. Fencing will be installed at the locations shown on the tree protection plan.
7. Fencing locations will not be altered without prior approval of the supervising arboriculturist.
8. Fencing will not be removed at the end of the construction activity without prior approval of the supervising arboriculturist.

SGN 2: Explanatory notes and examples

Purpose

SGN 2 describes where the temporary protective fencing will be installed, what form it can take and how long it should remain in place to effectively protect the RPAs of trees to be retained, based on the recommendations in BS 5837 (6.2 & 7.3).



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

SGN 2.01 Protective fencing recommendations taken from figure 2 of BS 5837.

SGN 2: Explanatory notes and examples

General principles and clarifications

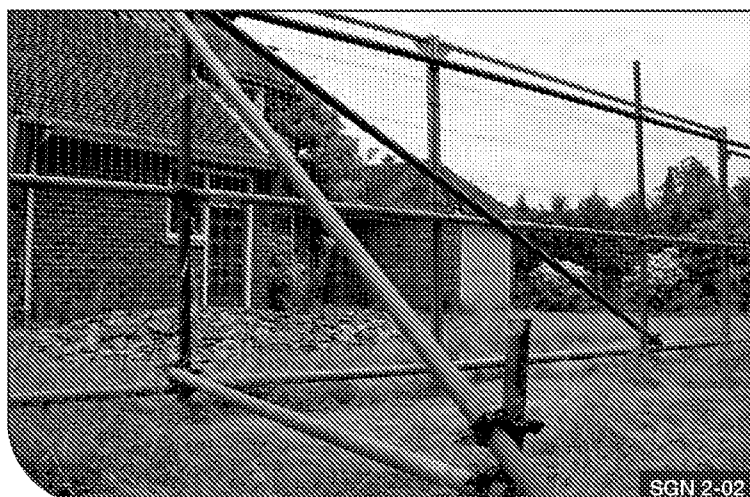
The fencing will be installed at the locations shown on the tree protection plan and agreed by the local planning authority before any construction activity starts on site. It will remain in place until there is no risk of harm from the development activity.

No fencing will be moved from its agreed location, removed, or temporarily dismantled, without consulting the supervising arboriculturist. Furthermore, the condition of the fencing will be regularly monitored by the supervising arboriculturist to ensure it remains fit for purpose, i.e. sufficient to prevent unauthorised access or activities within the RPAs of retained trees.

The minimum specification for the fencing will be as shown in figure 2 of BS

5837, or an equivalent design that effectively restricts access to the RPAs it protects. The precise form of the fencing can vary, provided it is fit for purpose. More specifically, behind the fencing, there will be no unauthorised vehicular access; no repeated pedestrian access; no fires; no storage of excavated debris, building materials, chemicals, or fuels; no mixing of cement; no service installation or excavation; no raising or lowering of soil levels; and no excessive cultivation for landscape planting.

Any variations to these restrictions will be agreed by the supervising arboriculturist.



Heras fencing wired to scaffold braced posts is a robust and effective interpretation of the BS specification.

SGN 2: Explanatory notes and examples

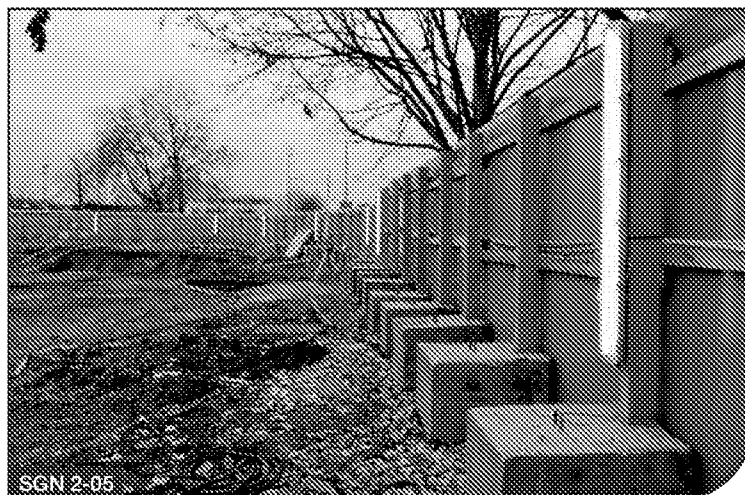
Board specification on secure wooden posts is a suitable alternative to the standard braced scaffold design.



Boards following the line of existing hard standing, enclosing the vulnerable RPA within the fencing.



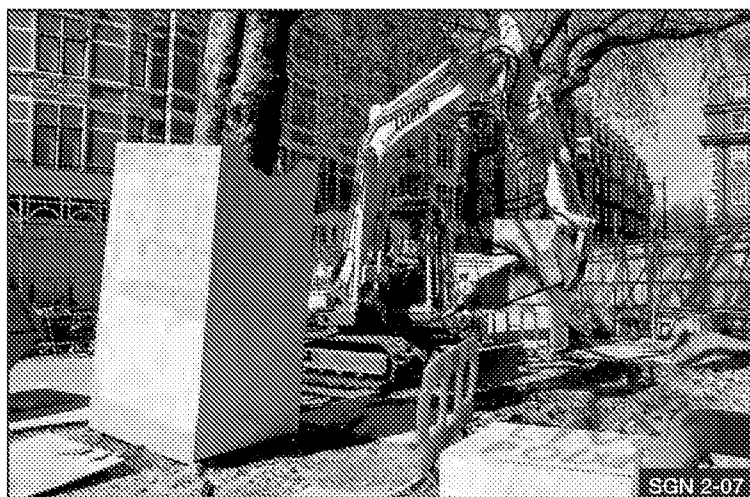
An alternative to dug supports is concrete blocks set outside the RPA.



SGN 2: Explanatory notes and examples



Improvised use of drainage pipe wrapped around the trunk can provide an added layer of protection beneath a layer of plywood.



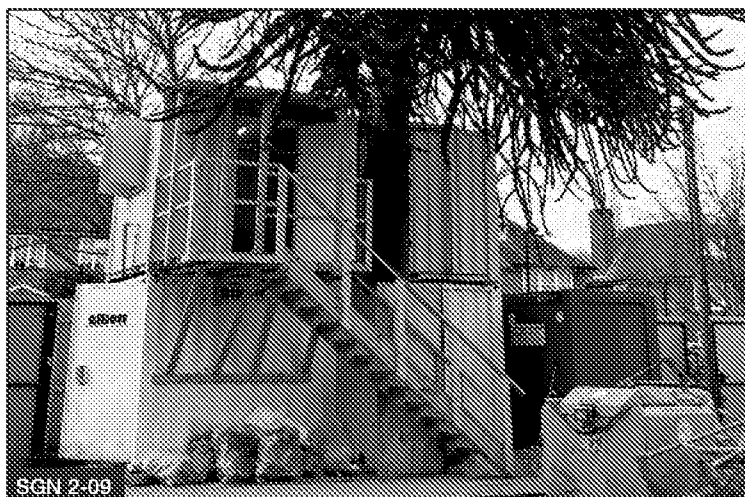
Boards attached to a supporting framework surrounding the trunk reduces the risk of accidental impact.



A wood frame around the trunk can be used to support a plywood surround.

SGN 2: Explanatory notes and examples

An innovative use of plywood and accommodation cabins to protect the trunk and roots of this retained tree.



Scaffold and boards can be installed around trees that have to be retained within working areas.

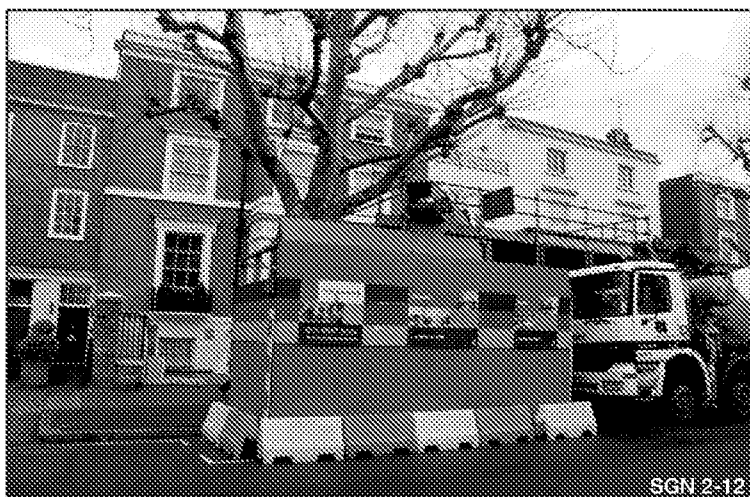


SGN 2: Explanatory notes and examples



SGN 2-11

Boxing in trunks provides effective protection, even in the tightest of situations, along with the retention of existing hard surfacing to protect the RPA.



SGN 2-12

If street trees could be harmed during development, they should also be protected even though they may be off site.



SGN 2-13

BS 5837 recommends warning signs are attached to fencing as a reminder of the restrictions within the RPA.

SGN 2: Explanatory notes and examples

Technical reference

Due to copyright restrictions, the relevant British Standard clauses are summarised, not quoted, as follows:

1. **BS 5837 (2012) Trees in relation to design, demolition and construction – Recommendations:**
Clauses 6.2 (Barriers and ground protection) and 7.3 (Tree protection during development) recommend:
 - 6.2.1.1 *All retained trees should be protected by fencing and ground protection before any demolition, development or soil stripping starts.*
 - 6.2.1.3 *The protected area is sacrosanct. Fencing and ground protection should not be removed or altered unless agreed by the supervising arboriculturist.*
 - 6.2.1.5 *The supervising arboriculturist should confirm that the tree protection has been installed as agreed before any significant site work starts.*
 - 6.2.2.1 *The tree protection should be fit for purpose, i.e. preventing inappropriate work in the RPAs of retained trees, and be maintained to remain rigid and complete.*
 - 7.3.2 *Where structures are to be removed from RPAs, fencing and ground protection should be installed up to the edge of the structure to protect the underlying soil.*



Site Guidance Note 4: Pollution control

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SGN 4: Summary guidance for site operatives

Administration

1. Unauthorised damage to protected trees is a criminal offence and could lead to enforcement action.
2. Manage pollution control under the normal site risk assessment procedures and comply with the wider site safety rules.
3. Where a significant risk of root protection area (RPA) contamination is identified, put pollution control measures in place to manage that risk.

Other relevant SGNs

4. Monitor works in RPAs by the supervising arboriculturist (See SGN 1 Monitoring tree protection).

Important reminders

5. Make provision for emergency spillage clean-up.
6. Mix cement and wash vehicles as far away from RPAs as possible.
7. Use bunding and impermeable membranes to prevent liquid contaminants reaching RPAs.
8. Use impermeable membranes to prevent leachates from poured concrete contaminating RPAs.
9. Keep pollution control measures in place until there is no significant risk of RPA contamination.

SGN 4: Explanatory notes and examples

Purpose

SGN 4 describes why pollution control is necessary, what form it will take, and how long it will remain in place to effectively protect retained trees, based on the recommendations in BS 5837 (5.5, 6.2.4, 7.4, 7.5, & A.2).



General principles and clarifications

Pollution control is intended to prevent pollutants contaminating RPAs and it will be necessary wherever risk assessment identifies a significant risk of harm arising from this cause. Spilt solid or liquid chemicals that reach RPAs can kill existing roots and may prevent new roots growing, so provision will be made to minimise the risk of soil contamination within the normal risk management protocols for the site. If identified as necessary in the risk assessment process, pollution control measures will include physical means of containing spillages and procedures for clearing them up if they occur. All cement mixing and vehicle washing points will be

located outside RPAs, with provision to contain any spillages. Where the contours of the site create a risk of polluted water or toxic liquids running into RPAs, a precautionary measure of bunding or a frame, sealed with heavy-duty plastic sheeting sufficient to prevent contamination, will be used to contain accidental spillages. Where wet concrete is poured within RPAs, an impermeable liner will be used to prevent contamination of the soil from any leachate. Pollution control measures will remain in place until there is no significant risk of RPA contamination.