

Arboricultural Implications Assessment and Method Statement for 'Greywell', High Street, Bursledon

eco **urban**
ARBORICULTURAL

Ash Fraxinus excelsior Aspen Populus tremula Beech Fagus sylvatica Blackthorn Prunus spinosa Black poplar Populus nigra Box elder Acer negundo Catalpa Catalpa bignonioides Coast redwood Sequoia sempervirens Dawn redwood Metasequoia glyptostroboides Deodar cedar Cedrus deodara Douglas fir Pseudotsuga menziesii Elder Sambucus nigra False acacia Robinia pseudoacacia Field maple Acer campestre Goat willow Salix caprea Hawthorn Crataegus monogyna Hazel Corylus avellana Holm oak Quercus ilex Holly Ilex aquifolium Hornbeam Carpinus betulus Horse chestnut Aesculus hippocastanum Indian bean tree Catalpa bignonioides Japanese cedar Cryptomeria japonica Judas tree Cercis siliquastrum Lawson cypress Chamaecyparis lawsoniana Leyland cypress x Cupressocyparis leylandii Liquidambar Liquidambar styraciflua Lombardy poplar Populus nigra 'Italica' London plane Platanus x hispanica Maidenhair Ginkgo biloba Mimosa Acacia dealbata Monkey puzzle Araucaria araucana Monterey cypress Cupressus macrocarpa Monterey pine Pinus radiata Norway maple Acer platanoides Norway spruce Picea abies Oak Quercus robur Persian ironwood Parrotia persica Red horse chestnut Aesculus carnea Red oak Quercus rubra Rowan Sorbus aucuparia Scots pine Pinus sylvestris Sitka spruce Picea sitchensis Swedish whitebeam Sorbus intermedia Sweet chestnut Castanea sativa Sycamore Acer pseudoplatanus Tulip tree Liriodendron tulipifera Turkey oak Quercus cerris Walnut Juglans regia Western Hemlock Tsuga heterophylla Western red cedar Thuja plicata Whitebeam Sorbus aria Wild cherry Prunus avium Wellingtonia Sequoiadendron giganteum White poplar Populus alba White willow Salix alba Wild Cherry Prunus avium Yew Taxus baccata Ash Fraxinus excelsior Aspen Populus tremula Beech Fagus sylvatica Blackthorn Prunus spinosa Black poplar Populus nigra Box elder Acer negundo Catalpa Catalpa bignonioides Coast redwood Sequoia sempervirens Dawn redwood Metasequoia glyptostroboides Deodar cedar Cedrus deodara Douglas fir Pseudotsuga menziesii Elder Sambucus nigra False acacia Robinia pseudoacacia Field maple Acer campestre Goat willow Salix caprea Hawthorn Crataegus monogyna Hazel Corylus avellana Holm oak Quercus ilex Holly Ilex aquifolium Hornbeam Carpinus betulus Horse chestnut Aesculus hippocastanum Indian bean tree Catalpa bignonioides Japanese cedar Cryptomeria japonica Judas tree Cercis siliquastrum Lawson cypress Chamaecyparis lawsoniana Leyland cypress x Cupressocyparis leylandii Liquidambar Liquidambar styraciflua Lombardy poplar Populus nigra 'Italica' London plane Platanus x hispanica Maidenhair Ginkgo biloba Mimosa Acacia dealbata Monkey puzzle Araucaria araucana Monterey cypress Cupressus macrocarpa Monterey pine Pinus radiata Norway maple Acer platanoides Norway spruce Picea abies Oak Quercus robur Persian ironwood Parrotia persica Red horse chestnut Aesculus carnea Red oak Quercus rubra Rowan Sorbus aucuparia Scots pine Pinus sylvestris Sitka spruce Picea sitchensis Swedish whitebeam Sorbus intermedia Sweet chestnut Castanea sativa Sycamore Acer pseudoplatanus Tulip tree Liriodendron tulipifera Turkey oak Quercus cerris Walnut Juglans regia Western Hemlock Tsuga heterophylla Western red cedar Thuja plicata Whitebeam Sorbus aria Wild cherry Prunus avium Wellingtonia Sequoiadendron giganteum White poplar Populus alba White willow Salix alba Wild Cherry Prunus avium Yew Taxus baccata Ash Fraxinus excelsior Aspen Populus tremula Beech Fagus sylvatica Blackthorn Prunus spinosa Black poplar Populus nigra Box elder Acer negundo Catalpa Catalpa bignonioides Coast redwood Sequoia sempervirens Dawn redwood Metasequoia glyptostroboides Deodar cedar Cedrus

Arboricultural Implications Assessment and Method Statement

'Greywell', High Street, Bursledon

Produced by:

Barrie Draper BSc (Hons) Arb TechCert(ArborA) CertArb(RFS)

Arboricultural Consultant

Report Ref: **211433 - AIA**

Report Date: **24 June 2022**

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1 INTRODUCTION

- 1.1 **Instruction:** I am instructed by Mr Ellis to report on trees which could be affected by a development proposal at 'Greywell', High Street, Bursledon and prepare an Arboricultural Implications Assessment (AIA) and preliminary Arboricultural Method Statement (AMS) to support a planning application on the site.
- 1.2 **Document disclosure:** Initially, I was provided with a topographical survey (drawing reference 'Greywell, Bursledon - Survey'). This showed the positions of the significant trees on or near the site, together with the existing buildings and other important features. Subsequently, I was supplied with a copy of the proposed layout, (drawing reference '1972-10c Site Layout [Garage] [A1 250]') showing a new site configuration. I was also provided with a Heritage Statement (dated June 2022) and a structural engineers report (Reference KBS/211) regarding the condition of a boundary wall.
- 1.3 **Scope of report:** All my tree observations are of a preliminary nature, with the tree survey carried out from ground level without any investigations using invasive or diagnostic equipment. I have not checked the accuracy of the positions of the trees shown on the provided plans and I have estimated all dimensions unless otherwise indicated.
- 1.4 **The Tree Protection Plan:** This is included in Appendix 1 and is a composite drawing derived from the information provided. It shows the existing landscape features (from the land survey) in grey superimposed over the position of a new garage outlined in black. This allows the relationship between the two to be clearly seen and an appropriate analysis of the implications of the proposed site changes to be undertaken. The Tree Protection Plan has also been annotated to show protection measures for the trees which could realistically be affected by the proposed development. It shows any activities in Root Protection Areas (RPAs) and if trees are to be removed, they are shown with a red dashed crown outline.
- 1.5 **Qualifications and experience:** This report is based on my site observations and I have come to my conclusions in the context of my experience as a former local government tree officer and a private practice arboricultural consultant. I have qualifications in both arboriculture and forestry and details of these, together with a career summary are provided in Appendix 7.

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- 1.6 **Ecological issues and statutory tree protection:** Providing guidance on ecological issues is not within my sphere of expertise. However, trees and other vegetation can often provide nesting, roosting and feeding opportunities for protected species. Therefore, before any tree work proceeds on site, I advise that appropriate advice is sought to see whether the trees to be removed are being utilised by any protected species. I understand that trees on site are covered by a tree preservation order and the site is also located within a conservation area. Therefore, any person intending to carry out any operations involving trees (before a formal planning consent is issued) should consult the council before any such works are undertaken.

2 SITE VISIT, DESCRIPTIONS, OBSERVATIONS AND SURVEY METHODOLOGY

- 2.1 **Site visit and description:** I visited the site initially on 3 December 2021 and more recently on 15 June 2022 to gather tree data. The site is located in the High Street/Station Hill, which is situated in the village of Bursledon. 'Greywell' is on the western side of the adjacent road and consists of a single Grade II listed dwelling. A large wall runs along the eastern site boundary and vehicular access to the site is via gated entrances on the northern and southern side of the building. These lead to an outbuilding to the rear of the dwelling and a car parking area to the north. A large garden is located to the north and west of the house, with park land beyond. A small number of large trees are located adjacent to the wall on the eastern site boundary and also to the rear of the dwelling.
- 2.2 **Description of proposed development:** This development proposal is for a new garage and the rebuilding of a boundary wall.
- 2.3 **Soil assessment:** British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations advocates that a soil assessment should be carried out to inform decisions relating to Root Protection Areas (RPAs), tree protection, new planting and foundation design. I have consulted the British Geological Survey (BGS) website and their Geology of Britain viewer and this advises that the bedrock geology for the site is Wittering Formation - Sand, Silt and Clay. I did not undertake any excavations on site to confirm this and a full geotechnical site investigation may need to be undertaken to provide a more in-depth level of information regarding soil type for the site.
- 2.4 **Tree survey methodology:** My inspection of the trees was visual and did not involve any climbing or exploratory investigations. During my visit, I identified individual trees and I assigned an identification number to each, as shown on the plan in Appendix 1. I then collected the tree data included in Appendix 2 and placed the vegetation in one of four categories (U, A, B or C), as set out in British Standard (BS) 5837:2012. I have included the BS categorisations in Appendix 6 for easy reference. Where of relevance, I also estimated the crown spreads for each tree at the appropriate cardinal compass points and this information is also shown in the tree schedule in Appendix 2. Although this document is not a full and detailed report on tree health and safety, any significant visible structural defects or physiological conditions identified, together with preliminary tree works, are also noted in the appropriate columns in the tree schedule. However, this report is not a tree condition survey and a full post development tree inspection is recommended to establish that the trees retained pose acceptable levels of risk once the development has been completed.

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- 2.5 **Data interpretation:** The Root Protection Area (RPA) figures are included in Appendix 2. As set out in paragraphs 4.6.2 and 4.6.3 of the BS, the RPAs may have been adjusted as a matter of arboricultural judgement to indicate the estimated likely position of important tree roots. These modified (or unmodified) RPAs dictate the location of the tree protection barriers and also determine the position of any ground protection measures. Tree protection details are shown on the plan included in Appendix 1. Where there is a need for incursions into RPAs, an assessment of the implications of these activities is set out in Section 3 (Arboricultural Implications Assessment) of this report. Where appropriate, details of suitable work methodologies to protect trees and also mitigate any impact are set out in Section 5 (Arboricultural Method Statement).
- 2.6 **Revisions to the provided land survey:** During my site visits I noted that some trees (T1, T3 and T4) were not shown on the provided topographical survey. For completeness, their approximate positions are illustrated on the plan in Appendix 1.

3 ARBORICULTURAL IMPLICATIONS ASSESSMENT

- 3.1 **Introduction to the implications of the development proposal on trees:** BS 5837:2012 sets out in some detail how trees on development sites should be managed. It is usually accepted amongst arboriculturists that Category A (high quality) and Category B (moderate quality) trees are potential constraints on any development proposal, whereas vegetation belonging to Category C (low quality) is considered to be generally less important. Category U trees/hedges are in such poor condition that they are considered unsuitable for retention. This is because they cannot realistically be retained as living entities in respect of the current land use for longer than 10 years. Therefore, these can be effectively discounted in the context of a planning application. On this site a total of six individual trees were recorded during the tree survey and were assigned to the BS 5837:2012 categories, as set out in Table 1 below:

Category A and B trees	Category C trees	Category U trees
A total of three trees (T4, T5 and T6) were rated Category A and B	A total of two trees (T1 and T2) were rated Category C	A total of one tree (T3) was rated Category U

Table 1: Tree numbers and BS categories

Of the total of six trees surveyed, four are scheduled to be removed to facilitate this development proposal and/or because of their poor condition. Additionally, two trees will have activities arising from the development occurring within their RPAs. I have summarised the development related implications on trees in Table 2 below and set out the site tree issues in more detail in the following paragraphs.

Trees to be removed for development		Activities in RPAs arising from the development proposal	
Category A and B	Category C	Category A and B	Category C
T4	T1 and T2	T5 and T6 (ground protection issues)	n/a

Table 2: Trees lost and activities in RPAs arising from the development proposal

3.2 Direct implications of the development proposal - Tree retention and tree loss

3.2.1 **Trees to be removed (moderate and low quality trees):** Trees T1, T2 and T4 are indicated for removal to allow the existing boundary wall to be rebuilt. The wall is in a dangerous condition in respect of the adjacent highway and cannot be rebuilt with the trees in situ. A structural engineers report is included in Appendix 5 and this confirms the dangerous condition of the wall and the impact that the trees are having on it. The removal of the trees is also the subject of a recently submitted tree work application under the TPO in force on the site. Whilst the loss of these trees is unfortunate, it does provide an opportunity for new sustainable tree planting to be accommodated. New tree planting proposals are indicated on the plan included in Appendix 1.

3.3 Additional implications arising from the development proposal

3.3.1 **Trees and activity within RPAs:** The protective barriers around trees T5 and T6 will need to be set back to allow suitable space for the movement of materials and personnel around the existing outbuilding during its refurbishment. The protective barrier positions around the trees are shown on the plan in Appendix 1. The area of the RPAs that is outside of the barriers will be covered in ground protection and this will be installed after the erection of the barriers, but before any clearance or construction work starts on site. The provision of ground protection to allow pedestrian access in RPAs is supported in paragraph 6.2.3 of BS 5837:2012 and I do not perceive this to be a particular problem provided it is implemented correctly and remains in situ during the construction phase of the project.

3.4 Additional site tree issues

- 3.4.1 **BS Category U trees normally removed for management reasons:** Category U trees are in such poor condition that they are considered unsuitable for retention. This is because they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. Therefore, these can be effectively discounted in the context of the planning process. On this site, I have assessed tree T3 as falling into Category U due to its infection with *Kretzschmaria deusta* and consequently it is scheduled for removal for management reasons. As it is unsuitable for retention in the context of the current site use, I do not believe that its loss should be a consideration in respect of the current planning application.
- 3.4.2 **Tree protection during development:** A preliminary Arboricultural Method Statement is included in Section 5 and it details the various issues associated with successful tree protection in a development context on this site. If deemed appropriate by the council, this can be specifically referred to in a suitably worded planning condition attached to any subsequently issued planning consent.

4 SUMMARY OF THE IMPLICATIONS OF THE DEVELOPMENT ON TREES

- 4.1 **Summary:** Of the total of six trees surveyed, four are scheduled to be removed to facilitate this development proposal and/or because of their poor condition. Additionally, two trees will have activities arising from the development occurring within their RPAs. The loss of the trees indicated is required to allow the boundary wall to be rebuilt and/or because they are in poor condition. Their loss is proposed to be mitigated by the provision of new tree planting. Provided the tree protection measures detailed in this report are realised around retained trees, then the proposal is acceptable from an arboricultural perspective and the risk of implications for retained trees is likely to be low.

5 PRELIMINARY ARBORICULTURAL METHOD STATEMENT

5.1 Tree protection issues

5.1.1 **Tree Protection Plan (TPP):** The plan in Appendix 1 is illustrative, but is based on the layout drawings and topographical survey provided. Therefore, all scaled measurements should be checked against the original design documents. The attached plan and all other information in this report should only be used for dealing with the tree protection issues and all other uses are prohibited, unless authorised by ecourban ltd. All the existing trees will have been numbered, with any higher categories (A and B) highlighted in green and blue rectangles and any low categories (C and U) highlighted in grey and red respectively. The plan also shows the locations of the proposed protective measures and new tree planting, with anticipated radial crown spreads after 25 years. Additionally, any trees to be removed are indicated with a red dashed crown outline. The TPP is an important document and a copy of it should be kept on site for reference during the construction phase.

5.1.2 **Protective barriers:** The approximate location of the barriers is illustrated on the plan in Appendix 1 and information on barrier design based on BS 5837:2012 guidance is included in Appendix 3. The protective barriers will be erected before any materials or machinery are brought onto the site and before any clearance or construction activities occur. Once the protective barriers have been positioned, these will stay in situ for the duration of the construction, unless previously agreed with the arboricultural consultant or council's tree officer. There will be no access into the protected areas and the storage of excavated debris and building materials will be prohibited in RPAs, unless authorised by the arboricultural consultant, after discussion with the council's tree officer. No fires or fuel storage will be allowed within or near to protected areas under any circumstances.

5.1.3 **Ground protection measures:** Where the positioning of tree protection barriers is not feasible due to the need for construction access, then ground protection measures will be needed to safeguard RPAs. The position of ground protection is shown on the plan included in Appendix 1, with guidance for ground protection design included in Appendix 4 and an installation video for proprietary ground protection is available to view at <https://www.youtube.com/watch?v=QiaRgNUackY>. The ground protection will also be installed before any materials or machinery are brought onto the site and prior to any clearance or construction activities occurring. Again, once the ground protection has been positioned, it will stay in situ for the duration of the construction phase, unless previously agreed with the project arboricultural consultant or council's tree officer.

5.2 Additional tree-related issues

- 5.2.1 **Site supervision:** Site personnel will be properly briefed regarding the tree protection issues before any work starts and the tree protection will be inspected periodically to ensure the retained trees are protected in accordance with this document and any conditions imposed by the council.
- 5.2.2 **Installation of new services or upgrading of existing provision:** Where practicable, all new services will be outside the protected areas indicated on the plan in Appendix 1, but where existing services within RPAs require upgrading or new provision is needed, great care will be taken to minimise any disturbance. Trenchless installation will be the preferred option, but if this is not feasible, any excavation will be carried out by hand in accordance with the guidelines set out in NJUG Volume 4 - Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.
- 5.2.3 **Material storage areas and site compounds:** All construction material storage areas, cement silos or cement mixing areas, fuel storage points and compounds for machinery etc. will be outside protected areas, unless otherwise agreed with the council.
- 5.2.4 **Contractors car parking, site offices and welfare facilities:** Whilst it is possible to have site offices and welfare facilities within RPAs, care is needed in their positioning and also in the connection of water, electricity and drainage to service them. Therefore, these will generally be sited outside the tree RPAs, unless agreed previously with the council. Contractor's car parking facilities will also be located away from retained trees.
- 5.2.5 **Tree works:** Any tree pruning or tree removal operations are set out in the tree schedule included in Appendix 2. Additionally, those trees scheduled for removal are also shown on the Tree Protection Plan included in Appendix 1.
- 5.2.6 **Planning, communication and preliminary timing of events:** It is not unusual for the details of timing of operations that could impact on important trees to only be finalised once planning consent has been given. Site managers, clearance and construction teams and other important personnel are normally only appointed at this stage and it is these people who will be crucial in delivering the tree protection detailed in this report. My experience is that the pre commencement site meeting is critical in terms of avoiding damage to trees and this particular aspect, along with tree protection issues can be specifically referenced in a suitably worded

planning condition imposed by the council. In the intervening time, I propose the following preliminary cascading timetable of events to help minimise the risk of impact on important trees. However, the following schedule may be modified at the pre-commencement meeting, subject to discussion with all parties and agreement with the council:

1. Pre-commencement site meeting
2. Extent of any arboricultural supervision agreed
3. Tree works undertaken
4. Protective barriers erected before any clearance or construction activities occur on site and notification to the council that this is in place
5. Ground protection installed before any clearance or construction activities occur on site and notification to the council that this is in place
6. Tree protection only removed at the end of the construction phase when there is no longer any risk to trees

Barrie Draper BSc (Hons) Arb TechCert(ArborA) CertArb(RFS)
Arboricultural Consultant

Date: **24 June 2022**

Appendix 1: Tree Protection Plan

1 A2 plan



ECO 4 - TREE PROTECTION AT 'GREYWELL', HIGH STREET, BURSLEDON

SCALE: 1:200 @ A2

COMPOSITE PLAN:
LAND SURVEY IN GREY,
PROPOSED GARAGE IN BLACK

BS Category A: Trees of high quality and value

BS Category C: Trees
of low quality and value

Tree protection barriers

Approximate position of trees
not shown on land survey

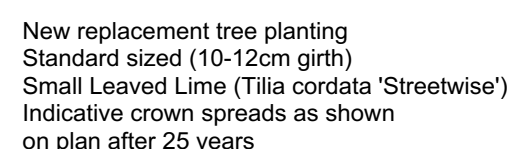
RPA outside barriers requiring ground protection

BS Category B: Trees of moderate quality and value

BS Category U: Trees normally removed for arboricultural management reasons

Root Protection Areas (RPAs):
Below ground tree constraints for retained trees based on BS 5837 guidance

Trees to be removed



Appendix 2: Tree Schedule and Inventory

Background fill colour represents BS 5837:2012 categories: A Category trees have green backgrounds, B Category trees have light blue backgrounds, C Category trees have grey backgrounds and U Category trees have red backgrounds.

Tree No.	Species	Ht (m)	Single stem dia. at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (MULTIPLE)								Branch spread (m)				Ht above ground (m)	Age class	Notes	Management proposals	BS cat	RPA area (m²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia. (cm)	No. of stems	N	E	S	W							
T1	Oak	21	-	*	84	105	-	-	-	134	-	-	7	-	10	11	5	M	Twin stemmed at 1.4m, trunks conjoined at 2m. Some dieback and localised thinning of branch extremities. Close proximity to wall, wall leaning due tree positioning. Some crown asymmetry. <i>Collybia fusipes</i> infection.	Fell.	C1	707	15.0
T2	Sycamore	21	91	-	-	-	-	-	-	-	-	-	3	-	8	6	5	M	Twin stemmed at 1.6m, tight fork with included bark union. Additional bark inclusion southern stem 2.5m. Proximity to overhead service and boundary wall. Wall leaning due to tree position. Some crown asymmetry.	Fell.	C1	375	10.9

Appendix 2: Tree Schedule and Inventory

Tree No.	Species	Ht (m)	Single stem dia. at 1.5m (cm)	Est. Dia. *	STEM DIAMETERS (MULTIPLE)								Branch spread (m)				Ht above ground (m)	Age class	Notes	Management proposals	BS cat	RPA area (m²)	RPA radius (m)
					Multi stemmed trees with 1 - 5 stems (cm)					Multi stemmed trees with 1 - 5 stems combined (cm)	Multi stemmed trees >5 stems												
					1	2	3	4	5		Mean stem dia. (cm)	No. of stems	N	E	S	W							
T3	Beech	18	55	*	-	-	-	-	-	-	-	-	8	7	8	8	4	MA	Main stem covered in ivy and obscured by hedging, limiting access to survey. Occluding wound lower main stem east side. <i>Kretzschmaria deusta</i> infection.	Fell.	U	137	6.6
T4	Sycamore	17	62	*	-	-	-	-	-	-	-	-	8	7	5	8	4	MA	Main stem covered in ivy and obscured by hedging, limiting access to survey. Some crown asymmetry due to position of adjacent tree.	Fell.	B1	174	7.4
T5	Sycamore	20	61	-	-	-	-	-	-	-	-	-	5	6	5	4	6	MA	Twin stemmed at 3m, some deadwood in upper canopy.		B1	168	7.3
T6	Oak	20	126	-	-	-	-	-	-	-	-	-	6	10	7	9	4	M	Old high pollarded previously. Some scattered deadwood throughout canopy. Large decayed low limb extending west with child's swing attached.	Remove swing and ropes.	A1	707	15.0

Appendix 2: Tree Schedule and Inventory

Abbreviations:

Abbreviations	Meaning	Abbreviations	Meaning	Abbreviations	Meaning
T	Individual tree	M	Mature	>	More than
G	Groups of trees	MA	Maturing	<	Less than
H	Hedge	Y	Young	Lgst	Largest tree diameter within group
W	Woodland	RPA	Root Protection Area	Avg	Average tree diameter within group

Tree Schedule Notes:

Tree number	Assigned during the site visit and also referenced on the plan in Appendix 1.
Species	Common name and referenced to scientific name in the above list. Where I have some doubt over the actual tree species, the genus will have been noted followed by sp. Where trees are numerous and present in groups, not every individual species may have been noted.
Height	Measurement of total tree height using a laser hypsometer to nearest metre or where clear line of site is not possible then an estimate based on interpolation of heights of nearby measured trees.
Stem diameters	Measurement of stem diameter either at 1.5m above ground (or in accordance with BS guidance where trees have multiple stems) with a forester's girth measuring tape. Diameters followed by asterisk symbol indicate estimated diameters because of access difficulties, presence of ivy or other obstructions. Where trees are present in a group, the tree with the largest stem diameter within the group will have been measured/estimated.
Est. Dia.	Estimated diameters due to access restrictions are indicated with an asterisk
Branch spread	Where appropriate and where ground conditions allow, an estimate of the crown spread at each of the cardinal compass points. Where only part of the site is affected by trees, measurement may be in one or two directions only
Existing height above ground level	Distance in metres to first significant branch or canopy or a height above which crown lifting operations would not be appropriate
Age class	Simplistic estimate of tree age in one of FOUR categories (young, maturing, mature or over mature).

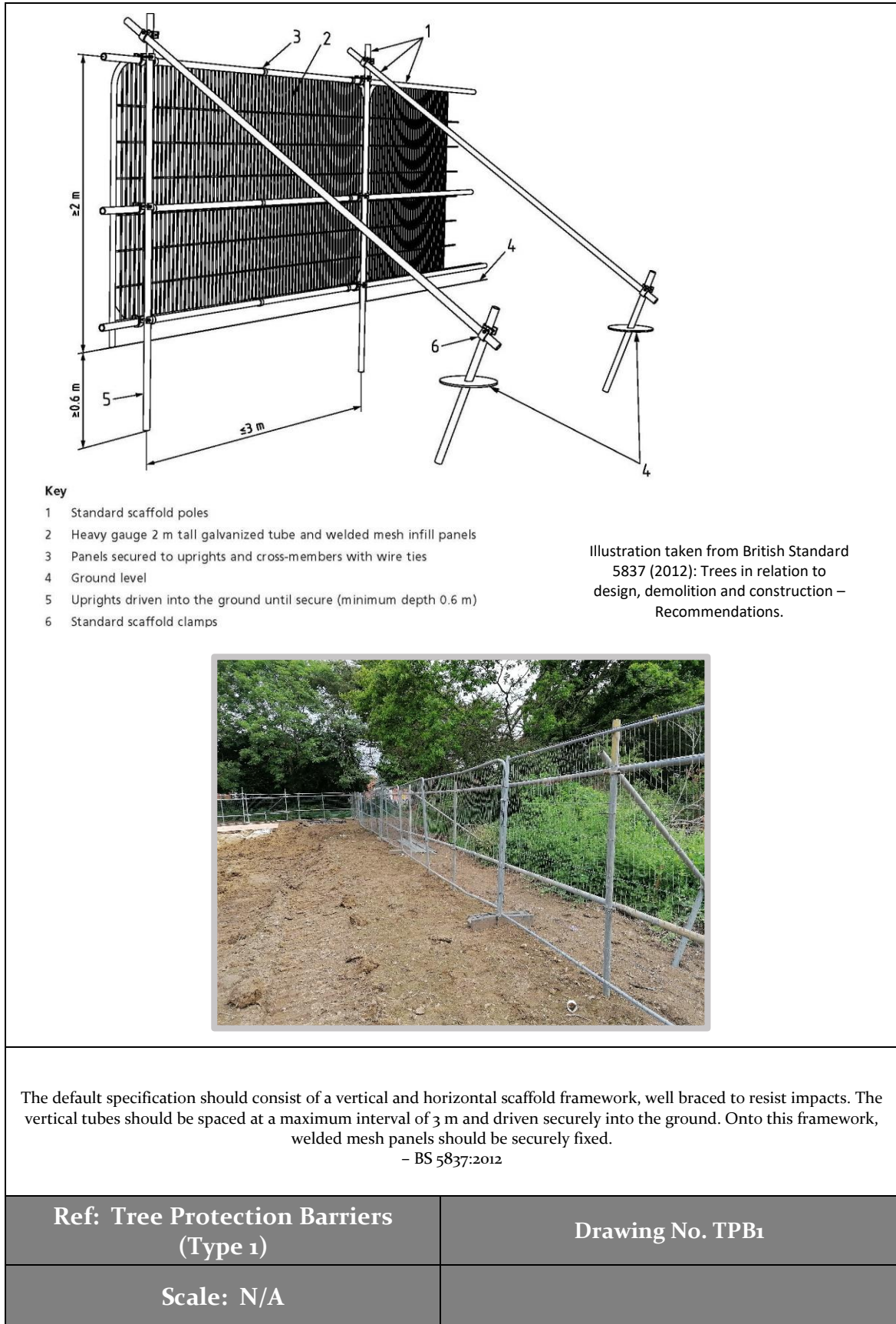
Appendix 2: Tree Schedule and Inventory

Notes	Although this document is not intended to be a full and detailed report on tree health and safety, any significant structural defects or physiological conditions have been identified where these were visible. Where no entries are recorded, this indicates no observable issues were identified. Where there is restricted access to the base of a tree, its attributes are assessed from the nearest point of access. Climbing inspections are not carried out during a walkover tree survey and, if heavy ivy is present, tree condition is assessed from what can be seen from the ground.
Management proposals	The inspection of all trees was of a preliminary nature and only defects visible from the ground have been identified. Each individual tree may not have been inspected closely because of access difficulties and only defects visible from the inspection point have been identified. Monitoring may be indicated where tree risk can be adequately managed by increased frequency of site inspections. Further investigation may be indicated where additional data may be required beyond a purely visual assessment. However, a full post development tree inspection is recommended to establish that the trees retained during construction pose acceptable levels of risk once the development has been completed.
BS 5837 :2012 Category	Either U, A, B or C based on the BS 5837:2012 guidance.
RPA and RPA radius	RPA and RPA radius calculations have been undertaken in accordance with the guidance set out in BS 5837:2012.

Tree Inventory:

Common Tree Names	Scientific Tree Names		Common Tree Names	Scientific Tree Names
Beech	Fagus sylvatica		Sycamore	Acer pseudoplatanus
Oak	Quercus robur			

Appendix 3: Illustrative Specification for Tree Protection Barriers



Appendix 4: Illustrative Specification for Ground Protection within RPAs



New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*
- b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards, placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;*
- c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.*

– BS 5837:2012

Ref: Ground Protection	Drawing No. GP1
Scale: N/A	

Appendix 5: Structural engineers report

9 A4 pages

Mr K. Ellis
Greywell
High Street
Bursledon
Southampton
SO31 8DL

Our Ref: KBS/211

18th March 2022

Dear Ken

GREYWELL, BURSLEDON, SOUTHAMPTON

Thank you for your request for us to undertake a structural inspection of the boundary retaining wall at the above property. We are pleased to report as follows;

1.0 Introduction

We visited the site on 9th February, at which time the weather was dry and cold and followed a period of wet weather.

The wall was located along the boundary with the High Street and was of traditional brick construction. The visible part of the wall was two bricks thick, built as separate leaves with a soldier course on top and typically had a Sussex bond (also known as Flemish garden wall bond). Please refer to Photograph 1.

Our inspection was limited to those parts of the structure that were visible, and we have not inspected those parts of the wall that were covered, unexposed or inaccessible. We are therefore unable to report if these such areas are free from defects.

At the time of our inspection part of the wall that bordered the High Street had been cordoned off by Hampshire County Council Highways, due to their concerns regarding the condition of the wall.

The section of the boundary wall of greatest concern was located along the North-East border and was approximately 40m long. The Southern part of the wall continues towards to the main entrance of the property, and the Northern part of the wall continues beyond this length but at that point it is beyond the site boundary and under separate ownership.

2.0 Observations

Along this length of the wall four mature trees were located, which were set apart by similar distances of between approximately 11m to 16m. Each of the mature trees were positioned close to the back of the wall. At each of these locations the wall was found to be significantly out of alignment and the lateral displacement in the wall was recorded. There were no masonry movement joints noted along this length of the boundary wall.

A plan view of the wall, labelled SK01, is attached to illustrate the length and heights of the wall relative to the existing trees with the extent of lateral movement recorded. The three sections of the wall have been labelled for ease of reference.

The stretch of the wall closest to the property, Length A, was 1800mm high when measured from the High Street and appeared to be the original construction. At the end closest to the property where the first oak tree occurred, the wall was found to be 110mm out of plumb when measured along a 900mm long spirit level with the top of the wall leaning outwards towards the highway. Please refer to Photographs 2 and 3.

Adjacent to the second oak tree, the amount of lateral displacement in the 1800mm high wall had increased to 180mm when measured along a 900mm long spirit level. A step in the height of the wall occurred at this point, with it then dropping to be only 600mm high. The lower section of the wall was found to be 250mm out of alignment. It was noted that the end of what appears to be a ground anchor with a pattress plate had been installed close to where the step in height occurred. Please refer to Photograph 4.

The second stretch of wall, Length B, increased from being 600mm high at the southern end to 1200mm high at the northern end. In the central section of this wall horizontal shear failure was noted with a local displacement in the brickwork of 25mm. At the Northern end of the wall, the wall was again found to be 250mm out of alignment. Please refer to Photographs 5 and 6.

The last stretch of the wall between the two mature trees was fairly constant in height, increasing to be 1300mm high at the Northern end. At this point the wall was 230mm out of alignment. Please refer to Photograph 7. Again, horizontal shear failure was noted in the base of this wall, occurring close to the third of the mature trees.

We understand that the lower section of wall had been reduced in height as it was considered to otherwise be unstable and at risk of collapse. This is evident by the introduction of a visibly new soldier course along part of the wall, and the absence of a soldier course or capping stone along the remainder.

3.0 Discussion

The general rule of thumb when considering the stability of masonry walls is that any vertical loads in the wall, which in this instance would be its own self weight, should be applied within the middle third of the wall. This is to ensure that the eccentricity of the load does not then itself become a destabilising load and start to contribute to any further lateral displacement. For a 225mm thick wall, this would equate to any lateral displacement being no more than approximately 38mm.

Whilst it is not uncommon for historic walls to exceed this limit, the more this limit is exceeded the greater tendency there will be for the lateral displacement in the wall to be progressive and the greater acceleration with which any further lateral movement could occur.

The stretch of wall referred to as Length A had a maximum lateral displacement of 180mm when measured along a 900mm long spirit level. This would equate to a total displacement of 360mm along the total height of the wall.

Wall Length B had been reduced in level and measured 250mm out of alignment, but wall Length C was 230mm out of line over a height of 1300mm, giving a total displacement over the full height of the wall of 330mm.

In addition, shear failures have occurred in the wall with the brickwork being locally displaced by up to 25mm relative to the adjacent surrounding brickwork.

Given the extent of lateral displacement coupled with the shear failures, we would deem the wall to be structurally unstable and beyond repair. The wall along this length will therefore require demolition and reconstruction.

The lateral forces acting on the wall that will have contributed to this displacement will primarily be from the retained material behind the wall and the root bowl of the mature trees. For a retained height of no more than 800mm, the BRE have produced a publication which states that a 215mm solid brick wall would be adequate. As the retained height is less than this, the current wall should have been suitable. It is therefore more likely that the lateral displacement has been caused by the trees. This is clearly evident in Photograph 5, where the tree is so close to the wall that the root bowl has locally pushed the wall towards the highway.

If the wall were to be simply demolished and reconstructed in its current position, this is unlikely to be viable as the corrected line of the wall and its foundation would then encroach into the footprint of the tree and would significantly damage its root bowl.

As the main contributing factor to the lateral displacement would also then still be present, it is likely that any lateral movement could then simply re-occur in the replacement wall.

Consideration could be given to bridging over the area of the tree roots, but the wall above ground level would still appear to be fouled by the line of the tree in some instances when it is reconstructed in its corrected position. In addition, the boundary wall would then be required to span horizontally as well as acting as a vertical cantilever. This would result in a more substantial structure that, as the thickness of the structure would increase, would then foul the line of the tree. We therefore do not believe that this would be a viable alternative.

4.0 Recommendations

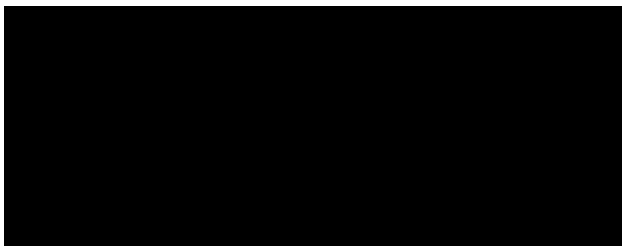
The existing boundary retaining wall has reached a state of lateral displacement where it is now considered to be structurally unstable. The wall will therefore need to be demolished and reconstructed.

The main contributing factor to the displacement in the wall is the four mature trees located close to the back of the wall on the retained side. These trees will also prevent the wall from being reconstructed back in its original corrected position as they now foul the original line of the wall. We would therefore recommend that the trees be removed before the wall is rebuilt.

Replacement trees can be provided if desired, but at a greater distance from the wall to ensure that the boundary wall is outside the zone of influence of the trees so that the trees are no longer a destructive factor.

We trust this report is to your satisfaction, however, should you have any queries or wish to discuss any of the above please do not hesitate to contact us.

Yours sincerely,



Keith Sargent

B Eng (Hons) CEng MICE MFPWS

KBS STRUCTURAL ENGINEERING LIMITED

Encl.



Photograph 1 – General view of Southern end of wall



Photograph 2 – General view of wall Length A



Photograph 3 – View along wall Length A



Photograph 4 – View along junction between wall Lengths A & B showing step in height



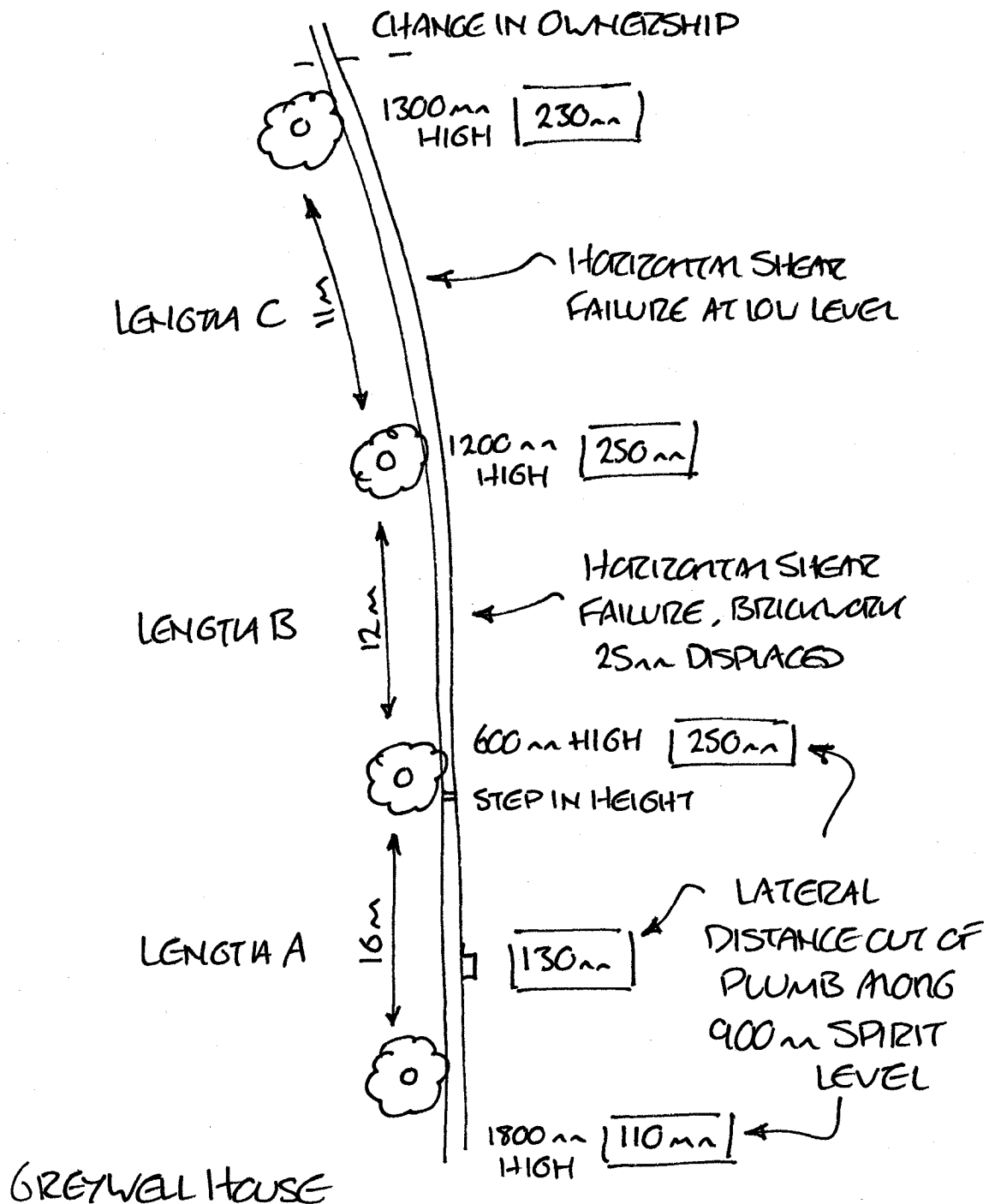
Photograph 5 – Proximity of mature tree behind wall in Length B



Photograph 6 – View along wall Length B showing shear failure along base of wall



Photograph 7 – View along wall Length C



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Project

GREYWELL, BURZLEDON

Drawing No.

211/SK01

Project No. 211

Date MAR'22

By V/S

Rev. - Scale NTS

Appendix 6: BS 5837:2012 – Assessment Categories

TREES FOR REMOVAL				
Category and definition	Criteria			Identification on plan
<u>Category U</u> Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• 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 (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.</i>			RED
TREES TO BE CONSIDERED FOR RETENTION				
Category and definition	Criteria — Subcategories			Identification on plan
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
<u>Category A</u> Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	GREEN
<u>Category B</u> Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation)	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	BLUE
<u>Category C</u> Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

Appendix 7: Qualifications and Experience of Barrie Draper

- 1 Qualifications:** I have a BSc degree (with Honours) in Arboriculture from the University of Central Lancashire. I also hold a BTEC Higher National Diploma (HND) in Forestry (Lowland Management), the Arboricultural Association's Technician's Certificate in Arboriculture (Tech Cert), the Royal Forestry Society's Certificate in Arboriculture (Cert Arb) and the National Examinations Board Certificate in Forestry.

- 2 Career experience:** I began my arboricultural career in 1993 as an arborist with Portsmouth City Council. During my time with the council I worked for both the direct labour organisation and for a private contractor where I obtained valuable hands on experience in all aspects of arboriculture. From 1999 to 2002 I was employed as Senior Arborist by Parchment Housing Group, a housing association based near Portsmouth. I managed the Groups' tree stock on their behalf, carrying out tree inspections and practical management operations. I have also worked in local government, spending time with Thurrock Borough Council in Essex where I was the Tree and Landscape Officer, and with Winchester City Council, where I was Arboricultural Officer for a period of 2 years. During my time working in local government, I was responsible for making Tree Preservation Orders, administering applications to work on protected trees and advising on planning applications when trees were considered material constraints on development. Working within a planning environment allowed me to gain valuable experience in the management of trees in development situations and an understanding of the planning process and how it relates to trees. From January 2005 I worked for Barrell Tree Consultancy Ltd advising clients on a wide range of tree related issues. I left the company in September 2008 and set up **ecourban** ltd.



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