

# ARBORICULTURAL REPORT

BRIDGE PARISH COUNCIL  
SECTIONS OF VERGE ADJACENT TO WESTERN AVENUE,  
BRIDGE,  
NR CANTERBURY,  
KENT

REF NO. 3765\_RP\_001

STATUS: DESIGN

DOCUMENT CREATED: 04/03/2016

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## EXECUTIVE SUMMARY

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- S.1** This report is intended to provide guidance for the design and any proposed works on sections of verge adjacent to Western Avenue, Bridge, near Canterbury, Kent. The verges are owned and managed by Kent County Council.
- S.2** A total of 18 individual trees and 1 group are the subject of this report which has been written in accordance with British Standard, BS 5837:2012 'Trees in relation to demolition, design and construction – Recommendations'.
- S.3** 9 individual trees have been categorised as B grade trees of moderate quality and value, while 8 individual trees and 1 group have been classified as C grade trees of low quality and value. 1 tree has been classified as a U grade tree which should be removed for reasons of sound arboricultural management.
- S.4** The trees are growing in areas of broken hard surfacing with grass growing through it. Originally the majority of the trees were planted in kerb edged tree pits but have outgrown them and sections of the edging has been removed while others are being lifted by the tree roots.
- S.5** The majority of the verges are located within the root protection areas (RPAs) of the trees. Great care should be taken during any alterations to the surface treatment to prevent damage to the tree roots growing beneath the broken hard surfacing. This report provides further guidance on working methods that may be required and provides an aid in the design in any change in surfacing.

## 1. INTRODUCTION

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- 1.1. Brief:** Lloyd Bore have been instructed by Bridge Council to carry out a survey of significant trees on sections of verge adjacent to Western Avenue, Bridge, Nr Canterbury, Kent in accordance with the principles of British Standard BS 5837:2012, 'Trees in relation to design, demolition and construction – Recommendations' (The BS) and to prepare the following information to accompany a planning application:
- details of significant trees including an assessment of condition using BS 5837 categorisation.
  - a plan showing tree survey information, categorisation and root protection areas.
- 1.2. Site description:** This report covers 4 sections of grass verge along Western Avenue, in the residential heart of the village of Bridge, south east of the city of Canterbury. The first section is a roughly triangular area at the junction of Western Avenue and Green Court, bordered on all sides by the roads. The second two sections are located opposite Green Court on the north side of Western Avenue, either side of the entrance to a cul-de-sac. The fourth section is located to the west of the first three, at the junction of Western Avenue and Ford Close. All four areas appear to have originally consisted of hard surfacing with trees planted in edged pits, however the hard surfacing has now broken up and is overgrown with grass. The edges of the tree pits have been overgrown by the trees and the edging stones have been removed in places. In other areas the tree roots are lifting the edging stones and hard surfacing, creating a potential trip hazard. Surface roots are evident, growing above the surfacing around a number of trees.

- 1.3. **Scope of this report:** This report covers trees on and adjacent to the site. It is concerned with the impact any alterations to the surface treatment may have on nearby trees and the effect retained trees may have on the development. Its purpose is to allow the designers and those planning on undertaking the works to assess the potential impacts and constraints presented by the trees and inform their designs for any potential changes of use.
- 1.4. **Summary of the general impact of development on trees:** Development and changes in surface treatment or use, can adversely impact upon trees in a number of different ways, if arboricultural issues are not considered at an early stage of the development process. Considered and careful planning will prevent valuable trees being lost during design, damaged during the removal or replacement of surfacing, or lost following completion of the works from pressures to prune or remove.
- 1.5. Damage to the branches or trunk may be quite obvious, but it is damage caused to the below ground portion of the tree which is less obvious and may have the most devastating long term effect on the future health and safe retention of a tree. Tree roots can be asphyxiated and die if the rooting environment becomes compacted or soil structure damaged or contaminated. This can easily occur, particularly on clay soils, even with the passage of light vehicles or pedestrians. It is important, therefore, that the root protection area (RPA)<sup>1</sup> is left undisturbed. Where this is unavoidable the disturbance can be minimised by following a strict working methodology and through innovative design.
- 1.6. Trees are long lived organisms, which take time to mature, and if their protection is considered at an early stage, they can complement and increase the value of an area. Construction and demolition activities, including removal of existing hard surfaces and changes of land levels must be considered at the design stage to achieve an appropriate relationship between existing trees and new proposals.
- 1.7. **Legislation:** From information on Canterbury City Council's Website it is understood that none of the trees on or adjacent to the site are the subject of a tree preservation order (TPO), nor is the site located within a conservation area. The tree protection status is correct at the time of report production but can be subject to change. It is therefore the responsibility of any persons undertaking tree works operations to the trees which are the subject of this report and in accordance with our recommendations, to undertake their own statutory checks. The trees are under the ownership of Kent County council and any works to the trees will require their consent.
- 1.8. **Ecological constraints:** The Wildlife and Countryside Act 1981, as amended, The Conservation of Habitats and Species Regulations 2010 and the Countryside and Rights of Way Act 2000, provide statutory protection to species of flora and fauna including birds, bats and other species that are associated with trees. These could impose significant constraints on the use and timing of access to the site. It is the responsibility of the main contractor and tree surgery contractor to ensure that no protected species are harmed whilst carrying out site clearance or tree surgery works. Unless competent to do so, the advice of an ecologist must be sought.

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<sup>1</sup> Root protection area (RPA) - A layout design tool indicating the minimum area surrounding the tree that contains sufficient rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. Assessed according to the recommendations set out in clause 4.6 of BS 5837. It is calculated by multiplying the radius squared by 3.142. Clause 4.6.2 of BS 5837 states that the RPA may be changed in shape, taking into account local site factors, species tolerance, condition and root morphology.

## 2. SITE VISIT AND OBSERVATIONS

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- 2.1. Site visit:** A site visit was undertaken on 22nd February 2016. The weather was overcast with occasional showers.
- 2.2. Methodology:** The trees are inspected from ground level only. Whilst every effort is made to ensure that the comments relating to the trees surveyed are accurate it must be noted that no climbing of trees, internal inspections or excavations of the root areas have been undertaken. All trees with a trunk diameter of 75mm or above are surveyed. All dimensions are accurately measured on-site unless otherwise indicated.
- 2.3.** Obvious hedges and shrub masses were identified where appropriate. Information collected is in accordance with recommendations in subsection 4.4.2.5 of BS 5837 and includes species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition and remaining contribution. Each tree was then allocated one of four categories (U, A, B or C) to reflect its suitability as a material constraint on development. Surveyed trees are identified with a prefix 'T' and a unique number on Tree Survey Plan 3765\_DR\_001. Groups of trees are identified with the prefix 'G'. The tree canopies and their spread are shown with green shapes and Root Protection Areas (RPAs) are indicated by a solid blue line. The label attached to each tree shows the individual tree number and the grading of the tree.
- 2.4. Limitations:** Trees are a dynamic living organism and due to their changing nature and other site circumstances or weather events, this report and any recommendations made are limited to a 12 month period from the survey date. Any alterations to the site or the development proposals could change the current circumstances and may invalidate this report and any recommendations made.
- 2.5.** The constantly changing nature of trees and their interactions with site conditions mean that no tree can be guaranteed 100% safe. Even trees in good condition at the time of an inspection can suffer damage by alterations to the site conditions or as a result of adverse weather. Regular inspections can help to identify potential problems before they become acute. Absence of recommendations for work to a given tree within this report does not imply that a tree is safe, and likewise it should not be concluded that a tree will be made safe following the completion of any recommended work.
- 2.6. Tree survey plan:** Tree Survey Plan 3765\_DR\_001 is based on a topographical survey supplied by the client. The Tree Survey Plan can only be used for dealing with the tree issues in relation to design. This can be found at Appendix 3. Below ground constraints are represented by the RPA (shown as a dashed blue line). Above ground constraints consist of the existing crown spreads of the trees and are represented by the solid outlines.
- 2.7. Soil type:** An assessment of soils on-site was carried out by a desktop analysis using the National Soil Resources Institute website which identified the soils as likely to be freely draining lime-rich loamy soils. This is a guide only and detailed on-site soil analysis should be undertaken if necessary.
- 2.8. The subject trees:** 9 individual trees have been categorised as B grade trees of moderate quality and value, while 8 individual trees and 1 group have been classified as C grade trees of low quality and value. 1 tree has been classified as a U grade tree which should be removed for reasons of sound arboricultural management. The categories are explained in Appendix 1.
- 2.9. Comments on specific trees:** The highest quality trees on the site are trees T1, T2 and T5-T9. This mixture of beech, holm oak and London plane are dominant features along Western Avenue and bring character to the area. Although individually they have defects, their visual amenity and contribution to the area is high. The trees at the junction of Western Avenue and Ford Close are of a

general lower quality, with less contribution to the aesthetic of the area, though they do provide screening to the houses. In particular T13 is showing dieback in 90% of its crown. As such this tree should be removed for reasons of sound management.

### 3. CONSIDERATIONS FOR DESIGN

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- 3.1. Root protection areas:** The root protection areas shown on the tree survey plan show the theoretical root protection areas based on the ideal circular rooting area. The British standard allows for the shape of the RPA of retained trees to be altered under certain circumstances (see below), but not reduce its area whilst still providing adequate protection for the root system:
- a. The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age and condition and presence of other trees.
  - b. The morphology and disposition of the roots, when known to be influenced by past or existing site conditions (e.g. the presence of roads, structures and underground services).
  - c. The soil type and structure.
  - d. Topography and drainage.
  - e. Where any significant part of a tree's crown overhangs the provisional position of tree protection barriers, these parts may sustain damage during the construction period. In such cases, it may be necessary to increase the extent of tree protection barriers to contain and thereby protect the spread of the crown. Protection may also be achieved by access facilitation pruning.
- 3.2.** Trees have the potential to intercept light and cast shade onto external landscape areas. The design of any new works must take into account existing and proposed tree positions. It should be borne in mind that up to half the light striking an area is from ambient or non-directional scattered light that is reflected from other surfaces and not directly from the sun.
- 3.3.** Proposed landscape treatment should be designed with growth of trees and shrubs in mind. Tree and vegetation cover does have the benefit of providing shelter from the wind and shade in the summer months.
- 3.4.** Some of the RPA of retained trees is covered with hard surfacing. The removal of this surfacing has the potential to cause significant damage to the structure of soils and to tree roots directly and requires special working methods, such as only removing the tarmac surface and leaving the sub-base intact. All works should be carried out by hand, or using a hydraulic breaker mounted on a mini-digger located on the existing hard surfacing or suitable ground protection and rolling the surface back away from the tree. Hand held tools (including a pneumatic breaker) must be used around obvious surface roots. Materials should be removed by hand or using a toothless bucket on a mini-digger.
- 3.5.** Should a new hard surfacing be required to replace the existing surfacing, the excavations and disturbance to the tree roots must be kept to a minimum to avoid long term health issues for the tree. Only the existing top surface material may be removed and the sub-base left intact and the replacement surface constructed using a porous material. When non-permeable materials are present above roots, the gas cannot diffuse out and is trapped in the soil around the roots. When concentrated, carbon dioxide is detrimental to the development and function of tree roots and consequently the whole tree. It is also essential that the tree roots are able to maintain an adequate supply of water and oxygen from the soil around it, which non-porous materials hinder. The use of bitumen along with the use of other non-permeable materials within the CEZ is therefore prohibited.
- 3.6.** It is important that all aspects of the development process are considered with respect to protection of trees and their root zones, and proposed tree positions. This includes for the design of

underground services, which often occurs independent of initial planning design and can escape scrutiny at the development control stage.

- 3.7. All services should be designed so as not to cause damage to retained trees. In this respect reference should be made to the current NJUG Regulations (Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees).
- 3.8. Roots of existing and newly planted trees have the potential to cause damage to structures, foundations and services. This should be taken into consideration by the project engineer and landscape team when designing these elements.
- 3.9. Landscape operations have the potential to cause significant damage to a tree, if works within the CEZ are not carried out with care. Once the surface is removed all works must be carried out by hand and soil works kept to a minimum with the soil level not increased by more than 100mm to avoid suffocation of the roots or the ingress of pathogens into the trunk. Materials should be transported in wheel barrows running on boards within the CEZ and pedestrian movements minimised beyond the boards to reduce the risk of soil compaction.

#### 4. CONCLUSIONS

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- 4.1. The trees on this site are of high aesthetic value and careful consideration must be given to the removal of any of the B grade trees. Ideally these trees should be retained and incorporated into any design.
- 4.2. Prior to any works being carried out on site an Arboricultural Impact Assessment should be undertaken to assess which trees should be retained, which should be removed and where special construction measures are required. This will also detail any pruning works required to retained trees.
- 4.3. Where archaeological or contaminated land reports and hard and soft landscape design plans are prepared for the site, these should be cross referenced with the Arboricultural Impact Assessment to ensure there are no conflicts in land treatments, recommendations or retention plans.
- 4.4. The routes of any proposed services must be assessed by the arboriculturist and a detailed arboricultural method statement written where the services run through the RPA of any retained tree.

## 5. APPENDIX 1 - TREE SURVEY KEY

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The schedule tree survey lists the trees and groups included in the survey and details the following:

- Species;
- Height (m);
- Trunk diameter generally at 1.5 m above ground level (mm);
- Branch spread (m);
- Height of crown clearance and height and compass direction of first significant branch(m);
- Age class (newly planted, Y , SM , M , over-mature, veteran);
- Physiological condition (good, fair, poor, dead);
- Structural condition (as determined from the ground);
- Estimated years remaining (<10, 10-20, 20-40, >40);
- Category grading (U or A to C).

**Species:** Species of tree with both common and botanical names.

**Ht:** Height in metres.

**Ult ht:** Ultimate height likely to be achieved for this tree in this location.

**Dia:** Diameter of stem in millimetres at 1.5m above ground level for single-stemmed trees or in accordance with Annex C of BS 5837 for multi-stemmed trees or trees with low forks or irregular stems.

**NSEW:** Crown spread at the four cardinal points.  $\emptyset$  = average crown radius.

**Cr ht 1:** Height of first significant branch above ground level and direction of growth.

**Cr ht 2:** Height of canopy above ground level.

**Cond:** Physiological and structural condition. G = good; F = fair; P = poor; D = dead.

**Life exp:** Estimated remaining contribution in years.

**Age Class:**

**NP** = Newly planted.

**Y** = Young - an establishing tree that could be easily transplanted.

**SM** = Semi-mature - an established tree still to reach its ultimate height and spread and with considerable growth potential.

**EM** = Early mature - a tree reaching its ultimate height and whose growth is slowing, however it will still increase considerably in stem diameter and crown spread.

**M** = Mature - a tree with limited potential for further significant increase in size although likely to have a considerable safe useful life expectancy.

**OM** = Over mature - a senescent or moribund tree with a limited useful life expectancy.

The report includes the following categories as indicated in BS 5837:2012.

To be assessed in respect of arboricultural, landscape and/or cultural (incl. conservation), values.

**Category A:** Those of high quality and value, those in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested).

**Category B:** Those of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested).

**Category C:** Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm.

**Category U:** Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

**Criteria (subcategories):**

1. mainly arboricultural value.
2. mainly landscape value.
3. mainly cultural value.

## 6. APPENDIX 2 - TREE SURVEY SHEETS

Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem dia. (mm)	Root Protection Radius (m)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Crown Clearance (m)	Age class	Condition	Comments	Est. Rem. Contr. (Yrs)	BS : 5837 Grade
T1	Beech	Fagus sylvatica	11.0	1.0	840.0	10.0	8.0	10.0	7.0	2.0	M	G	F	Tree growing in edged pit surrounded by old hard surfacing. Edges of pit lifted and distorted. Deflection of hard surfacing typical of tree root growth. High amenity value	20+	B1, 2
T2	Holm oak	Quercus ilex	12.0	8.0	300, 300, 300, 300, 300, 300	10.0	8.0	10.0	11.0	1.0	M	F	F	Tree growing in edged pit surrounded by old hard surfacing. Edges of pit and surrounding surface has been significantly lifted and distorted by tree root growth. Some surface roots growing above surface. Multi-stemmed from base with included unions. Bark damage on lower stems due to vandalism. High amenity value	20+	B2
T3	Horse chestnut	Aesculus hippocastinum	8.0	1.0	560.0	7.0	4.0	7.0	7.0	2.5	EM	F	F	Tree growing in area of hard surfacing. Soil mounded around base and planted with flowering plants. Bark cracking due to bleeding canker. High amenity but lowered life expectancy due to large pruning wounds and bleeding canker.	10+	C2
T4	Silver birch	Betula pendula	8.0	1.0	290.0	3.0	3.0	3.0	2.0	2.0	SM-EM	F	F	Tree growing in edged pit in area of overgrown hard surfacing. Edges of pit damaged by root action. Surface roots damaged. Slightly sparse crown. Epicormic growth and witches brooms within crown. High amenity. Tree appears stressed.	10+	C2
T5	Holm oak	Quercus ilex	12.0	13.0	260, 260, 260, 260, 260, 260, 260, 260, 260, 260	10.0	10.0	9.0	7.0	2.0	M	F	F	Mature tree growing in edged pit within area of hard surfacing. Edging removed on 2 sides. Multi-stemmed from base with sprawling form. Causing lifting of hard surfacing. High amenity.	20+	B2
T6	Beech	Fagus sylvatica	12.0	1.0	860.0	9.0	7.0	10.0	10.0	2.0	M	F	F	Tree growing in area of overgrown hard surfacing with roots breaking through the surface. Planted in edged pit but edging damaged with roots growing above line of edging. Saprophytic fungus present on large pruning wounds in centre of crown at 2.5m. Very high amenity. Deadwood in crown. Crossing limbs.	20+	B2
T7	Holm oak	Quercus ilex	11.0	4.0	400, 310, 380, 480	9.0	8.0	8.0	7.0	2.5	M	G	F	Tree growing in area of overgrown hard surfacing with roots causing obvious damage to the surface. Multi-stemmed from 1m. High amenity value.	20+	B2
T8	London plane	Platanus x hispanica	9.0	1.0	490.0	9.0	6.0	7.0	8.0	2.5	EM	G	F	Tree growing in previously edged pit (edging removed on 3 sides) within area of overgrown hard surfacing with roots causing obvious damage to the surface. Good form. High amenity value.	40+	B2

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STATUS: DESIGN

Tree Ref No.	Common Name	Botanical Name	Height (m)	No. of Stems	Stem dia. (mm)	Root Protection Radius (m)	Canopy Spread N (m)	Canopy Spread E (m)	Canopy Spread S (m)	Canopy Spread W (m)	Crown Clearance (m)	Age class	Condition	Comments	Est. Rem. Contr. (Yrs)	BS : 5837 Grade
T9	Beech	Fagus sylvatica	12.0	1.0	740.0	7.0	8.0	8.0	9.0	3.0	M	G	F	Tree growing in area of overgrown hard surfacing with soil levels raised around base. Roots causing obvious damage to the surface. Small holly and mahonia growing from base. High amenity value.	20+	B2
T10	Horse chestnut	Aesculus hippocastinum	9.0	1.0	790.0	6.0	5.0	6.0	7.0	0.8	M	F	F	Tree growing in area of overgrown hard surfacing with Roots causing obvious damage to the surface. Crossing limbs in crown. Poor previous pruning works leaving large wounds. Bleeding canker and pockets of decay in branch framework. High amenity value.	10+	C2
T11	Silver birch	Betula pendula	14.0	1.0	410.0	7.0	5.0	4.0	6.0	1.0	EM	F	F	Tree growing in area of overgrown hard surfacing within edged pit, however roots causing obvious damage to the surface and edging. Edging removed on 3 sides. Uneven crown due to group pressure. High amenity value due to location.	20+	B2
T12	Sycamore	Acer pseudoplatanus	12.0	4.0	360, 300, 300, 270	6.0	8.0	7.0	5.0	1.8	EM	F	F	Tree growing in area of overgrown hard surfacing. Multi-stemmed from base with included unions starting to form cracks. Surface roots damaging hard surface. High amenity value.	10+	C2
T13	Hawthorn	Crataegus monogyna	7.0	1.0	140.0	0.5	2.0	0.5	0.5	2.0	SM	P	P	90% crown dieback. Tree growing in hard surfacing.	<10	U
T14	Hawthorn	Crataegus monogyna	7.0	7.0	100, 100, 100, 100, 100, 100	2.0	3.0	2.0	3.0	1.0	SM	F	F	Small tree, multi-stemmed from base with included unions. Growing out of hard surfacing, possibly self set. Understorey tree with lower amenity value.	10+	C2
T15	Hawthorn	Crataegus monogyna	8.0	5.0	200, 150, 220, 130, 200	4.0	4.0	4.0	2.0	0.5	SM-EM	F	F	Possibly self set multi-stemmed tree growing out of overgrown hard surfacing. Surface roots evident damaging surface. Understorey tree in group.	20+	C2
T16	Sycamore	Acer pseudoplatanus	12.0	3.0	390, 380, 380	8.0	8.0	8.0	8.0	1.7	EM	F	F	Triple-stemmed from 0.75m. Tree growing in overgrown hard surfacing. Roots growing above surfacing up to 1.5m from base of tree. Suckering and epicormic growth. Included unions. High amenity value.	20+	B2
T17	Holm oak	Quercus ilex	5.0	15.0	75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75	3.0	2.0	3.0	3.0	0.1	SM	F	P	Regrowth from stump of felled tree located within hard surfaced area. Weak attachment points. Provides some evergreen screening. Low long term retention. Consider removal	10+	C2
T18	Hawthorn	Crataegus monogyna	6.0	2.0	100, 120	3.0	2.0	1.0	2.0	1.0	SM	F	F	Possibly self set twin-stemmed tree growing out of overgrown hard surfacing. Stems crossing at 2m. Understorey tree in group with lower amenity.	10+	C2
G1	Ash and holly	Fraxinus excelsior and Ilex aquifolium	8.0	1.0	150.0	2.0	2.0	2.0	2.0	0.1	Y-SM	F	F	Group of multi-stemmed trees growing within a 2m square within hard surfacing. Surface roots breaking up surface. Poor long term retention.	10+	C2

DATE: 04/03/2016

## 7. APPENDIX 3 - TREE SURVEY PLAN

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Please see attached plan - 3765\_DR\_001