

Silva Arboriculture Ltd

Darren Hood FdSc MArborA - 32 Weller Avenue, Rochester, Kent ME1 2LG – Tel: 01634 846839
Company Number 10746172



READING GATE RETAIL PARK, RG2 0QG

BS 5837: 2012 Arboricultural Impact Assessment

June 2025



CONTACT DETAILS

SILVA ARBORICULTURE LTD

Darren Hood FdSc MArborA,
Silva Arboriculture Ltd,
32 Weller Avenue,
Rochester, ME1 2LG
United Kingdom

Tel: 07898 788930

Email: Darren@silva-arb.co.uk

Version control

Version	Date	Author	Changes
3	June 2025	Darren Hodd FdSc MArborA	Details added regarding amended RPA and updated Method Statement.
2	May 2025	Darren Hood FdSc MArborA	Changes to tree Categories and Method Statement in line with Council comments.
1	March 2025	Darren Hood FdSc MArborA 	N/A

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Executive Summary

Silva Arboriculture Ltd has been commissioned by JMS Planning to provide Arboricultural services to support a planning application for the installation of new EV charging bays and associated infrastructure at Reading Gate Retail Park, RG2 0QG, referred to as 'the Site'.

The Site is located within the Local Authority of Reading Borough Council, approximately 4km South of Reading town centre.

A total of eleven arboricultural items have been recorded within the Study Area.

- Eight individual trees were recorded within the Study Area as Category B.
- Three individual trees were recorded within the Study Area as Category C.

Reading Borough Council's online Tree Preservation Directory was consulted in March 2025 to ascertain if any of the recorded trees are protected by Tree Preservation Orders (TPO). None of the recorded trees are currently protected by TPO and the Site does not fall within a Conservation Area.

In line with *section 4.3.1 of BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, soil conditions have been assessed and the local geology is Lambeth Group - Clay, silt and sand. With clay being a heavy, compactable soil type and the existing constructed hard surface, the Site has been assessed and it is considered that the area within the proposed footprint will not be optimal to support significant tree rooting material (roots in excess of 25mm). There was no evidence of tree roots lifting any of the hard surfaces nor deflection of the curb within the study area, indicating the absence of roots greater than 25mm in diameter within the first 600mm of soil.

Due to existing hard surfaces and following *section 4.6.3 in BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, it is considered the design footprint will not directly impact any of the recorded trees calculated root protection area (RPA) and the design proposal can be implemented without causing a negative impact on the recorded tree stock.

Mulching of open areas of the retained trees RPA has been recommended.

None of the recorded trees will need to be removed and no facilitation pruning will be required.

Ten of the recorded trees can be protected in accordance with specifications set out in *section 4.6.3 of BS 5837:2012*. One tree can be protected using bespoke methods.

1 Introduction

1.1 Overview

Silva Arboriculture Ltd has been commissioned by JMS Planning to provide Arboricultural services to support a planning application to seek planning permission for the installation of six EV charging bays and associated infrastructure at: Reading Gate Retail Park RG2 0QG, referred to as 'the Site'.

This report presents the results of an Arboricultural Survey conducted in line with *BS 5837: 2012 - Trees in relation to design, demolition and construction – Recommendations*¹ and is designed to identify arboricultural constraints that could impact development of the Site.

1.2 Site Location and Setting

The Site is located within the Local Authority of Reading Borough Council and is located approximately 4km south of Reading town centre. The Site comprises of a retail and commercial units and associated car parking and is located within a commercial area. The Site is presented in Figure 1 Tree Constraints Plan.

1.3 Proposed Scheme

The proposed application is to seek planning permission for the installation of six EV charging bays and associated infrastructure.

¹ British Standards Institution (2012) BS 5837: 2012 *Trees in relation to design, demolition and construction – Recommendations*

2 Methodology

2.1 Tree Survey Methodology

An arboricultural survey was undertaken by Darren Hood FdSc MArborA (Arboricultural Consultant) on 17th March 2025 in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

Observations were conducted from ground level, utilising the “Visual Tree Assessment” (VTA) system as outlined in *The Body Language of Trees, A Handbook for Failure Analysis Research for Amenity Trees No.4*², with the aid of binoculars. For reference, individual trees have been identified with the letter ‘T’ and an associated number on the tree schedules and plans. The stem diameter of the Site trees was recorded using a rounded down diameter tape and scaled tree calipers at 1.5m above ground level. Measurements were taken in centimetres. The height of the subject tree was estimated to the nearest metre using a digital laser range finder.

Maximum crown spread of the subject tree was measured from the centre of the trunk to the tips of the live lateral branches taken at four compass points (N-E-S-W) using a digital laser range finder where access allowed. Crown spread measurements were taken in metres.

Tree age was estimated from visual indicators (such as tree size and appearance of bark) and should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records and local knowledge.

In compliance with Table 1 of *BS 5837:2012* the trees surveyed in this report have been categorised according to their arboricultural quality and value. A glossary of survey terms can be found in Appendix A - Explanation of Terms.

2.2 Arboricultural Impact Assessment Methodology

The Arboricultural Impact Assessment (AIA) was undertaken by Darren Hood, FdSc, MArborA (Arboriculturist) in May 2025, as a desk-based study based using the design details and field data collected. Table 1 provides the data sources used.

Table 1: Data sources used

Document / Plan Title and Author	Date	Information Type
Drawing No. RP-SI24-102-17-P-12-B-Proposed Site Plan	May 2025	Design footprint information – DWG

2.3 Root Protection Area

The Root Protection Area (RPA) is a recommendation in *BS 5837:2012* and is based upon a minimum area (in m²) calculated from the measurement of the tree stem diameter. The resulting area is usually recorded as a generalised circle surrounding the tree on the Tree Constraints and Protection and Impact Plan. In this study, the RPA has been amended to take in consideration of existing roads and built structures in line with section 4.6.3 *BS 5837:2012*. The RPA is represented in purple in Figure 1. The RPA presents an exclusion zone for construction activity to protect the health of the tree.

² Mattheck, C. and Broeler, H. DETR (1994) *The Body Language of Trees: A Handbook for Failure Analysis Research for Amenity Trees No.4*

2.4 Survey Limitations

Topographical base mapping was available without exact locations of the Site trees; tree positions are therefore considered approximate. For the purposes of *BS 5837:2012*, only trees with a stem diameter greater than 75mm, (measured at 1.5m above ground level), have been included within the survey; however, it should be noted that a number of individual trees/shrubs with a stem diameter of less than 75mm were present within the Site. Only trees within the likely zone of influence of the proposed scheme have been included within this report.

Any protective fencing distances are based on a given trees stem diameter taken at 1.5 metres above ground level with each RPA (see Appendix B - Tree Schedules) being calculated from the above ground portions of the tree. It should be recognised that the RPA may not entirely encompass all of the tree rooting material.

Trees are living organisms and as such their health and condition are naturally subject to change over time. Unforeseen future circumstances such as neglect, wilful damage or severe/extreme weather conditions may affect the future health and condition of the trees included in this report.

3 Survey Results

3.1 Tree Assessment and Categorisation

A total of eleven arboricultural items were recorded within the Study Area. These were recorded as eleven individual trees (T). Full details of the survey data can be found in the Tree Schedule in Appendix B - Tree Schedule and Figure 1: Tree Constraints Plan.

Each arboricultural item was assigned to one of four categories, as listed below:

- Category A arboricultural items: No individual trees were graded as category A (trees of high quality) as part of this survey.
- Category B arboricultural items: Eight individual trees were graded as category B (trees of moderate quality) as part of this survey.
- Category C arboricultural items: Three individual trees have been identified as category C (trees of low quality) as part of this survey.
- Category U arboricultural items: No individual trees were graded as category U (trees of poor quality unsuitable for retention) as part of this survey.

3.2 Tree Species Recorded

Two tree species were recorded during the survey and were represented throughout the survey area. A summary of the species surveyed can be found within the Tree Survey Schedule located in Appendix B - Tree Schedule and within Table 2 below.

Table 2 Tree Species Recorded

Common Name	Botanical Name	Presence within the Survey Area - High, Moderate or Low
Ash	<i>Fraxinus excelsior</i>	Low
Grey poplar	<i>Populus canescens</i>	High

3.3 Age Diversity

Table 3: Age Diversity

Age Class	Number of Arboricultural Items	Approximate Percentage
Young	1	9.1%
Semi-mature	1	9.1%
Early-mature	9	81.8%
Mature	0	0%
Over-mature	0	0%
Totals	11	100%

3.4 Statutory Tree Protection

Reading Borough Council's online Tree Preservation Directory was consulted in March 2025 to ascertain if any of the recorded trees are protected by Tree Preservation Orders (TPO). None of the recorded trees are currently protected by TPO.

3.5 Soil Type

British Geological Society records show the site Bedrock Geology being of Lambeth Group - Clay, silt and sand. Sedimentary bedrock formed between 59.2 and 47.8 million years ago during the Palaeogene period.

4 Arboricultural Impact Assessment

4.1 Arboricultural Impacts

Development can have an adverse impact on trees and other woody vegetation within a site. This can result in: (1) immediate vegetation removal to facilitate the footprint of a new development; (2) potential future tree loss through the early decline of trees due to soil compaction; and (3) root disturbance and damage within a tree's rooting area.

4.2 Tree Removal

None of the recorded trees will require removal to facilitate the design proposal.

4.3 Facilitation Pruning

None of the recorded trees will require facilitation pruning to facilitate the design proposal.

4.4 Incursions within Calculated RPA

Due to the site Bedrock Geology being of Lambeth Group and existing hard surfaces, the RPA has been amended as per section 4.6.3 *BS 5837:2012*. It is therefore considered that the design footprint is outside of the recorded trees calculated RPA.

4.5 Mulching

It is proposed that the open areas of retained trees RPA are mulched to a depth of 10cm with a layer of well-rotted organic mulch. This will improve existing ground conditions and to help mitigate any potential impacts of the development. It is recommended that this takes place prior to enabling works.

4.6 Future Potential Impacts

The Site is currently a car park, and it is considered that the retained trees will not place any additional future pressures on the proposed design such as excessive shading or leaf fall on the proposed development. It should be noted that tree produced debris, such as leaf fall, will have a limited influence on the proposed end-use of any site, however, as this is a natural phenomenon it should be treated as a regular maintenance issue.

4.7 Tree Protection

Ten individual trees can be protected in accordance with specifications set out in *section 6.2 of BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*. One tree can be protected using bespoke methods. Details on tree protection can be found in Appendix 3.

5 CONCLUSIONS

A total of eleven arboricultural items were recorded within the Study Area. These include eleven individual trees. All of the recorded arboricultural items are located outside of the redline application boundary.

No individual trees were recorded within the Study Area as Category A.

Eight individual trees were recorded within the Study Area as Category B. This being due to the trees life stage and useful life expectancy of the species.

Three individual trees were recorded within the Study Area as Category C. This being due to structural condition and stem diameter.

No individual trees were recorded within the Study Area as Category U.

Reading Borough Councils online Tree Preservation Directory was consulted in March 2025 to ascertain if any of the recorded trees are protected by Tree Preservation Orders (TPO). None of the recorded trees are currently protected by TPO and the Site does not fall within a Conservation Area.

In line with *section 4.3.1 of BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, soil conditions have been assessed and the local geology is Lambeth Group - Clay, silt and sand. Clay being a heavy, compactable soil type and the existing constructed hard surface, it has been assessed and it is considered that the area within the proposed footprint will not be optimal to support significant tree rooting material (roots in excess of 25mm).as, in order to thrive, tree roots need air, water and nutrients; it is unlikely that this area will have all of these.

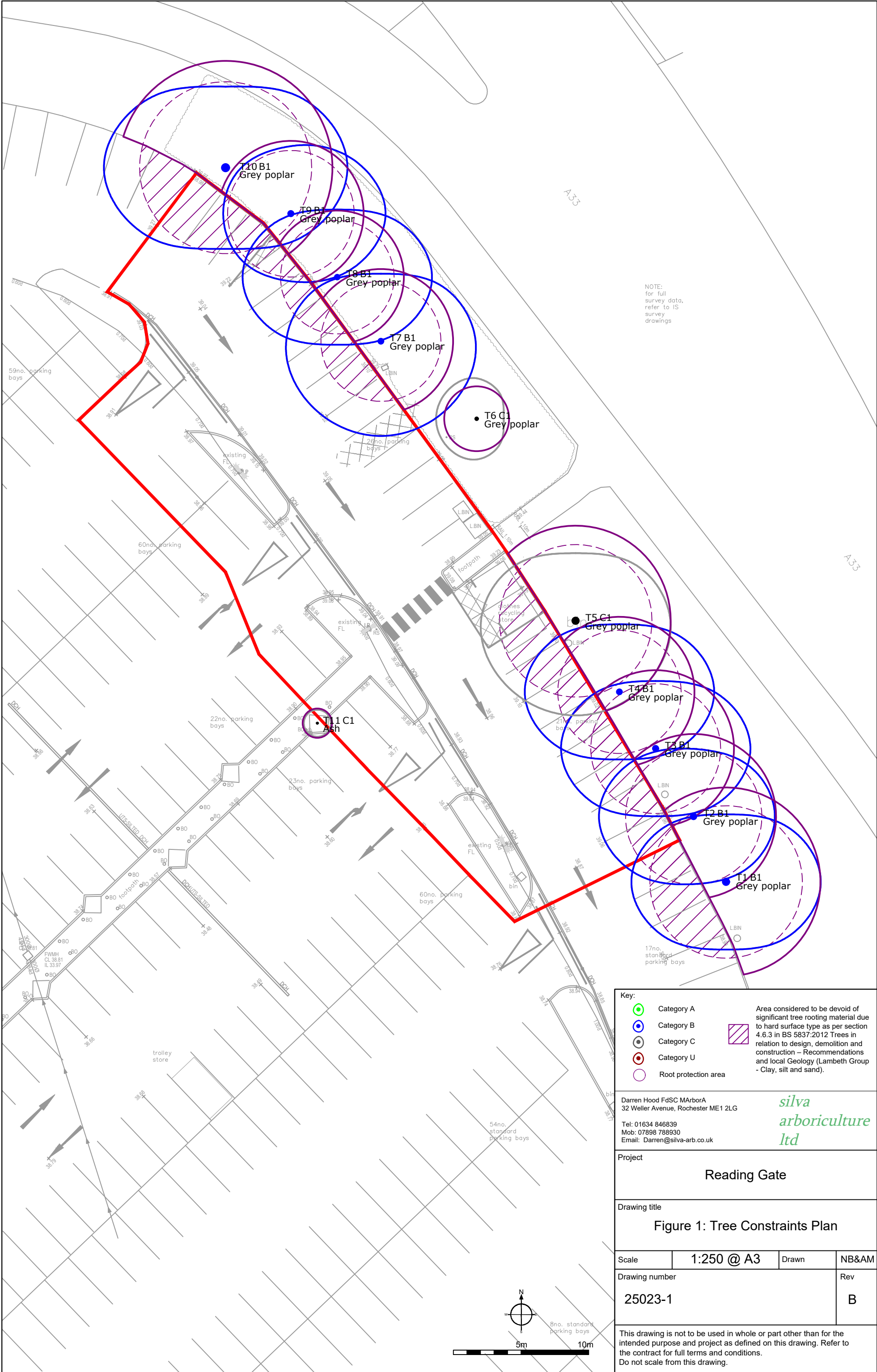
In line with *section 4.6 of BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, the RPA of recorded trees has not been plotted as a circle and has taken into account pre-existing site conditions and other factors that indicate that rooting has occurred asymmetrically, and the morphology and disposition of the roots has been influenced by the existing site conditions. In addition there was no evidence of roots lifting any of the hard surfaces, nor deflection of the curb, indicating the absence of roots greater than 25mm in diameter within the first 600mm of soil.

Mulching of open areas of the retained trees RPA has been recommended.

None of the recorded trees will need to be removed and no facilitation pruning will be required.

Ten of the recorded trees can be protected in accordance with specifications set out in section 6.2 of *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*. One tree can be protected using bespoke methods.

FIGURE 1. Tree Constraints Plan.



NOTE:
for full
survey data,
refer to IS
survey
drawings

Category A

Category B

Category C

Category U

Root protection area

Area considered to be devoid of significant tree rooting material due to hard surface type as per section 4.6.3 in BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations and local Geology (Lambeth Group - Clay, silt and sand).

Darren Hood FdSC MArborA
32 Weller Avenue, Rochester ME1 2LG
Tel: 01634 846839
Mob: 07898 788930
Email: Darren@silva-arb.co.uk

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ltd

Project

Reading Gate

Drawing title

Figure 1: Tree Constraints Plan

Scale

1:250 @ A3

Drawn

NB&AM

Drawing number

25023-1

Rev

B

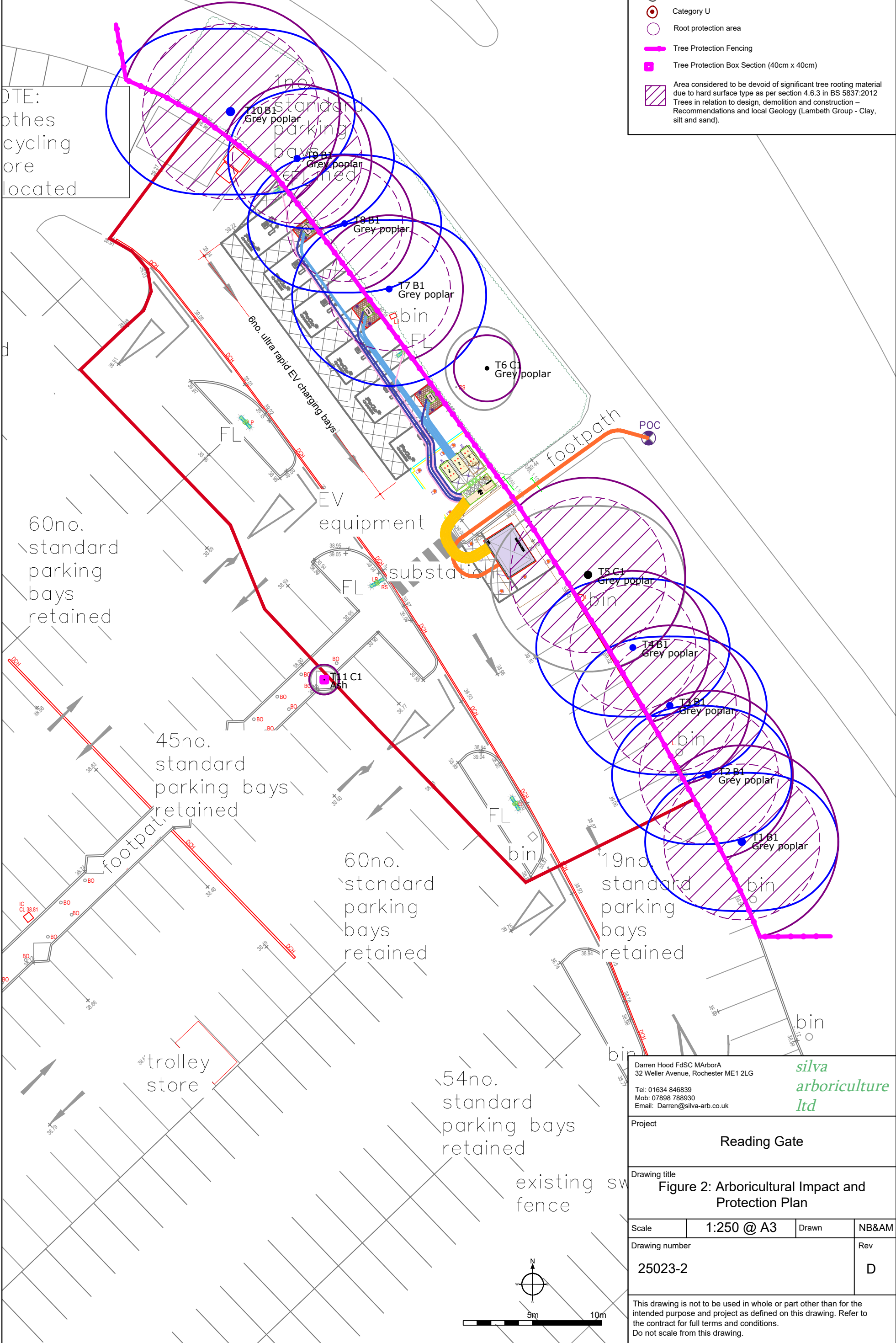
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.
Do not scale from this drawing.

FIGURE 2. Arboricultural Impact and Protection Plan

Key:

- Category A
- Category B
- Category C
- Category U
- Root protection area
- Tree Protection Fencing
- Tree Protection Box Section (40cm x 40cm)
- Area considered to be devoid of significant tree rooting material due to hard surface type as per section 4.6.3 in BS 5837:2012
Trees in relation to design, demolition and construction –
Recommendations and local Geology (Lambeth Group - Clay, silt and sand).

DTE:
bikes
cycling
store
are
located



Darren Hood FdSC MarborA
32 Weller Avenue, Rochester ME1 2LG
Tel: 01634 846839
Mob: 07898 788930
Email: Darren@silva-arb.co.uk

*silva
arboriculture
ltd*

Project			
Reading Gate			
Drawing title			
Figure 2: Arboricultural Impact and Protection Plan			
Scale	1:250 @ A3	Drawn	NB&AM
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APPENDIX A. Explanation of Terms

Age Class

Young – Trees in the first fifth of full life expectancy

Semi-mature – Trees in the second fifth of full life expectancy

Early-mature – Trees in the third fifth of full life expectancy

Mature – Trees in the fourth fifth of full life expectancy

Over Mature – Trees having reached full life expectancy and trees in natural decline

Veteran – Trees of interest biologically, culturally and aesthetically because of their age

Stem Diameter

The diameter of the stem measured in millimetres (mm) at a height of 1.5m above ground level

Crown Spread

Average measured in metres using a ground tape where possible

Physiological Condition

Good – Healthy tree with no signs of ill health and signs of good extension growth for species

Fair – Trees with signs of disease, minor defects and decreased life expectancy due to physical damage

Poor – Trees with significant disease, significantly reduced life expectancy and/or under major physiological stress

Dead – Dead tree or trees with over 70% crown dieback

Structural Condition

Good – Trees with no significant defects

Fair – Trees with remedial defects which require minor tree surgery works

Poor – Trees with remedial defects which require significant tree surgery works or felling

Dead – Trees which require felling

BS 5837 Retention Category

Each tree, group of trees or hedge is assigned to a retention category where:

Table A1 Categorisation of trees

Category	Description
A	Trees of high quality and value, retention is highly desirable
B	Trees of moderate quality and value where retention is desirable
C	Trees of low quality and value, or young trees with a stem diameter <150mm. Category C trees may be retained, replaced or in the case of younger trees, relocated
U	Trees of poor quality unsuitable for retention or trees which should be removed

In addition, each tree, group of trees or hedge is assigned to a retention sub-category where categorisation is for:

Table A2 Reasons for Categorisation

Sub-category	Reason for Categorisation
1	Mainly arboricultural qualities
2	Mainly landscape qualities
3	Mainly cultural values, including conservation

APPENDIX B. Tree Schedules

Client: **JMS Planning**

Project: **Reading Gate Retail Park, RG2 0QG**

Survey date: **17th March 2025**

Surveyor: **Darren Hood FdSc MArborA**

Table B1 - Tree Schedule

Tree reference number	Species	Height (m)	Stem diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Comments	Estimated remaining contribution (years)	Category grading
T1	Grey poplar (<i>Populus canescens</i>)	18	470	N5 E7 S5 W7	6	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T2	Grey poplar (<i>Populus canescens</i>)	16	420	N5 E6 S5 W7	4	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T3	Grey poplar (<i>Populus canescens</i>)	17	400	N5 E7 S5 W7	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T4	Grey poplar (<i>Populus canescens</i>)	17	380	N5 E7 S5 W7	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T5	Grey poplar (<i>Populus canescens</i>)	18	470	N5 E7 S7 W7	5	EM	Good	Fair	Pruning wounds on stem; cavity at base east probed to 20cm.	10+	C (1)
T6	Grey poplar (<i>Populus canescens</i>)	12	200	N3 E2 S3 W3	4	SM	Good	Fair	Not on topographical plan.	10+	C (1)
T7	Grey poplar (<i>Populus canescens</i>)	18	370	N5 E7 S7 W7	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T8	Grey poplar (<i>Populus canescens</i>)	18	350	N5 E7 S5 W7	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)

Reading Gate Retail Park RG2 0QG
BS5837: 2012 Arboricultural Report

Tree reference number	Species	Height (m)	Stem diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Comments	Estimated remaining contribution (years)	Category grading
T9	Grey poplar (<i>Populus canescens</i>)	18	390	N5 E7 S5 W5	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T10	Grey poplar (<i>Populus canescens</i>)	18	530	N6 E9 S6 W9	5	EM	Good	Fair	Pruning wounds on stem.	20+	B (1)
T11	Ash (<i>Fraxinus excelsior</i>)	3	90	N1 E1 S1 W1	2	Y	Fair	Fair	Impact wound on main stem.	10+	C (1)

Table B3 Root Protection Area

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m ²)
T1	Grey poplar (<i>Populus canescens</i>)	470	5.6	99.9
T2	Grey poplar (<i>Populus canescens</i>)	420	5	79.8
T3	Grey poplar (<i>Populus canescens</i>)	400	4.8	72.4
T4	Grey poplar (<i>Populus canescens</i>)	380	4.6	65.3
T5	Grey poplar (<i>Populus canescens</i>)	470	5.6	99.9
T6	Grey poplar (<i>Populus canescens</i>)	200	2.4	18.1
T7	Grey poplar (<i>Populus canescens</i>)	370	4.4	61.9
T8	Grey poplar (<i>Populus canescens</i>)	350	4.2	55.4
T9	Grey poplar (<i>Populus canescens</i>)	390	4.7	68.8
T10	Grey poplar (<i>Populus canescens</i>)	530	6.4	127.1
T11	Ash (<i>Fraxinus excelsior</i>)	90	1.1	3.7

Table B3 Key to Categories

Tree Reference Number	Category
T/GXX	Category A
T/GXX	Category B
T/GXX	Category C
T/GXX	Category U

Appendix C Arboricultural Method Statement

ARBORICULTURAL METHOD STATEMENT

Arboricultural Method Statement Sequence of Works

Prior to the start of any site work a logical sequence of works should be observed and followed. This should be broken into the following basic phases.

1. Phase 1 Pre-commencement meeting
2. Phase 2 Mitigation works and tree protection
3. Phase 3 Construction works
4. Phase 4 Removal of tree protection

Pre-commencement meeting

It is recommended a pre-commencement meeting should take place and be attended by an appointed arboriculturalist, and members of the construction and design team. The purpose of this meeting is to agree on the finer points of detail on protective measures prior to any site works commencing. Should site monitoring be required a basic monitoring schedule can be drafted at this point. All parties should read and sign the Arboricultural Method Statement (AMS) by way of acknowledgement of the terms and requirements. Contact details of each party should be exchanged at this point. A Site monitoring schedule will be set at this point to cover 2 monitoring visits over the length of the project.

The monitoring should include:

1. Monitoring visit to check tree protection and mitigation mulching pre construction works.
2. Monitoring visit and watching brief during open excavations within hatched areas as indicated on Figure 2 (Areas within hard standing)

Mitigation works and tree protection

As ground compaction is considered not to be an issue within the construction footprint prior to the commencement of construction works protective fencing will be installed along the boundary of RPA on T1 through to T10 in accordance with specifications set out in section 6.2 of *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* to create a Construction Exclusion Zone (CEZ) Other trees are considered outside of the zone of influence of the proposed construction works., bespoke tree protection using 18mm shuttering ply to create to a 400mm x 400mm box section or a size appropriate to the stem diameter around each stem to a height of 1.5m will be installed around the stem of the recorded tree T11. This will prevent any accidental knocks during the construction damaging the tree stems. The plotted RPA should be considered as a Construction Exclusion Zone.

The Construction Exclusion Zone is the area identified by an arboriculturist to be protected during development, including site clearance and construction work, through the use of barriers and/or ground protection fit-for-purpose to ensure the successful long-term retention of a tree. The area within the construction exclusion zone is to be regarded as sacrosanct and the fencing shall not be taken down or relocated at any time.

All areas excluded by protective tree fencing or as detailed on Figure 2 (Tree Protection Plan) shall be treated as a CEZ, and the following restrictions shall apply:

- No alterations of ground levels or ground conditions.
- No chemicals or cement washings.
- No temporary structures*.

- No storage of soil, rubble or other materials.
- No vehicles or machinery to be used or parked without appropriate ground protection measures as per BS5837 recommendations. This will require the use of a proprietary system of reinforced steel road plates on a compressible layer, or side butting scaffold boards/ 18mm plywood sheets on a compressible layer. The type of ground protection used shall be appropriate for the likely loading applied.
- No fixtures (lighting, signs etc.) to be attached to trees.

*Sales cabins or site huts, provided they are of the Jack-Leg type, can be sited to act as ground protection for the duration of the construction.

Once erected the construction exclusion zone is considered to be sacrosanct. Barriers will not be altered or moved during the demolition phase without prior consent from the appointed arboriculturalist. The site manager should inspect the condition of the protective fencing on a daily basis and rectify any defects or damage immediately. Appropriate signs will be attached at a minimum of 5m intervals on the protective fencing stating 'Tree Protection Area – No Access'.

Protective barriers will remain on site until the main demolition works are completed and should be checked once erected by the project arboriculturist or other competent person.

Due to local geology/soil type and existing hard surfaces section 4.6.3 *BS 5837:2012* has been adhered to and the RPA of recorded trees has been amended. However it is recommended that the open areas of ground within the calculated RPA of T1- T10 be mulched to a depth of 10cm with a layer of well-rotted organic material to improve the soil environment. This will improve existing ground conditions and to help mitigate any potential impacts of the development. It is recommended that this takes place prior to enabling works. It is proposed that mulching only takes place within the boundary of the Site and on open ground only.

Construction works

Due to local geology/soil type and existing hard surfaces section 4.6.3 *BS 5837:2012* the RPA of recorded trees has been amended however excavations within close proximity of the recorded trees will be undertaken under an arboricultural watching brief, these areas are identified with hatching on Figure 2. In the event that roots up to 25mm in diameter be encountered during excavation works they will be pruned back to the side of the excavation using sharp secateurs or loppers by the appointed arboriculturalist.

Should roots greater than 25mm be unearthed, these roots will be wrapped in dry hessian and preserved and the service ducting inserted around the retained roots. The hessian wrap will be removed before back filling and sharp sand will be used to cover the roots before infill with standard construction materials takes place.

During the enabling phase and construction phase no materials should be stored, dumped or stockpiled within the fenced off root protection area (RPA) and no vehicles or plant movement should occur within the RPA unless on existing hard surfaces. No additional pruning works or limb removal should take place without prior consultation with the appointed arboriculturalist and then only by suitably qualified contractors.

All chemical and hazardous substances should be stored outside of the RPA, in a suitably bunded container or designated area as appropriate. Lime in cement-based products is toxic to tree roots and consequently should be mixed in a designated area outside of the RPA where surface water runoff does not drain into the protective areas. No fires should be made within 20m of any of the tree that are to be retained.

Removal of tree protection

The protective hording should only be removed after completion of all site works including the removal of plant and site skips.

Appendix D Selected Site Photographs



Figure 1 T7 through to T10



Figure 2 T1 through to T6. No evidence of root deflection on curb or hardstanding.



Figure 3 Cavity at base of T5.



Figure 4 Wound on stem on T11.