



BS 5837:2012 Arboricultural Survey

Gelderd Road, Birstall
for:

Tesla

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BS 5837:2012 Arboricultural Survey

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1.0 Non-Technical Summary

1.1 Arboricultural Survey

- 1.1.1 The site is an area of land located off Gelderd Road in an industrial area and comprises a disused building with associated hardstanding and carparking space.
- 1.1.2 A tree survey in accordance with BS 5837:2012 was carried out by Enzygo Ltd. in April 2024. Four trees and four tree groups were surveyed within the site and within 15m of the site boundary. The surveyed trees are located along the boundary lines and are predominantly native, early mature trees of low value (BS retention category C).

1.2 Design recommendations

- 1.2.1 The site layout design should take into account the constraints posed by the trees on site and should seek to retain as many trees on site as possible to minimise the effect of the development on the amenity of the site and the local landscape as well as on the ecological value of the site. The retention of trees described in this report as being of moderate value should be prioritised.
- 1.2.2 It is recommended that the trees along the northern and western boundaries are retained for screening benefits and amenity value.
- 1.2.3 *BS 5837:2012 Trees in relation to design, demolition and construction* chapters 5.2 and 5.3 describe the constraints posed by existing trees and outline the potential conflict between proposed structures and retained trees and how these can be avoided or minimised.
- 1.2.4 New structures, hard landscape, services and construction access should be designed outside the canopy spreads and Root Protection Areas (RPA) of retained trees as far as reasonably practicable. Lowering of ground levels within the RPA of retained trees is not acceptable. Specialist solutions to manage the conflict between the proposals and retained trees are available but may have significant impact on the costs of the construction phase. These include access facilitation pruning, no-dig construction for hard surfaces, temporary ground protection and trenchless solutions for services.

2.0 Overview

2.1 Introduction

2.1.1 Enzygo Limited [Enzygo] have been commissioned by Tesla Motors Ltd. to prepare an Arboricultural Survey Report in accordance with BS 5837:2012 for the site off Gelderd Road, Birstall in support of a planning application for the development of a Tesla EV charging hub, with vehicle charging bays and associated electrical cabinets and substation.

2.1.2 This report should assist the preparation of the site layout, allowing the designer to consider the arboricultural constraints on site, including the retention of desirable trees (high and moderate value and/or trees which are found to be legally protected) and the protection of above and below ground parts of retained trees.

2.2 Structure of the Report

2.2.1 This report presents site-specific information as follows:

- Chapter 2.0 provides a brief description of the site and its location.
- Chapter 2.3.2 summarises the planning background, including national and local planning policies and any relevant planning history of the site.
- Chapter 4.0 summarises the findings of the Arboricultural Survey, describing the overall species mix, age, condition and value of the trees recorded on site.
- Chapter 5.0 provides both general and site-specific design recommendations to assist with the development of any future site layouts which are sympathetic to the existing trees.

2.2.2 Supportive of and appended to the report are the Tree Constraints Plan in Appendix 1, the Arboricultural Survey Schedule in Appendix 2 and relevant site photographs in Appendix 3. The methodology underlying the Arboricultural Survey is described in Appendix 4 – Methodology.

2.3 Site Description

2.3.1 The site is located approximately 250m south of the M62 within the junction 27 Birstall retail park in an industrial location. To the north, east and south of the wider retail park are agricultural fields and to the west lies an area of residential housing. The site falls within the metropolitan borough of Kirklees, within the County of West Yorkshire.

- 2.3.2 The application boundary for the site is approximately 2,237m² [0.22 hectares]. The site is an area of land located off Gelderd Road in an industrial area and comprises a disused building with associated hardstanding and carparking space.

3.0 Planning background

3.1 National Planning Policy Framework (December 2023)

3.1.1 The National Planning Policy Framework (NPPF) published by the government and updated in December 2023 sets out the framework objectives for development in England. These are used by Local Planning Authorities (LPA) both during the preparation of their local planning policies as well as to guide them in making individual decisions for Planning Applications.

3.1.2 The NPPF sets out several objectives concerning the natural environment, including trees, woodland and hedgerows. In addition to broad objectives addressing biodiversity and the challenges posed by climate change (e.g. flood resilience, species selection), the following paragraphs ask for the recognition of existing trees in relation to development:

- Paragraph 136 states that *“Trees make an important contribution to the character and quality of urban environments, and can also help mitigate and adapt to climate change. Planning policies and decisions should ensure (...) that existing trees are retained wherever possible.”*
- Paragraph 180 requests that *“Planning policies and decisions should contribute to and enhance the natural and local environment by [...] recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland”*.

3.2 Local Planning Policy

3.2.1 The most relevant tree-related Policy LP 33 of the *Kirklees Local Plan strategy and policies - Adopted 27 February 2019* makes specific reference to trees in relation to development, as follows:

- *The Council will not grant planning permission for developments which directly or indirectly threaten trees or woodlands of significant amenity.*
- *Proposals should normally retain any valuable or important trees where they make a contribution to public amenity, the distinctiveness of a specific location or contribute to the environment, including the Wildlife Habitat Network and green infrastructure networks.*
- *Proposals will need to comply with relevant national standards regarding the protection of trees in relation to design, demolition and construction. Where tree loss*

is deemed to be acceptable, developers will be required to submit a detailed mitigation scheme.

3.2.2 In addition to that, Policy LP24 asks that:

- *[...] Proposals should promote good design by ensuring [...] the retention of valuable or important trees [...]*

3.2.3 Policy LP32 further requests that:

- *Proposals should be designed to take into account and seek to enhance the landscape character of the area considering in particular [...] the patterns of woodland, trees and field boundaries [...].*

4.0 Arboricultural Survey

4.1 Overview

- 4.1.1 The arboricultural survey in accordance with BS 5837:2012 was carried out by Hazel Irving *FdSc Arboriculture and Urban Forestry* in April 2024. At the time of the survey any deciduous trees were in leaf.
- 4.1.2 Four tree groups and four individual trees were recorded during the walk-over survey. These trees are located along the site boundary lines.
- 4.1.3 A plan of the site illustrating the location, canopy spread and Root Protection Area of each feature is included in Appendix 1 – Tree Survey and Constraints Plan
- 4.1.4 Appendix 2 - Arboricultural Survey Schedule providing survey details of each tree.
- 4.1.5 A selection of photographs showing both the site and notable individual trees and tree groups is included in Appendix 3 – Site photographs.

4.2 Tree species, age and overall condition

- 4.2.1 Species on site include native tree species, such as ash, sycamore, goat willow and hazel, as well as Italian alder, which is common in urban planting.
- 4.2.2 The trees surveyed on the site are mainly in the semi-mature to early mature age range and appear to be currently unmanaged and healthy.

4.3 Tree quality, value and significance on site and local landscape

- 4.3.1 The prevalent BS5837 Category on the site is Category C (low value trees). The trees are situated on the site boundaries and offer screening between the various areas of the surrounding industrial estate.

4.4 Root Protection Areas (RPA)

- 4.4.1 The Root Protection Areas for each Category A to C tree and tree group has been calculated based on measured stem diameters. Both the radius and the area of each RPA are shown on the plan included in [Appendix 1 – Tree Survey and Constraints Plan](#)
- 4.4.2 [Appendix 2 - Arboricultural Survey Schedule](#) Appendix 2 - Arboricultural Survey Schedule.

4.5 Tree Preservation Orders (TPO) and Conservation Areas

- 4.5.1 The online tool provided on the Kirklees Council website has confirmed that none of the trees included in this survey are protected by Tree Preservation Order, and the site is not located within a Conservation Area.

5.0 Design recommendations

5.1 General recommendations

- 5.1.1 Design decisions should be based on the recommendations in chapters 5.2 and 5.3 of *BS 5837:2012 Trees in relation to design, demolition and construction* which describe the constraints posed by existing trees and outline the potential conflict between proposed structures and retained trees and how these can be avoided or minimised.

5.2 Maximise tree retention

- 5.2.1 It is recommended that the site layout design considers the safe retention of any trees which have been assigned the retention categories A, B and C as far as practicable to retain the ecological value and the mature character of the site and to minimise the potential visual impact the development may have on the surrounding landscape. The retention of legally protected trees should be a priority.

5.3 Minimise residual effect of trees on development

- 5.3.1 In addition to the desired retention of existing trees as described in 5.2 above, it is advised to consider the impacts any retained trees would have on the development, including excessive shading of sensitive building elevations and open spaces and the increased requirement for routine tree management near built structures (i.e. regular crown reduction near buildings).

5.4 Minimise residual effect of development on retained trees

Proposed buildings, structures and hard surfacing

- 5.4.1 The site layout design should allow generous distances between vertical structures and tree canopies and allow for the expected future expansion of crowns.
- 5.4.2 The location of new structures and hard surfacing within the canopy spread of existing trees and tree groups should be considered carefully. Excessive management of these trees to facilitate any such elements may cause an imbalance of stem/crown ratio, unbalanced crowns or unnatural shape of specific tree species. The future requirement for continuous tree management to limit any conflicts should remain minimal.
- 5.4.3 Where built structures and hard landscape elements are proposed within the Root Protection Areas of existing trees, specialist methodologies may have to be adopted to manage the conflict. These solutions may have an impact on costs of the construction phase and it may be desirable to keep this to a minimum by developing a layout which is sensitive to the existing

trees. Any vertical elements such as fences should be proposed at such a distance from tree stems as to allow for the future increase of the stem diameter and root buttresses.

Utilities and earthworks

- 5.4.4 Underground services and any proposed design elements requiring foundations (e.g. boundary treatments, street furniture, hard surfaces) should be placed outside of Root Protection Areas where possible.
- 5.4.5 Excavations for underground services may have an impact where they are proposed within the RPA of retained trees. Proposed above ground services may further conflict with parts of tree canopies.
- 5.4.6 The reduction of ground levels within the Root Protection Areas of retained trees are not acceptable. Where this can't be avoided, the removal of the tree may have to be considered.

Construction operations

- 5.4.7 Demolition and construction operations near retained trees are likely to cause accidental damage of tree trunks and low hanging branches. Where possible, the design should allow for reasonable distances between new structures and above ground parts of retained trees, including sufficient clear working areas around those structures.
- 5.4.8 Vehicle and plant movement during demolition and construction may further cause ground compaction which could lead to irreversible damage of tree roots and the rooting environment within the RPA of retained trees. The construction phase plans should ensure that site access routes, site compounds and internal routes are proposed outside the Root Protection Areas (RPA) of retained trees.

6.0 Appendix 1 – Tree Survey and Constraints Plan



- NOTES**
- Do not scale from this drawing for construction purposes
 - This drawing is to be read in conjunction with all relevant drawings and documents associated with this project.
 - All surveyed information including levels and layout is provided by others
 - All existing and proposed dimensions, levels and locations to be checked and verified by the main contractor on site prior to the commencement of the works and any anomalies reported to the engineer.

KEY - Tree Survey and Tree Constraints Plan

- Tree Categories BS 5837 (2012)**
-  Tree Category A
 -  Tree Category B
 -  Tree Category C
 -  Tree Category U
-  Root Protection Area (RPA)

PL01	23/04/24	For Planning	HI	VM	TB
Rev	Date	Description	DRA	CHK	APP

Project
Gelderd Road, Birstall

Client
Tesla Motors Ltd.

Drawing Title
Tree Constraints Plan

Status	Date	Scale	
For Planning	23/04/24	1:250 @ A3	
Drawn	Designed	Checked	Approved
HI	N/A	VM	TB
DWG No.			Revision
3030.020.ENZ.XX.00.DR.AR.45.101			PL01



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Scale 1:250

7.0 Appendix 2 - Arboricultural Survey Schedule

7.1 Information recorded and symbols used

Ref	Sequential tree reference as per Tree Survey Plan
Species	Common name (<i>Scientific name</i>)
Ht (m)	Estimated tree height in metres
Stem dia (cm)	Stem diameter measured in accordance with BS5837:2012 Annex C
Canopy Spread	Estimated branch spread (in metres) at four cardinal points
Clear crown	Height of the lowest branch(es) including cardinal point(s) where applicable
Life stage	YNG -Young SM -Semi-mature EM - Early mature M - Mature OM - Over-mature (including veteran trees)
RULE	Remaining useful life expectancy estimated in years
Cond.	G - Good F - Fair P - Poor
Notes	Including observations and notes on: Defects and other structural and physiological abnormalities, nesting birds, bat roost potential (where possible), notes on surrounding land incl. soil compaction, Tree Preservation Orders and Conservation Area (where information is available), notes on limited access/inspection, off site location and preliminary management recommendations (in italics)
BS Cat.	Retention category and sub-category in accordance with BS5837:2012 A - High Quality1 - Mainly arboricultural value B - Moderate Quality2 - Mainly landscape value C - Low Quality3 - Mainly cultural value U - Unsuitable for retention
RPA (m)	Radius of Root Protection Area calculated in metres (Radius of RPA= 12x stem diameter). This will usually be capped at 15m for trees with a stem diameter larger than 1.25m
RPA (m²)	Area of Root Protection Area (relevant if RPA is not circular due to pre-existing site conditions, incl. water courses, retaining structures and building foundations). Rounded up to nearest m ² . This will usually be capped at 707m ² for trees with a stem diameter larger than 1.25m.

Ref	Species	Ht (m)	Stem dia (cm)	Canopy spread (m)				Clear crown	Life stage	RULE	Cond.	Notes (Including preliminary management recommendations)	BS Cat.	RPA (m)	RPA (m ²)
				N	E	S	W								
T1	Italian alder (<i>Alnus cordata</i>)	7	80, 50	1.5	1.5	1.5	1.5	1.5	SM	40+ Years	Good	Twin-stemmed from ground level.	C1	1.1	4
G2	Italian alder (<i>Alnus cordata</i>) Goat Willow (<i>Salix caprea</i>) Hazel (<i>Corylus avellana</i>)	12	200#	See plan for canopy extents				2	EM	40+ Years	Good	A linear group of boundary trees, mainly goat willow and hazel with 4 stems of Italian alder within. Limited inspection due to lack of access.	C1,2	See plan	154
T3	Elder (<i>Sambucus nigra</i>)	6	50#	1.5	1.5	1.5	1.5	1	EM	20+ Years	Good	Multi-stemmed tree from approximately 0.3m, where it appears the original single stem was cut down. The regrowth now consists of approximately 25 stems with an average diameter of 50mm.	C1	3	28
G4	Goat willow (<i>Salix caprea</i>) Italian alder x15 (<i>Alnus cordata</i>)	13	160#	See plan for canopy extents				2	EM	40+ Years	Good	Boundary group of trees growing on an embankment which is sloping upward from southeast to northwest. Group is providing boundary screening.	C1,2	See plan	76
G5	Italian alder x3 (<i>Alnus cordata</i>)	15	460, 430, 280	See plan for canopy extents				2	EM	40+ Years	Good	Three Italian alders which are all kinked at their bases, but self-righted. These are growing in the sloping embankment. Debris and rubbish at base of trees limited a full detailed inspection, however there are no visible sign of lifting of the root plates. Ivy on stems. Most northern tree is slightly leaning away from the group towards the light.	B1,2	See plan	199
T6	Sycamore (<i>Acer pseudoplatanus</i>)	6	140, 110, 110	4.0	5.0	3.0	0.0	1.5	SM	40+ Years	Good	A self-set tree. Multi-stemmed from ground level.	C1	2.5	20

Ref	Species	Ht (m)	Stem dia (cm)	Canopy spread (m)				Clear crown	Life stage	RULE	Cond.	Notes (Including preliminary management recommendations)	BS Cat.	RPA (m)	RPA (m ²)
				N	E	S	W								
G7	Goat willow x7 (<i>Salix caprea</i>) Common ash (<i>Fraxinus excelsior</i>) Italian alder x3 (<i>Alnus cordata</i>)	14	300#	See plan for canopy extents				2	EM	40+ Years	Good	Early mature boundary trees. Ivy on stems. Trees growing on sloping embankment.	C1,2	See plan	300
T8	Italian alder (<i>Alnus cordata</i>)	15	430	5.0	4.0	2.0	3.0	4	EM	40+ Years	Good	Single-stemmed and vertical. A larger tree growing on the edge of G7. Ivy obscuring main stem.	B1	5.2	85

8.0 Appendix 3 – Site photographs



Figure 1: Northern boundary tree group G4 (Category C. mixed tree species).



Figure 2: Northern boundary tree group G5 (three Category B. Italian alders). Category C sycamore (T6) is shown in front of the group.



Figure 3: Western boundary tree group G7 (Category C. mixed tree species). Category B Italian alder (T8) is shown at the front of the group.

9.0 Appendix 4 – Methodology

9.1 Introduction

- 9.1.1 This report and the methodology adopted to carry out the Arboricultural Survey is based on recommendations outlined in *British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction- Recommendations*. This was published by BSI Standards Limited and came into effect on 30th April 2012. It supersedes BS 5837:2005 which is withdrawn.

9.2 Arboricultural Survey

- 9.2.1 A tree survey or arboricultural survey is a ground-based visual assessment of existing trees and tree groups on a site. It records the location of trees, the species, the estimated height and canopy spread, the stem diameter, and the tree's life stage, remaining useful life expectancy (RULE) and overall condition. Any distinctive features and abnormalities such as structural defects and physiological condition which may or may not have an adverse effect on the health or stability of the tree are also recorded, together with any signs of nesting birds and bat roost potential. Where ground conditions may influence the tree's growth, health and stability, such as water logging, ground compaction and severe level changes, this would also be recorded.
- 9.2.2 The site walkover includes an assessment of the overall value and quality of the trees on site by assigning a retention category to each tree and tree group. This assists stakeholders in deciding which trees should be removed or retained in the event of development occurring. There are four categories: A (high quality), B (moderate quality), C (low quality) and U (unsuitable for retention). For trees in categories A to C, these should qualify under one or more subcategories: 1 (mainly arboricultural qualities), 2 (mainly landscape qualities) and 3 (mainly cultural values).
- 9.2.3 The findings of the tree survey are recorded in an Arboricultural Survey Schedule supported by a Tree Survey and Tree Constraints Plan, both appended to the report.
- 9.2.4 The survey includes all trees which have a stem diameter of at least 75mm at 1.5m height or measured in accordance with BS 5837:2012 Annex C.
- 9.2.5 The tree survey usually records individual trees (labelled "T" on the Tree Survey and Tree Constraints Plan and in the Tree Survey Schedule), but may also group trees of similar age, species and condition into Groups (labelled "G"). Trees may also be grouped where they form a homogeneous unit (e.g. tree belts and woodland groups) which is unlikely to be directly

affected by the development (labelled “G” for small groups or “W” for Woodland Groups, as appropriate). Hedgerows are also recorded where present (labelled “H”).

- 9.2.6 To determine the location of trees, groups and hedgerows on site, Enzygo Ltd. and any surveyor sub-consultants use a handheld GPS tracking device with an accuracy of up to 1-2m. It enables the surveyor to plot trees onto a base plan, usually a digital copy of a topographic survey or an OS map tile, and to simultaneously record all tree survey information required for a full tree survey schedule to BS 5837:2012.
- 9.2.7 Following the completion of the site survey this is then uploaded into a Computer Aided Design (CAD) programme in order to produce the Tree Survey and Tree Constraints Plan, with the tree survey information converted into a corresponding Tree Survey Schedule.
- 9.2.8 The survey includes any trees outside the site boundary which may be affected by any development proposals by overhanging canopies or by Root Protection Areas which are likely to extend into the site. These trees are normally found within 15m from the site boundary.
- 9.2.9 In addition to a site walk-over survey, a desk-study is carried out which includes the calculation of Root Protection Areas (RPA) in accordance with BS 5837:2012 clause 4.6 as the minimum area of land around the stem of a tree which should be protected during construction.
- 9.2.10 The desk study includes liaison with the relevant local authority to establish whether any of the trees on site are protected by Tree Preservation Order (TPO) or whether Conservation Areas affect the legal status of any trees. Some local authorities provide online mapping tools on their website which identify any legal tree protection.



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