Kirklees Council

HECKMONDWIKE BUS STATION

Arboricultural Impact Assessment Report

70091329-ARB-001
JULY 2022

PUBLIC

Kirklees Council

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Arboricultural Impact Assessment Report

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EXECUTIVE SUMMARY

The Proposed Development, at Heckmondwike Bus Hub, requires construction and demolition activities in order to redevelop the site for a new covered bus station.

An arboricultural walkover survey was undertaken on 18 June 2021. Data from that survey has been used as a baseline to assess the arboricultural impact of the Proposed Development.

A total of eight arboricultural features were surveyed, consisting of six individual trees, and two tree groups. One arboricultural feature (G4) was assessed to be moderate quality and all others assessed as low quality.

The extent of potential tree removal is indicated on the Tree Removal and Protection Plan of Appendix C. Overall, four features require removal for the Proposed Development.

Retained trees outside of the Planning Application Boundary are sufficiently far from the Proposed Development that they will not be impacted by demolition and construction. Principles for tree protection are set out in the Arboricultural Method Statement (Appendix D).

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1. WSP has been instructed by Kirklees Metropolitan Council to provide arboricultural support for a planning application to redevelop a bus station structure (hereafter referred to as the 'Proposed Development') at the Heckmondwike Bus Hub.

1.1.2. This report considers the Proposed Development which consist of:

- A new covered concourse with new bus stands, seating and real time information boards;
- Five new Drive-in-Reverse-Out (DIRO) bus stands, one Drive-in-Drive-Out (DIDO) layover stand and one layover resting bus bay located off the carriageway on a new hard landscaped bus apron, replacing the existing 4 No. bus layover bays to increase bus capacity;
- A new fully enclosed waiting area with an Accessible WC and Changing Places facility. This will also provide enclosed staff office space, rest areas, and plant rooms;
- A harmonious modern building design that integrates well into the surrounding heritage assets and public realm but also provides a unique design identity;
- Enhanced soft and hard landscaping to create a more inviting and usable public realm that also promotes art, culture, and biodiversity;
- New reversing camera facilities to allow for safe bus reversing activity so the drivers can view what's behind them at bus stands 1 to 5;
- An environmentally friendly bus station design which will incorporate energy efficiency, local energy generation such as roof-mounted solar photovoltaic (PV) panels, and green features that complements the surrounding heritage and public realm;
- 6 No. cycle stands (accommodating 12 No. cycles);
- Bin store; and
- Improved pedestrian circulation routes around the bus station site.

1.1.3. The Proposed Development is centred on Ordnance Survey National Grid Reference: SE 21515 23544. The Proposed Development is currently an outdoor Bus Hub, situated in Heckmondwike north of the A638 where South George Street meets the Royle Fold.

1.1.4. The Proposed Development is accessible by vehicle from the A638 at the Royle Fold junction, with limited parking bays available at the north of South George Street.

1.2 SCOPE OF REPORT

1.2.1. The purpose of this report is to identify all trees which may be affected by the Proposed Development, to assess the impact of the Proposed Development upon those trees and to recommend such protection measures as are necessary to ensure the health of retained trees.

1.2.2. The scope and level of detail included within this report is commensurate with that required for the adequate consideration of arboricultural features as part of the Proposed Development.

1.2.3. Information provided complies with the requirements of British Standard BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations, and includes reference to the following:

- results of a BS 5837 walkover survey;
- an Arboricultural Impact Assessment (AIA); and,
- an Outline Arboricultural Method Statement (AMS).

1.2.4. Impacts should be defined as an assessment of arboricultural removals and identification of matters to be addressed within an AMS.

1.3 LIMITATIONS

1.3.1. Provisional Tree Preservation Orders (TPOs) may be made whenever a local planning authority deems it appropriate with only those persons interested in the land served with a copy of the Order. Because of this, any reference to the presence of TPOs is only valid on the date at which the desk study search was undertaken. In instances where works unspecified in this report are to be undertaken, and which may impact trees, a further search for the presence of TPOs should be carried out prior to commencement.

1.3.2. Trees are dynamic organisms which are influenced by a variety of environmental variables and whose health and condition can rapidly change. Because of this, any recommendations made within this report are valid for a period of 24 months from the date of survey, when any site conditions change or pruning or other works unspecified in the report are carried out to, or affecting, the subject trees, whichever is the sooner.

1.3.3. This report does not constitute a health and safety survey. Where concerns for tree health and safety exist then necessary and appropriate tree inspections should be carried out.

1.4 RELEVANT LEGISLATION, POLICY AND GUIDANCE

1.4.1. This report has been compiled with reference to the following legislation, policy and guidance:

LEGISLATION

- *The Town and Country Planning Act 1990*

POLICY

- *National Planning Policy Framework (NPPF) (revised 20 July 2021)*
- *Kirklees Council, Policy LP33 'Trees', from Kirklees Local Plan Strategy and Policies 2013 – 2031.*

GUIDANCE

- *British Standards Institute. BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. London: BSI*

1.5 ABBREVIATIONS OF TERMS USED

Table 1-1 – List of acronyms used within this report

Acronym	Definition
AIA	Arboricultural Impact Assessment
AMS	Arboricultural Method Statement - A methodology for the implementation of any aspect of development which is within the root protection area, or has the capacity to adversely affect, any retained tree.
BS 5837	British Standard BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations'. This standard '*gives recommendations and guidance on the relationship between trees and the design, demolition and construction process. It sets out the principles and procedures to be applied to achieve a harmonious and sustainable relationship between trees and structures*'.
CEZ	Construction Exclusion Zone - An area within which all site clearance and construction activities, access and storage of materials are prohibited.
RPA	Root Protection Area - Layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's vitality.
TRPP	Tree Removal and Protection Plan
TPO	Tree Preservation Orders - An order made by the Local Planning Authority to protect specific trees, groups of trees or woodlands in the interests of amenity.

2 METHODS

2.1 STUDY AREA

2.1.1. The arboricultural study area includes trees up to 15m from the planning application boundary shown in Figure 2-1. The purpose of a 15m buffer is to ensure compliance with BS 5837 which recommends that all arboricultural features whose Root Protection Areas (RPAs) may be impacted are identified, surveyed and included within the assessment. The British Standard caps RPAs to a maximum radius of 15m, hence the extent of the buffer.

Figure 2-1 - Planning application boundary (red line) as taken from the location plan Drawing no. 20-233-SGP-XX-00-DR-A-010001

2.2 BASELINE DATA COLLECTION

2.2.1. Baseline data collection has been undertaken with reference to BS 5837 and has been undertaken using the following data sources:

- an arboricultural desk study; and
- a walkover survey of arboricultural features within the study area.

2.3 DESK STUDY

2.3.1. A desk study was undertaken on 6 June 2022 to identify specific statutory and non-statutory arboricultural constraints which may apply to arboricultural features within the study area. The desk study review, as outlined in Appendix A, was undertaken to establish the following statutory and non-statutory arboricultural constraints:

- Tree Preservation Orders;
- Conservation Areas;
- Ancient Woodland; and
- Ancient or Veteran trees.

2.4 WALKOVER SURVEY

2.4.1. A walkover survey of trees within the study area was undertaken on 18 June 2021. The survey was undertaken to comply with BS 5837 and details of the method used are presented in Appendix A.

2.4.2. The location of arboricultural features was recorded using a combination of topographical data, GPS, and aerial images.

3 ARBORICULTURAL SURVEY FINDINGS

3.1 DESK STUDY FINDINGS

3.1.1. The desk study established no TPOs nor conservation areas are within the study area. The desk study also found no records of ancient or veteran trees nor ancient woodland, this was verified by the walkover survey.

3.2 WALKOVER SURVEY FINDINGS

3.2.1. An arboricultural survey schedule detailing information about trees in the study area is presented at Appendix B. Table 3-1 summarises the number of trees surveyed and tree quality categories within the study area. The locations of arboricultural features are shown on the Tree Removal and Protection Plan (TRPP) of Appendix C.

Table 3-1 – Summary of tree quality categories

BS 5837 Category	Quality	Individual Trees	Groups	Hedges	Totals
Category B	Moderate	0	1	0	**1**
Category C	Low	6	1	0	**7**
Totals		**6**	**2**	**0**	**8**

3.2.2. The only arboricultural feature surveyed of moderate quality was G4, a group of five Callery pear trees, situated in urban planting pits at the south of the site adjacent to A638 Westgate. All other arboricultural features were identified as low quality.

4 ARBORICULTURAL IMPACT ASSESSMENT

4.1 SCOPE OF ASSESSMENT

4.1.1. The scope of this assessment has been established with reference to BS 5837. The scope of assessment is to evaluate the effects of the Proposed Development on arboricultural features and where necessary recommend mitigation.

4.1.2. The assessment includes specific reference to the effects of tree loss and other potentially damaging activities which could foreseeably occur in the vicinity of retained trees. Further reference is made concerning recommendations for mitigation, including those matters which require inclusion within an AMS.

4.2 ASSUMPTIONS AND LIMITATIONS

4.2.1. This AIA report has been compiled on the basis of the following assumptions:

- All construction and demolition activities will be confined to the site boundaries of the Proposed Development;
- All construction and demolition activities will be excluded from Construction Exclusion Zones (CEZ) identified on the TRPP; and
- Existing areas of hard surfacing will remain in-situ or be utilised for construction access, site compounds and material storage as specified in this AIA.

4.2.2. The following limitations apply to this AIA report:

- Enabling works (such as the installation or diversion of services by statutory undertakers beyond the red line boundary) have not been considered;
- Details on earthwork extents or drainage proposals have not been considered;

4.3 ARBORICULTURAL FEATURES TO BE REMOVED

4.3.1. The proposed development in relation to arboricultural features is shown in the TRPP of Appendix C. The Proposed Development will result the removal of LG1, T2, T3 and G4.

4.3.2. LG1 and G4 are to be removed to enable the construction of the covered concourse and the enclosed waiting area with welfare and office space. T2 and T3 are to be removed to enable the reconfigured layout of the site. While there is potential to retain T3 in a new landscaped area the tree has suffered damage to the upper crown and the tree is of a size that can be replaced with relative ease securing a better quality tree in a location more suited the Proposed Development layout.

4.4 OTHER ARBORICULTURAL IMPACTS

4.4.1. Above and below ground impacts of the Proposed Development have been reviewed with regard to T5, T6, T7 and T8 which are all outside of the Planning Application Boundary. All the trees are sufficiently far from the site not to be impacted by the Proposed Development. The RPAs for these trees and extent of crowns are shown on the TRPP in Appendix C. In the unlikely event that demolition or construction activity associated with the Proposed

Development approaches these trees, physical measures should be put in place to protect these trees, details of which are provided in the AMS at Appendix D.

4.5 MITIGATION PLANTING

4.5.1. Through implementing appropriate tree protection measures, all retained trees can be kept without detrimental impact on them.

4.5.2. A Landscape Design (Ref. TCF-WSP-KHBH-XXX-DR-LE-000001 Rev P04) has been prepared which illustrates the locations of trees that are proposed to be planted to compensate for the removal of the four the arboricultural features.

4.6 ARBORICULTURAL METHOD STATEMENT

4.6.1. An outline AMS is included in Appendix D. Given the proximity of retained trees to the Proposed Development it is unlikely the AMS will be required but has been provided in the event that circumstances change. The AMS adopts a precautionary approach to tree protection and addresses activities which have the potential to cause damage to retained trees.

4.6.2. The AMS addresses, in principle, the following matters which are of relevance to the Proposed Development.

- arboricultural monitoring;
- tree protection fencing; and
- temporary hard surfaces in RPAs.

4.6.3. It is recommended that this AMS be viewed as a 'living document'. It should therefore be reviewed, and if necessary updated as and when required. It is anticipated that a pre-commencement site meeting would be required with the Local Planning Authority Tree Officer to confirm tree protection measures.

4.6.4. All tree works undertaken must comply with British Standard 3998:2010 – Tree Work Recommendations and should therefore be carried out by skilled tree surgery contractors.

5 SUMMARY AND CONCLUSIONS

5.1.1. A walkover survey of the arboricultural features within the arboricultural study area was undertaken on 18 June 2021. The arboricultural survey was undertaken in accordance with BS 5837.

5.1.2. A desk study conducted on 6 June 2022 confirms the absence of any TPOs or conservation areas within the arboricultural study area. No other statutory or non-statutory arboricultural constraints were found.

5.1.3. A total of eight arboricultural features, consisting of six individual trees, and two groups of trees were surveyed. One of the arboricultural features (G4) was of moderate quality and all others were assessed as low quality.

5.1.4. The Proposed Development will result in the removal of one moderate quality arboricultural feature (G4) as well as the removal of three low quality features.

5.1.5. All other arboricultural features can be retained and protected through demolition and construction. Principles for tree protection are set out in the outline AMS which includes the need for arboricultural supervision and tree protection fencing.

Appendix A

ARBORICULTURAL SURVEY METHOD

SURVEY METHOD

METHOD OF BASELINE DATA COLLECTION

Baseline data collection has been undertaken with reference to BS 5837 and uses the following data sources:

- An environmental desk study, and;
- A walkover survey of all arboricultural features within the study area.

DESK STUDY

The arboricultural desk study for the Proposed Development was undertaken on 6 June 2022. The desk study reviewed Kirklees Council's online databases for TPOs[1] and conservation areas as well as publicly available information on ancient woodland[2] and ancient/veteran trees[3].

WALKOVER SURVEY

A walkover survey was undertaken on 18 June 2021 and in accordance with the following criteria:

- Arboricultural features have been recorded as individual trees or tree groups/woodland where this has been deemed appropriate. Tree groups/woodland have been recorded on the basis that they form distinct arboricultural features either aerodynamically, visually or because they collectively contain trees of similar size or value.
- The trees have been visually inspected from ground level only.
- No tissue samples were taken nor was any internal investigation of the subject trees undertaken.
- Tree heights and crown spreads have been estimated.
- Notes have been recorded where they relate to the quality of the arboricultural feature.
- Management recommendations have been provided where work is necessary for the abatement of a hazard which presents a high level of risk to persons or property.

[1] Kirklees Council, 2022. *TPO & conservation area database* [online]. Available at: https://mapping.kirklees.gov.uk/connect/analyst/mobile/#/main?mapcfg=Tree%20Preservation%20Orders%20(Public)&lang=en-gb [Accessed 06 June 2021]
[2] Natural England, 2022. *Multi-Agency Geographic Information for the Countryside (MAGIC) database* [online]. Available at: https://magic.defra.gov.uk/MagicMap.aspx [Accessed 06 June 2022]
[3] Ancient Tree Inventory, 2022. *Ancient Tree Inventory* [online] Available at: < https://ati.woodlandtrust.org.uk [Accessed 06 June 2022]

Stem diameters have been measured in accordance with Annex C of BS 5837. By default, Root Protection Areas (RPAs) are calculated as an area equivalent to a circle with a radius 12 times the stem diameter.

Diameters of single stem trees on level ground have been measured at 1.5m above ground level. The diameters of other commonly encountered stems have been measured as per the guidance. The combined stem diameters for multi-stemmed trees have been calculated in accordance with BS 5837 paragraph 4.6.1. For tree groups or woodland features, the largest visible stem near the outer margins of each feature was measured unless stated in Arboricultural Survey Schedule

QUALITY ASSESSMENT

The quality of arboricultural features has been determined in accordance with BS 5837 Table 1 as provided in Figure A-1. The purpose of the quality assessment is to enable informed decisions to be made regarding the removal and retention of arboricultural features in the context of development. For an arboricultural feature to be included within a particular quality category it should accord with the description provided.

The quality of each arboricultural feature is defined based on its sub-category. Sub-categories carry equal weight, do not influence retention priority and are simply included to indicate the primary value associated with each surveyed item. Sub-categories 1, 2 and 3 are intended to reflect arboricultural, landscape and cultural values, respectively.

The quality and sub-category assigned to each arboricultural feature are identified within the Arboricultural Survey Schedule included in Appendix B of this report.

Figure A-1 - BS 5837 Table 1 - Cascade Chart for Tree Quality Assessment

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
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	• 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 *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **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)	See Table 2
Category B **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	See Table 2
Category C **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	See Table 2

NOTES AND LIMITATIONS

Arboricultural survey data is of a preliminary nature and has been collected based on a walkover survey.

Only defects visible from the ground have been noted and each individual feature may not have been inspected closely due to access difficulties, the presence of dense ivy, other vegetation or safety constraints. Safety related features have not been recorded on the basis that the arboricultural features will be subject to a normal programme of tree hazard assessment and only those features which materially affect the quality of the feature or pose a real and immediate safety concern have been recorded.

Arboricultural survey data is typically valid for a period of two years unless otherwise stated. Significant environmental events (such as extreme weather conditions) or changes within the study area may render it invalid within a shorter timescale.

Whilst arboricultural surveys are not seasonally limited it is the case that certain pests and diseases may be more or less evident at different times of the year. This is especially true of certain wood decaying fungi such as the Giant Polypore (*Meripilus giganteus*) where fruiting bodies are short-lived, and the early stages of root decay may not result in other identifiable

symptoms. Walkover survey data is therefore based upon observations made at the time of the site visit and may be subject to change should further or more detailed inspections be undertaken.

The survey has only been undertaken from land within the client's ownership, from public land or from areas where formal access has been arranged.

Appendix B

ARBORICULTURAL SURVEY SCHEDULE

Measurements		Life Stages		Quality Assessment of BS Category		ULE (relates to BS Category)
Height	Overall height (m) – maximum and minimum heights may be recorded for tree groups, wooded areas and hedges where these vary considerably.	Young	Young trees; Establishing and typically with good vigour and fast growth rates and strong apical dominance; < 1/3rd estimated life expectancy	Category A	Trees of high quality with an estimated remaining life expectancy of at least 40 years.	40+ years
Stem Dia.	Diameter measured (mm) in accordance with BS 5837 paragraph 4.6.1, Annex C. Average stem diameter is provided for tree groups, woodlands and hedges.	Semi-mature	Semi-mature trees; 1/3rd estimated life expectancy	Category B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	20-40 years
Crown Radius	Estimated on site or measured using a digital distometer radially from the stem (m). Cardinal points north (N), east (E), south (S) and west (W) provided.	Early-mature	Early mature; > 2/3rd estimated life expectancy. The stage in the life cycle of a tree between youth and maturity.	Category C	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.	10-20 years
LCH	Lowest crown height (m)* Lowest branch height (m)*	Mature	Mature; > 2/3rd estimated life expectancy, generally good vigour and achieving full height potential with crown still spreading	Category U	Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	<10 years
FSB	Height of lowest significant branch (m)*	Veteran	Biological, cultural or aesthetic value comprising niche saproxylic habitat. Individuals of large proportions (stem girth) in comparison to trees of the same species/ exists significantly beyond its normal life expectancy.	Sub-categories: 1 - Mainly arboricultural value 2 - Mainly landscape value 3 - Mainly cultural or conservation value		

* In some instances, where an arboricultural feature abuts the edge of the Study Area then only the portion of the crown within/overhanging the Study Area will be surveyed and recorded.

Abbreviations and Notes

est - Estimated stem diameter
avg - Average stem diameter for multiple stems
upto - Maximum stem diameter of a group
erc - Estimated remaining contribution

The BS category particular consideration has been given to the following:

- The presence of any structural defects in each tree/group and its future life expectancy
- The size and form of each tree/group and its suitability within the context of a proposed development
- The location of each tree relative to existing site features e.g. its screening value or landscape features
- Age class and life expectancy

Structural Condition	
Good	No significant structural defects.
Fair	Structural defects that can be remediated.
Poor	Significant defects beyond remediation, presents a risk of failure in the foreseeable future.
Dead	Dead tree with structural integrity of tree severely compromised.

Physiological Condition	
Good	No significant health problems.
Fair	Symptoms of ill-health that can be remediated.
Poor	Significant ill-health. Unlikely the tree will recover in the long term.
Dead	Advanced state of decline and unlikely to recover or dead.

Root Protection Area (RPA)

- The RPA Radius column provides the extent of an equivalent circle from the centre of the stem (m).

- The RPA is calculated using the formulae described in paragraph 4.6.1 of British Standard 5837: 2012 and is indicative of the rooting area required. Tree roots extend beyond the calculated RPA in many cases and where possible a greater distance should be protected. An average stem diameter is provided for tree groups, wooded areas and hedges

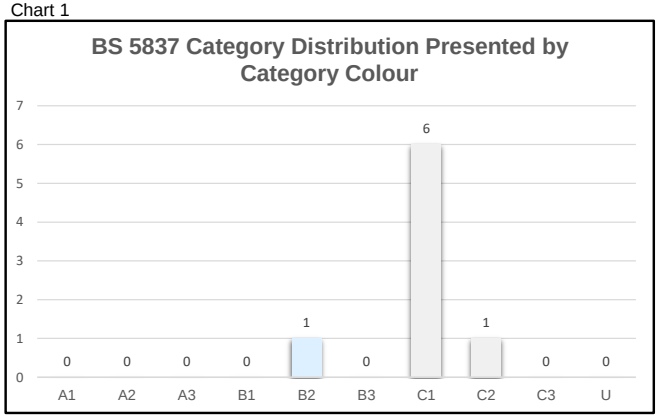
- Where veteran trees have been identified the RPA has been calculated in accordance with Natural England guidance i.e. 15x the stem diameter or 5m beyond the crown whichever is greater.

Arboricultural Survey Summary

Table 1 - Summary of Individual Tree, Groups of Trees, Woodlands and Hedgerows by BS5837:2012 Category

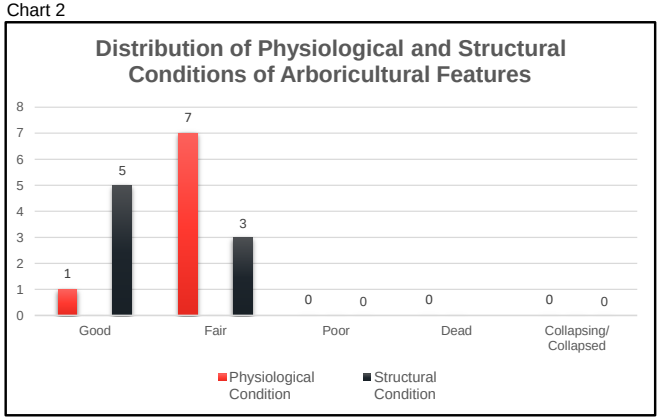
Category	Individual Trees, Groups, Woodlands, Hedgerows	Total
Category A		0
Category B	G4	1
Category C	LG1, T2, T3, T5, T6, T7, T8	7
Category U		0
	Total	8

Chart 1



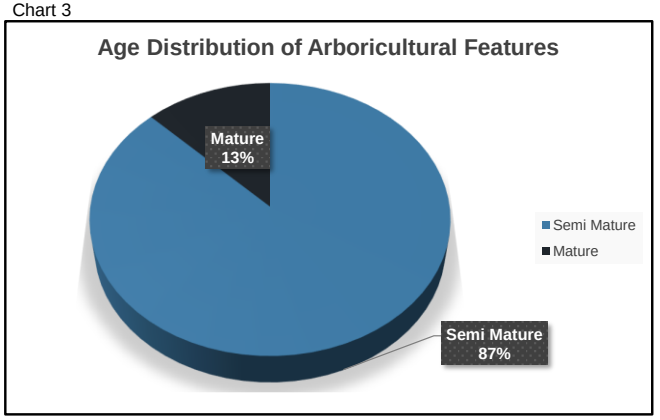
BS 5837 Category Distribution displays the proportion of trees assessed in each category type to enable a better understanding of the category distribution across the population. Trees have been divided into one of four categories based on Table 1 of BS5837 Cascade chart for tree quality assessment.

Chart 2



One of the key factors in assessing the long-term value and vulnerability of the resilience of the tree population to pests and diseases is the overall condition of that population. Physiological condition provides an indication of the physiological vitality of the tree whilst tree structural condition is related to the presence of defects (e.g. large cavity or codominant branches with included bark) that can lead to tree failure. An assessment of the condition allows for an assessment of the overall health of the tree population

Chart 3



Age Distribution of Arboricultural features shows the percentage of the tree population in each age category. The distribution of age category across the population is useful for understanding the expected longevity of the exisitng tree cover which can be used for determining mitigation, management and replacement. A population requires sufficient large, mature trees to deliver the widest range of environmental benefits in urban areas and enough trees of a younger age classes to replace these mature trees as they eventually die.

Arboricultural Survey Schedule

Ref.	Species	Height (m)	Min. Height (m)	Max Height (m)	Stem measurement	Stem Dia. (mm)	N	E	S	W	LCH	LBH	Life Stage	Physiological Condition	Structural Condition	Tree Condition Notes & Observations	RPA (m²)	RPA Rad. (m)	BS5837 Category	Estimated Remaining Contribution
LG1	Maidenhair tree, Ginkgo biloba; Box maple, Acer negundo	0	4	6.5	Average	160	2	2	2	2	2	2	Semi Mature	Fair	Fair	4 trees, 2 Ginko and 2 Box Maple. Trees planted in public realm. 1 tree has been removed since planting.	11.6	1.9	C2	10-20 years
T2	Maidenhair tree, Ginkgo biloba	4	0	0	Estimated	130	1.5	1.5	1.5	1.5	2	2	Semi Mature	Fair	Fair	Unable to measure due to proximity of people awaiting buses.	7.6	1.6	C1	10-20 years
T3	Maidenhair tree,Ginkgo biloba	3.5	0	0	Estimated	130	1.5	1.5	1.5	1.5	2	2	Semi Mature	Fair	Fair	Unable to measure due to proximity of people awaiting buses.	7.6	1.6	C1	10-20 years
G4	Callery pear, Pyrus calleryana ‘Chanticleer’	0	5	6	Average	210	2	2	2	2	2	2	Mature	Good	Good	5 trees, planted in urban planting pits. Some minor lower bark wounds.	20.0	2.5	B2	20-40 years
T5	Hornbeam, Carpinus betulus	3	0	0	Estimated	100	1	1	1	1	1.5	1.5	Semi Mature	Fair	Good	Planted in a planter on the pavement. Die back in the upper crown noted.	4.5	1.2	C1	10-20 years
T6	Hornbeam, Carpinus betulus	4	0	0	Estimated	100	1	1	1	1	1.5	1.5	Semi Mature	Fair	Good	Planted in a planter on the pavement. Die back in the upper crown noted.	4.5	1.2	C1	10-20 years
T7	Hornbeam, Carpinus betulus	4	0	0	Estimated	100	1	1	1	1	1.5	1.5	Semi Mature	Fair	Good	Planted in a planter on the pavement. Die back in the upper crown noted.	4.5	1.2	C1	10-20 years
T8	Hornbeam, Carpinus betulus	4	0	0	Estimated	100	1	1	1	1	1.5	1.5	Semi Mature	Fair	Good	Planted in a planter on the pavement. Die back in the upper crown noted.	4.5	1.2	C1	10-20 years

Appendix C

TREE REMOVAL AND PROTECTION PLAN

NOTES:

1. All dimensions are in metres unless otherwise stated.
2. Do not scale from this drawing.

KEY:

PREFIX		CATEGORY GRADING
T	TREE	A CATEGORY
G	GROUP	B CATEGORY
H	HEDGE	C CATEGORY
LG	LINEAR GROUP	U CATEGORY
		TREES TO BE REMOVED

COLOUR INDICATES BS5837:2012 CATEGORY

Planning Application Boundary

Indicative root protection area (RPA)

REV	DATE	DESCRIPTION	DRAWN	CHECK	DISC CHECK	APP
P01	07/06/2022	First Revision	JM	HB	---	---

DRAWING STATUS: S0 Work In Progress

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PROJECT: Heckmondwike Bus Hub

TITLE: Tree Retention and Removal Plan

Sheet 01 of 01

SCALE @ A1:	DRAWN:	ENG CHECK:	DISC CHECK:	APPROVED:
1:200	JM	---	---	---
PROJECT NO:	DATE:	DATE:	DATE:	DATE:
70091329	07/06/2022	---	---	---

DRAWING No: TCF-WSP-KHBH-XXX-DR-LE-00011-P01 REV: P01

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Appendix D

ARBORICULTURAL METHOD STATEMENT

INTRODUCTION

The Arboricultural Method Statement (AMS) is designed to provide guidance to the Principal Contractor to ensure appropriate protection is given to retained trees during the demolition and construction phases of the project.

Provided all demolition and construction activity, including storage and movement of materials, plant and welfare units, is within the Planning Application Boundary shown in Appendix C then implementing tree protection measures for retained trees is not required. In the event that activities are undertaken in close proximity to the tree root protection areas or crowns this AMS is to be implemented.

The AMS should be considered as a working document and be modified appropriately with input from the Site Manager and the appointed project arboriculturist acting as an Arboricultural Clerk of Works (ACoW).

PHASING

Detailed below is the phasing programme which should be followed by the contractor throughout the life of the Proposed Development to ensure that trees are protected in accordance with the Arboricultural Method Statement.

Phase 1 – Pre-development

- Pre-commencement site meeting with client, contractor, Local Planning Authority, engineer and appointed arboriculturist;
- Pegging out of construction areas;
- With reference to project plans and in consultation with client, contractor, LPA and scheme arboriculturist confirm trees to be removed and trees to be retained;
- Install protective fencing; and
- Carry out tree removal.

Phase 2 – Scheme development/construction

- Establish site compounds - location for cabins, car park and the storage of materials;
- Carry out initial ground works and services installations; and
- Undertake main development.

Phase 3 – post-development

- Carry out soft landscaping;
- Remove protective fencing; and
- Remove ground protection.

TREE PROTECTION

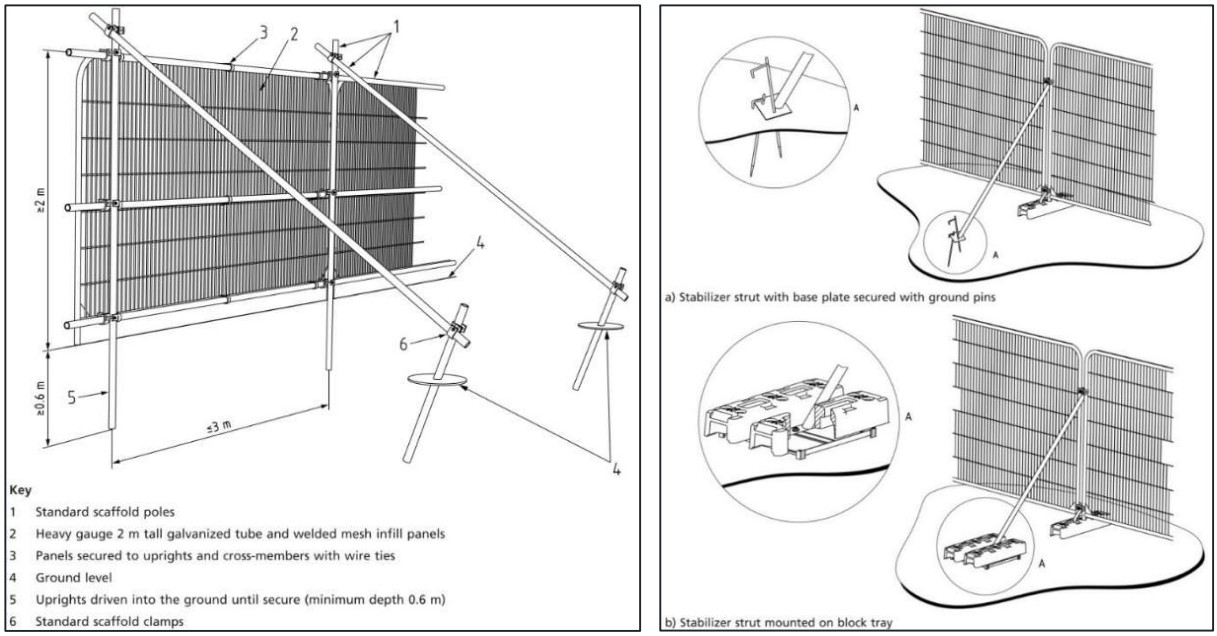
Effective tree protection can only be achieved by adherence to a logical sequence of works combined with effective arboricultural monitoring. Tree protection fencing in accordance with BS5837 (or similar and approved) shall be erected prior to the commencement of any of the following activities:

- The delivery of any plant or materials;

- Demolition;
- Soil stripping;
- Construction works;
- Installation of utilities; and
- Landscape works.

Temporary tree protection fence is to be erected to protect retained trees with the positioning agreed on site with the ACoW. Typical examples of the type of tree protection fencing are included in Figure D-1.

Figure D-1 - Tree Protection Fencing (Extracts taken from BS 5837:2012 - Trees in relation to design, demolition and construction – Recommendations)



All weather notices should be attached to the tree protection fencing at suitable intervals and positioned an eye level. These notices should include suitably sized informative text containing the following statement:

''TREE PROTECTION FENCING

CONSTRUCTION EXCLUSION ZONE – NO ACCESS''

Once erected these areas should be regarded as sacrosanct, and once installed, barriers should not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the Local Planning Authority (LPA).

This fencing is to remain in place until completion of all construction works on site.

The areas covered by the tree protection fencing are known as the Construction Exclusion Zones (CEZ) and should not be compromised. The following shall apply within these areas:

- No mechanical excavations;
- No excavations by other means without the agreement of the project arboriculturist;
- No change in levels (except removal of grass sward using hand tools);
- No storage of plant or materials;

- No storage or handling of any chemicals including cement washings; and
- No vehicular access.

Where the Root Protection Areas (RPAs) for retained trees exceeds the perimeter of the tree protection fencing then temporary ground protection should be installed in areas of soft landscaping. This should be in accordance with BS5837.

Suitable ground protection with the objective of avoiding soil compaction and therefore leaving the tree roots to function unimpaired shall consist of the following:

- For pedestrian access only: single thickness scaffold boards laid butt jointed on a 100mm compression-resistant layer of woodchip, laid on a geo-textile membrane. Or a single thickness of scaffold boards laid on top of a driven scaffold frame to form a suspended walkway.
- For pedestrian-operated machinery up to 2 tonnes gross weight: 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.
- For wheeled or tracked construction traffic exceeding 2 tonnes 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.

On completion of all works the above systems shall be removed only with the consent of the LPA. Surface de-compaction and root zone enhancement measures may then be undertaken. This may include spiking, aeration and/or injection of rhizobium inoculants.

SITE HUTS, STORAGE OF MATERIALS AND SPOIL

Temporary site compounds, including mobile WCs and all their service connections, are to be positioned clear of the RPAs of retained trees.

The delivery, storage, mixing and discharge of concrete and all other cement-based materials shall be carried out so that there is no run-off and spillage near the RPAs of retained trees. No substances that are potentially injurious to plant tissue (including diesel, bitumen, concrete, mortar and other phyto-toxic materials) shall be stored, discharged, prepared or used, where direct contact, infiltration or run-off might reasonably be considered liable to harmfully affect existing root growth or other parts of retained trees. Where chemicals are stored it is now standard practice to have emergency spillage kits available to minimise the impacts of any accidental spillages to the local environment. All cement mixing, vehicle washing or any other activity where toxic chemicals are used shall have the provision to contain any accidental spillage. This can be achieved using suitable soil bunding or using a supporting timber framework sealed with heavy duty plastic sheeting.

No building materials shall be stored within RPAs of retained trees. Spoil from any site activity, including demolition and any materials from the project designated for re-use, shall either be removed from site; or, if kept on site, shall be stored or piled well clear of RPAs of retained trees.

MONITORING

Once the protective fencing and ground protection measures have been installed but prior to the commencement of the development a site inspection should be undertaken by the project ACoW. This is to confirm that all protection measures have been installed in accordance with the TRPP and AMS.

Regular monitoring visits should be carried out as necessary during the development.

On completion of the development a general survey of the trees is recommended to identify any remedial action necessary as a result of the works. Note that permission for any additional tree works not included in the original development consent may need to be obtained through application to the LPA.

If any arboricultural issues arise during the development, then the site manager should immediately contact the project ACoW for advice on how to proceed.

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