Silva Arboriculture Ltd

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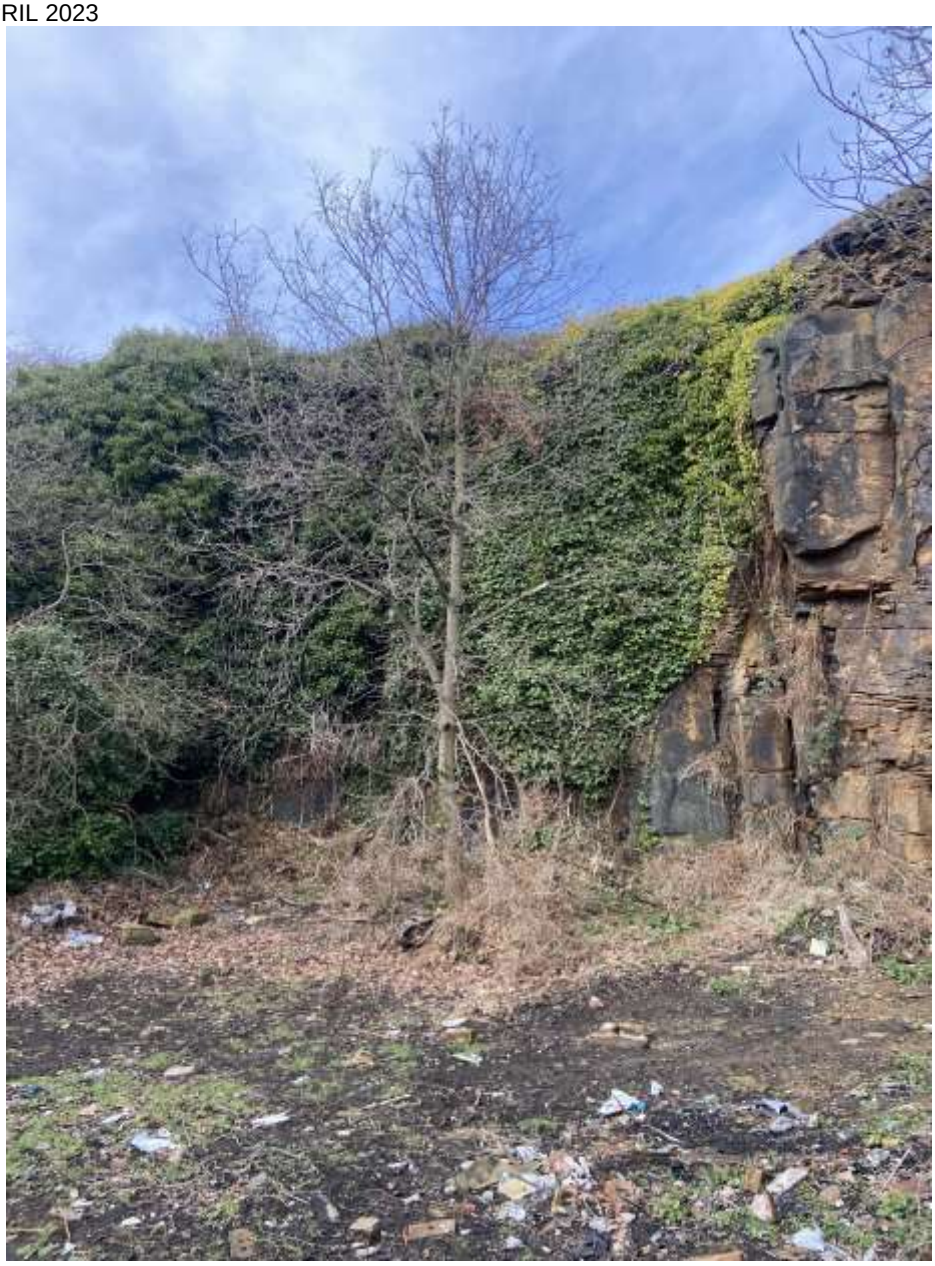
KNOWLES QUARRY BARNSLEY ROAD, CUDWORTH, S72 8UU.

BS 5837: 2012 Arboricultural Impact Assessment Report

Report no. 23017
APRIL 2023



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Version control

Version	Date	Author	Changes
1	April 2023	Darren Hood FdSc MArborA 	N/A

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Executive Summary

Silva Arboriculture Ltd has been commissioned by Consult Construct Ltd to provide Arboricultural services to support a planning application for the installation of new onsite parking at the Site, referred to as: Knowles Quarry Barnsley Road, Cudworth, S72 8UU.

The Site is located within the Local Authority of Barnsley Metropolitan Borough Councils approximately 4.5km north-east of Barnsley town centre. The Site is a disused and redundant quarry. The Site is located on the edge of Cudworth.

A total of 20 arboricultural items have been recorded within the Study Area, all are under the direct ownership of the client.

- Seventeen individual trees were recorded within as Category C.
- Three individual trees were recorded as Category U.

To facilitate the design proposal, a total of 14 individual trees will require removal, these are made up of 11 Category C trees and three Category U trees. These trees are of poor and low quality and hold little public amenity.

Six Category C trees can be maintained as part of the scheme. It should be noted that these trees are all located on the existing quarry rock face as such it will not be practical or necessary to protect these trees with protective fencing.

None of recorded trees are currently protected by Tree Preservation Orders and the Site does not fall within the Conservation Area.

It is recommended that prior to any on-site construction activities protective fencing should be installed around the root protection area (RPA) of the retained trees, where practical, as indicated in Appendix B Table 2, to protect them from any demolition and construction activities. Details of protective fencing have been provided in Appendix C (Protective fencing) to safeguard the retained trees and arboricultural features within the survey area.

All tree works must be carried out by a qualified contractor in accordance with *BS3998:2010: Tree Work – Recommendations*[1].

[1] British Standards Institution (2010) *BS3998:2010: Tree Work – Recommendations*

1 Introduction

1.1 Overview

Silva Arboriculture Ltd has been commissioned by Consult Construct Ltd to provide Arboricultural services to support a planning application for the installation of new onsite parking at the Site, referred to as: Knowles Quarry Barnsley Road, Cudworth, S72 8UU.

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*[2] 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 Barnsley Metropolitan Borough Councils approximately 4.5km north east of Barnsley town centre. The Site is a disused and redundant quarry. The Site is located on the edge of Cudworth. The Site is presented in Figure 1 Tree Constraints Plan.

1.3 Proposed Scheme

The proposed application is to seek planning permission to redevelop the Site to accommodate nine supported living accommodation comprising nine units with communal space and staff office/base.

[2] 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 14th March 2023 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*[3], with the aid of binoculars. For reference, individual trees have been identified with the letter 'T' 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 March 2023, 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
Topographical – CAD Surveys Ltd. Drawing no. T13/01/A	November 2022	Base mapping and Topographical Information - DWG
Proposed Ground Floor Plan – ConsultConstruct Ltd Drawing number 02	March 2023	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 m^2) 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 is represented in purple in Figure 1.

The RPA presents an exclusion zone for construction activity to protect the health of the tree.

[3] 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 with full locations of the Site trees therefore tree positions should be considered accurate. Trees outside of the property were plotted using a GPS device offset from the Site boundary. 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 and 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 trees 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 20 arboricultural items were recorded within the Study Area. These were recorded as 20 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 or groups of trees were graded as category A (trees of high quality) as part of this survey.
- Category B arboricultural items: No individual trees or groups of trees were graded as category B (trees of moderate quality) as part of this survey. Both of these trees are located outside of the Site boundary on third party land.
- Category C arboricultural items: Seventeen individual trees have been identified as category C (trees of low quality) as part of this survey.
- Category U arboricultural items: Three individual trees were graded as category U (trees of poor quality unsuitable for retention) as part of this survey.

3.2 Tree Species Recorded

A total of 11 different 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
Common Oak	*Quercus robur*	Low
Elder	*Sambucus nigra*	Low
Field maple	*Acer campestre*	Low
Goat willow	*Salix caprea*	High
Hawthorn	*Crataegus monogyna*	High
Silver birch	*Betula pendula*	Low

3.3 Age Diversity

Table 3: Age Diversity

Age Class	Number of Arboricultural Items	Approximate Percentage
Young	10	50%
Semi-mature	3	15%

Age Class	Number of Arboricultural Items	Approximate Percentage
Early-mature	4	20%
Mature	1	5%
Over-mature	2	10%
Totals	**20**	**100%**

3.4 Statutory Tree Protection

Review of Barnsley Metropolitan Borough Councils online database l was undertaken in March 2023. None of the recorded tees are currently protected by Tree Preservation Orders and the Site does not fall within a Conservation Area.

3.5 Soil Type

British Geological Society records show the site Bedrock Geology being of Pennine Middle Coal Measures Formation - Sandstone. Sedimentary bedrock formed between 318 and 309.5 million years ago during the Carboniferous period.

4 Arboricultural Impact Assessment

4.1 Potential Arboricultural Impacts

Development can have an adverse impact on trees and other woody vegetation within a site. This can be due to: (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

The proposal can be implemented with the removal of 11 Category C individual trees and three Category U trees. The Category U tress have been identified as requiring removal due to their condition and the removal of these trees should be seen as sound arboricultural management and not reflect on any planning application. Details of the trees highlighted for removal can be found in Table 4 below and in Figure 2.

Table 4 Proposed Tree Removal

Tree No.	Species	Reason	Grade
T1	Goat willow *(Salix caprea)*	Located within proposed access road and parking footprint.	C (1)
T4	Common Oak *(Quercus robur)*	Located within proposed access road and parking footprint.	C (1)
T5	Goat willow *(Salix caprea)*	Located within proposed access road and parking footprint.	C (1)
T6	Goat willow *(Salix caprea)*	Located within proposed access road and parking footprint.	C (1)
T7	Goat willow *(Salix caprea)*	Located within proposed access road and parking footprint.	C (1)
T8	Goat willow *(Salix caprea)*	Located within proposed access road and parking footprint.	C (1)
T9	Silver birch *(Betula pendula)*	Located within proposed building footprint.	C (1)
T13	Elder *(Sambucus nigra)*	Arboricultural management	U
T14	Hawthorn *(Crataegus monogyna)*	Located within proposed building footprint.	C (1)
T15	Elder *(Sambucus nigra)*	Arboricultural management	U
T16	Hawthorn *(Crataegus monogyna)*	Located within proposed building footprint.	C (1)
T17	Hawthorn *(Crataegus monogyna)*	Located within proposed building footprint.	C (1)
T18	Hawthorn *(Crataegus monogyna)*	Located within proposed building footprint.	C (1)
T19	Elder *(Sambucus nigra)*	Arboricultural management	U

5 CONCLUSIONS

A total of 20 individual trees have been recorded within the Study Area. All recorded trees are located with the Knowles Quarry Site, however, 6 trees are located on the redundant rock face of the quarry.

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

No trees were recorded within the Study Area as Category B.

Seventeen individual trees were recorded within the Study Area as Category C.

Three individual trees were recorded within the Study Area as Category U.

To facilitate the design proposal 11 Category C trees will require removal. These trees are all of low quality and hold little public amenity.

Three Category U trees will also require removal, however, their removal should be seen as good arboricultural management and not reflect on any planning application.

Six Category C trees can be maintained as part of the scheme. It should be noted that these trees are all located on the existing quarry rock face as such it will not be practical or necessary to protect these trees with protective fencing.

None of recorded trees are currently protected by Tree Preservation Orders and the Site does not fall within a Conservation Area.

The installation of protective fencing around the RPA of retained trees will not neccesery or practical due to Site topography. beAll tree works must be carried out by a qualified contractor in accordance with *BS3998:2010: Tree Work – Recommendations*[4].

[4] British Standards Institution (2010) *BS3998:2010: Tree Work – Recommendations*

FIGURE 1. Tree Constraints Plan.

T3C1
Silver birch

T2C1
Common Oak

T5C1
Goat willow

T4C1
Common Oak

T6C1
Goat willow

T7C1
Goat willow

T10C1
Field maple

T11C1
Field maple

T1C1
Goat willow

T8C1
Goat willow

T18C1
Hawthorn

T12C1
Field maple

T9C1
Silver birch

T17C1
Hawthorn

T16C1
Hawthorn

T15U
Elder

T14U
Elder

T13U
Elder

T14C1
Hawthorn

T20C1
Hawthorn

BARNSLEY RD

BUS STOP

N

W E

S

5m 10m

Key:

- Category A
- Category B
- Category C
- Category U
- Root protection area

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Project

Knowles Quarry,
Barnsley Road,
Cudworth, S72 8UU

Drawing title

Figure 1: Tree Constraints Plan

Scale	1:200 @ A2	Drawn	NB

Drawing number

23017-01

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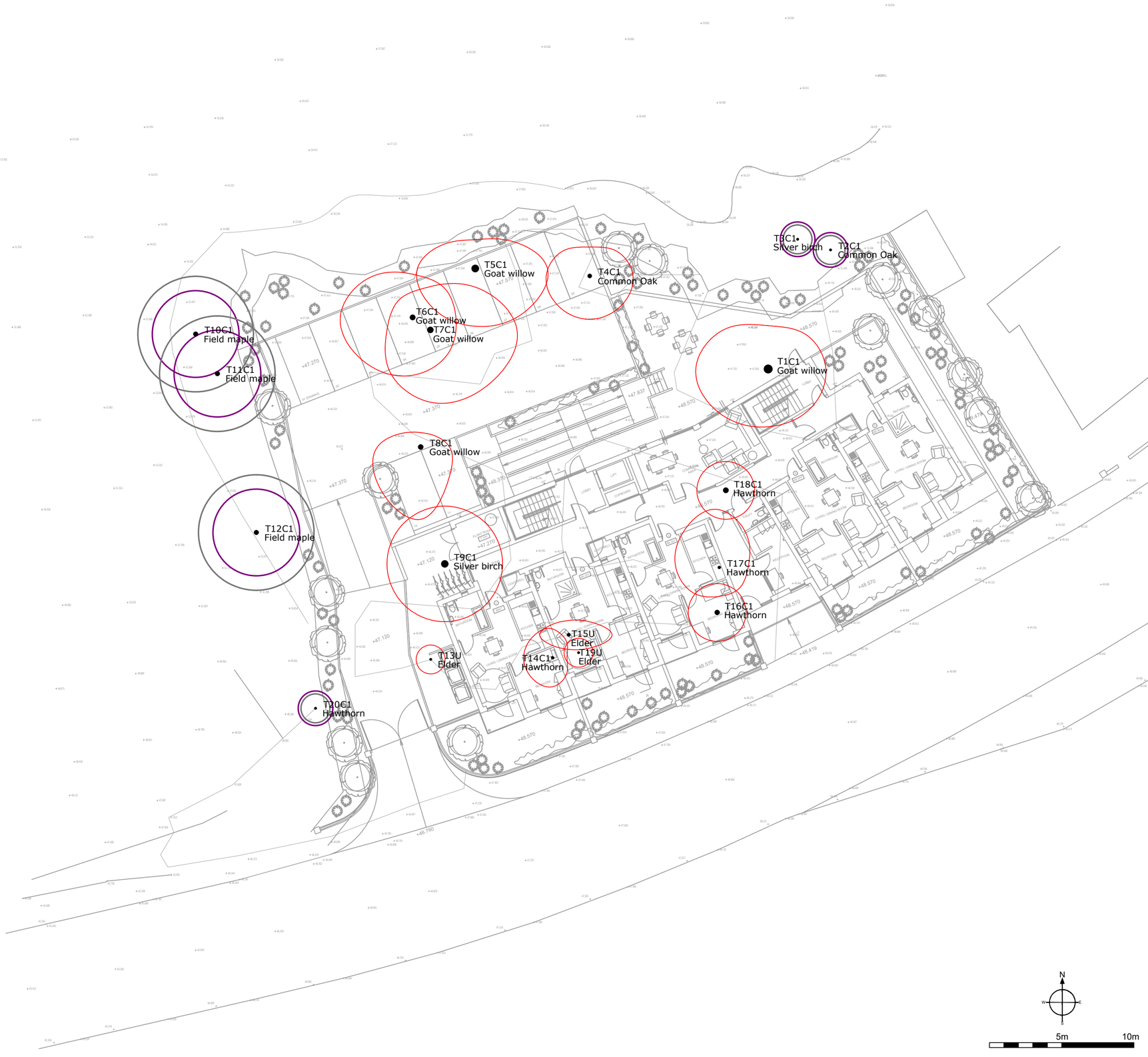
FIGURE 2. Arboricultural Impact Plan.



Key:

- Category A
- Category B
- Category C
- Category U
- Root protection area
- Tree to be removed

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Project

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Drawing title

Figure 2: Arboricultural Impact Assessment

Scale	1:200 @ A2	Drawn	NB

Drawing number

23017-02

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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: **Consult Construct Ltd**

Project: **Knowles Quarry Barnsley Road, Cudworth S72 8UU**

Survey date**: 14th March 2023**

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	Estimated remaining contribution (years)	Category grading
T1	Goat willow *(Salix caprea)*	6	3 stes @ 300	N3 E4 S4 W5	1	OM	Fair	Fair	10+	C (1)
T2	Common Oak *(Quercus robur)*	3	100#	N1 E1 S1 W1	1	Y	Good	Good – Located on rock face.	40+	C (1)
T3	Silver birch *(Betula pendula)*	8	100	N1 E1 S1 W1	1	Y	Good	Good – Located on rock face.	40+	C (1)
T4	Common Oak *(Quercus robur)*	9	210	N2 E3 S3 W3	1	Y	Good	Fair – Large bark wound at main union.	20+	C (1)
T5	Goat willow *(Salix caprea)*	7	2 stems @ 300	N2 E5 S4 W4	1	OM	Fair	Fair – Multi stemmed.	10+	C (1)
T6	Goat willow *(Salix caprea)*	9	300	N3 E3 S4 W5	1	EM	Fair	Fair – Ivy on stem.	10+	C (1)
T7	Goat willow *(Salix caprea)*	9	340	N3 E6 S5 W3	1	EM	Fair	Fair – Ivy on stem.	10+	C (1)
T8	Goat willow *(Salix caprea)*	6	280	N1 E2 S5 W3	1	EM	Fair	Fair – Ivy on stem.	10+	C (1)
T9	Silver birch *(Betula pendula)*	12	420	N4 E4 S4 W4	1	M	Good	Fair – Twin leader.	10+	C (1)

Tree reference number	Species	Height (m)	Stem diameter (mm)	Crown spread (m)	Height of crown clearance (m)	Age class	Physiological condition	Structural condition	Estimated remaining contribution (years)	Category grading
T10	Field maple *(Acer campestre)*	6	250#	N4 E4 S4 W4	1	SM	Good	Fair – Located on rock face.	20+	C (1)
T11	Field maple *(Acer campestre)*	6	250	N4 E4 S4 W4	1	SM	Good	Fair – Located on rock face.	20+	C (1)
T12	Field maple *(Acer campestre)*	6	250	N4 E4 S4 W4	1	SM	Good	Fair Located on rock face.	20+	C (1)
T13	Elder *(Sambucus nigra)*	4	100	N1 E1 S1 W1	1	SM	Poor	Poor – Dead.	<10	U
T14	Hawthorn *(Crataegus monogyna)*	5	130	N2 E1 S2 W2	1	SM	Good	Fair	10+	C (1)
T15	Elder *(Sambucus nigra)*	5	160	N1 E3 S1 W2	2	EM	Poor	Poor – Dead.	<10	U
T16	Hawthorn *(Crataegus monogyna)*	5	4 stes @ 130	N2 E2 S2 W2	1	SM	Good	Fair	10+	C (1)
T17	Hawthorn *(Crataegus monogyna)*	5	130	N4 E2 S2 W3	1	SM	Good	Fair	10+	C (1)
T18	Hawthorn *(Crataegus monogyna)*	6	5 stems @ 130	N2 E2 S2 W2	1	SM	Good	Fair	10+	C (1)
T19	Elder *(Sambucus nigra)*	4	100	N1 E1 S1 W1	1	SM	Poor	Poor – Dieback.	<10	U
T20	Hawthorn *(Crataegus monogyna)*	4	100	N1 E1 S1 W1	1	SM	Fair	Fair	10+	C (1)

Table B3 Root Protection Area

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m^2)
T1	Goat willow *(Salix caprea)*	3 stems @ 300	6.2	122.1
T2	Common Oak *(Quercus robur)*	100#	1.2	4.5
T3	Silver birch *(Betula pendula)*	100	1.2	4.5
T4	Common Oak *(Quercus robur)*	210	2.5	20
T5	Goat willow *(Salix caprea)*	2 stems @ 300	5.1	81.4
T6	Goat willow *(Salix caprea)*	300	3.6	40.7
T7	Goat willow *(Salix caprea)*	340	4.1	52.3
T8	Goat willow *(Salix caprea)*	280	3.4	35.5
T9	Silver birch *(Betula pendula)*	420	5	79.8

Tree reference number	Species	Stem diameter (mm)	Radius of nominal circle (m)	RPA (m^2)
T10	Field maple *(Acer campestre)*	250#	3	28.3
T11	Field maple *(Acer campestre)*	250	3	28.3
T12	Field maple *(Acer campestre)*	250	3	28.3
T13	Elder *(Sambucus nigra)*	100	1.2	4.5
T14	Hawthorn *(Crataegus monogyna)*	130	1.6	7.6
T15	Elder *(Sambucus nigra)*	160	1.9	11.6
T16	Hawthorn *(Crataegus monogyna)*	4 stems @ 130	3.1	30.6
T17	Hawthorn *(Crataegus monogyna)*	130	1.6	7.6
T18	Hawthorn *(Crataegus monogyna)*	5 stems @ 130	3.5	38.2
T19	Elder *(Sambucus nigra)*	100	1.2	4.5
T20	Hawthorn *(Crataegus monogyna)*	100	1.2	4.5

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