MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council

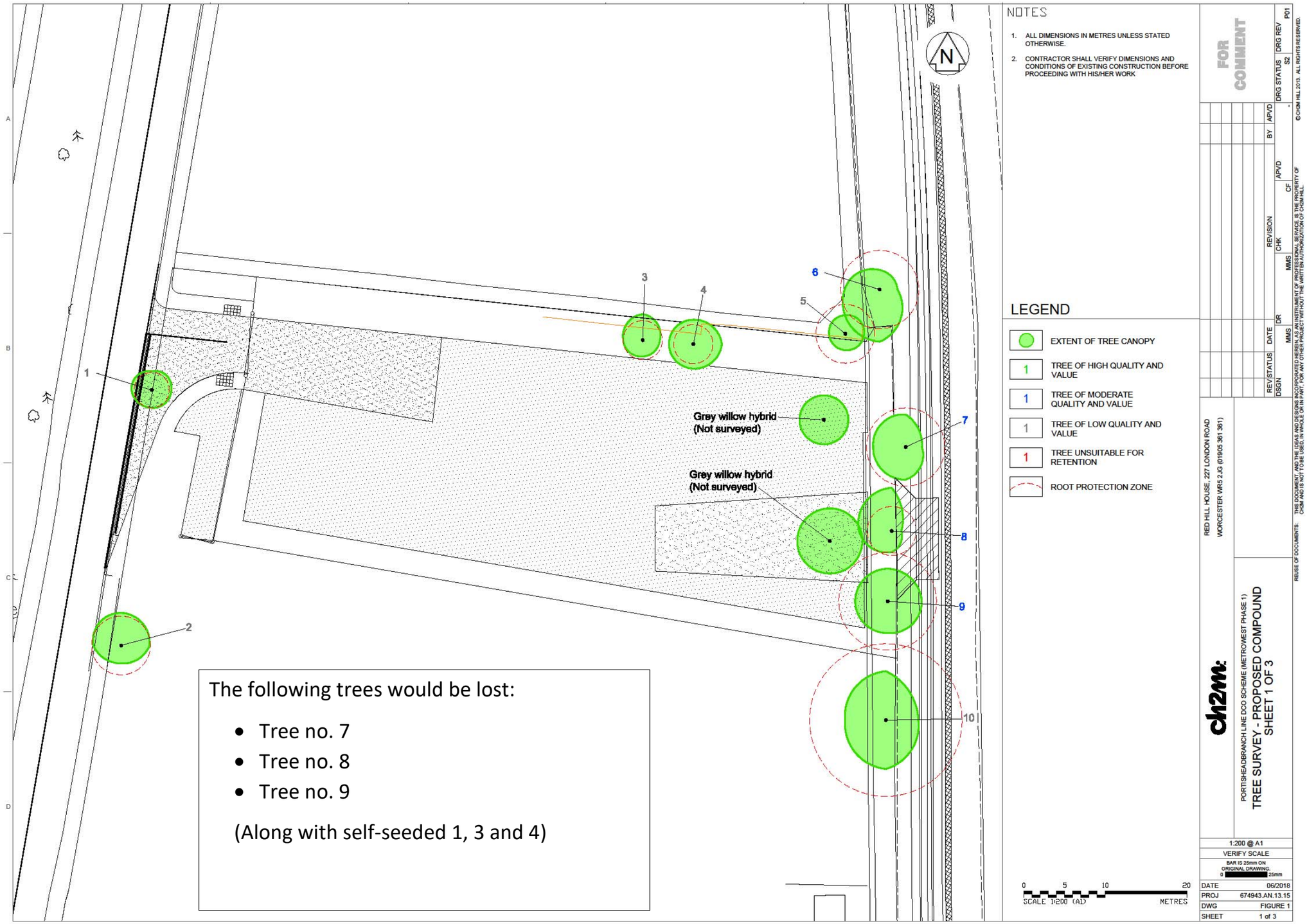
9.17 ExA.WQ1R.D3.V1 – Appendix Series BIO.1.14 to Applicant's comments on responses to the Examining Authority's Written Questions ExQ1

Author: CH2M
Version: 1
Date: December 2020

The Examining Authority (ExA) published EXQ1 round of Written Questions (WQs) on 26th October 2020 – Submission by Deadline 2 on 23rd November 2020

BIO.1.14 Appendices

Appendix 1 – Tree survey plan - Proposed Clanage Road Compound Area



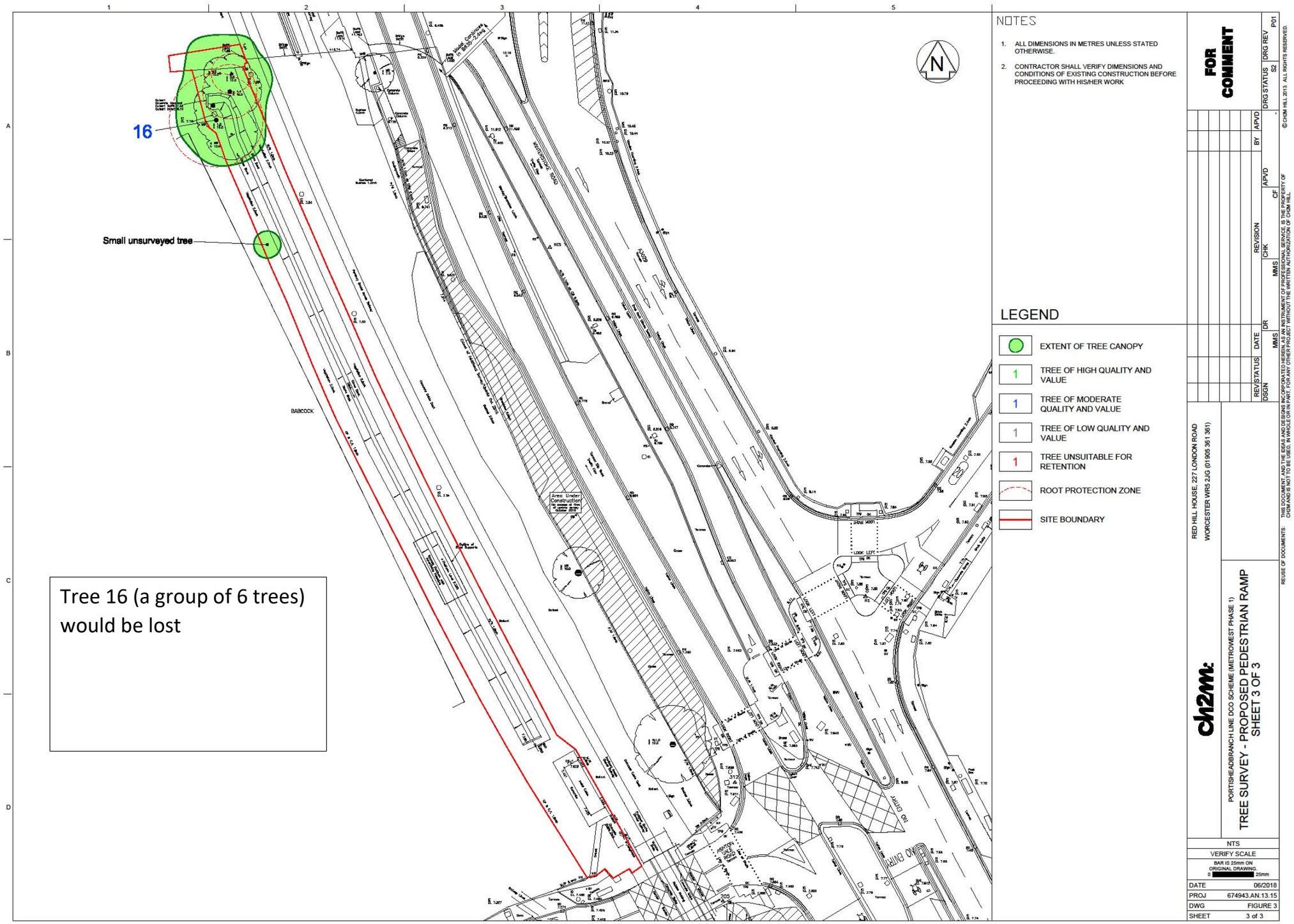
The following trees would be lost:

- Tree no. 7
- Tree no. 8
- Tree no. 9

(Along with self-seeded 1, 3 and 4)

Appendix 2 - Tree Survey Plan – Proposed Fence Installation

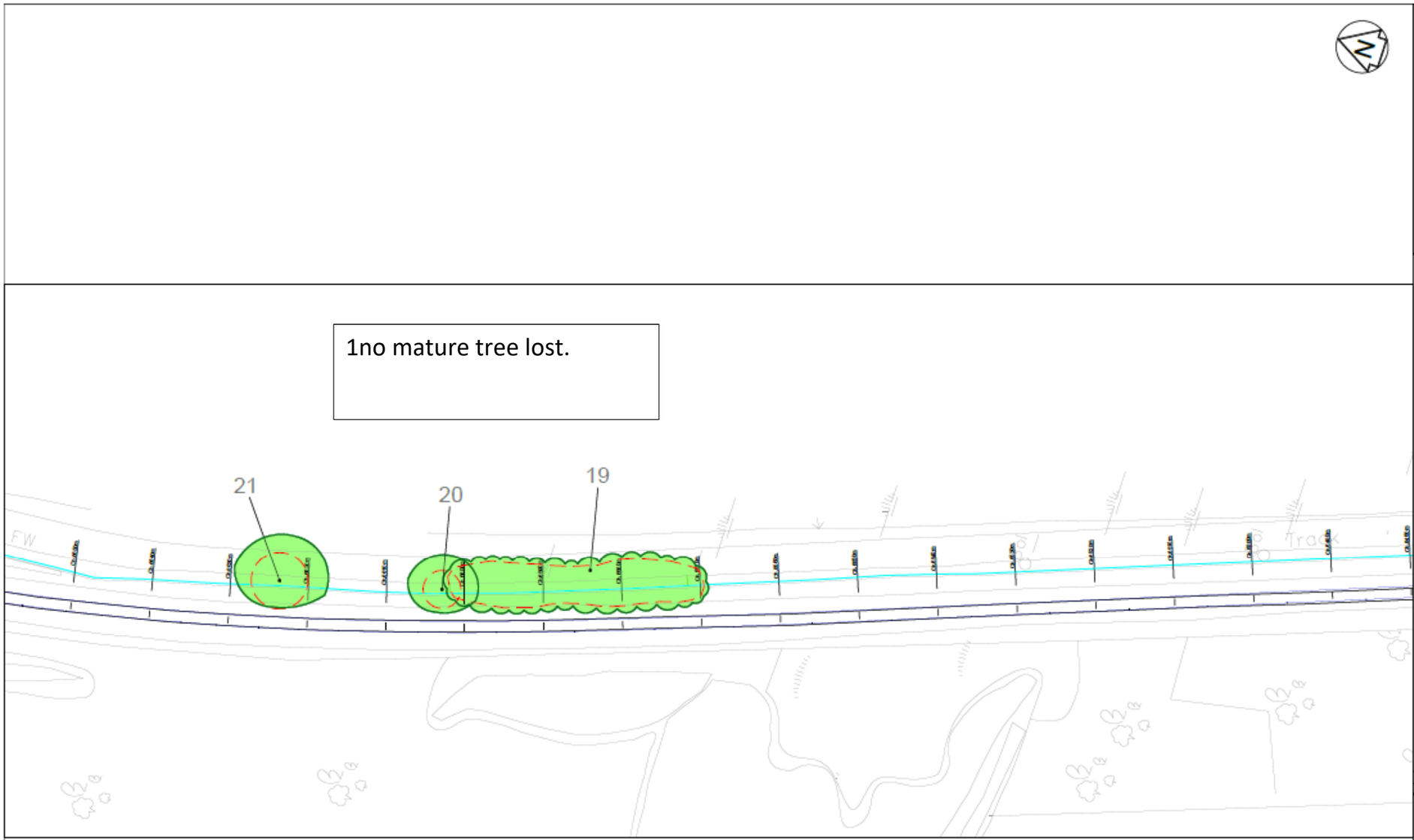
Appendix 3 - Tree Survey Plan – Proposed Pedestrian Ramp



Tree 16 (a group of 6 trees) would be lost

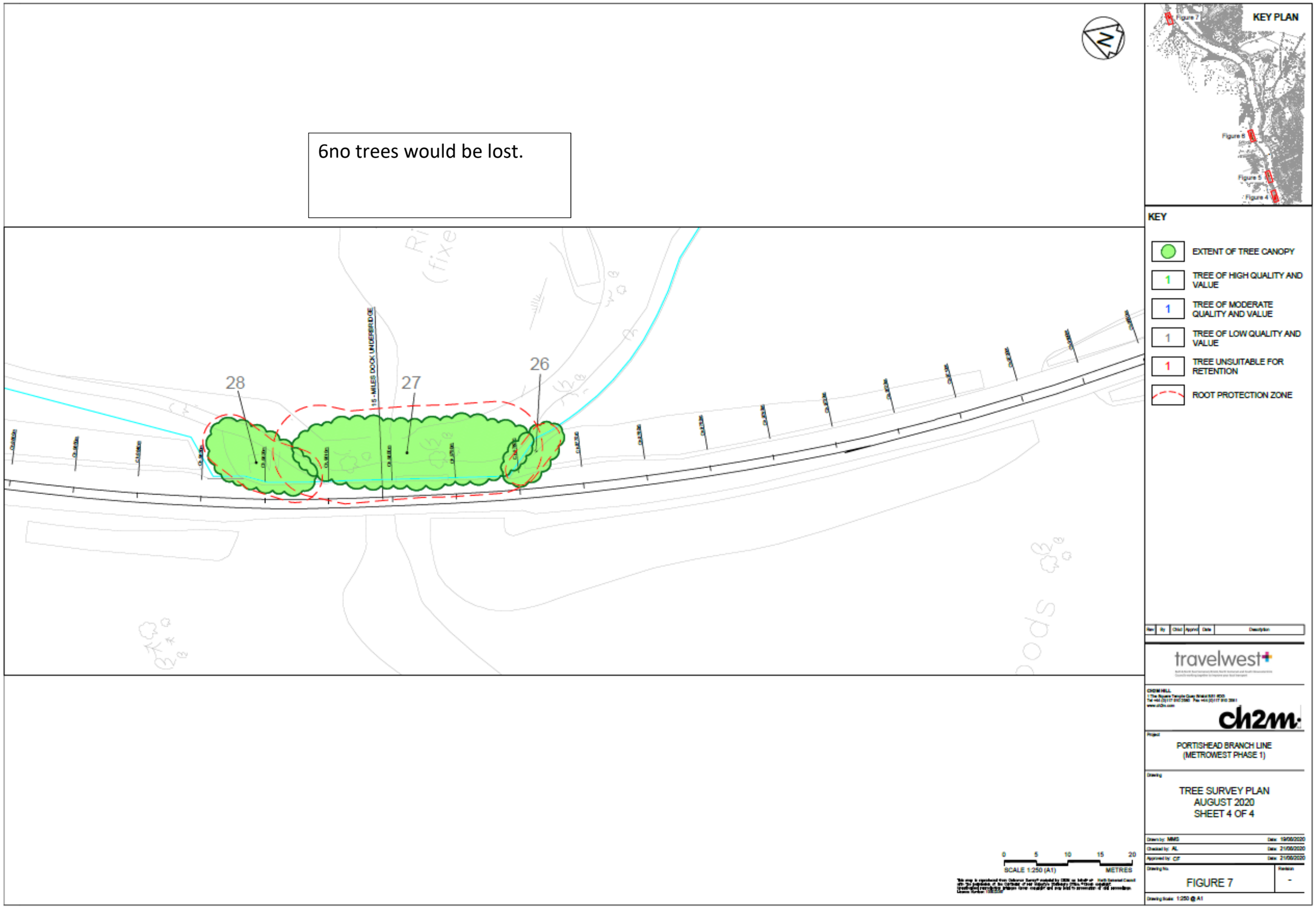
Appendix 4 - Tree Survey Plan – August 2020 (Sheet 1 of 4)

Appendix 5 - Tree Survey Plan – August 2020 (Sheet 2 of 4)

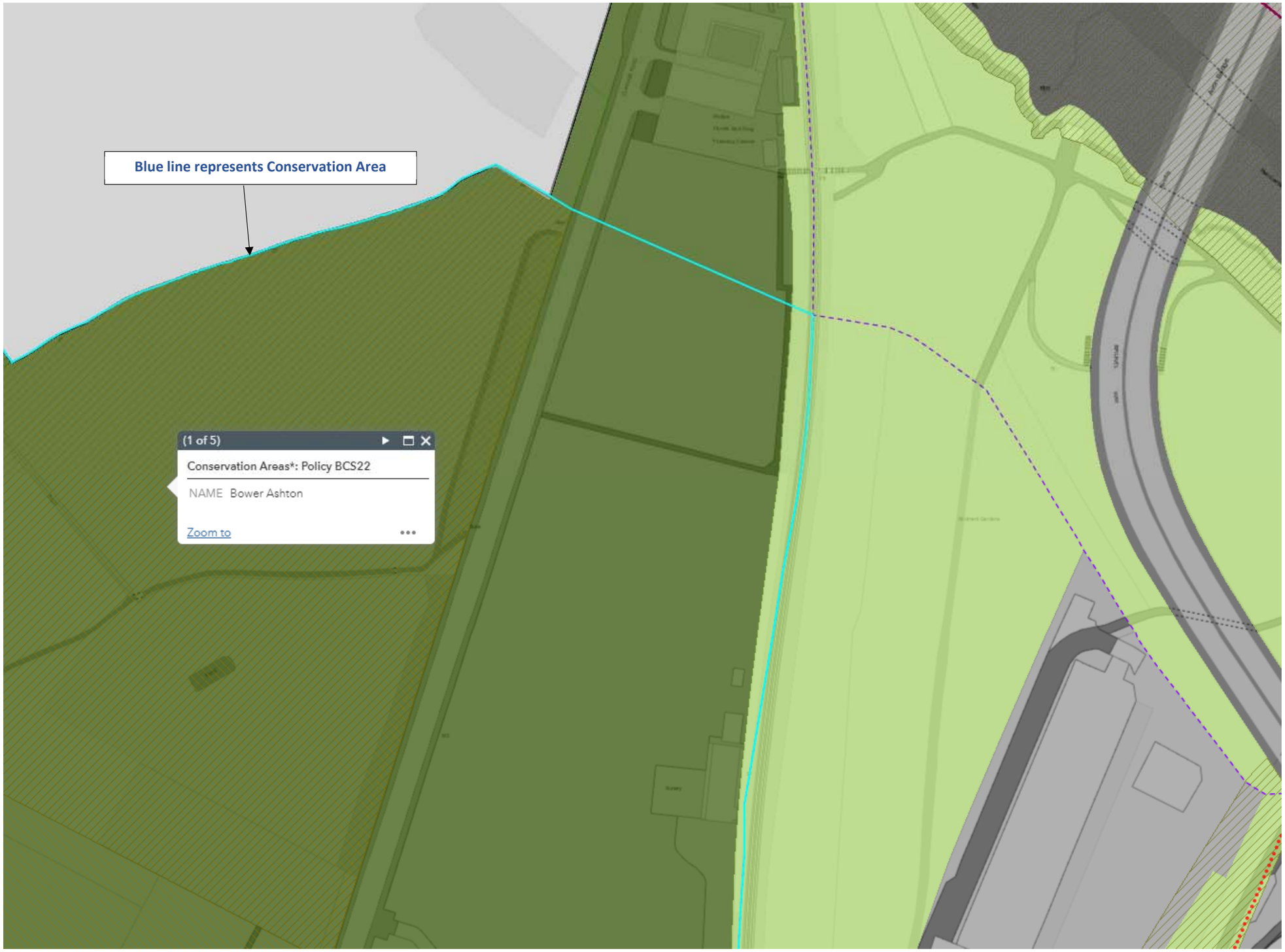


Appendix 6 - Tree Survey Plan – August 2020 (Sheet 3 of 4)

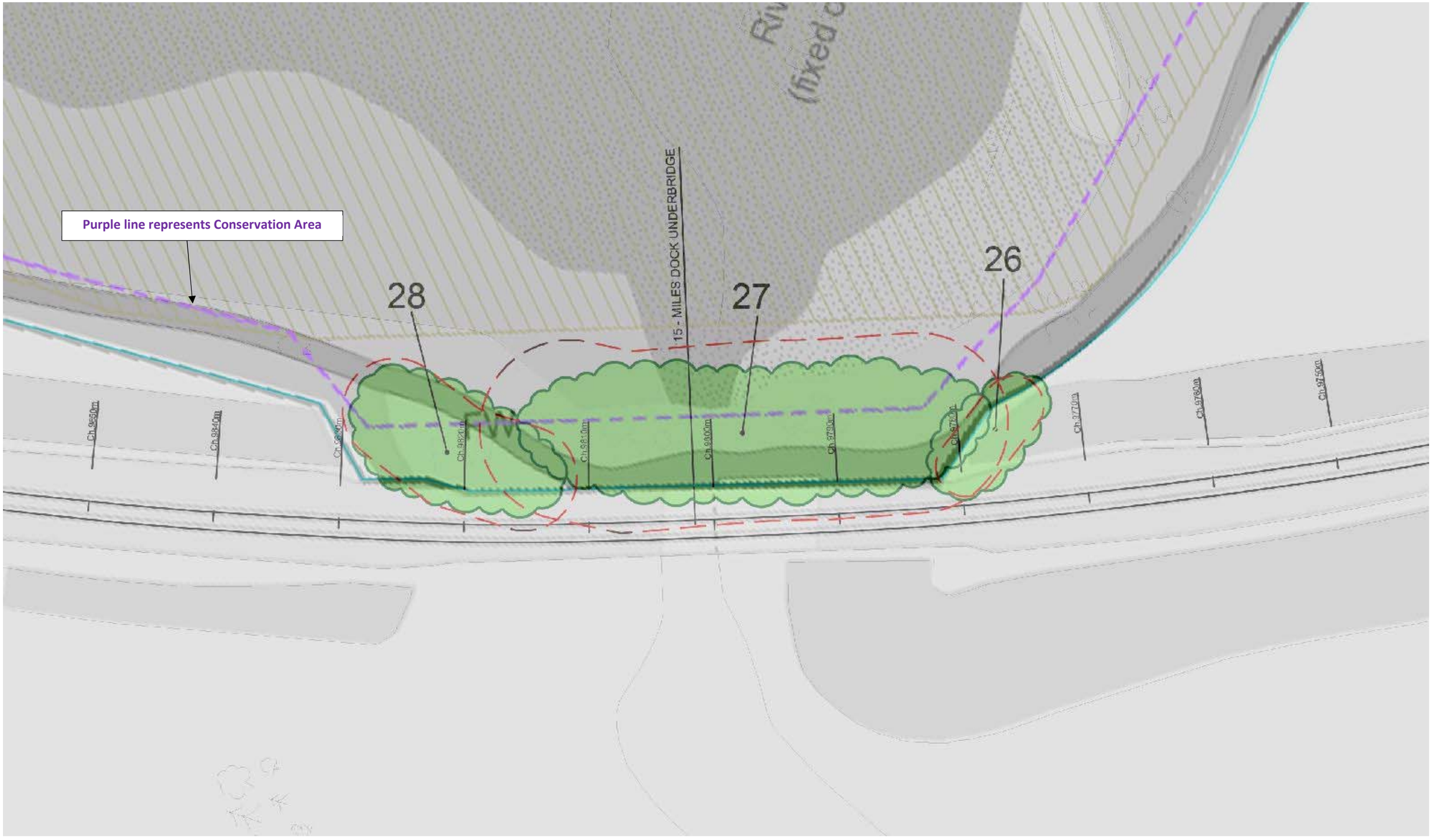
Appendix 7 - Tree Survey Plan – August 2020 (Sheet 4 of 4)



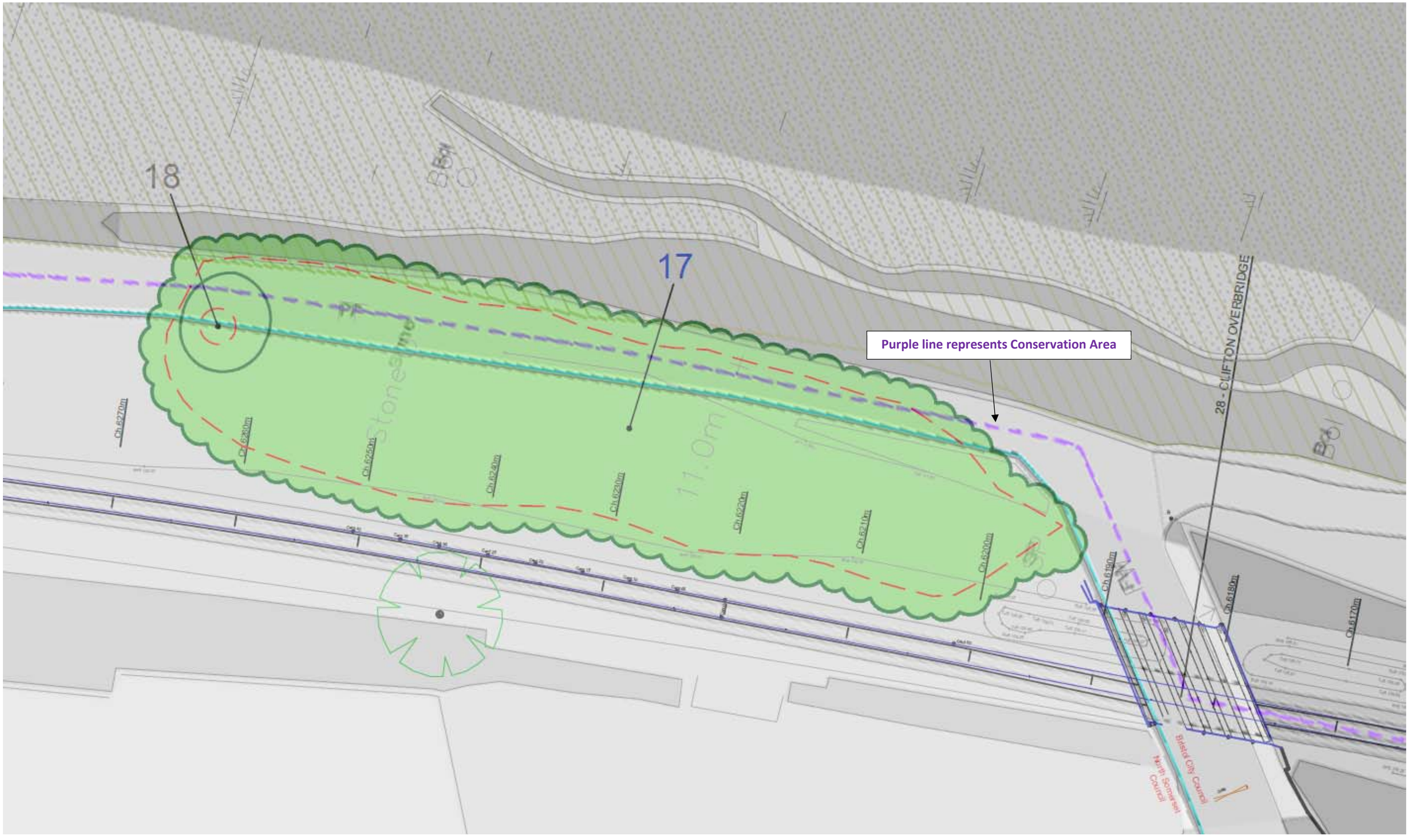
Appendix 8 - Clanage Road Compound Bower Ashton Conservation Area Boundary Extract Policy BCS22



Appendix 9 - Miles Dock Underbridge tree survey with Sneyd Park Conservation Area Boundary Extract Policy BCS22



Appendix 10 - Structure 28 and City Docks Conservation Area Boundary Extract Policy BCS22



Appendix 11 – Tree Survey Report

PORTISHEAD BRANCH LINE (METROWEST PHASE 1)
DCO SCHEME

Tree Survey Report

Prepared for

North Somerset Council

July 2018

ch2m SM

travelwest

Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

Document history

Project number: 674946

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0a	Tree Survey Report	M Sanderson	M Sanderson	C Francis	C Francis	02/08/18
Rev 2.0	Tree Survey Report	M Sanderson	M Sanderson	C Francis	C Francis	19/08/20

Table of Contents

SECTION 1

Introduction

1.1.1 The Portishead Branch Line (MetroWest Phase 1) DCO Scheme is being led by North Somerset Council (NSC) on behalf of the four West of England authorities, also comprising Bristol City Council, South Gloucestershire District Council, and Bath and North East Somerset District Council, as a third-party rail project, working with Network Rail Infrastructure Limited (Network Rail or NRIL).

1.1.2 The Portishead Branch Line (MetroWest Phase 1) DCO Scheme will reinstate passenger services between Portishead and Bristol. The scheme includes the reconstruction of the disused railway between Portishead and Pill and improvement works along the existing operational railway between Pill and Bristol.

1.1.3 The tree survey was undertaken in June 2018 at three specific locations within the proposed red line boundary where it is likely that trees will have to be removed. The first location is where the proposed site compound is to be located just off the A369 Clanage Road. The second location is adjacent to the line itself between chainages Ch. 5480m and Ch. 5360m. This is the location of a proposed fence. The third location is the site of a proposed pedestrian ramp that will run alongside Babcock International Group from Ashton Road to Ashton Vale Road.

1.1.4 A subsequent tree survey was carried out in August 2020 at several locations along the existing operational railway line between Pill and Bristol. These include areas near to two existing underbridges (15 Miles Dock Underbridge and 25 Underbridge (Private) where works to the structures are proposed. The other three locations are at chainages Ch.7350m - Ch.7250m, Ch.6630 - Ch.6570m and Ch.6270 - Ch.6190m. At these locations the installation of the proposed railway fencing may affect the neighbouring trees.

1.1.5 This report details the methodology of the survey and provides plans showing tree locations, canopy sizes, indicative Root Protection Areas (RPA) and classification with an accompanying tree schedule for the site.

1.1.6 This report provides the basis for deciding which trees might be suitable for retention within the site and should be used to assist with any proposed layout design. However, it should be noted that there are many aspects to a site's development and the number of trees that can be retained may be influenced by other factors, such as land use, planning policies, replacement planting proposals and the practicality of ensuring adequate provision to protect the trees physically during the construction of the development.

1.1.7 This tree survey gathers basic data and records the condition of the trees at the time of the survey.

1.1.8 Following this introduction, Section 2 describes the tree survey methodology. The supporting appendices provide the tree survey schedule, a cascade chart for tree quality assessment, an arboricultural implications assessment, and a glossary of arboricultural terms.

Method

2.1 Introduction

2.1.1 This survey has been carried out in accordance with BS 5837 (2012), Trees in relation to design, demolition and construction – Recommendations.

2.1.2 The survey was undertaken from ground level and only those features visible from the ground are included in this assessment.

2.1.3 Where the main trunks of trees have limited access due to dense vegetation, epicormic growth (new growth arising from dormant or new buds directly from main branches/stems or trunks), or are ivy Hedera helix clad the inspection of such trees is limited. A further inspection may be necessary following the removal of the obstruction. The category grading for such trees should be considered as provisional only.

2.1.4 The soil type or condition was not assessed.

2.1.5 In cases where it was not possible to accurately identify specimens, the notation sp. (species) has been used after the genus, or var. (variety) after the species.

2.1.6 Only trees with a stem diameter of 75 mm and over (measured at 1.5 m from ground level) were surveyed.

2.1.7 Whilst this report makes general observations on the long-term potential of the trees surveyed, trees are dynamic organisms and subject to continual change, thus this report should not be relied upon for the purposes of development for more than 12 months from the date of survey.

2.1.8 The results of the tree survey are recorded in the schedule (Appendix A). The following information is provided.

Table 1: Tree Schedule Information

Tree ref no	Shown on survey plans
Species	Common and scientific name, where possible
Height	Measured using a clinometer.
Stem diameter	Measured at 1.5 m above ground level. For multi-stem trees each stem diameter is recorded. Where the tree is inaccessible due to vegetation or obstacles then the stem diameter has been estimated. The RPA is then calculated using the stem diameter. The RPA is an area equivalent to a circle with a radius 12 times the stem diameter for a single stem tree. For trees with 2-5 stems the overall diameter is calculated by squaring each stem diameter, adding these figures together and square rooting the result. For trees with more than 5 stems the mean stem diameter is squared and multiplied by the number of stems. The result is then square rooted to give the overall diameter. The results of the calculations for multi-stemmed trees are shown in bold and in brackets the schedule. The calculated RPA should be capped to 707 m², i.e. equivalent to a circle with a radius of 15 m or a square with approximately 26 m sides.

Table 1: Tree Schedule Information

Tree ref no	Shown on survey plans
Branch spread	Measured at the four cardinal points to derive an accurate representation of the crown and is recorded on the tree survey plan. Where the tree is inaccessible due to vegetation or obstacles then the branch spreads have been estimated
Height of first significant branch and direction of growth	To inform on ground clearance, crown stem ratio and shading.
Height of canopy	To inform on ground clearance, crown stem ratio and shading.
Life stage	Young, semi-mature, early mature, mature or over mature.
General observations	Particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect) and/or preliminary management recommendations.
Estimated remaining contributions	In years, (<10, 10 +, 20 +, 40+).
Category grading	Recorded on the tree survey plans and schedule. Note – Hedgerows have not been categorised as they should be assessed separately by an ecologist in line with the Hedgerows Regulations 1997 to determine their importance. Occasionally trees are given more than one category grading, where trees would otherwise be categorized as U, but have identifiable conservation, heritage or landscape value, even though only for the short term, they may be upgraded (shown in brackets), although they might be suitable for retention only where issues concerning their safety can be appropriately managed. A – Trees of high quality with an estimated remaining life expectancy of at least 40 years. (Shown as green on the tree survey plans). B – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. (Shown as blue on the tree survey plans). 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. (Shown as grey on the tree survey plans). 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. (Shown as red on the tree survey plans).
Category grading	Recorded on the tree survey schedule only. 1 – Mainly arboriculture qualities. 2 – Mainly landscape qualities. 3 – Mainly cultural values, including conservation

Source: BS 5837 (2012), Trees in relation to design, demolition and construction – Recommendations

See Appendix B for Cascade Chart for Tree Quality Assessment.

2.2 Survey Details

2.2.1 The survey was undertaken on 28 June 2018. An additional survey was undertaken on 18 August 2020. The person employed to carry out the tree survey is a qualified Arboriculturist and holds the Technicians' Certificate in Arboriculture, is a Technician Member of the Arboricultural Association and has a Higher National Diploma in Landscape and Horticultural Technology.

2.3 Limitations to The Survey

2.3.1 No decay detecting equipment was used during the survey and a full hazard assessment has not been made therefore no guarantee is given as to the structural integrity of the trees on the site. Topographical surveys of the sites have not picked up the locations of all the trees, therefore their positions cannot be guaranteed. Where possible their locations have been determined by taking measurements from known points using a laser measurer. Where this has not been possible their position has been determined using Google maps.

2.3.2 A number of trees were inaccessible during the survey for a number of reasons: they were on private land, they were behind fencing, or they were on steep embankments. Their measurements have therefore been estimated.

Figures – Tree Survey

NOTES

1. ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
2. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS OF EXISTING CONSTRUCTION BEFORE PROCEEDING WITH HIS/HER WORK

LEGEND

- EXTENT OF TREE CANOPY
- 1 TREE OF HIGH QUALITY AND VALUE
- 1 TREE OF MODERATE QUALITY AND VALUE
- 1 TREE OF LOW QUALITY AND VALUE
- 1 TREE UNSUITABLE FOR RETENTION
- ROOT PROTECTION ZONE

0 5 10 20
SCALE 1:200 (A1) METRES

FOR COMMENT

REV	STATUS	DATE	DR	CHK	APV'D	BY	APV'D	DRG STATUS	DRG REV
	REVISION		MMS	MMS	CF			S2	P01

RED HILL HOUSE, 227 LONDON ROAD
WORCESTER WR5 2JG (01905 361 361)

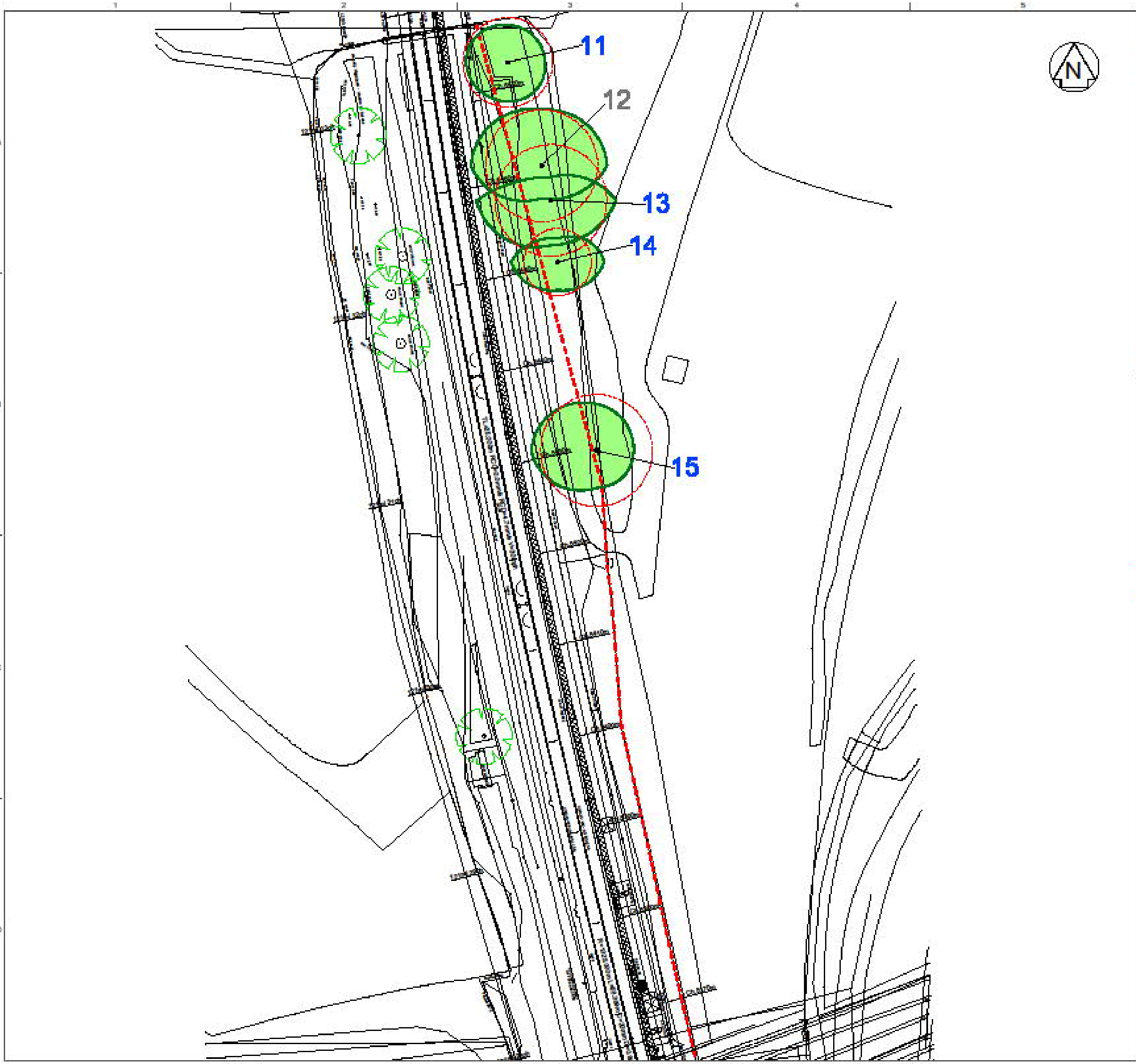
ch2m:

PORTISHEAD/BRANCH LINE DCO SCHEME (METROWEST PHASE 1)

TREE SURVEY - PROPOSED COMPOUND SHEET 1 OF 3

1:200 @ A1
VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm

DATE	06/2018
PROJ	674943.AN.13.15
DWG	FIGURE 1
SHEET	1 of 3



NOTES

1. ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
2. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS OF EXISTING CONSTRUCTION BEFORE PROCEEDING WITH HIS/HER WORK

FOR COMMENT

LEGEND

- EXTENT OF TREE CANOPY
- 1 TREE OF HIGH QUALITY AND VALUE
- 1 TREE OF MODERATE QUALITY AND VALUE
- 1 TREE OF LOW QUALITY AND VALUE
- 1 TREE UNSUITABLE FOR RETENTION
- ROOT PROTECTION ZONE
- PROPOSED FENCE

0 5 10 20
SCALE 1:200 (A1) METRES

RED HILL HOUSE, 227 LONDON ROAD
WORCESTER WR5 2JG (01905 361 361)

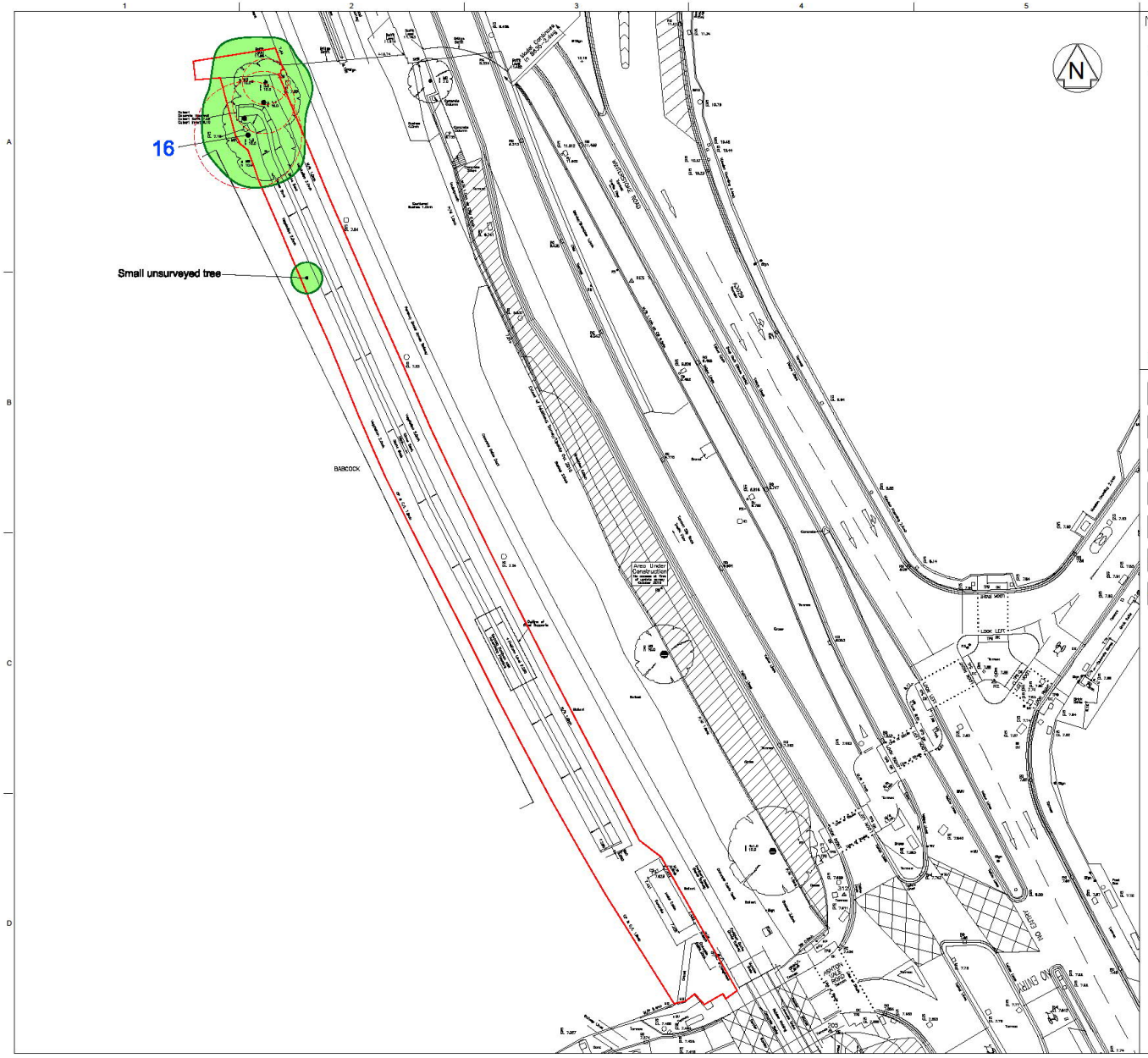
ch2m

PORTISHEAD BRANCH LINE DCO SCHEME (METROWEST PHASE 1)

TREE SURVEY - PROPOSED FENCE INSTALLATION
SHEET 2 OF 3

1:200 @ A1
VERIFY SCALE

DATE	06/2018
PROJ	674943.AN.13.15
DWG	FIGURE 2
SHEET	2 of 3



NOTES

1. ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
2. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS OF EXISTING CONSTRUCTION BEFORE PROCEEDING WITH HIS/HER WORK

LEGEND

- EXTENT OF TREE CANOPY
- 1 TREE OF HIGH QUALITY AND VALUE
- 1 TREE OF MODERATE QUALITY AND VALUE
- 1 TREE OF LOW QUALITY AND VALUE
- 1 TREE UNSUITABLE FOR RETENTION
- ROOT PROTECTION ZONE
- SITE BOUNDARY

FOR COMMENT

REV/STATUS	DATE	DR	REVISION	CHK	BY	APVD	DRG STATUS	DRG REV
DSGN	MMS	MMS		CF		APVD	S2	P01

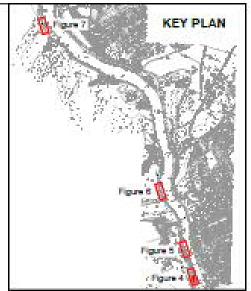
RED HILL HOUSE, 227 LONDON ROAD
WORCESTER WR5 2JG (01905 361 361)

ch2m:

PORTISHEAD/BRANCH LINE DCO SCHEME (METROWEST PHASE 1)

TREE SURVEY - PROPOSED PEDESTRIAN RAMP
SHEET 3 OF 3

NTS	
VERIFY SCALE	
BAR IS 25mm ON ORIGINAL DRAWING	0 25mm
DATE	06/2018
PROJ	674943.AN.13.15
DWG	FIGURE 3
SHEET	3 of 3



KEY

	EXTENT OF TREE CANOPY
1	TREE OF HIGH QUALITY AND VALUE
1	TREE OF MODERATE QUALITY AND VALUE
1	TREE OF LOW QUALITY AND VALUE
1	TREE UNSUITABLE FOR RETENTION
	ROOT PROTECTION ZONE

Rev	By	Chkd	Apprvd	Date	Description

travelwest

CH2M HILL

ch2m

Project

PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing

TREE SURVEY PLAN
AUGUST 2020
SHEET 1 OF 4

Drawn by: MMG — Date: 19/08/2020
Checked by: AL — Date: 21/08/2020
Approved by: CF — Date: 21/08/2020

Drawing No: FIGURE 4 — Revision: -

Drawing Scale: 1:250 @ A1

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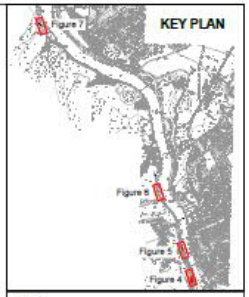
SCALE 1:250 (A1) METRES



KEY

	EXTENT OF TREE CANOPY
1	TREE OF HIGH QUALITY AND VALUE
1	TREE OF MODERATE QUALITY AND VALUE
1	TREE OF LOW QUALITY AND VALUE
1	TREE UNSUITABLE FOR RETENTION
	ROOT PROTECTION ZONE

Rev	By	Chkd	Apprvd	Date	Description

travelwest

CH2M HILL

ch2m:

Project

PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing

TREE SURVEY PLAN
AUGUST 2020
SHEET 2 OF 4

Drawn by: MMS	Date: 19/08/2020
Checked by: AL	Date: 21/08/2020
Approved by: CF	Date: 21/08/2020
Drawing No. FIGURE 5	Revision -

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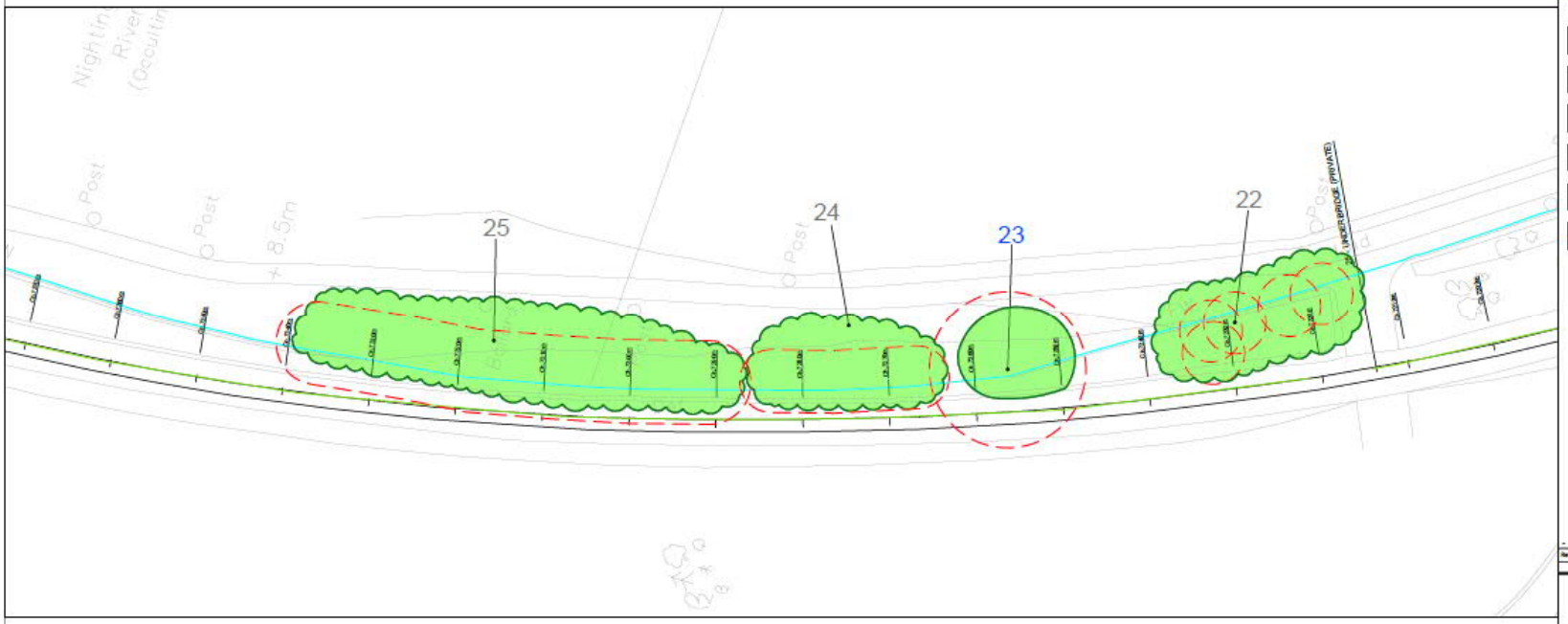

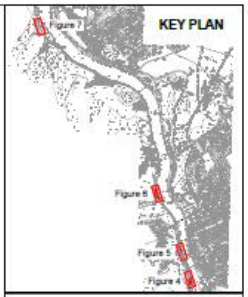

KEY

- EXTENT OF TREE CANOPY
- 1 — TREE OF HIGH QUALITY AND VALUE
- 1 — TREE OF MODERATE QUALITY AND VALUE
- 1 — TREE OF LOW QUALITY AND VALUE
- 1 — TREE UNSUITABLE FOR RETENTION
- ROOT PROTECTION ZONE

Rev	By	Chkd	Apprvd	Date	Description

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Project

PORTISHEAD BRANCH LINE
(METROWEST PHASE 1)

Drawing

TREE SURVEY PLAN
AUGUST 2020
SHEET 3 OF 4

Drawn by: MMO	Date: 19/08/2020
Checked by: AL	Date: 21/08/2020
Approved by: CF	Date: 21/08/2020

Drawing No. FIGURE 6 — Revision -

Drawing Scale: 1:250 @ A1

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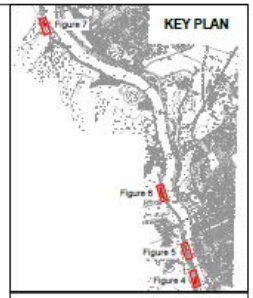

KEY

- EXTENT OF TREE CANOPY
- 1 — TREE OF HIGH QUALITY AND VALUE
- 1 — TREE OF MODERATE QUALITY AND VALUE
- 1 — TREE OF LOW QUALITY AND VALUE
- 1 — TREE UNSUITABLE FOR RETENTION
- ROOT PROTECTION ZONE

Rev	By	Chkd	Apprvd	Date	Description

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(METROWEST PHASE 1)

Drawing
TREE SURVEY PLAN
AUGUST 2020
SHEET 4 OF 4

Drawn by: MMS	Date: 19/08/2020
Checked by: AL	Date: 21/08/2020
Approved by: CF	Date: 21/08/2020
Drawing No. FIGURE 7	Revision -
Drawing Scale: 1:250 @ A1	

0 5 10 15 20
SCALE 1:250 (A1) METRES

Appendices

Appendix A- Tree Survey Schedule June 2018 and August 2020

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years	Cat Grading
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations	<10 10+ 20+ 40+	A B C U
TREES – PROPOSED CLANAGE COMPOUND AREA															
1	Sambucus nigra (Elder)	6	0.18	2.16	2.3	2.2	2.4	2.5	1.5 – E	1.5	EM	Growing out of pavement against wall.	No immediate action required.	10+	C1
2	Salix cinerea (Grey willow)	7	0.3	3.6	4	2.2	3.5	3.4	1 – N/S/E/W	<1	EM	No obvious significant defects.	No immediate action required.	20+	C1
3	Sambucus nigra (Elder)	6	0.2	2.4	3.2	2 est.	2.1	2.4	<1 – N/S/E/W	1.5	EM/M	Self-sown on embankment.	No immediate action required.	10+	C1
4	Sambucus nigra (Elder)	6	0.2	2.4	3	3 est.	3.5	3	<1 – N/S/E/W	2	EM/M	Self-sown on embankment.	No immediate action required.	10+	C1
5	Sambucus nigra (Elder)	6	0.3	3.6	2.3	2	2.3	2	<1 – N/S/E/W	2	EM/M	Self-sown, growing out of edge of path.	No immediate action required.	10+	C1
6	Betula pendula (Silver birch)	12	0.4	4.8	2.4	6.4	2.2	4.3	1.5 – N	2	M	Ivy up trunk.	No immediate action required.	20+	B1
7	Betula pendula (Silver birch)	12	0.4 est.	4.8	4	4	1.95	4 est.	2.5 – S	3	M	Not accessible.	No immediate action required.	20+	B1

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years <10 10+ 20+ 40+	Cat Grading A B C U
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations		
8	Acer pseudoplatanus (Sycamore)	10	0.25	3.0	5.3	2.6	1.2	4 est.	2 – S	2.5	EM	No obvious significant defects.	No immediate action required.	40+	B1
9	Betula pendula (Silver birch)	12	0.1 0.1 0.2 0.3 0.3	6.0	4	3.9	4.16	4 est.	3 – S	3	EM	No obvious significant defects.	No immediate action required.	20+	B1
10	Salix cinerea (Grey willow)	9	0.25 0.25 0.25 0.25 0.25 0.3 0.3 0.35	9.36	6	6	4	5 est.	<1 – N/S/E/W	3	OM	No obvious significant defects.	No immediate action required.	10+	C1
TREES – PROPOSED FENCE INSTALLATION AREA															
11	Acer pseudoplatanus (Sycamore)	12	0.4 est.	4.8	4	4.2	4 est.	4.5	N/A	3	M	No obvious significant defects. Growing on railway embankment, not accessible.	No immediate action required.	40+	B1

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years <10 10+ 20+ 40+	Cat Grading A B C U
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations		
12	Acer pseudoplatanus (Sycamore)	12	0.1 0.15 0.2 0.3 0.3	6.0	6.0	3.5	7 est.	7.6	N/A	5	EM	Slightly sparse canopy. Growing on railway embankment, not accessible.	No immediate action required.	20+	C1
13	Acer pseudoplatanus (Sycamore)	12	0.15 0.2 0.2 0.25 0.3	6.0	2.5	4.8	7 est.	8	N/A	4-5	M	Partially suppressed by adjacent trees. Growing on railway embankment, not accessible.	No immediate action required.	40+	B1
14	Acer pseudoplatanus (Sycamore)	12	0.1 0.1 0.15 0.15 0.2	3.6	2.5	3	5 est.	5	N/A	4	EM	Partially suppressed by adjacent trees. Growing on railway embankment, not accessible.	No immediate action required.	40+	B1
15	Fraxinus excelsior (Ash)	12	0.15 0.2 0.2 0.2 0.35	6.0	5	4	4 est.	7	N/A	4-5	M	Growing on railway embankment, not accessible.	No immediate action required.	20+	B1
TREES – PROPOSED PEDESTRIAN RAMP AREA															

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years	Cat Grading
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations	<10 10+ 20+ 40+	A B C U
16	Acer pseudoplatanus (Sycamore)	10-12	0.25-0.6	3.1 – 7.26	See plan.				N/A	N/A	EM-M	Group of 6 trees.	No immediate action required.	20+	B2
TREE SURVEY AUGUST 2020															
17	Acer pseudoplatanus (Sycamore) x 18 Crataegus monogyna (Hawthorn) x 1 Fraxinus excelsior (Ash) x 10 Prunus sp. (Cherry) x 2 Quercus ilex (Holm oak) x 1 Ulmus glabra (Wych elm) x 2	16	0.3 max.	3.6	See plan.				N/A	1-4	SM-EM	Several multi-stem specimens. Etiolated. Ivy clad. Closed canopy. Numerous dead ash seedlings due to ash die back disease. Signs of ash die back on older ash trees.	No immediate action required.	40+	B2
18	Acer platanoides (Norway maple)	12	0.12	1.44	3	4	4.5	3.5	3 – E	2	SM	Partially suppressed.	No immediate action required.	40+	C1

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years <10 10+ 20+ 40+	Cat Grading A B C U
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations		
19	Acer platanoides (Norway maple) Acer pseudoplatanus (Sycamore) Corylus avellana (Hazel) Crataegus monogyna (Hawthorn) Tilia cordata (Small leaved lime)	16	0.2	2.4	See plan.				N/A	<1-3	Y-SM	Mutual suppression. Etiolated.	No immediate action required.	40+	C2
20	Acer pseudoplatanus (Sycamore)	16	0.2	2.4	3-5m				N/A	2	SM	No obvious significant defects.	No immediate action required.	40+	C1
21	Fraxinus excelsior (Ash)	16	0.3	3.6	3-6m				N/A	3	M	Possible ash die back.	No immediate action required.	40+	C1
22	Acer campestre (Field maple) x 2 Fraxinus excelsior (Ash) x 3	18	0.3	3.6	See plan.				N/A	<1 – 2.5	SM-EM	Etiolated. Ivy. Signs of ash die back on ash trees.	No immediate action required.	40+	C2

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years	Cat Grading
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations	<10 10+ 20+ 40+	A B C U
23	Acer pseudoplatanus (Sycamore)	18	0.75	9	6	7	7.5	4	N/A	2.5	EM	Multi-stem.	No immediate action required.	40+	B1
24	Acer campestre (Field maple) Fraxinus excelsior (Ash)	18	0.3	3.6	See plan.				N/A	1-3	SM-EM	Etiolated. Signs of ash die back on ash trees.	No immediate action required.	20+	C2
25	Acer pseudoplatanus (Sycamore) Cornus sanguinea (Dogwood) Corylus avellana (Hazel) Crataegus monogyna (Hawthorn) Fraxinus excelsior (Ash) Ulmus glabra (Wych elm)	18	0.4	4.8	See plan.				N/A	0-3	Y-M	Etiolated. Signs of ash die back on ash trees. Mutual suppression. Ivy.	No immediate action required.	20+	C2

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years <10 10+ 20+ 40+	Cat Grading A B C U
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations		
26	Acer platanoides (Norway maple) Acer pseudoplatanus (Sycamore) Corylus avellana (Hazel) Crataegus monogyna (Hawthorn) Tilia cordata (Small leaved lime)	14	0.2	2.4	See plan.				N/A	2	Y-SM	Etiolated. Mutual suppression.	No immediate action required.	40+	C2
27	Acer platanoides (Norway maple) Acer pseudoplatanus (Sycamore) Corylus avellana (Hazel) Fagus sylvatica (Beech)	18	0.6	7.2	See plan.				N/A	1-3	Y-EM	Etiolated. Signs of ash die back on ash trees. Ivy-clad. Approximately 6 no. mature trees within group.	No immediate action required.	40+	C2

Tree Ref No	Species	Height (m)	Stem dia at 1.5m above GL (m) to the nearest 10mm	RPA Radius (m)	Branch Spread (m)				Crown Clearance		Age Young, Semi Mature, Early Mature, Mature, Over Mature.	General Observations		Estimated remaining contribution in years <10 10+ 20+ 40+	Cat Grading A B C U
					N	S	E	W	Height of 1st significant branch (m) and direction	Height of canopy (m)		Structural and physiological condition	Preliminary management recommendations		
	Fraxinus excelsior (Ash) Quercus ilex (Holm oak) Quercus robur (English oak) Tilia cordata (Small leaved lime)														
28	Acer platanoides (Norway maple) Acer pseudoplatanus (Sycamore) Aesculus hippocastanum (Horse chestnut) Corylus avellana (Hazel) Fraxinus excelsior (Ash)	16	0.35	4.2	See plan.				N/A	1.5-2	Y-EM	2 no. mature trees within group. Etiolated. Signs of ash die back.	No immediate action required.	40+	C2

Appendix B – Cascade Chart for Tree Quality Assessment

(Extract taken from B.S. 5837; (2012), “Trees in relation to design, demolition and construction – Recommendations”)

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

Appendix C - Arboricultural Implications Assessment

Arboricultural Implications Assessment

Tree Removal

Several trees are to be removed in order for the works to be carried out. Several trees may or may not require removal depending on for example the extent of ground excavations or the location of fence posts.

Schedule of Tree Works

Ref No.	Species	Work	Category
PROPOSED COMPOUND AREA			
1	Elder	Remove to allow for compound entrance.	C
2	Grey willow	Outside of proposed compound footprint and therefore unaffected by the proposals.	C
3	Elder	On embankment between footpath and compound. Unaffected if embankment retained.	C
4	Elder	On embankment between footpath and compound. Unaffected if embankment retained.	C
5	Elder	Growing outside compound footprint. Root Protection Area within embankment. Unaffected if embankment retained.	C
6	Silver birch	Remove to allow access from proposed compound to rail corridor.	B
7	Silver birch	Remove to allow access from proposed compound to rail corridor.	B
8	Sycamore	Remove to allow access from proposed compound to rail corridor.	B
9	Silver birch	Remove to allow access from proposed compound to rail corridor.	B
10	Grey willow	Remove to allow access from proposed compound to rail corridor.	C
N/A	Grey willow x 2	2 unsurveyed trees to be removed to accommodate proposed compound.	N/A
PROPOSED FENCE INSTALLATION AREA			
11	Sycamore	Remove to accommodate installation of the proposed fence.	B
12	Sycamore	Remove to accommodate installation of the proposed fence.	C
13	Sycamore	Remove to accommodate installation of the proposed fence.	B
14	Sycamore	Remove to accommodate installation of the proposed fence.	B
15	Ash	Remove to accommodate installation of the proposed fence.	B
PROPOSED PEDESTRIAN RAMP AREA			
16	Sycamore group	Remove group of 6 trees to accommodate proposed pedestrian ramp.	B
ADDITIONAL TREE SURVEY AUGUST 2020			
17	Sycamore x 18 Hawthorn x 1 Ash x 10 Cherry x 2 Holm oak x 1 Wych elm x 2	Remove to accommodate installation of the proposed fence.	B
18	Norway maple	Retain.	C
19	Norway maple Sycamore Hazel Hawthorn Small leaved lime	Remove approximately 6 no. young/semi-mature specimens to accommodate installation of the proposed fence.	C
20	Sycamore	Remove to accommodate installation of the proposed fence.	C
21	Ash	Remove to accommodate installation of the proposed fence.	C
22	Field maple x 2 Ash x 3	Remove to accommodate installation of the proposed fence.	C
23	Sycamore	Retain.	B

24	Field maple x 1 Ash x 6	Remove to accommodate installation of the proposed fence.	C
25	Sycamore Dogwood Hazel Hawthorn Ash Wych elm	Remove approximately 50 no. young/semi-mature specimens to accommodate installation of the proposed fence.	C
26	Norway maple Sycamore Hazel Hawthorn Small leaved lime	Retain.	C
27	Norway maple Sycamore Hazel Beech Ash Holm oak English oak Small leaved lime	Remove approximately 6 no. early mature trees and 20 no. young/semi-mature specimens to accommodate installation of proposed structure.	C
28	Norway maple Sycamore Horse chestnut Hazel Ash	Remove approximately 2 no. early mature trees and 5 no. young/semi-mature specimens at southern end of the group to accommodate installation of proposed structure.	C

Appendix D – Glossary of Arboricultural Terms

Glossary of Arboricultural Terms

Abscission: The shedding of a leaf or other short-lived part of a woody plant, involving the formation of a corky layer across its base; in some tree species twigs can be shed in this way.

Abiotic: Pertaining to non-living agents; e.g. environmental factors.

Adaptive growth: In tree biomechanics, the process whereby the rate of wood formation in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium. This helps to maintain a uniform distribution of mechanical stress.

Adaptive roots: The adaptive growth of existing roots; or the production of new roots in response to damage, decay or altered mechanical loading.

Adventitious shoots: Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'.

Anchorage: The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree.

Axil: The place where a bud is borne between a leaf and its parent shoot.

Bark: A term usually applied to all the tissues of a woody plant lying outside the vascular cambium.

Bolling: A term sometimes used to describe pollard heads.

Bottle-butt: A broadening of the stem base and buttresses of a tree, in excess of normal and sometimes denoting a growth response to weakening in that region, especially due to decay involving selective delignification.

Bracing: A term used to describe the use of rods or cables to restrain the movement between parts of a tree.

Branch bark ridge: The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem.

Branch collar: A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base.

Brown-rot: A type of wood decay in which cellulose is degraded, while lignin is only modified.

Buckling: An irreversible deformation of a structure subjected to a bending load.

Buttress zone: The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of their junction.

Cambium: Layer of cells between the xylem and phloem tissues.

Canker: A lesion formed by the death of bark and cambium often due to fungal or bacterial infection.

Cleaning out: is the term used to describe the removal of; dead, crossing, weak and/or damaged branches.

Compartmentalization: The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region.

Compression strength: The ability of a material or structure to resist failure when subjected to compressive loading.

Compressive loading: Mechanical loading which exerts a positive pressure; the opposite to tensile loading.

Condition: An indication of the physiological vitality of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree.

Conservation Area: A designated area that requires notice (currently six weeks) to be given to the local planning authority prior to the commencement of any tree works.

Construction exclusion zone: Area based on the Root Protection Area (in square metres) to be protected during development, by the use of barriers and/or ground protection.

Crown/Canopy: The main foliage bearing section of the tree.

Crown lifting: A term used to describe the removal of limbs and small branches to a specified height above ground level.

Crown thinning: A term used to describe the removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure.

Crown reduction/shaping: A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape.

Crown reduction/thinning: Reduction of the canopy volume by thinning to remove dominant branches whilst preserving, as far as possible the natural tree shape.

Deadwood: Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard.

Defect: In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment.

Delamination: The separation of wood layers along their length, visible as longitudinal splitting.

Dieback: The death of parts of a woody plant, starting at shoot-tips or root-tips.

Disease: A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms.

Dominance: In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours.

Dormant bud: An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so.

Dysfunction: In woody tissues, the loss of physiological function, especially water conduction, in sapwood.

DBH (Diameter at Breast Height): Stem diameter measured at a height of 1.5 metres (UK) or the nearest measurable point. Where measurement at a height of 1.5 metres is not possible, another height may be specified.

Epicormic shoot: A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot.

Exudates: They are the gummy liquid ooze from areas of bark on stems or limbs and may indicate underlying physiological disorders.

Felling licence: In the UK this is a permit to fell trees in excess of a stipulated size of stems or volume of timber.

Flush-cut: A pruning cut which removes part of the branch bark ridge and or branch-collar.

Girdling root: is a root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue.

Guying: is a form of artificial support with cables for trees with a temporarily inadequate anchorage.

Habit: The overall growth characteristics, shape of the tree and branch structure.

Hazard beam: An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting.

Heave: A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate.

Incipient failure: In wood tissues, a mechanical failure which results only in deformation or cracking, and not in the fall or detachment of the affected part.

Included bark (ingrown bark): Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact.

Increment borer: A hollow auger, which can be used for the extraction of wood cores for counting or measuring wood increments or for inspecting the condition of the wood.

Lever arm: A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch.

Lignin: The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed lignification.

Lions tailing: A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to endloading.

Loading: A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure.

Longitudinal: Along the length (of a stem, root or branch).

Lopping: A term often used to describe the removal of large branches from a tree, but also used to describe other forms of cutting.

Minor deadwood: Deadwood of a diameter less than 25mm and or unlikely to cause significant harm or damage upon impact with a target beneath the tree.

Mulch: is a material laid down over the rooting area of a tree or other plant to help conserve moisture; it may consist of organic matter or a sheet of plastic or other artificial material.

Mycelium: The body of a fungus, consisting of branched filaments (hyphae).

Occluding tissues: A general term for the roll of wood, cambium and bark that forms around a wound on a woody plant (cf. wound-wood).

Occlusion: The process whereby a wound is progressively closed by the formation of new wood and bark around it.

Pathogen: A micro-organism which causes disease in another organism.

Photosynthesis: The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products.

Phytotoxic: Toxic to plants.

Pollarding: is the removal of the tree canopy, back to the stem or primary branches. Pollarding may involve the removal of the entire canopy in one operation, or may be phased over several years.

The period of safe retention of trees having been pollarded varies with species and individuals. It is usually necessary to re-pollard on a regular basis, annually in the case of some species.

Primary branch: A major branch, generally having a basal diameter greater than 0.25 x stem diameter.

Pruning: The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs.

Radial: In the plane or direction of the radius of a circular object such as a tree stem.

Rays: Strips of radially elongated parenchyma cells within wood and bark. The functions of rays include food storage, radial translocation and contributing to the strength of wood.

Reactive Growth/Reaction Wood: Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth).

Removal of dead wood: Unless otherwise specified, this refers to the removal of all accessible dead, dying and diseased branch-wood and broken snags.

Removal of major dead wood: The removal of, dead, dying and diseased branch-wood above a specified size.

Residual wall: The wall of non-decayed wood remaining following decay of internal stem, branch or root tissues.

Root-collar: The transitional area between the stem/s and roots.

Root protection area (RPA): An area of ground surrounding a tree that contains sufficient rooting volume to ensure the tree's survival, calculated with reference to Table 2 of BS5837 (2005).

Root zone: Area of soils containing absorptive roots of the tree/s described. The primary root zone is that which we consider of primary importance to the physiological well-being of the tree.

Sapwood: Living xylem tissues.

Secondary branch: A branch, generally having a basal diameter of less than 0.25 x stem diameter.

Selective delignification: A kind of wood decay (white-rot) in which lignin is degraded faster than cellulose.

Shedding: is the normal abscission, rotting off or sloughing of leaves, floral parts, twigs, fine roots and bark scales.

Simultaneous white-rot: A kind of wood decay in which lignin and cellulose are degraded at about the same rate.

Snag/stub: In woody plants, a portion of a cut or broken stem, branch or root which extends beyond any growing-point or dormant bud; a snag usually tends to die back to the nearest growing point.

Soft-rot: A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole.

Stem/s: The main supporting structure/s, from ground level up to the first major division into branches.

Stress: In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature.

Stress: In mechanics, the application of a force to an object.

Stringy white-rot: Is a form of wood decay produced by selective delignification.

Structural roots: Roots, generally having a diameter greater than ten millimetres, and contributing significantly to the structural support and stability of the tree.

Subsidence: In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots.

Subsidence: In relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight.

Taper: In stems and branches, the degree of change in girth along a given length.

Target canker: A kind of perennial canker, containing concentric rings of dead occluding tissues.

Targets: In tree risk assessment it relates to persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it.

Topping: In arboriculture it is the removal of the crown of a tree, or of a major proportion of it.

Torsional stress: Mechanical stress applied by a twisting force.

Translocation: In plant physiology, the movement of water and dissolved materials through the body of the plant.

Transpiration: The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells.

Tree Preservation Order (TPO): Is an order made by the local authority and placed upon individual trees, groups of trees or areas of trees. The local authority must usually grant permission prior to any works undertaken to affected trees.

Under-storey: A layer of vegetation beneath the main canopy of woodland or forest or plants forming this.

Veteran tree: A loosely defined term for an old specimen that is of interest biologically, culturally or aesthetically because of its age, size or condition and which has usually lived longer than the typical upper age range for the species concerned.

Welding: Describes the grafting of adjacent stems/branches. Sometimes this may be between branches from different individual trees.

White-rot: A range wood decays in which lignin, usually together with cellulose and other wood constituents, is degraded.

Wind exposure: The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity.

Wind-throw: The blowing over of a tree at its roots.