Wombwell Wetlands and Doveside Tree Report

Final

December 2017

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Revision History

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V1.0 December 2017		The Garganey Trust

Contract

This report describes work commissioned by The Garganey Trust. Darren Whitaker of JBA Consulting, and Jeff Lunn carried out this work.

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Purpose

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Abbreviations

AIA	Arboricultural Impact Assessment
DBH	Diameter Breast Height
NGR	National Grid Reference
RPA	Root Protection Area
WATI	Wings Across the Ings

Definitions

Coppicing	Cutting a tree off at the base of the trunk and allowing it to regrow multiple stems.
Coppice Stool	The base of the tree trunk where the multi stems arise after the tree has been coppiced.
Canopy	The area of the tree above the trunk containing the branches and leaves.
Leaders	The top most growing point in a young tree.
Target	The area adjacent to the tree were something may be struck by falling wood.

1 Scope of Works

JBA Consulting has been commissioned by The Garganey Trust to undertake a Tree survey and Arboricultural Impact Assessment at Doveside and Wombwell prior to implementation of the 'Wings Across the Ings' (WATI) Project, which involves habitat creation/enhancement.

Doveside is located south of Darfield, South Yorkshire, and is centred on National Grid Reference (NGR) SE 41215 03901. The Wombwell Wetlands site is located immediately south of Doveside, centred on NGR SE 41594 03457, and Bulling Dike flows along the north and north-easterly site margins. Both sites are shown in Figure 1-1.

The survey aims to identify the number, species, and condition of trees on the site prior to further works. Any health and safety and environmental issues relevant to the trees are also highlighted in order to inform necessary management prescriptions.

The trees selected for survey include those which are established within the site, as well as those trees located along the boundary, and trees growing in adjacent land which may potentially be affected by the proposed works. The location of the works, in context with the local landscape, is shown in Figure 1-1 below.

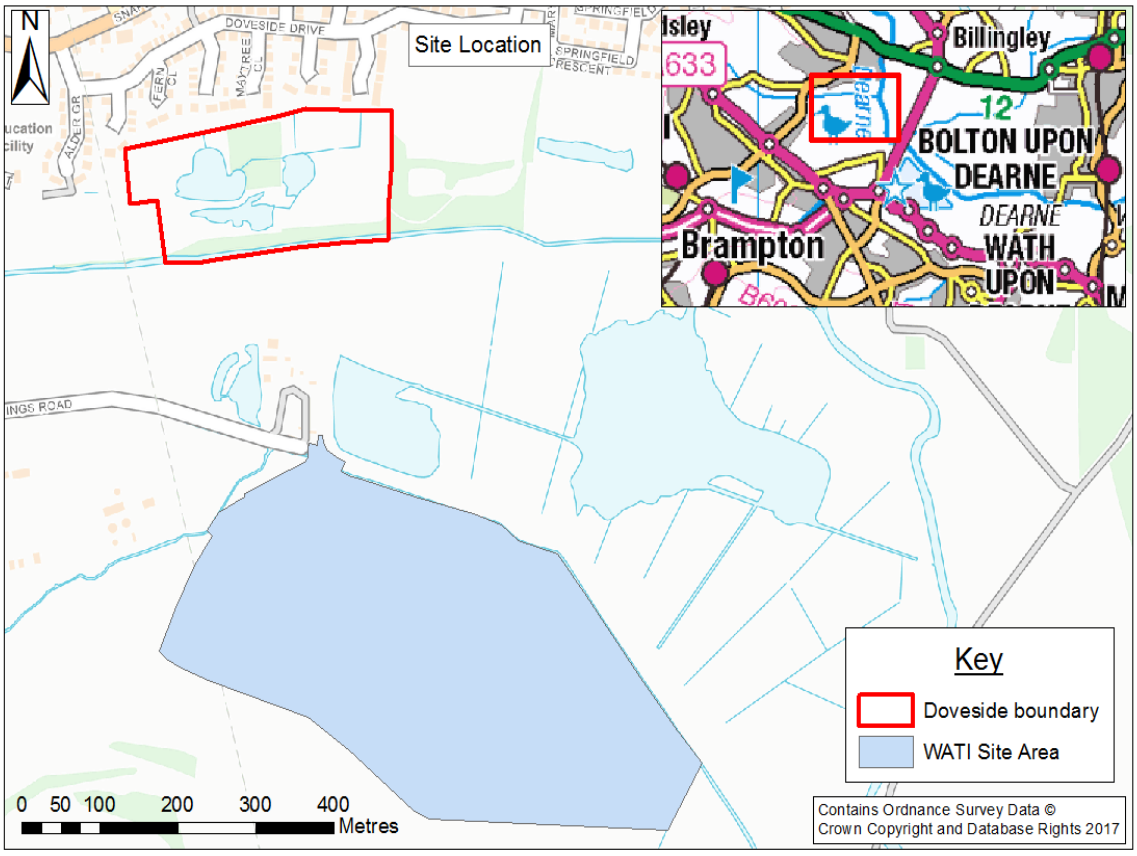


Figure 1.1 Site Location and Areas Surveyed

2 Methodology

The tree inspection aims to:

- ascertain the age, previous management and condition of tree roots, trunks and branches;
- identify any physical or cultural issues; and
- identify the presence of any diseases or fungal growth.

The trees were Inspected on the 7th and the 12th of September 2017 by an experienced Arboriculturalist. The trees were visually inspected from the ground using binoculars, following guidance from *British Standards (BS) 5837:2012 Trees in relation to design, demolition and construction - recommendations* (British Standards Institution, 2012).

As part of the survey, an Arboricultural Impact Assessment (AIA) was undertaken for the proposed works in accordance with the guidance contained within BS 5837:2012 publication (British Standards Institution, 2012). The AIA evaluates both the direct and indirect effects of proposed works through assessing the constraints posed by existing trees (i.e. Root Protection Areas (RPAs), tree height, spread and characteristics) and the proximity of any introduced structures, in order to determine any probable impacts. The assessment further considers the effects of any potentially damaging activities in the vicinity of trees. All construction and associated preparatory works are considered within the assessment. Any trees selected for retention/removal and pruning are identified, as well as, any areas designated for structural landscaping where trees would require protection throughout construction operations. The outcome of the AIA determines the need for any mitigation/compensatory recommendations where necessary. No soil will be removed during this survey; a visual inspection of the RPAs only is carried out.

The tree survey table is presented in Appendix A, Appendix B provides guidance from the BS 5837:2012 (British Standards Institution, 2012) for trees in relation to design, demolition and construction, including recommendations for RPA protective fencing. The definitions of the category grading used in the tree table are also found in Appendix B. Appendix C presents the photographs of trees taken during the survey. Appendix D presents a key to the common and Latin names of plants referred to in this report.

2.1 Limitations

Due to seasonal constraints, the presence of some fungal growth may not be obvious during the time of undertaking the survey.

3 Results

3.1 Overview

Figure 3-1 shows the tree survey locations within the context of the site boundaries.

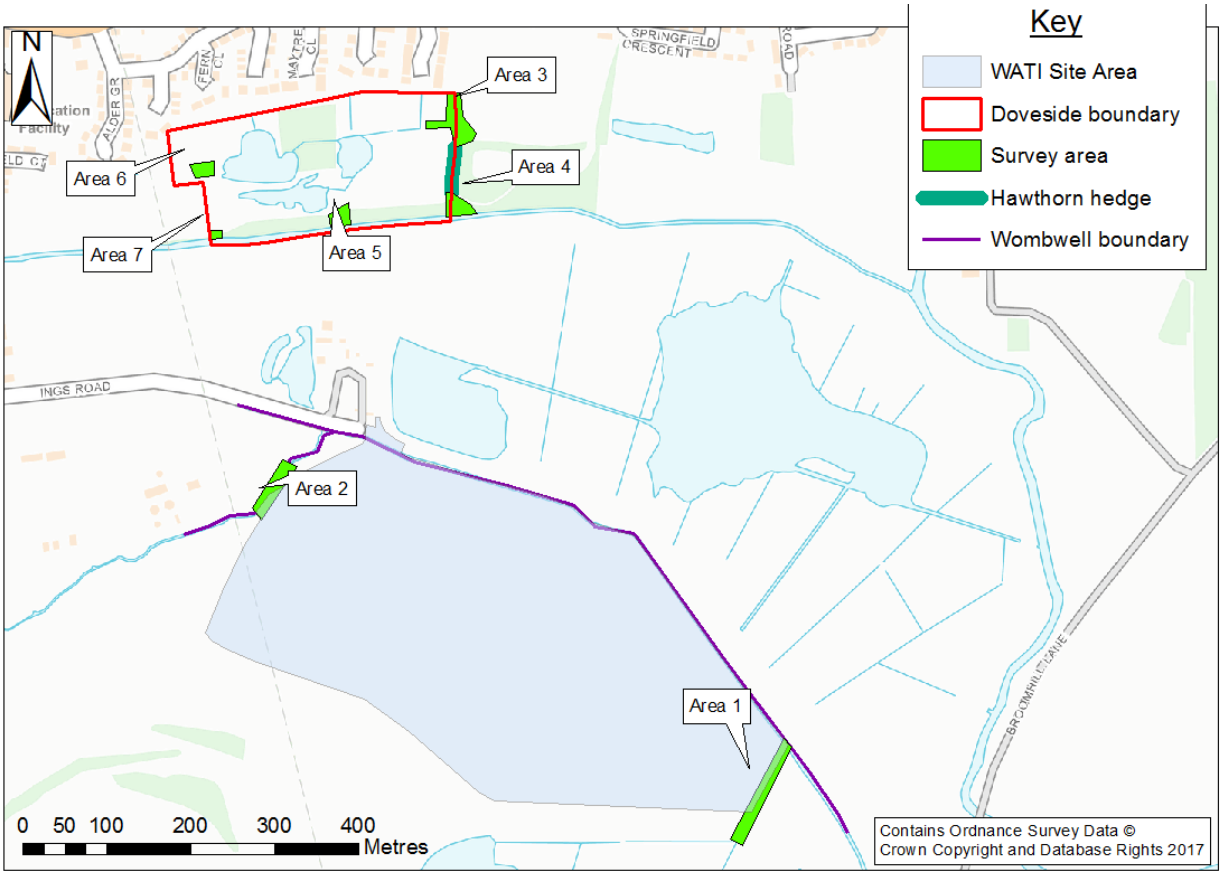


Figure 3-1: Tree Survey Area Plan

The areas surveyed are situated both north and south of the River Dove. The south side has a section of hedgerow that will potentially be impacted by the works and a small number of Elder trees on an embankment adjacent to an area of embankment reprofiling.

The areas north of the river are a mix of natural and planted trees, and hedgerows along the edge of the ex-landfill site, and along the river bank.

Adjacent woodland on the ex-landfill site has Poplar, Field Maple and Silver Birch with some older Crack Willow present along the edges and on the river bank

The access track along the east side of the playing fields has a stone track that provides access to through the woodland to the site. The track is lined with a row of mature to over-mature Black Poplar. The track terminates at the east side of Area 4.

The older Crack Willow trees have some significant deadwood present in the canopy, and most have splits, cracks, and voids in their stems that have the potential to be utilised by roosting bats and nesting birds.

It was noted that the site is infested with Himalayan Balsam with an area of Japanese Knotweed on the embankment of the River Dove at Area 7.

3.2 Area 1

This area is a mature, single-species hedge comprised of Hawthorn with improved grassland south of hedge, and arable land to the north of the hedge. The hedge is reasonably intact with occasional gaps along its length. The understorey is mainly ruderal species with grasses, Nettle, and Cleavers

present. There are a number of active rabbit holes present occasionally in the base of the hedge. The hedge has been managed in the past by laying, and is now managed through annual flailing.

3.3 Area 2

Access to this area of the site is restricted by the security fencing around the water treatment works. In the vicinity of the works, three mature Elder trees are situated on the top of the bank. These appear to be mature specimens growing amongst rough grassland with brambles.

There are a number of mature trees situated to the west of the proposed works site, and these are located an adequate distance away from works so as to be considered unlikely to be affected by the works.

3.4 Area 3

Located at the northwest corner of the site (west of the recreation ground), there is an over-mature Ash growing amongst a line of mature Ivy-covered Hawthorn. These trees form a grown out hedgerow, and this hedge line continues south across the site to Area 4. The trees in this Area 3 are a mixture of planted young mature Silver Birch, Field Maple, and occasional Ash on the embankment of the ex-landfill site, with over-mature Crack Willow at the base of the bank. These trees have been coppiced in the past resulting in multi-stemmed trees. In some of these, the stems have sheared from the coppice stool and re rooted resulting in large spreading trees. These trees have a considerable amount of deadwood present within their crowns, and some rot at the base of the trunks within the coppice stool.

3.5 Area 4

This area is in the location of the proposed new drain outfall. The area has a large coppiced Crack Willow on the river bank on the west side of the new drain cut. The east side has a mix of young mature Pedunculate Oak, Ash, and Hawthorn planted in three rows on the river bank. These trees are still at the original 3m planting spacing. There are several Hazel present growing along the end of the grass paddock. These trees have been coppiced several times and predate the planted trees, and are considered to be of a similar age to the Crack Willows.

3.6 Area 5

Situated in the centre of the site on the west edge (at the opposite end of the plantation to Area 4), there is a mix of Common Alder, Crack Willow, Hawthorn, with some Black Poplar which are planted in rows and have suckered, giving the woodland a more natural appearance. On the river bank south of the plantation is a large over-mature Crack Willow with a double stem; one of which has failed and re-rooted, leaving an exposed rot pocket at the base of the stem. West of the Crack Willow is a mature Hawthorn growing on the crest of the river bank.

3.7 Area 6

This area is located in the centre of the site, on the north side of an existing drain. The area has a large, collapsed Crack Willow. This tree has re-rooted and produced a mass of new growth making a dense, low, bushing canopy. The tree appears to have been laid to produce nesting habitat. To the west of the Crack Willow is a Grey willow that appears to have received similar treatment. Growing amongst the willow stems is an evergreen Honeysuckle, that is well established and is growing well.

3.8 Area 7

Located at the southwest corner of the site this is a length of Hawthorn hedge that has been planted on the top of the river bank. Planted as a double staggered row, some of the original plants have died, but the remaining hedge is thick and bushy, having only received light pruning in the past. The plants are at 250mm to 400mm spacings. The hedgerow is in good condition and growing well. On the south side of the hedge, on the river bank, the is an area of Japanese Knotweed.

4 Recommendations and Conclusions

4.1 Conclusion

The trees on the Wombwell and Doveside site are a mix of young mature trees and Hawthorn hedgerow, interspersed with some much older trees and hedgerows. The hedgerows are all single-species Hawthorn with the occasional Dog Rose .

The younger trees and hedgerows are generally considered to be in good condition and growing well. The planted trees are generally still at original planting spacings and are beginning to out-compete each other, leading to some tall 'straggly' trees that will eventually die as they are out-competed by other, stronger trees. The Crack Willow are of considerable age and probably predate the ex-landfill site. They have all been subject to coppicing in the past and now have large spreading crowns with some stems partially failing as the coppice stool rots, allowing branches to split from the stool and re root where they make contact with the ground. The mature Hawthorn have formed dense, tangled crowns, and many have grown out to form lines of trees with dense canopies; some of which are colonised with dense Ivy growth. These trees provide a significant contribution to the ecological value of the area.

Many of the willows have a considerable amount of deadwood present, with split branches and stems that increases their ecological value. These features may be unstable and could result in timber falling into the target area. These trees should be fenced-off to ensure personnel and equipment are kept safe during the works.

4.2 Recommendations

4.2.1 Micro siting of drains.

A number of the proposed drains are likely to fall within the RPA`s of some of the trees, it is recommended that these RPA`s are established and fenced off by an experienced Arboriculturalist, at the laying out stage. Following the recommendations in BS5837 'Trees in relation to design, demolition and construction' (British Standards Institution, 2012) (as outlined in Appendix B)The line of the proposed drains should be moved slightly to accommodate the RPA`s. This will prevent any impact on the trees and prevent issues with die back etc in the future.

The drains that imping on the Japanese Knotweed area, should also be moved to prevent ground disturbance of the ground, in the area of this Invasive Non Native Species

4.2.2 Pruning to facilitate access

It is likely that some branch removal and crown pruning will be required to allow vehicles and plant to access site. Any works undertaken should be completed by a suitably qualified and experienced Arborist.

4.2.3 Access track

Access along the track on the west side of the playing field, and through the woodland is likely to involve access close to, or over, the roots of existing trees. The increased traffic in this area is likely to have a negative effect on the trees along the track side. The protection of these trees in accordance with BS5837 (British Standards Institution, 2012) (as outlined in Appendix B), should be considered as part of the site works.

4.2.4 Hedgerows in Area 1 and Area 7

The hedgerows in Area 1 will be removed to facilitate the habitat improvements proposed within this area.

The section of hedgerow within Area 7 will be removed to facilitate the excavation of the new drain to allow access for machinery and equipment to site. A section wider than the actual channel will be removed to provide an area for machinery to operate. The trees on the edge of the work area will require their roots to protected according to the RPA's calculated and outlined in Appendix A in accordance with BS5837 (British Standards Institution, 2012).

4.2.5 Hedgerow between Area 3 and Area 4

It is recommended that the RPA for the hedgerow and the Crack Willow are protected in accordance with BS5837 (British Standards Institution, 2012) as outlined in Appendix B. The line of the new drain should be moved slightly towards the west to avoid the roots of these trees. This deviation may require the removal of a small number of the trees in the planted section of Area 4. These trees are relatively young, and should be replaced with some understorey species to form a shrubby edge to the woodland, increasing the species diversity and ecological value, and reducing the amount of wind blowing through the base of the woodland.

4.2.6 Re-planting

Re stocking of the areas post works provides an opportunity to introduce a wide variety of species into the woodland and hedgerows to increase species diversity. The restocking should use species known to be native to the area and stock of local provenance. These works could be completed as part of the Gargney Trusts long term management of the site.

Any replanting plan should be accompanied by a suitable management to provide maintenance for the growing replacement trees, and to ensure successful establishment. Maintenance should include the replacement of any trees that fail within the first three years after planting.

4.2.7 Nesting birds and roosting bats

Arboricultural works should be avoided during bird breeding season (March-September). Where this is not possible, a nesting bird survey will be required by a suitable experienced ecologist within 48 hours of the works commencing.

Appendices

A Tree Table

Area	Species	Circ	Stem Diameter (mm)	Branch Spread (m) N	S	E	W	Crown Clearance (m)	Age	Height (m)	Class Estimated Remaining Contribution (Years)	Root Protection Area m²	Physiological Condition	Structural Condition	Category Grading	Preliminary Management Recommendations
1	Hawthorn	950	303	2	2	na	na	0.25	Mature	5	40+	36	Good	Good	A2	Remove to facilitate works
2	Elder	350	111	3	3	2	2	1	Mature	3	20+	13	Fair	Fair	B2	Fence off to protect RPA
3	Crack Willow	3000	955	6	7	7	5	1	Overmature	10	40+	115	Good	Poor	A1	Fence off to protect RPA and isolate potential targets
3	Ash	400	127	3	3	5	4	3	Early Mature	6	40+	15	Good	Good	A2	Fence off to protect RPA
3	Silver Birch	1000	318	3	3	3	3	3	Early Mature	6	40+	38	Good	Good	A2	Fence off to protect RPA
3	Field Maple	450	143	3	3	3	3	3	Mature	6	40+	17	Good	Good	A2	Fence off to protect RPA
4	Crack Willow	2700	860	6	6	7	8	2	Overmature	10	40+	103	Good	Ok	A1	Fence off to protect RPA and isolate potential targets
4	Hazel	700	223	2	3	3	3	0.5	Overmature	4	40+	27	Good	Fair	A2	Fence off to protect RPA
4	Pedunculate Oak	750	239	4	5	4	4	3	Early Mature	6	40+	29	Good	Good	A2	Fence off to protect RPA
4	Ash	900	287	4	5	4	4	3	Early Mature	6	40+	34	Good	Good	A2	Fence off to protect RPA
5	Poplar	1250	398	5	6	4	5	3	Mature	7	40+	48	Good	Good	A2	Fence off to protect RPA
5	Crack Willow	1200	382	7	8	9	9	4	Overmature	9	40+	46	Good	Ok	A1	Fence off to protect RPA and isolate potential targets
5	Hawthorn	1200	382	2	3	2	2	2	Mature	5	40+	46	Good	Fair	A2	Fence off to protect RPA
5	Pedunculate Oak	1200	382	4	5	4	4	3	Early Mature	6	40+	46	Good	Good	A2	Fence off to protect RPA
6	Crack Willow	2850	908	na	na	na	na	0.5	Overmature	4	40+	109	Good	Ok	A2	Fence off to protect RPA and isolate potential targets
6	Grey Willow	1200	382	na	na	na	na	0.5	Mature	4	40+	46	Good	Fair	A2	Fence off to protect RPA
7	Hawthorn		350	2	2	na	na	0.2	Young	3	40+	42	Good	Good	A2	Fence off to protect RPA
Hedgerow between area 3 &4	Hawthorn	2000	637	6	5	3	3	2	Overmature	6	40+	76	Good	Fair	A2	Fence off to protect RPA

B Definitions, Root Protection Advice

Physiological Condition		Structural Condition	
Term	**Definition**	**Term**	**Definition**
Poor	Several instances of Disease, pest or pathogen, Specific infections, scale of infections, Large scale or large size deadwood present. Epicormic Growth	Poor	Defects in growth broken/ splits in major branches, congested stems, tight forks , major leaning, hazard beams, advanced decay at critical points . Significant Deadwood present
Fair	Frequent instance of disease or pest, damage, epicormic growth, multiple symptoms of stress	Fair	Several minor or occasional major defect, non-critical decay, some dead wood present throughout crown
OK	Occasional instance of disease or pest, minor symptoms of stress	OK	Some minor defects in branch structure, pruning defects, crown off balance etc, localised small diameter deadwood
Good	Minor disease or pest infestation, not exhibiting symptoms of stress, small instances of deadwood	Good	Well grown balanced tree, open branch structure, open forks etc.

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

6.2 Barriers and ground protection

6.2.1 General

6.2.1.1 All trees that are being retained on site should be protected by barriers and/or ground protection (see **5.5**) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed (see **6.2.3**).

6.2.1.2 Areas of retained structural planting, or designated for new structural planting, should be similarly protected, based on the extent of the soft landscaping shown on the approved drawings.

6.2.1.3 The protected area should be regarded as sacrosanct, and, once installed, barriers and ground protection should not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the local planning authority.

6.2.1.4 Where required, pre-development tree work may be undertaken before the installation of tree protection measures, with the agreement of the project arboriculturist or local planning authority if appropriate (see also **8.8.1**).

6.2.1.5 It should be confirmed by the project arboriculturist that the barriers and ground protection have been correctly set out on site, prior to the commencement of any other operations.

6.2.2 Barriers

6.2.2.1 Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected

on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray (Figure 3b).

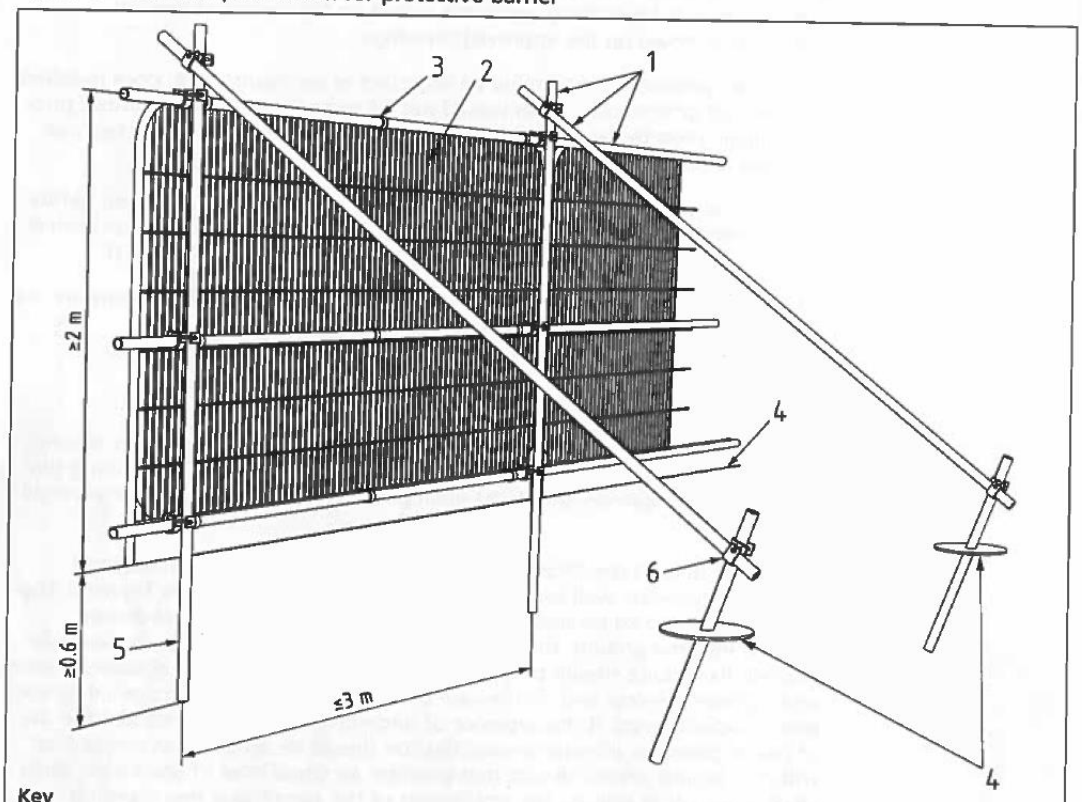
NOTE 1 Examples of configurations for steel mesh perimeter fencing systems are given in BS 1722-18.

NOTE 2 It might be feasible on some sites to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without damaging the retained trees or their rooting environment.

6.2.2.4 All-weather notices should be attached to the barrier with words such as:

"CONSTRUCTION EXCLUSION ZONE – NO ACCESS".

Figure 2 **Default specification for protective barrier**



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

a) *for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*

b) *for pedestrian-operated plant up to a gross weight of 2 t, 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;*

c) *for wheeled or tracked construction traffic exceeding 2 t 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.*

6.2.3.4 The locations of and design for temporary ground protection should be shown on the tree protection plan and detailed within the arboricultural method statement (see 6.1).

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

6.2.4 Additional precautions outside the exclusion zone

6.2.4.1 Planning of site operations should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweights (including drilling rigs), in order that they can operate without coming into contact with retained trees. Such contact can result in serious damage to the trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banksman, to ensure that adequate clearance from trees is maintained at all times. Access facilitation pruning should be undertaken where necessary to maintain this clearance.

NOTE In some instances, local planning authority consent for pruning might be required.

6.2.4.2 Fires on sites should be avoided if possible. Where they are unavoidable, they should not be lit in a position where heat could affect foliage or branches. The potential size of a fire and the wind direction should be taken into account when determining its location, and it should be attended at all times until safe enough to leave.

NOTE Local environmental health authorities might have specific restrictions.

6.2.4.3 Any materials whose accidental spillage would cause damage to a tree should be stored and handled well away from the outer edge of its RPA.

C Photographs

Photograph 1 Area 1 North Side

Photograph 2 Area 1 South Side

Photograph 3 Area 2 Elders on the top of the bank

Photograph 4 Area 3 over mature Crack Willow

Photograph 5 Hedgerow along the edge of area 3

Photograph 6 Coppiced Crack Willow, East of area 4

Photograph 7 Area 3 Planted Pedunculate Oak and Ash on river bank

Photograph 8 Area 5 Planted Poplar and Common Alder

Photograph 9 Area 5 Natural Crack Willow and Hawthorn on the riverbank

Photograph 10 Area 6 Laid Crack Willow

Photograph 11 Area 7 Planted Hawthorn hedge

D Table of common and scientific names

Common Names	Scientific Names
Ash	*Fraxinus excelsior*
Black Poplar	*Populus nigra*
Blackthorn	*Prunus spinosa*
Bramble	*Rubus fruiticosa*
Cleavers	*Galium aperine*
Common Alder	*Alnus cordata*
Crack Willow	*Salix fragilis*
Dog Rose	*Rosa canina*
Elder	*Sambucus nigra*
European Rabbit	*Oryctolagus cuniculus*
Grey Willow	*Salix cineria*
Field Maple	*Acer campestre*
Hawthorn	*Crateagus monogyna*
Hazel	*Corylus avellana*
Himalayan Balsam	*Impatiens glandulifera*
Honeysuckle	*Lonicera henri*
Ivy	*Hedra helix*
Japanese Knotweed	*Fallopia japonica*
Nettle	*Urtica diocea*
Pedunculate Oak	*Quercus robus*
Silver Birch	*Betula pendula*

References

British Standards Institution (2012) British Standards (BS) 5837:2012: *Trees in relation to design, demolition and construction - Recommendations*. No date : BSI Standards Limited

NNSS (2016) NNSS Check-Clean-Dry [Online]. [Accessed: 22 December 2017]. Available at: http://www.nonnativespecies.org/checkcleandry/.

Offices at
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