Oxfordshire Highways

Cogges Link Road
Existing Vegetation Incorporating BS 5837:2005 Tree Survey

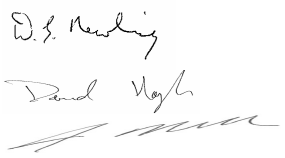
Doc ref: B0834600/DOC/PA/TREE Date: April 2008

Jacobs Engineering UK Ltd
Jacobs House, 427 London Road, Reading, Berkshire, RG6 1BL. UK
Tel 0118 963 5000 Fax 0118 949 1054

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Document No	:	B0834600/DOC/PA/TREE
Revision No	:	1
Date	:	April 2008

Prepared by	:	Don Newling
Checked by	:	Daniel Haigh
Approved by	:	Jon Mullins



Contents

1. Introduction

1.1 The author is a qualified arboriculturalist with a national diploma in arboriculture who is experienced in undertaking tree surveys.

1.2 This report records an assessment of trees along the route of the proposed Cogges Link, at Witney.

1.3 The tree survey was commissioned to assess the current condition, value and suitability for retention of trees potentially affected by the prposal. The report includes recommendations relating to the future development of the site and an arboricultural method statement (AMS) – see Appendix A.

1.4 Trees have been assessed in accordance with the British Standard BS 5837: 2005 'Trees in relation to construction - Recommendations' (2005), which can then be used to allow development to be integrated with trees. According to BS 5837: 2005 the process can be divided into four phases:

- Survey
- Design
- Construction
- Aftercare

1.5 This report has not been prepared for health and safety purposes and a comprehensive health and safety appraisal has not been carried out. Hence the report must not be used for this purpose and Jacobs accepts no liability in this respect. For health and safety purposes further arboricultural work will be required generally in due course and taking account of development proposals, however these requirements have not been identified by the survey.

1.6 The natural environment is dynamic and is in constant change. Therefore this report is accurate for only a limited period – see paragraph 2.4.

1.7 Abbreviations used in this report are:

AMS	-	arboricultural method statement
RPA	-	root protection area
TCP	-	tree constraints plan
TPP	-	tree protection plan

2. Method of Survey

2.1 The trees were inspected on 10 December 2007, 4 January 2008 and 15 January 2008 by Don Newling and Daniel Haigh. All observations were made from ground level under overcast weather conditions.

2.2 For background and reference purposes the outline for the proposed road has been shown on the TCP and TPP. In this context this report comments on the implications of the proposed development and the arboricultural factors that should be considered.

2.3 Trees were inspected from ground level, by eye. Trees were examined from close about their trunks as well as from a distance (where possible), thus enabling an overall assessment of the whole tree condition as well as the scrutiny of any areas of concern within the tree. The current use of the surrounding land was also noted and this may be reflected in the comments pertaining to one particular tree compared with a similar tree elsewhere. This survey includes all trees with a stem diameter of 75mm or greater at 1.5m height and comments on the presence of any significant young trees or trees with stems below 75mm diameter.

2.4 Whilst reasonable skill and care was taken to identify faults and potential dangers in the trees inspected, there is a possibility that a defect may have been obscured or not apparent at the time of inspection. It should be noted that trees and shrubs are living organisms whose health and condition can change rapidly. All trees, even healthy ones, are at risk from unpredictable climatic and man-made events. The assessment of risk for any tree is based upon factors evident at the time of inspection and the interpretation of those factors by suitably qualified inspectors. The health, condition and safety of trees should be checked on a basis commensurate with the level of risk and preferably on an annual basis. Therefore, the opinions and information provided as a result of a tree inspection are applicable for a limited period and we therefore restrict our liability to a maximum of one year from the date of inspection.

2.5 The following should be noted with regard to potentially relevant protected species legislation which may place limitations on the timing of tree removal, site clearance and tree management operations.

Bats: Bats (*Chiroptera*) and their roosts are protected by the Wildlife and Countryside Act 1981, The European Habitats Directive 1992, The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) and the CROW Act 2000. The legislation makes it an offence to:

- Intentionally, deliberately or recklessly kill, injure or capture (take) bats
- Deliberately or recklessly disturb bats (whether in a roost or not)

- Damage, destroy or obstruct access to bat roosts

Birds: All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act, 1981. Some rare species are afforded special protection. These are listed on Schedule 1 of the Act and cannot be intentionally or recklessly disturbed when nesting. Various exceptions to the Act include the killing of sporting birds or wildfowl, except in the close season.

2.6 An assessment of bat roost potential was not undertaken.

3. Results

3.1 Each tree is identified on the tree constraints plan (TCP) in Appendix B. All detailed design work should take into consideration the results of the survey and the TCP. This is a design tool which shows the below ground constraints represented by the root protection area (RPA) and the above ground constraints posed by virtue of tree size and position.

3.2 The RPA is calculated as an area equivalent to a circle with a radius 12 times the stem diameter for single stem trees and 10 times the basal diameter for trees with more than one stem arising below 1.5m above ground level as set out within Table 2 of the BS 5837: 2005.

3.3 Specifications relating to tree protection during construction are contained within the AMS in Appendix A and the tree protection plan (TPP) in Appendix C. A polygon is plotted to scale around each tree or group of trees to be retained and shows the construction exclusion zone (minimum protection area) which should be left undisturbed as stipulated in clause 9 of BS 5837: 2005.

3.4 The data collected for each tree, or group of similar trees, is described in Table 1. The column headings in the table are as follows.

Tree Number: Reference number for each tree(s) as it appears on the TCP and TPP where:

T = Individual tree
G = Group of two or more trees

NB: Numbering starts at T1

Species: The common (generic) name for the species has been used.

Stem Diameter: Stem diameter to the nearest mm taken at 1.5m above ground level unless specified otherwise within brackets. For multi-stemmed trees the reading relates to the largest stem.

Tree Height: Estimated in metres from ground level to the upper most part of the tree canopy.

Crown Spread: Estimated in metres taken at the four cardinal points from the stem.

Height of Crown Clearance: Taken in metres above adjacent ground level.

Age Class: The maturity of the tree is defined in 1 of 5 categories:

Y	=	Young – small recently planted tree not yet fully established.
MA	=	Middle-aged – fully established tree in the early stages.
M	=	Mature – biologically mature tree. The 'M' may be prefixed by an 'E' for early or an 'L' for late.
OM	=	Over mature – old tree showing signs of terminal decline.
V	=	Veteran

Physiological Condition: This is based upon an assessment of tree health and vigour i.e. Good, Fair, Poor, Dead.

NB. Groups are allocated an overall assessment. Thus individual trees within a group may have a higher or lower score.

Structural Condition: Description of defects (where applicable) e.g. collapsing, compression forks.

Preliminary Management Recommendations: Arboricultural or ecological work required.

Estimated Remaining Contribution in Years: Less than 10, 10 to 20, 20 to 40 etc.

Category Grading:

A = Trees of high quality and value. Shown on TCP as Light Green
B = Trees of moderate quality and value. Shown on TCP as Mid Blue
C = Trees of low quality and value. Shown on TCP as Grey
R = Trees to be removed. Shown on TCP as Dark Red

Subcategories: Categories A - C are also allocated a superscript number that indicates specific values i.e. 1 arboricultural values, 2 landscape values, 3 cultural values including nature conservation. For further information regarding category grading for trees, see BS 5837: 2005 Table 1. Cascade chart for tree quality assessment.

3.5 Observations about problems/characteristics of individual trees are included within the above headings.

3.6 The dimensions pertinent to the definition of RPA are included in Table 2

Table 1: Tree Data

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
G1	Willow, alder, ash, hawthorn	>24	>1130	-	-	-	-	0	>M	F	Some multi-stem, dead wood, unmanaged, ivy growth, stem collapse.	-	20+	C2
T2	Willow	26	1140	10	10	10	10	4	M	F	Old pollard, dead wood, tight forks.	-	20+	B2
G3	Field maple, willow, alder	>13	>310	-	-	-	-	0	>MA	F	Some multi-stem, some stem collapsed, deadwood, unmanaged.	-	20+	C2
G4	Sycamore, willow	450	20	-	-	-	-	2	>M	F	Some multi-stem, some tight forks, some stem collapsing.	-	20+	B2
G5	Alder, willow	>13	>310	-	-	-	-	0	M	F	Ivy growth, one-sided, minor dead wood.	-	20+	B2
G6	Willow	>14	950	-	-	-	-	0	MA	F	Multi-stem.	-	10+	C2
T7	Ash	20	665	12.5	3	5.5	7	6	M	F	Established basal sucker, one-sided, small stem cavities.	-	20+	C1
T8	Silver birch	11	175	2	1.5	1.5	1.5	0	MA	F	Leaning.	-	10+	C1
G9	Willow, ash, hawthorn, elder	>18	530	-	-	-	-	0	>M	F	Woodland area, unmanaged.	-	40+	B2
G10	Hawthorn, plum, willow	5	200	-	-	-	-	0.2	>M	F	Multi-stem, tight forks.	-	10+	C2
G11	Hawthorn, ash, willow, sycamore	10	180	-	-	-	-	2	MA	F	Some multi-stem, some stem collapsing.	-	40+	B2
G12	Willow, hawthorn, ash, sycamore	>12	>240	-	-	-	-	0	>MA	F	Some dead wood, ivy some suppressed.	-	40+	B2
T13	Willow	18	560	4	6	3	8	6	M	F	Ivy, dead wood, broken branches, leans.	-	20+	C2
T14	Willow	-	-	-	-	-	-	-	-	-	Dead tree.	-	<10	R
T15	Ash	18	630	8	9.5	6	8	6	M	F	Ivy, dead wood.	-	40+	B2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
G16	Willow	11	315	-	-	-	-	0	M	F	Pollard at 1m, dead wood, canker, some torn limbs.	-	10+	C2
T17	Willow	10	1160	3	7	10	10	0	M	F	Multi-stem, layering branches, partially collapsed, trunk decay, canker, deadwood.	-	<10	R
G18	Walnuts	18	-	-	-	-	-	2	M	F	Dead wood, (need access to fully assess).	-	40+	A2
T19	Willow	8	490	5	4.5	5	5	2	MA	F	Dead wood.	-	40+	C2
T20	Ash	6	500	3.5	3.5	5.5	4	1	MA	F	Minor dead wood.	-	40+	B2
G21	Willow	15	>960	-	-	-	-	0.5	M	F	Multi-stem, dead wood, canker.	-	10+	C2
T22	Willow	13	310	4.5	5.5	4	2	1.5	M	F	Pollarded at 1.8m, canker.	-	20+	C2
T23	Willow	10	1120	5	5	4.5	3.5	0	M	P	Multi-stem, fungal fruiting, trunk deadwood, rubbing branches, cavities, canker, split limb.	-	<10	R
G24	Willow, ash, hawthorn.	6	240	-	-	-	-	0	MA/M	F	One sided, minor dead wood, epicormic growth.	-	20+	C2
G25	Willow, hawthorn	4	150	-	-	-	-	0	MA	F	Minor dead wood, multi stem, epicormic growth.	-	20+	C2
G26	Willow, hawthorn	6	520	-	-	-	-	0	M	F	Multi-stem, pollarded willow, dead wood.	-	20+	C2
G27	Willow, hawthorn	6	360	-	-	-	-	0	MA	F	Minor dead wood, epicormic growth.	-	20+	C2
G28	Willow, hawthorn	6	280	-	-	-	-	0	MA	F	Minor dead wood, epicormic growth.	-	20+	C2
T29	Willow	6.5	540	1.5	1.5	1.5	1.5	0.3	M	F	Multi-stem, pollard.	-	20+	B2
T30	Willow	6.5	540	1.5	1.5	1.5	1.5	0.3	M	F	Multi-stem.	-	20+	B2
T31	Willow	6.5	540	1.5	1.5	1.5	1.5	0.3	M	F	Multi-stem.	-	20+	B2
T32	Willow	6	190	1.5	3	2	1.5	0.5	MA	F	Pollard at 1.8m, canker.	-	20+	C2
T33	Willow	5	370	1.5	1.5	1.5	1.5	0	M	F	Twin stem, pollard at 1.8m, canker, decay at pollard.	-	10+	C2
T34	Walnut	6	160	1.5	2	1.5	2	0.5	MA	F	One sided, steep bank.	-	10+	C2
T35	Willow	11	540	8	6	4.5	5.5	2	MA	F	Dead wood.	-	40+	B1

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T36	Willow	10.5	345	6	4	0.5	7	3	MA	F	Dead wood.	-	40+	C2
T37	Willow	11	720	2	5	6.5	4.5	2	MA	F	Dead wood.	-	40+	C2
T38	Willow	5.5	980	3	5	6.5	4	0	M	P	Multi-stem, decay at base, dead wood, basal suckers, canker.	-	10+	C2
T39	Willow	8	350	4	6	4.5	5	2.5	MA	F	Minor dead wood.	-	40+	C2
T40	Willow	10	535	5.5	6.5	6	6.5	2.5	MA	F	Minor dead wood.	-	40+	C2
T41	Willow	10	615	5	7	8	5	2	MA	F	Dead wood.	-	40+	C2
T42	Walnut	8	270	3	3	3.5	4	0	M	F	On steep bank.	-	20+	B2
T43	Willow	11	570	5.5	5	7.5	7	3.5	MA	F	Minor dead wood.	-	40+	C2
T44	Willow	11	920	5	8	6.5	9	2.5	M	F	Dead wood.	-	40+	C2
T45	Willow	12	380	2	3.5	3	4.5	2.5	MA	P	Twin stem, canker.	-	10+	C2
S46	Willow	1	-	-	-	-	-	-	-	-	Tree stump.	-	-	-
T47	Willow	9	600	6	8	5	8	4	M	F	Dead wood.	-	40+	C2
T48	Willow	9	515	5	4	7	7	2.5	MA	F	Minor dead wood.	-	40+	C2
T49	Willow	6	470	2.5	4.5	2	4	3	MA	F	Dead wood.	-	40+	C2
G50	Hawthorn x 5	4	160	-	-	-	-	0.5	MA	F	Minor dead wood.	-	40+	C2
T51	Alder	7	1020	5	4.5	3.5	4	1	MA	F	Minor dead wood.	-	40+	C2
T52	Willow	6	180	4	5	5.5	4.5	2.5	MA	F	Minor dead wood.	-	40+	C2
T53	Willow	8	535	4.5	4.5	4.5	4	2	MA	F	Minor dead wood.	-	40+	C2
T54	Willow	2.5	300	2.5	2.5	2.5	2	2	MA	F	Pollard.	-	40+	C2
T55	Willow	16	500	4.5	7	6.5	5	0	M	F	Dead wood, canker.	-	20+	C2
T56	Willow	14	450	4.5	2	6	2	0	M	P	Leans over river, Multi-stem at 1m, stem wounds, canker, dead wood.	-	<10	R
T57	Willow	18	580	4.5	5	7.5	6	1	M	F	Surface roots, crossing branches, dead wood, canker.	-	20+	B2
T58	Willow	16	205	1	4.5	0.5	1	3	MA	F	One sided, leaning, damaged surface roots, dead wood, canker.	-	<10	R

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T59	Willow	16	980	5.5	3.5	7	5.5	0.5	M	F	Multi stem at 0.5m, dead wood, canker.	-	20+	C2
T60	Willow	16	480	3	5	6.5	4.5	1.8	M	F	Canker, dead wood, partially suppressed.	-	20+	C2
T61	Willow	16	560	6.5	4.5	4.5	5.5	2	M	F	Canker, dead wood, steep bank.	-	10+	C1
T62	Willow	14	460	4.5	4.5	3	4	1	M	F	Multi stem at 1m, dead wood, canker.	-	10+	C1
T63	Willow	14	325	4.5	3.5	3	4	2	M	F	Twin-stem, dead wood, canker, ivy.	-	10+	C2
T64	Willow	18	525	6	4	0	8.5	1	M	F	Three stems from 1.5m, dead wood, canker, one sided.	-	20+	C2
T65	Willow	18	550	3.5	6	4	9	1	M	F	Dead wood, one sided.	-	20+	C2
T66	Willow	18	510	2.5	6.5	6	8.5	2	M	F	Dead wood, canker, twin leader.	-	20+	C2
T67	Willow	18	460	5	6	3	6.5	2	M	F	One sided, canker, dead wood, small stem cavity.	-	20+	C2
T68	Willow	18	555	6	5.5	3.5	5.5	2	M	F	Low stubs, dead wood, canker.	-	20+	C2
T69	Willow	16	475	5	5	4.5	6	1.8	M	F	Dead wood, canker.	-	20+	C2
T70	Willow	6	720	5	4.5	5.5	4	0	M	P	Multi stem, dead wood, canker, broken branches, epicormic growth.	-	<10	R
T71	Willow	14	520	3.5	4.5	3	3	1.8	M	F	Trunk cavity, twin leader, canker.	-	20+	C2
T72	Willow	6	240	2	3	2.5	3.5	2	M	F	Pollard at 2.5m, one sided, dead wood, canker.	-	10+	C2
T73	Alder	8	390	4	5.5	4.5	4.5	0	M	F	Partially fallen into the river, exposed roots, established basal sucker, basal suckers, unstable rooting, leans over river.	-	10+	C1
T74	Hawthorn	6	560	4	3.5	3	3.5	0	M	P	Multi-stem, basal suckers, partially collapsed, exposed roots on bank, rubbing branches, dead wood, leans over river.	-	<10	R
T75	Willow	4	2000	0	3	3	1.5	0	M	P	Multi-stem, one dead stem, remaining stems pollarded, trunk cavities and decay in some stems.	-	10+	C1
T76	Willow	10	580	1	3.5	5	3	0	MA	F	Multi-stem, minor dead wood, canker.	-	10+	C1
T77	Hawthorn	6	470	1.5	2	1.5	3	0	MA	F	Multi-stem, rooted into water, leans into river.	-	10+	C1
G78	Elder x 1 hawthorn x 3	6	260	-	-	-	-	0	MA	F	Rooted in steep bank, exposed roots, multi-stem.	-	10+	C2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
G79	Hawthorn x 3 elder x 1	7	320	-	-	-	-	0	M	P	Multi-stem, dead wood, ivy, largest hawthorn topped under utility cable.	-	10+	C2
T80	Willow	16	1045	8.5	7	5.5	7.5	0	M	F	Split trunk, decay in trunk, old pollard, dead wood.	-	10+	C2
T81	Willow	17	580	8.5	7	1.5	7	0	M	F	Twin leader, one sided, dead wood, split in fork, canker.	-	10+	C2
T82	Willow	17	545	2	0.5	7.5	8	1.8	M	F	Leans towards river, one sided, dead wood, canker.	-	10+	C2
T83	Willow	17	455	7	9	7	1.5	0	M	F	One sided, twin leader, leans to East, dead wood. Canker.	-	10+	C2
T84	Willow	16	1890	9	9.5	5	8	0	M	F	Split stem, cavities and decay in trunk, pollarded at 1.8m, dead wood, canker, split stems.	-	10+	C2
T85	Willow	16	360	1.5	2	6	2	1.5	M	F	One sided, dead wood, canker.	-	10+	C2
T86	Willow	16	800	3.5	4	7	5.5	0	M	F	Twin stem, dead wood, canker, one sided, crossing / fused branches.	-	10+	C2
T87	Willow	16	2150	7	6.5	8	7.5	0	M	F	Split stem, cavities and decay in trunk, old pollard, dead wood, canker, rubbing branches, crown wounds.	-	10+	C2
T88	Willow	15	750	0	2.5	9	7	0	M	F	Multi-stem, one sided, leans towards river, rubbing stems, stem cavity, stubs, dead wood, canker, partially suppressed.	-	<10	R
T89	Willow	11	380	1	5	2	0	0.5	M	F	Twin stem, suppressed, bramble covered, one sided, dead wood, T15 branch leaning on tree, canker.	-	<10	R
G90	Hawthorn x 2	6	240	-	-	-	-	0	MA	F	Growing on steep bank, basal suckers, minor dead wood.	-	10+	C2
T91	Willow	14	340	0	2.5	7	3.5	0	M	F	Partially up rooted, leans into river, dead wood, canker, rubbing branches.	-	<10	R
T92	Willow	15	1350	10	9	11.5	8	0	M	F	Old pollard, large stem decay, pollard points breaking out, dead wood, stem split, canker, stem cavity.	-	10+	C2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T93	Sycamore	15	270	0	1.5	3	2	0	M	F	One sided, leans into river, on edge of steep bank, cavities and stem decay in secondary stems, rubbing branches with T20, minor dead wood.	-	10+	C2
T94	Hawthorn	7	270	1.5	2	2	2.5	0	M	F	Crossing branches, dead wood, partially suppressed.	-	10+	C2
G95	Willow, ash, hawthorn, plum, elder, field maple	18	-	-	-	-	-	0	MA/M	F	Includes a line of an old hedgerow trees, dead wood, cavities, some storm damage.	-	40+	B2
G96	Willow x 2	15	675	-	-	-	-	0	MA	F	Multi-stem, dead wood, canker, rubbing branches.	-	10+	C2
G97	Willow x 2	5	790	-	-	-	-	0	MA	F	Layering branches, edges of steep bank, multi-stem, basal suckers, dead wood.	-	10+	C2
T98	Willow	15	780	6	5.5	5	6.5	0	M	F	Dead wood, small fungal fruiting bodies, canker, leans over river, tight forks.	-	10+	C2
G99	Hawthorn x 2 elder	6	150	-	-	-	-	0	MA	F	Basal suckers, rubbing branches, minor dead wood.	-	10+	C2
T100	Hawthorn	6	340	3	3	3	3	0	M	F	Multi-stem, minor dead wood, ivy, rubbing branches.	-	20+	C2
T101	Elder	5	150	1.5	2	1	1	0	MA	P	Leans, covered in bramble, dead wood.	-	<10	R
T102	Willow	12	1750	10.5	11	3.5	7	0.5	MA	F	Dead wood.	-	40+	C2
T103	Willow	12	1800	2.5	8.5	8.5	9	0.5	MA	F	Dead wood.	-	40+	C2
T104	Willow	11	875	5	9.5	14	7	0.5	MA	F	Dead wood.	-	40+	C2
T105	Walnut	7	2.5	2	3	3	1.5	0.5	MA	F	One sided, partially suppressed.	-	40+	C2
T106	Hawthorn	4	350	2	1	1.5	3	0	MA	F	Multi-stem, rubbing branches, growing on side of bank.	-	10+	C2
T107	Hawthorn	4	320	1.5	1	2	2.5	0	MA	F	Multi-stem, rubbing branches, growing on side of bank.	-	10+	C2
T108	Elder	3	230	2	0.5	0.5	0.5	0	M	P	Multi-stem, dead wood, stem wounds and decay.	-	<10	R

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T109	Elder	4	250	3	2	1	1	0	M	P	On side of steep bank, leaning into river, exposed surface roots, crown die back.	-	<10	R
T110	Hawthorn	5	430	4	2	1.5	2.5	0	M	F	Exposed surfaced roots, multi-stem, growing on side of steep bank, rubbing branches, leans into river.	-	<10	R
T111	Willow	14	1060	5	5	9	10	0	M	F	Fungal fruiting bodies, split stem, leans over river, cavities and decay in trunk, surface roots, dead wood, old pollard, canker, layering branches, exposed roots	-	<10	R
T112	Elder	2.5	330	1	0.5	1	0.5	0	M	F	Multi-stem, dead wood, split stems, dead stem.	-	<10	R
T113	Hawthorn	4	360	2.5	2.5	2	2	0	MA	F	Multi-stem, rubbing branches, exposed roots.	-	10+	C1
G114	Hawthorn x 1 elder x 1	5	280	-	-	-	-	0	MA	P	Multi-stem, dead wood, rubbing branches.	-	<10	R
G115	Hawthorn x 2 elder x 3	5	>460	-	-	-	-	0.3	M	F	Multi-stem, tight forks, rubbing branches.	-	10+	C2
T116	Willow	15	550	6	11	11.5	8	0	M	F	Two split stems (layering), basal cavities, dead wood, canker, rubbing branches.	-	10+	C2
T117	Willow	16	360	5	7	4	5	0.5	M	F	Twin leader, dead wood, rubbing branches, crown wound, canker, small trunk cavities.	-	10+	C2
T118	Willow	16	290	3	6	7.5	5	0.5	M	F	Multi-stem, from 0.3m, dead wood, canker, broken branches.	-	10+	C2
T119	Willow	17	380	6	5	5	7	0.5	M	F	Dead wood, canker.	-	10+	C2
T120	Willow	15	420	5.5	7	7.5	7	0.3	M	F	Twin leader, dead wood, canker, rubbing branches.	-	10+	C2
T121	Willow	13	280	4.5	6	5	6.5	0.5	M	F	Multi-stem at 0.5m, dead wood, canker.	-	10+	C2
T122	Willow	6	310	2	2	2.5	5	0.3	M	F	Old pollard at 2m, small stem cavity, canker.	-	10+	C2
T123	Willow	13	1640	5	8	9	6	0	M	F	Multi-stem, stem cavity, dead wood, canker, two stems reduced.	-	10+	C2
T124	Hawthorn	7	230	5	3.5	4	4	0	M	F	Partially suppressed, rubbing branches, dead wood.	-	20+	C2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T125	Willow	14	1590	12.5	9	1	7.5	0	M	F	Multi-stem, one stem collapsed, three stems pollarded at 2.5m, fungal fruiting bodies, canker, dead wood, one sided.	-	10+	C2
T126	Willow	10	170	4.5	2	1	3.5	0.3	MA	F	Dead wood, twin leader, canker.	-	10+	C2
G127	Norway maple, alder, larch, Norway spruce, eucalyptus, Corsican pine, ash, field maple, birch, oak, willow, hawthorn, elder, sycamore	>16	>1200	-	-	-	-	-	MA	F	See para 4.17.	-	10+	B2
T128	Ash	16	350	5	4	5	0.5	0	MA	F	Basal suckers, severely pruned by utility company,, pruning wounds, stem cavity.	-	20+	C2
G129	Ash x 1 Sycamore x 1	17	370	-	-	-	-	0	M	F	Multi-stem, basal cavity, basal suckers, dead wood, crown wounds.	-	20+	C2
T130	Ash	16	1450	10	9	10	6	0	M	F	Multi-stem, basal suckers, exposed roots, crown cavities.	-	20+	C2
T131	Hawthorn	8	170	2	2	2	2	0	MA	F	Twin stem, dead wood, rubbing branches.	-	20+	C2
T132	Oak	14	495	5	3	8	8	1	M	F	Ivy, trunk cavity, dead wood, twin leader, exposed roots.	-	40+	B2
T133	Oak	14	1140	4	6.5	5.5	4	6	M	F	Ivy, slight lean into field, major dead wood, trunk cavities, crown cavities.	-	40+	B2
T134	Field maple	12	550	5	3	6	5.5	0	M	F	Basal suckers, trunk wound, multi-stem from 0.5, fused stems, rubbing branches, dead wood, one sided.	-	40+	B2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
G135	Ash, field maple, hawthorn, elder, apple.	>12	>220	-	-	-	-	0	Ma	F	Dead elms, mainly multi stem, some dead wood.	-	20+	C2
G136	Sycamore, hawthorn, ash	>15	>450	-	-	-	-	0	MA/M	F	Dead elms, ivy, dead wood.	-	20+	C2.
G137	Plum, ash, hazel, hawthorn, sycamore, cherry, Norway maple	>14	>260	-	-	-	-	0	MA	F	Dead wood, mainly overgrown hedge.	-	20+	C2
G138	Field maple, ash, elder	5	330	-	-	-	-	0	MA	F	Multi-stem, rubbing branches, dead wood.	-	20+	C2
G139	Norway maple, field maple, oak, cherry, hawthorn	>10	>380	-	-	-	-	0.5	MA	F	Growing on steep bank, dead wood.	-	20+	B2
G140	Field maple, hawthorn, alder, Scots pine, Norway maple, ash, plum	>12	>420	-	-	-	-	0.5	MA	F	Growing on steep bank, trunk wounds.	-	20+	C2
T141	Poplar	22	555	5	5.5	5.5	5	1	M	F	Tree grown into guard.	-	20+	C2
G142	Oak, alder, Norway maple, larch, cherry, field maple, plum, ash, Corsican pine, Scots pine	>14	>280	-	-	-	-	0	MA	F	Un-managed screen planting, some trees severely pruned for utility line clearance. Dead elms.	-	20+	B2

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
T143	Oak	6	105	1.5	1.5	1.5	1.5	0	MA	F	Still has stake attached, broken branches, stem wound.	-	20+	C2
T144	Poplar	16	170	2	2	2	2	4	MA	F	Needs stake removing.	-	20+	C2
T145	Hornbeam	7	135	2	2	2	1.5	2	MA	F	Basal damage.	-	10+	C2
T146	Poplar	18	245	2.5	2	2	2	3.5	Ma	F	Scaring on trunk, stake still attached.	-	20+	C2
G147	Elm, hawthorn, field maple, ash	5	>150	-	-	-	-	0	MA	F	Densely planted.	-	10+	B2
T148	Oak	14	760	7	7	7	7	1.8	M	F	Dead wood.	-	40+	B2
T149	Oak	14	810	2	5.5	7.5	5.5	2	M	F	Minor dead wood, storm damage cavity in upper stem.	-	40+	B2
T150	Oak	14	780	6	5.5	2.5	6	2	M	F	Lost leader at 4m, minor dead wood, one sided, minor crown cavities.	-	40+	B2
T151	Oak	16	1080	2	5	6	4.5	2.5	M	F	Minor ivy, dead wood, lost limb (stem damage).	-	40+	B2
T152	Oak	16	840	5	6	7.5	8	3	M	F	Side of ditch, dead wood.	-	40+	B2
T153	Oak	16	850	8	7	5	8.5	3	M	F	Side of ditch, large buttress roots, dead broken top, woodpecker holes in stem, stag headed, lost leader.	-	40+	B2
T154	Willow	7	960	7	3	2	9	0	M	P	Partially collapsed, large cavity, basal suckers, dead wood.	-	10+	C2
G155	Eilm	-	130	-	-	-	-				Dead.	-	<10	R
G156	Plum, elder, willow	>6	250	-	-	-	-	0	MA	F	Multi-stem, unmanaged.	-	20+	C2
G157	Hawthorn/ elder	>7	150	-	-	-	-	0	>MA	Dead - F	Majority of elms dead.	-	10+	C2
T158	Ash	8	250	3	3	3	1.5	1.8	MA	F	One sided, minor deadwood.	-	10+	C2
T159	Oak		1020	5.5	5.5	5.5	5.5	2.5	M	F	Lightning strike damage, stag headed top, large buttress roots with areas of damage. Possible pockets of decay, dead wood, Veteran? Wildlife?	-	40+	B1

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

Tree No.	Species	Tree Height (M)	Stem Dia (mm)	Crown Spread (M)				Height of Crown Clearance (M)	Age Class	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Category Grading
				N	E	S	W							
G160	Hawthorn, alder, elder, elm	7	560	-	-	-	-	0	MA	F	Multi-stem, unmanaged.	-	10+	C2
W161	Elm, hawthorn	16	>190	-	-	-	-	0	MA	F	Larch, Norway spruce, eucalyptus poplar, alder, woodland management.	-	20+	C2
G162	Field maple, ash, hawthorn, plum, cherry	6	230	-	-	-	-	0	MA	F	Densely planted, unmanaged.	-	40+	B2
T163	Willow	8	840	6	7	6	7	0	M	F	Multi-stem, canker, minor deadwood.	-	20+	B2
G164	Hawthorn, blackthorn	4	80	-	-	-	-	0	MA	F	Multi-stem, densely planted.	-	20+	B2
G165	Hawthorn, blackthorn	4	80	-	-	-	-	0	MA	F	Multi-stem, densely planted.	-	40+	B2
G166	Ash, oak, cherry, hawthorn, hazel	4	>85	-	-	-	-	0	Y	F	Field maple. In need of maintenance (tree ties, stakes/guards), dogwood / poplar / Vibernum.	-	40+	B2
T167	Oak	12	775	3.5	3.5	3.5	3.5	2	M	F	Significant buttress root damage, basal cavity, dead wood, previously reduced, wood pecker cavities, wildlife value.	-	20+	B1
G168	Hawthorn, elm	5	>80	-	-	-	-	0	MA	F	Densely planted, previously topped at 2m,	-	20+	B2
T169	Hawthorn	4	230	1.5	1.5	1.5	1.5	0	M	F	Multi-stem, attached to old fence post.	-	20+	C1
G170	Ash, field maple, hawthorn	8	>360	-	-	-	-	0	>M	F	Densely planted unmanaged woodland.	-	40+	B2
G171	Willow, alder, plum, field maple, poplar	7	170	-	-	-	-	0	MA	F	Unmanaged.	-	20+	C2

Table 2: Root Protection Area Specification

T/G Number	RPA Radii (m)	RPA Total M^2
G1	11.30	401.20
T2	13.68	588.00
G3	3.10	30.19
G4	0.20	0.13
G5	3.72	43.48
G6	9.50	283.57
T7	7.98	200.08
T8	2.10	13.86
G9	6.36	127.09
G10	2.00	12.57
G11	1.80	10.18
G12	2.88	26.06
T13	6.72	141.89
T14[1]	-	-
T15	7.56	179.58
G16	3.78	44.89
T17	11.60	422.79
G18[2]	-	-
T19	5.88	108.63
T20	6.00	113.11
G21	9.60	289.57
T22	3.72	43.48
T23	11.20	394.13
G24	2.88	26.06
G25	1.50	7.07
G26	5.20	84.96
G27	4.32	58.64
G28	3.36	35.47
T29	5.40	91.62
T30	5.40	91.62
T31	5.40	91.62
T32	2.28	16.33
T33	3.70	43.01
T34	1.92	11.58
T35	6.48	131.93
T36	4.14	0.05
T37	8.60	0.05
T38	9.80	301.76
T39	4.20	55.42
T40	6.42	129.50
T41	7.38	171.13
T42	3.24	0.03
T43	6.84	147.00
T44	11.04	382.95
T45	3.80	45.37
S46[3]	-	-
T47	7.20	162.88
T48	6.18	120.00
T49	5.64	99.95

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

T/G Number	RPA Radii (m)	RPA Total M^2
G50	1.92	11.58
T51	12.24	470.73
T52	2.16	14.66
T53	6.42	129.50
T54	3.60	40.72
T55	6.00	113.11
T56	4.50	63.63
T57	6.96	152.20
T58	2.46	19.01
T59	9.80	301.76
T60	5.76	104.24
T61	6.72	141.89
T62	4.60	66.48
T63	3.25	33.19
T64	5.25	86.60
T65	6.60	136.87
T66	6.12	117.68
T67	5.52	95.74
T68	6.66	139.37
T69	5.70	102.08
T70	7.20	162.88
T71	6.24	122.34
T72	2.88	26.06
T73	4.68	68.82
T74	5.60	98.53
T75	20.00	1256.80
T76	5.80	105.70
T77	4.70	69.41
G78	3.12	30.59
G79	3.20	32.17
T80	12.54	494.08
T81	6.96	152.20
T82	6.54	134.39
T83	5.46	93.67
T84	22.68	1616.19
T85	4.32	58.64
T86	8.00	201.09
T87	25.80	2091.44
T88	7.50	176.74
T89	3.80	45.37
G90	2.88	26.06
T91	4.08	52.30
T92	16.20	824.59
T93	3.24	32.98
T94	3.24	32.98
G95*	-	-
G96	6.75	143.16
G97	7.90	196.09
T98	9.36	275.27
G99	1.80	10.18
T100	3.40	36.32
T101	1.80	10.18
T102	21.00	1385.62
T103	21.60	1465.93

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

T/G Number	RPA Radii (m)	RPA Total M^2
T104	10.50	346.41
T105	0.03	0.00
T106	3.50	38.49
T107	3.20	32.17
T108	2.30	16.62
T109	3.00	28.28
T110	4.30	58.10
T111	12.72	508.37
T112	3.30	34.22
T113	3.60	40.72
G114	2.80	24.63
G115	4.60	66.48
T116	6.60	136.87
T117	4.32	58.64
T118	2.90	26.42
T119	4.56	65.33
T120	5.04	79.81
T121	2.80	24.63
T122	3.72	43.48
T123	16.40	845.07
T124	2.76	23.93
T125	15.90	794.33
T126	2.04	13.08
G127*	-	-
T128	4.20	55.42
G129	3.70	43.01
T130	17.40	951.27
T131	1.70	9.08
T132	5.94	110.86
T133	13.68	588.00
T134	6.60	136.87
G135	2.64	21.90
G136	5.40	91.62
G137	3.12	30.59
G138	3.30	34.22
G139	4.56	65.33
G140	5.04	79.81
T141	6.66	139.37
G142	3.36	35.47
T143	1.26	4.99
T144	2.04	13.08
T145	1.62	8.25
T146	2.94	27.16
G147	1.80	10.18
T148	9.12	261.33
T149	9.72	296.85
T150	9.36	275.27
T151	12.96	527.74
T152	10.08	319.25
T153	10.20	326.89
T154	11.52	416.98
G155	1.56	7.65
G156	2.50	19.64
G157	1.80	10.18

Oxfordshire Highways
Witney Cogges Link Road
Existing vegetation incorporating
BS 5837:2005 Tree Survey

T/G Number	RPA Radii (m)	RPA Total M^2
T158	3.00	28.28
T159	12.24	470.73
G160	5.60	98.53
G161*	-	-
G162	2.76	23.93
T163	8.40	221.70
G164	0.80	2.01
G165	0.80	2.01
G166	1.02	3.27
T167	9.30	271.75
G168	0.96	2.90
T169	2.30	16.62
G170*	-	-
G171	2.04	13.08

Notes:

Group RPA's are shown as 0.5m on the TPP as it is not possible to show tree groups crown spreads accurately.

[1] Wind snapped tree not safe to take measurement.

[2] Not able to access unable to take measurement.

[3] Stump unable to take measurement.

*Woodland areas have been left unmeasured as they are too diverse in nature.

4. Discussion

General Comments

4.1 The survey comprised trees along the route of the proposed Cogges Link at Witney. The proposals are shown in outline on the drawings accompanying this report, to show the extent of the built project. Additional areas are also required for access.

4.2 The majority of the trees are considered to be in a 'fair condition' taking into account all factors relating to their physiological condition. The category 'fair' indicates that a tree has less than normal vigour and consequently a reduced capacity to successfully tolerate any changes to their immediate environment.

4.3 Successful retention of trees with reduced vigour is possible only with full compliance with the RPA.

4.4 All trees in the surveyed area provide visual amenity and may have some value as a wildlife habitat.

4.5 The surveyed trees are within varying ownerships City Council and before any work is carried out it should be ascertained if the trees are covered by a Tree Preservation Order or within a Conservation Area.

4.6 The following factors, if undertaken within the RPA, will adversely affect the health and long-term sustainability of trees and should be avoided in the planning and execution of development:

- Soil level changes (lowering or raising)
- Soil compaction
- Changes to soil hydrology
- Soil contamination
- Fires (under canopies)
- Excavation e.g. routing underground cables

Specific Comments

4.7 The group of trees included in this survey are a valuable asset as they provide visual screening and soft landscaping in the local area as well as having potential for wildlife. It is therefore appropriate that these trees are not unjustifiably removed or pruned in a way that will detract from their visual amenity or biodiversity values.

4.8 Due to the constraints of alignment of the proposed road, the proposals require the removal of fifteen trees (T17, T19, T20, T51, T53, T100, T101, T102, T103, T104, 105, T132, T133, T134 & T169), nine groups (G3, G4, G5, G10, G11, G16, G135, G164 & G168), parts of seven groups (G9, G136, G139, G140,

G142, G160 & G166) and part of a woodland area (G170). However, it may be possible to reduce these losses by designing around the most significant trees, lifting and replanting small/young trees or by carrying out appropriate tree works and these issues are covered in more detail below. The trees and groups for removal are shown on the TPP.

4.9 In addition to this the works will encroach into the RPA of six trees (T105, T128, T130, T148, T152 & T159) and one group (G138) although once again the extent of this may be reduced by designing around significant trees, lifting and replanting small/young trees, by carrying out appropriate tree works or providing adequate protection during installation and these issues are covered in more detail below.

4.10 Compliant with requirements for the visibility splay required at the junction with Witan Way is likely to result in the loss of part of the group of trees (G1) and the mature willow (T2) although appropriate tree works within the group may reduce the extent of these losses.

4.11 The impact on five trees (T128, T130, T148, T152 & T159) and one group (G138) and the woodland area (G170) could be resolved by relatively minor changes in the proposals and the significance/importance of eight of these trees (T148, T152 & T159) is considered to be sufficient for this to be reviewed. **Note:** the changes required vary from retaining existing features (two parallel ditches rather than creating one large ditch) to working around the RPA of trees rather than encroaching into them or reducing the extent of excavation within their RPAs. The position of the temporary protective fencing may need to be reviewed if these trees are to be retained but the preferred line of protection has been shown on the TPP.

4.12 Trees within the group around the cemetery (G166) are small enough that it may be possible to lift and replant them although the cost of this compared to providing replacement trees should be checked.

4.13 A number of the tree groups consist of trees that may have been planted to form hedges rather than trees or that will respond well to coppicing and appropriate tree works (eg. coppicing or significant reduction to recreate a hedgerow) combined with adequate protection would enable more of the thirteen groups (G1, G4, G9, G11, G16, G135, G136, G139, G140, G142, G160, G164 & G168) to be retained. It might also allow the R category tree (T17) to be retained.

4.14 The retained trees will require ground protection to prevent compaction and this should be achieved using protective barriers although it may not be possible to protect the full extent of the RPA due to access requirements and a suitable form of temporary ground protection should be laid over such areas.

4.15 Where trees are in poor condition and have been identified as R category trees it is recommended that the owners are advised of the current condition of these trees to reduce the risk of tree failure and/or claims of the construction works having caused their decline.

4.16 The group of walnuts (G18) are within private ownership and could not be surveyed fully as they were behind boundary fences but providing they are adequately protected during the works they should not be affected by the proposals.

4.17 The woodland areas (G127 and G161) are dense plantations consisting of blocks of deciduous and coniferous species which have been left unmanaged. In G127 the area below and adjacent to the overhead power cables where severe pruning works and felling have taken place. The field edge of this woodland appears to be the remnants of a more natural woodland area and includes mature oak, ash and willow. The preparation and implementation of a Woodland Management Plan is recommended for both areas to enhance the features and prevent them from deteriorating further.

4.18 The requirements of BS 5837: 2005 include consideration of the effects of present and future tree shading when considering site design. Due to the nature and function of the development this has not been assessed and hence is not plotted on the TCP.

4.19 The location of the contractor's compound and storage facilities for materials, machinery, vehicles, spoil and fuel and areas for the mixing of concrete must also respect the construction exclusion zones defined by the RPAs and shown on the TPP.

4.20 Soil compaction or contamination as a result of construction activity within the construction exclusion zones is likely to result in irreversible tree damage and therefore a reduction in the visual amenity. The construction exclusion zones should be fenced as detailed in the AMS.

4.21 The development proposals do not provide information on the proposed location of utilities and drainage. Routing of surface water drains, land drains, soakaways, gas, oil, water, electricity, telephone, and other communication cables should avoid the construction exclusion zones shown on the TPP.

Arboricultural Method Statement

4.22 It is recommended that the specifications for protective measures and access for construction described within the AMS in Appendix A are adopted and adhered to rigorously.

4.23 In preparing the AMS, full consideration has been given to the age and vitality of trees within the survey boundary. In addition, full consideration should be given to the future mature heights and canopy spread of retained and planted trees and any effects or problems which would be likely to arise.

4.24 Where construction must take place within the construction exclusion zone, it may be impractical to erect protective fencing as indicated on the TPP. Therefore it is suggested that all construction workers are made fully aware of the need for care when using heavy machinery and especially when carrying out excavation works in close proximity to trees. However, protective fencing will still be required and the location should be agreed on site with an arboriculturist. Recommendations for work within construction exclusion zones are included in the AMS.

5. Recommendations

R1 The development brief should include as a key objective the medium term retention of all higher value trees (colour coded light green and mid blue).

R2 Those trees indicated in grey (Category C) on the TCP may be considered for removal subject to development constraints and future potential as landscape features.

R3 Those trees indicated in red on the TCP should only be removed where consent has been obtained from the owner and the Local Authority.

R4 Trees suitable for retention should not be unjustifiably removed or pruned in any way that will detract from their visual amenity value.

R5 If the proposals are amended to retain any additional trees (see para 4.11) the position of the temporary protective barrier should follow the preferred line of tree protection as shown on the TPP.

R6 A programme of arboricultural works should be prepared by an arboriculturist for implementation before construction work commences in order to provide the clearance required.

R7 The location of protective fencing should be agreed on site with an arboriculturist taking into account operational health and safety requirements.

R8 Construction methods within RPAs should adhere to the recommendations of the AMS.

R9 Depending upon the timing of the works there will be a need for a breeding bird survey immediately before works are scheduled to commence.

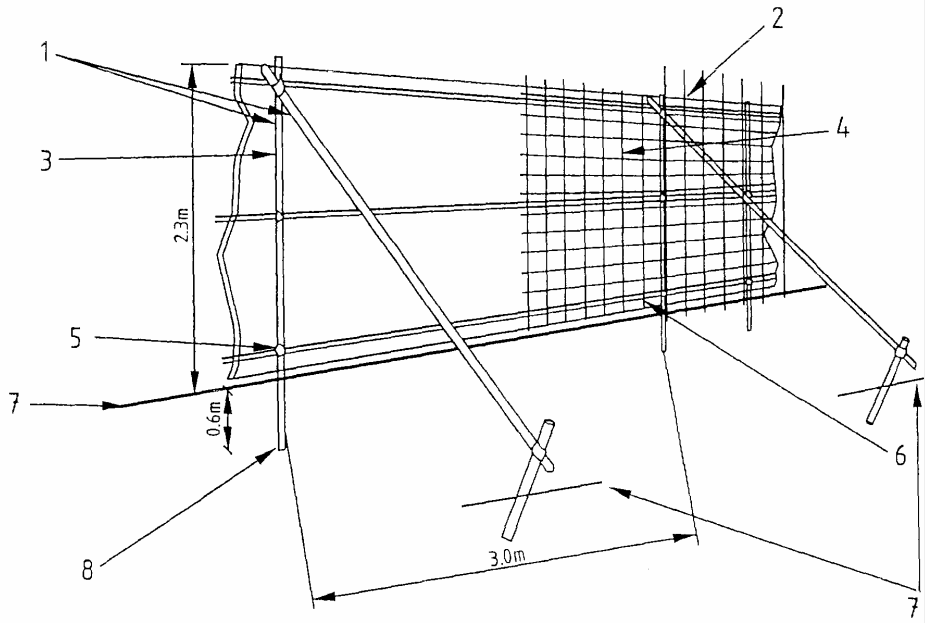
Appendix A: Arboricultural Method Statement

1. The timing and sequential order of operations is critical and should be followed as set out below.

Tree Protection

2. Prior to the commencement of non arboricultural works protective barriers will be installed around trees to be retained to distances shown on the TPP in Appendix B of this report and in accordance with specifications set out in clause 9 of BS 5837: Trees in relation to construction - Recommendations (2005).

3. Barriers to be constructed of 2.4m metre Herras panels secured with scaffold clips at the top and bases fixed to the ground with metal rods and braced with scaffold poles set at 45 degree angle and also secured into the ground able to resist impact.



Standard scaffold poles
Uprights to be driven into the ground
Panels secured to uprights with wire ties and where necessary andard scaffold clamps
Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to a easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

Figure 2 — Protective barrier

4. Once erected the construction exclusion zone is considered to be sacrosanct. No activity will be permitted within exclusion zones during construction including material or machinery storage or access to other parts of the site without

consultation with an arboriculturist. Barriers will not be altered or moved during the construction phase without prior consent of the arboriculturist or the planning authority. Protective barriers will remain on site until the main construction works are completed and the local planning authority or supervising arboriculturist authorise removal.

5. If protective barriers are not feasible due to the site layout or non arboricultural works are necessary within protection zones, in these instances it is recommended that alternate protection methods be agreed with the arboricultural adviser and local planning authority.

6. Any soft landscaping within construction exclusion zones will be carried out after consultation with the arboricultural adviser.

No-dig Construction of New Access

7. The principles set out below are in accordance with guidance given in Arboricultural Practice Note 12 'Driveways Close to Trees' which should also apply to pedestrian access.

8. For roots to be retained undamaged there must be no excavation, soil stripping or site grading within the construction exclusion zone. As a result construction will have to be above the existing ground level.

9. Passage of vehicles across unprotected soil surfaces should be avoided, especially when the soil is wet to avoid breakage of surface roots, soil compaction and consequently reduced soil aeration. Surviving roots may not be able to grow through compacted soil.

10. Roots must not be severed, soil must not be compacted and oxygen must be able to diffuse into the soil beneath the engineered surface.

11 Construction should incorporate two main components;

- *CellWeb 100mm* Geogrid high strength synthetic grid.
- Aggregate sub-base.

12. The interlock between aggregate and geogrid provides a reinforced platform and efficient load spread into the underlying ground.

13. Construction should be undertaken between May and October when the ground is driest and least prone to compaction.

14. Remove major protrusions such as rocks and tree stumps and fill major hollows with sharp sand.

15. Consider the need for edging with boards attached to pegs driven into ground through geogrid.

16. Cover geogrid with a minimum of 100mm of no fines aggregate. Machinery should move on the geogrid not either side on bare ground.

17. Lightly compact the sub-base to ensure binding.

18. Place final surfacing which should be permeable to moisture and oxygen i.e. gravel, slabs or brick paving (no fines or sealed with grout).

19. Details of all parties involved to be recorded.

Excavation Techniques in Proximity to Trees

20. Excavations such as trenching should aim to retain as many roots as possible.

21. Where possible all excavations shall be undertaken with care by hand to a depth of 300mm and under the supervision of an arboriculturist.

22. All roots greater than 25mm diameter shall be retained and worked around taking care not to damage the bark.

23. Any root severance shall be undertaken using a sharp saw leaving a cleanly cut surface.

24. Edging of the new cycle way will be carried out using timber so as to avoid digging deeper foundations for concrete edging.

25. Backfilling of any excavation shall be carried out carefully to avoid damage to roots.

26. Backfill to include the placement of an inert granular material mixed with topsoil or sharp sand (not builders sand) around retained roots.

Arboricultural Supervision

27. An arboriculturist will be appointed to oversee the proposed construction work.

28. Prior to work commencing a site meeting will be held between the arboriculturist and work site manager.

29. All parties to read and sign this AMS by way of acknowledgement of the terms and requirements. Contact details to be exchanged.

30. Site visits by the arboriculturist will be undertaken once a week on a random basis.

31. On completion of work the nominated arboriculturist will inspect and sign off the site.

32. In the event of a breach of the requirements of this AMS the site manager will notify the arboriculturist without delay.

Arboricultural Works

33. All tree works should be undertaken to BS 3998 'Tree Works' and current best arboricultural practice. It is recommended that a reputable contractor be used. Professional bodies such as the Arboricultural Association or the International Society of Arboriculture run professional accreditation schemes, which offer some level of quality assurance. However, it should be noted that membership of these bodies does not guarantee quality of work.

Supervision and Monitoring of Works

34. It is recommended that works be supervised by the arboricultural adviser.

General Constraints

35. No fires or heat sources such as generators are to be located within 20m of any tree to be retained.

36. No storage of chemicals or materials injurious to tree health are to be located within 20m of any tree to be retained.

Appendix B: Tree Constraints Plan

Appendix C: Tree Protection Plan