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Tree Survey Summary and Masterplan Assessment

Deerfields Farm, Bodicote

Client:	Royal HaskoningDHV Rightwell House, Bretton Peterborough PE3 8DW
Date of inspection:	22nd March 2018
Layout considered:	Site Layout Option 2
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DOCUMENT HISTORY

Revision	Purpose of issue	Originated	Reviewed	Approved	Date
-	Design information	TC	AMB	AMB	29/03/18

I hope you find this report satisfactory. If you need any more information regarding this assessment, please contact the office below.

Signed:

[redacted]

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Date: 29th March 2018

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1 INTRODUCTION

1.1 Instructions

1.1.1 This assessment was commissioned by Royal HaskoningDHV on behalf of the Client.

1.1.2 The instruction was to survey the trees on or adjoining the site in line with the recommendations of BS5837: 2012 and to produce a plan showing the tree constraints on which the potential implications of the preliminary Masterplan for the development could be broadly assessed.

1.1.3 The second instruction was to write a report setting out the criteria by which the trees were assessed, presenting the survey data, and discussing the constraints and implications of the landscape.

1.2 Source documents

1.2.1 The drawings that have been used to inform this assessment are:

- Topographical survey: R-16325_201-202_issue01
- Planning drawing: Site Layout Option 2

Note: This assessment is specific to the Masterplan and must not be generalised to other layouts.

1.3 Limitations

1.3.1 The tree survey was carried out for the purpose of informing the planning process. Relevant structural defects and aspects of tree condition are noted in the tree survey table in Appendix A; however, a full hazard assessment has not been carried out.

1.3.2 As trees and shrubs are living organisms whose health and condition can change rapidly, conclusions and recommendations are only valid for one year. The health, condition and safety of trees should be checked regularly, preferably annually.

1.3.3 It may have been necessary to estimate some measurements when assessing trees on neighbouring land. This will not generally affect the conclusions of this report.

1.3.4 No invasive investigations were carried out to assess the internal condition of the trees. Should this be required, it will be highlighted in the report.

1.3.5 The soil was not examined and no soil samples were taken. Should soil analysis be indicated, this will be recommended in the report

2 SITE INFORMATION

2.1.1 The trees inspected are growing both within the site and on neighbouring land

2.1.2 The site is currently a working farmyard with numerous agricultural buildings and extensive semi-paved heavily trafficked areas.

2.1.3 The site is generally level.

2.1.4 The site is surrounded by housing developments in various stages of completion.

2.1.5 Proposals are for the demolition of the existing buildings (with the exception of two residential dwellings on Canal Street which remain outside the site area) and the erection of a number of dwellings, parking areas and shared space with access off existing adjacent developments.

3 STATUTORY PROTECTION AND ECOLOGICAL ISSUES

3.1.1 Trees and other vegetation can often provide nesting, roosting and feeding opportunities for protected species, including bats. Providing guidance on these issues is outside my expertise, so I recommend that appropriate advice is sought before any tree work proceeds on site.

3.1.2 In certain areas classified as Conservation Areas, all trees with a stem diameter of 75mm (measured at 1.5m above ground) are protected by Conservation Area legislation. This site does not lie within a Conservation Area.

3.1.3 Where Local Planning Authorities assess trees as beneficial to the wider community in terms of their amenity value, they may be protected by a Tree Preservation Order (TPO). None of the trees surveyed are included in a Tree Preservation Order.

3.1.4 Trees that are dead or dangerous are excepted from legislation. Five days' notice must be given to the LPA for work to trees that fall into these categories.

3.1.5 Full Planning Consent would allow those works described in the supporting documentation or necessary to implement the consented development to go ahead without the need for any further notice or application to the Local Planning Authority.

3.1.6 The National Planning Policy Framework provides information and guidance on the issues raised by this legislation. See, for example:

http://planningguidance.communities.gov.uk/blog/guidance/tree-preservation-orders/

3.1.7 Trees may also be protected by Planning Conditions attached to any Planning Consent.

4 TREE INSPECTION

4.1 Method

4.1.1 All significant individual trees within the site were surveyed.

4.1.2 Two of the individual trees within the site were tagged with numbered aluminium tags, attached to the tree with two nails at around head height.

4.1.3 Six Groups of trees were identified and designated a letter.

4.1.4 Reference to the trees' locations can be made using the plans appended to this report.

4.1.5 The trees were assessed on these criteria, which relate directly to BS5837: 2012:

- Species – gives information on expected growth, habit, life expectancy and suitability for situation.
- Age Class – Indicates the tree's stage of growth in a normal life span.
- Remaining contribution (in years) – information used to assess the retention category of the tree and potential future growth.
- Diameter of main stem or stems at 1.5 metres above ground – information to use in calculating the Root Protection Area (RPA). Where a tree is multi-stemmed, its RPA is calculated in accordance with BS5837: 2012 Annex C and D.
- Physiological and structural condition.
- Category grading in accordance with Table 1 BS5837: 2012, reflecting the tree's or group's landscape function and condition.
- The suitability of the trees in the context of future development was also considered, including their safe useful life expectancy and sustainability.

4.1.6 The full table of survey data can be found in Appendix A.

4.2 Tree quality

4.2.1 There is a hedge (comprising Group B, C and D) on the western boundary that is almost contiguous. There is a gap around half way along the boundary, which has been planted with new Hawthorn stock. The plants are of some considerable age and as such, due consideration needs to be given in the layout as the root systems of the trees will be more extensive.

4.2.2 The Oak (tag 3898) has been pruned to lift the lower crown height. There were no significant defects found in the structure of the tree.

4.2.3 The northern boundary hedge has not been cut recently but there is no reason why the hedge could not be brought back into management

4.3 Landscape

4.3.1 The hedge on the western boundary has been sub-divided in the survey due to the significant differences in recent management. It remains a valuable landscape feature, even if the whole hedge is eventually managed at the same height and width for its entire length. This is because it reflects the historic landscape and because it contains several different tree species, which increases its amenity value.

4.3.2 The Oak (tag 3898) is an important landscape feature. It requires space to achieve a satisfactory juxtaposition with residential dwellings as many people are naturally fearful of large trees.

4.3.3 The northern boundary hedge (Group E) is a valuable landscape feature. It could be retained as-is or managed in a number of ways to retain it as a hedge.

4.3.4 Goat Willow 3899 is not an important tree and it should not dictate an otherwise satisfactory layout.

4.4 Arboricultural Constraints

4.4.1 Root Protection Area: The Arboricultural Implications Plan (see Appendix B) shows the constraint of the Root Protection Area (RPA) as a magenta circle or polygon around each tree or group of trees. This is the area where if the trees are retained, ideally no excavation should take place; the soil level should not be raised or lowered; no materials should be stacked; there must be no contamination and no services should be routed. However, trees may be tolerant of some disturbance and recent advances in construction techniques can avoid causing significant damage to roots. This will depend on a number of factors including tree species and site conditions along with the type of construction methods available to the developer.

4.4.2 Shade or Light-Loss: The shade footprint that may be cast by the trees has been shown as a grey hatch. The shade area is based on a solar inclination of 45 degrees in line with the median suggested by BS5837: 2012 that covers the main daylight hours. This simplifies the actual shade area that may affect the site but it is considered to be a good representation of the area in question.

4.4.3 Above Ground Constraints: The height of the lower crown above ground is shown in the Tree Survey Table (Appendix A). Lifting (or raising) the crown to a set height above ground in order to allow access for plant and machinery or to erect fences for example would be an acceptable arboricultural practice. Crown spread may in itself be a constraint where it is greater than the RPA radius. Reference must be made to the Arboricultural Implications Plan in Appendix B or the data in the tree survey schedule in Appendix A.

4.4.4 Trees on Neighbouring Land: Trees on neighbouring ground have been taken into consideration. These have been shown on the drawings as appropriate and in accordance with BS5837.

4.4.5 Suitability for Retention: In general, Grade 'A' and 'B' trees should be retained, especially if they offer a visual amenity to the wider community. It may be desirable to retain Grade 'C' trees where they can continue to offer a presence until they are replaced but they should not generally prevent an otherwise satisfactory layout from being achieved.

5 RECOMMENDED TREE WORK

5.1 Pre-commencement

5.1.1 Consider cutting the hedges formed by Groups B – E to an even height (the range of 1.5 – 2.5m would give a hedge that is easily-managed in a domestic setting) and cut to a width that allows maximum use of the site. All the plants in the western and northern hedges are tolerant of hard pruning. The removal of trees from within the hedge could also be considered but as this has the potential to leave gaps, it should only be specified with ample justification.

5.2 Post Construction

5.2.1 Offer a scheme of new tree planting as part of a landscaping scheme for the development so that the finished development provides an improvement over the current level of tree cover.

5.3 Standards

5.3.1 Tree work is skilled and potentially dangerous work, which must be carried out by trained and certificated staff working to BS3998: 2010 and working in accordance with the various Regulations within the Health and Safety at Work Act 1974

5.3.2 Contractors must have Public Liability Insurance (preferably £5 million) and Employer's Liability Insurance (preferably £10 million)

5.3.3 Machinery and equipment must be maintained, inspected and operated in accordance with the various Regulations within the Health and Safety at Work Act 1974

5.3.4 The British Standard 5837: 2012 'Trees in Relation to Design, Demolition and Construction' gives detailed guidance on the implications of constructing near to trees.

5.3.5 Before the commencement of any treeworks, the contractor should ensure that the proper checks for bats and nesting birds have been carried out by an appropriately-qualified inspector.

6 ASSESSING THE IMPACT OF A DEVELOPMENT ON TREES

6.1 Root system

6.1.1 Construction can impose enormous strain on trees through damage to, or loss of root mass. The root system is the part of the tree most susceptible to damage during construction Any retained trees could be at risk of root damage through:

- Demolition and site clearance
- Excavation causing root severance
- Siting of services and excavation causing root severance
- Access for plant and vehicles which may cause compaction of the root zone leading to root death through asphyxiation
- Storage of materials or spillage of damaging substances such as fuel oil, petrol or lime, which can kill roots.
- The raising of soil levels which can kill roots through asphyxiation
- The lowering of soil levels which removes root mass, including many of the fine water collecting roots and beneficial humus layer

6.1.2 The symptoms that can arise from root damage as identified above can take several years to become evident.

6.2 Above Ground

6.2.1 Construction can threaten the aerial parts of the tree through:

- Physical damage by contact from various plant and delivery vehicles
- The lighting of fires

6.2.2 A development may affect the way wind passes the retained trees, by raising its speed or direction. This may leave weakened or newly exposed trees liable to wind throw.

6.3 General

6.3.1 The British Standard 5837: 2012 'Trees in Relation to Design, Demolition and Construction' gives more detailed guidance.

7 ASSESSING THE IMPACT OF TREES ON A DEVELOPMENT

7.1 General

7.1.1 It is desirable to retain trees as they add maturity and structure to a site; provide shade and amenity value; screening or acoustic barrier.

7.1.2 Some trees are not suitable for retention due to brittle wood, poisonous berries or leaves, prickles and thorns.

7.1.3 Leaves falling from any of the retained trees may block gutters of nearby buildings.

7.1.4 Fruit, blossom and leaves can become a potential slip hazard.

7.1.5 Very large trees worry some people because they perceive the trees to be imposing and dangerous. This is typically unfounded.

7.2 Root Protection Area

7.2.1 The Root Protection Area (RPA) required for each tree may affect the layout of road, footpath, housing services and other built structures. It may be possible to pave a proportion of the RPA. This will depend on a number of factors and these are considered at Section 8 as appropriate to the layout proposed.

7.3 Shade

7.3.1 Building within the shade area can be acceptable where internal layout, fenestration or proposed use of buildings means they are not adversely affected by a lack of daylight received. Some shading may be welcomed in the summer when solar gain can make room temperatures uncomfortable. It should also be noted that deciduous trees only cast shade for seven or eight months of the year, depending on species.

7.4 Future Growth

7.4.1 Whilst trees may be small at the time of survey, future growth may be considerable, both in height and radial crown spread.

7.5 Engineering and Design

7.5.1 Trees can affect the type and depth of foundations used.

8 MASTERPLAN ASSESSMENT

8.1 Summary

8.1.1 The indicative layout shown on drawing 17/24/02 'Site Layout Option 2' is broadly acceptable but it will need to be adjusted in the region of Oak 3898 in order to successfully incorporate the tree into the layout.

8.2 Vehicular Access

8.2.1 Highway access is shown off the adjacent development to the east. This has no arboricultural implications.

8.2.2 Within the site, the roads and parking areas lie close to the Root Protection Areas of some hedges. This can be overcome through minimising excavation or utilizing no-dog surfacing. However, it would be best to avoid surfacing within rootzones.

8.3 Layout

8.3.1 The indicative layout is broadly acceptable from an arboricultural perspective but I consider that more space needs to be given between Oak 3898 and any residential buildings, and any garages should be located outside of the tree's RPA.

8.3.2 Goat Willow 3899 cannot be retained in this scheme but I do not consider that to be a significant issue.

8.4 Engineering and Design

8.4.1 Subject to the soil type found on site and an engineer's appraisal, the trees (whether retained or removed) may influence foundation design.

8.5 Services

8.5.1 Services are not shown on the drawing but there appears to be room to accommodate all services without affecting any trees.

8.5.2 Consideration must be given in the layout so that soakaways for dwellings near Oak 3898 can be excavated outside the tree's RPA.

8.6 Foreseeable issues during demolition and construction

8.6.1 The demolition of the existing buildings involves work close to the retained trees and hedges. Therefore, the methods of demolition must be controlled through site management, and the plant, equipment and staff involved.

8.6.2 This can be detailed in an Arboricultural Method Statement, secured through an appropriately-worded Condition attached to any Consent.

8.7 Shading, screening and privacy

8.7.1 Depending on the retained height of hedges B – D, the gardens of dwellings on the western side of the site could be partially affected by shade.

8.7.2 Reducing hedge heights will reduce shading but it will also reduce privacy.

8.8 Future growth and pressure to prune

8.8.1 I would not expect any significant future growth in the retained trees.

9 RECOMMENDED DESIGN OBJECTIVES

9.1.1 Retain hedges B – E; cut to a height that balances privacy against garden usability

9.1.2 Avoid any construction within Root Protection Areas.

9.1.3 Allow a greater distance beyond the edge of the Root Protection Area of Oak 3898 to take account of the tree's size.

9.1.4 Assume Goat Willow 3899 can be removed.

9.1.5 Design a layout that takes account of the root protection areas of hedges, with an aim to leave at least 2m beyond the radial extent of the RPA to make the practical execution of development feasible, (subject to other constraints)

9.1.6 Design a layout that takes the shading and above ground constraints into account. Shady areas beyond the crown spreads of trees would be best for car parking. Gardens must receive direct sunlight over a reasonable proportion of the area (25% is suggested) to be satisfactory.

9.1.7 Service routes must be located outside of the RPAs of retained trees.

9.1.8 Implement a tree protection scheme before development (including demolition) starts on site.

9.1.9 Make provision for tree planting within the landscape proposals.

APPENDIX A – TREE SURVEY RESULTS

Key to Survey

Height		Estimated or measured with clinometer where considered critical
Crown spread		(at cardinal points) In metres
Remaining Contribution		Estimated number of years the tree may contribute in a safe condition
Main Stem Diameter		Measured at 1.5 metres above ground or in accordance BS5837: 2012 Annex C and D
Condition	Good	No visible defects seen
	Reasonable	Some defects seen but none that contribute significantly to the overall health and safety of the tree
	Poor	Defects or health issues that contribute significantly to the overall health and safety of the tree
Age Class		Y = Young (Less than 1/3 of normal expected life) SM = Semi-mature (1/3 – 2/3 of normal expected life) M = Mature OM = Over-mature or in decline V = Veteran
RPA (Radius)		Distance in metres from centre of tree to achieve a circular Root Protection Area
RPA (Area)		Root Protection Area in square metres.
Recommendation		Recommended course of action made irrespective of proposed site layout.

Grading Categories

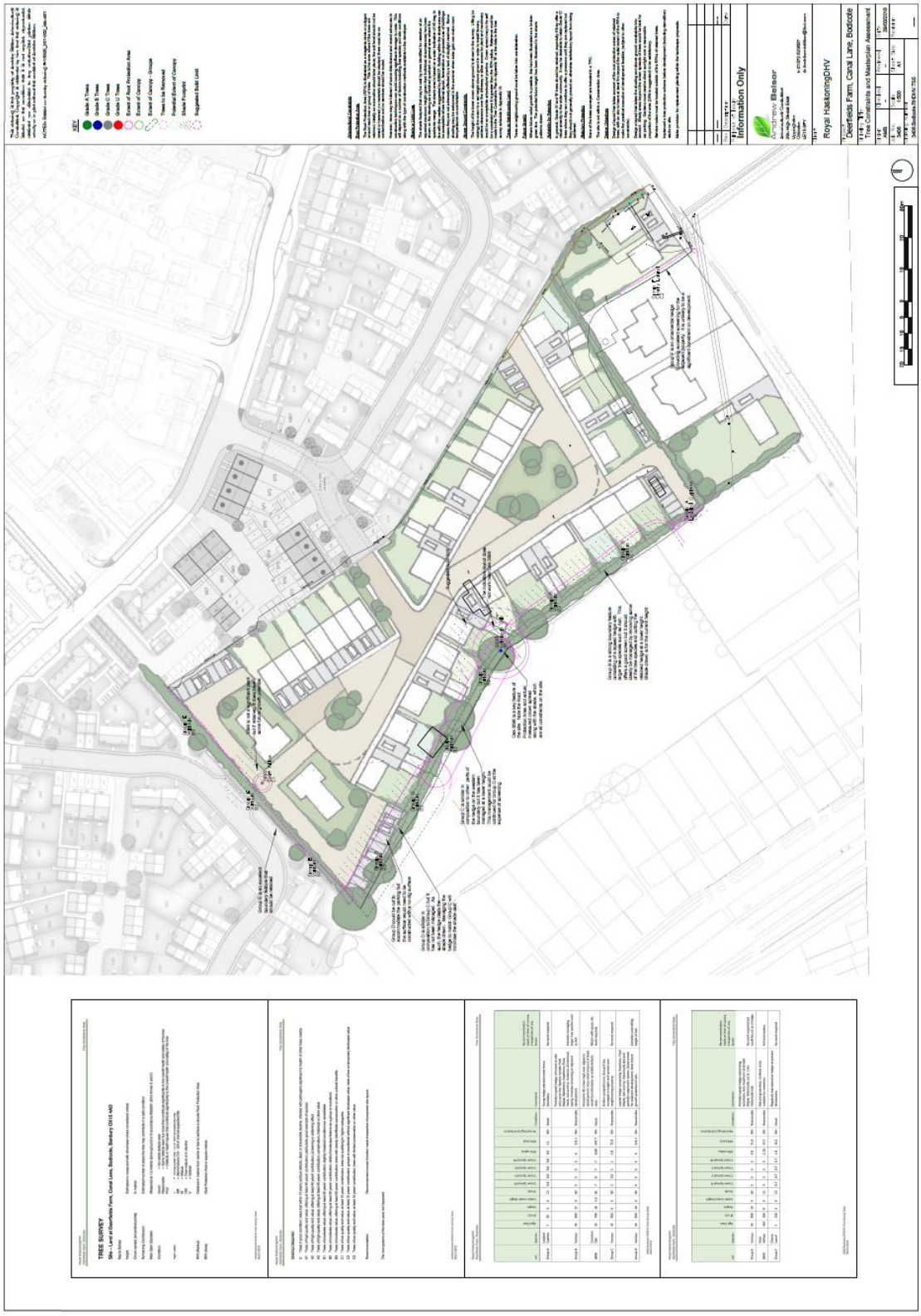
U Trees in poor condition; value lost within 10 years; serious defects, dead, in irreversible decline, infected with pathogens significant to health of other trees nearby
A1 Trees of high quality and value; offering at least 40 years' contribution; particularly good example of species
A2 Trees of high quality and value; offering at least 40 years' contribution; screening or softening effect
A3 Trees of high quality and value; offering at least 40 years' contribution; conservation, historical or other value
B1 Trees of moderate value; offering at least 20 years' contribution; slightly impaired condition but remediable
B2 Trees of moderate value; offering at least 20 years' contribution; distinct landscape feature as a group or woodland.
B3 Trees of moderate value; offering at least 20 years' contribution; trees with clearly identifiable conservation or other cultural benefits.
C1 Trees of low quality and value; at least 10 years' contribution; trees not qualifying in higher categories
C2 Trees of low quality and value; at least 10 years' contribution; groups or woodlands without significant landscape value, trees of low or temporary landscape value
C3 Trees of low quality and value; at least 10 years' contribution; trees with limited conservation or other value

ref.	Species	Age Class	Ø m/s	Height	Lower crown height	Grade	Crown Spread N	Crown Spread S	Crown Spread E	Crown Spread W	RPA radius	RPA (m2)	Remaining Contribution	Condition	Comments	Recommendations made at time of survey, irrespective of any layout
Group A	Leyland Cypress	Y	50	3	0	C2	0.6	0.6	0.6	0.6	0.6	1.1	40+	Good	Young hedge planted inside fence boundary.	No work required
Group B	Various	M	500	11	0	B2	5	5	5	5	6	113.1	40+	Reasonable	Partially lapsed hedge, trimmed to side only up to 4m. Species include Field Maple, Blackthorn, Hawthorn, Plum, Hazel, Ash and Ivy. Evidence of historical laying. Provides screening of adjacent development.	Consider managing larger tree species such as Ash
3898	Common Oak	M	740	18	4.5	B1	7	8	7	7	8.88	247.7	40+	Good	Pruned to lift crown high over adjacent development. Very small amount of dead wood but otherwise no visible defects seen.	Retain with space. No work required.
Group C	Various	M	400	4	0	B2	2	0.5	1	1	4.8	72.4	40+	Reasonable	Similar composition to Group B but managed in height and spread over neighbouring property.	No work required

ref.	Species	Age Class	Ø m/s	Height	Lower crown height	Grade	Crown Spread N	Crown Spread S	Crown Spread E	Crown Spread W	RPA radius	RPA (m2)	Remaining Contribution	Condition	Comments	Recommendations made at time of survey, irrespective of any layout
Group D	Various	M	500	10	0	B2	6	6	6	6	6	113.1	40+	Reasonable	Lapsed hedge comprising Hawthorn, Field Maple, Ash and Ivy. Historically laid and partially coppiced in places. Good screen for adjacent development. Note future growth potential of Ash.	Consider controlling height of Ash
Group E	Various	M	400	10	0	B2	5	5	5	5	4.8	72.4	40+	Reasonable	Partially lapsed hedge comprising Sycamore, Ash, Hawthorn and Field Maple. Historically cut at 1.5m. Historically laid.	No work required but could be cut as a hedge.
3899	Goat Willow	SM	180	8	0	C1	3	3	3	3	2.16	14.7	20+	Reasonable	Natural generation. Unlikely to be suitable for retention.	Fell and replace
Group F	Cherry Laurel	Y	150	2	0	C2	0.7	0.7	0.7	0.7	1.8	10.2	40+	Good	Regularly maintained as hedge at present dimensions.	No work required

APPENDIX B – TREE CONSTRAINTS AND ASSESSMENT PLAN

The Tree Constraints and Assessment Plan is pictured below. A full-sized version of the plan (Filename: 3406.Bodicote.RHDHV.TCAP) has been provided with this file.



APPENDIX C – REFERENCE MATERIAL

Arboricultural Advisory and Information Service 'Tree Root Systems' 1995

Arboricultural Advisory and Information Service 'Tree Roots and Foundations' 1998

Arboricultural Advisory and Information Service Research Note 'Forces Exerted by Tree Roots' 1996

BS3998: 2010 'Tree Work – Recommendations'

BS5837 'Trees in Relation to design, demolition and construction' 2012

Diagnosis of Ill Health in Trees (Strouts and Winter) 1994

Fungal Strategies of Wood Decay in Trees (FMWR Schwarze; J Engels; C Mattheck)

NHBC Chapter 4.2 'Building near Trees' 2017

NJUG Volume 4 Issue 2 (National Joint Utilities Group) 2007

Principals of Tree Hazard Assessment and Management (D Lonsdale) 1999

The Health and Safety at Work Act 1974

The Law of Trees, Forests and Hedgerows. (C Mynors) 2003

The Town and Country Planning (Tree Preservation) (England) Regulations 2012

Tree Preservation Orders and Trees in Conservation Areas (DCLG 2014)