

BS 5837:2012 Tree and Hedgerow Survey Report

Land off Spalding Road, Gosberton

Presented to **Robert Doughty Consultancy Ltd on behalf of Executors of Queenie Dennis**

Issued: November 2017

Delta-Simons Project No. 17-1076.02

deltasimons



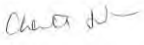
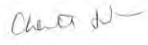
Delta-Simons Environmental Consultants Limited
Head Office: 3 Henley Office Park, Doddington Road, Lincoln, LN6 3QR
Tel: 01522 882555 | www.deltasimons.com

A member of INOGEN®

Report Details

Client	Robbie Doughty Consultancy (RDC) on behalf of Executors of Queenie Dennis
Report Title	Tree and Hedgerow Survey
Site Address	Land off Spalding Road, Gosberton
Project No.	17-1076.02
Delta-Simons Contact	Steven Kemp (Steven.Kemp@deltasimons.com)

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1.	Final	21st November 2017				
				Steven Kemp Senior Arboriculturalist	**Charlotte Sanderson-Lewis Associate and Ecology Team Leader**	**Charlotte Sanderson-Lewis Associate and Ecology Team Leader**

About us

Delta-Simons is a trusted, multidisciplinary environmental consultancy, focused on delivering the best possible project outcomes for customers.

Specialising in Environment, Health & Safety and Sustainability, Delta-Simons provide support and advice within the property development, asset management, corporate and industrial markets. Operating from eight locations - Lincoln, London, Leeds, Manchester, Norwich, Nottingham, Durham and Dublin - we employ over 70 environmental professionals, bringing experience from across the private consultancy and public sector markets.

Delta-Simons is proud to be a founder member of the Inogen® Environmental Alliance, enabling us to efficiently deliver customer projects worldwide by calling upon over 4,330 resources in our global network of consultants, each committed to providing superior EH&S and sustainability consulting expertise to our customers. Inogen® Environmental Alliance offers its clients more consultants, with more services in more countries than the traditional multinational consultancy.

Executive Summary

Purpose	Delta-Simons Environmental Consultants Ltd. was instructed by Robert Doughty Consultancy Ltd on behalf of Executors of Queenie Dennis ('the Client') to undertake a Tree and Hedgerow Survey to BS 5837:2012 standard of land situated off Spalding Road, Gosberton in Lincolnshire (the 'Site'). The survey was undertaken on 8th November 2017, and was undertaken in order to inform a planning application for residential development of the Site.
Current Site Status	The Site covers an area of approximately 1.7 hectares and is predominantly arable land in the south bordered by hedgerows and scattered trees to the east, south and west of the Site, with three farm outbuildings in the north of the Site, adjacent to Spalding Road.
Proposed Development	It is understood that the proposed development comprises a residential end use, with associated hard and soft landscaping. Furthermore, the hedgerows surrounding the Site are to be retained as part of the development.
Results	A total of 14 individual trees and three tree groups were identified and assessed as part of the Tree Survey. The results of the desk search revealed that no trees on or immediately adjacent to the Site are covered by Tree Preservation Orders, or are within a Conservation Area. A total of one species-rich hedgerow and one species-poor hedgerow were identified and assessed as part of the Hedgerow Survey. The species-rich hedgerow (H1) qualifies as an 'Important' under the Hedgerow Regulations (1997).
Recommendations	Recommendation 1 (Adequate Tree Protection) Those trees identified within the proposed development plan for retention will need to be adequately protected during any construction works. Measures to protect trees should follow the best practice principles set out in BS 5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the Root Protection Area (RPA) of individual trees to be retained should be marked out. Marking out should be completed by a competent person with arboricultural expertise. All trees that could be impacted should be protected by barriers or ground protection around the calculated RPA, and as indicated on the Tree Constraints Plan (TCP) produced in association with this Assessment. Recommendation 2 (Bats) Should any works be required to trees T10, T12, and T15, assessed as having low Bat Roost Potential (BRP), a further check should be undertaken by a licenced bat ecologist for signs of bats or bat activity, in order to determine the potential impact to roosting bats and, therefore, the requirement for supervision and/ or further surveys. Any works to the trees should only be completed during the active bat season (April-October, inclusive).
This Tree and Hedgerow Survey Executive Summary is intended as a summary of the assessment of the Site based on information received by Delta-Simons at the time of production. This Executive Summary should be read in conjunction with the full Report.	

Table of Contents

1.0 INTRODUCTION 1
1.1 Purpose and Scope of the Survey 1
1.2 Site Description 1
1.3 Proposed Development 1
2.0 LEGISLATION AND POLICY 2
3.0 METHODOLOGY 3
3.1 Trees 3
3.2 Potential for Protected Species 5
3.3 Tree Plans and Tree Schedules 5
3.4 Root Protection Area 5
3.5 Hedgerows 6
3.6 Limitations to the Survey 6
4.0 RESULTS 7
4.1 Desk Study 7
4.2 Survey Details 7
4.3 Trees 7
4.3.1 Species and their Arrangement in the Landscape 7
4.3.2 Height and Significance in the Landscape 7
4.3.3 Age and Condition 7
4.3.4 Environmental Condition 7
4.3.5 Bat Roost Potential 8
4.4 Tree Schedule 9
4.5 Hedgerows 11
4.5.1 Hedgerow H1 11
4.5.2 Hedgerow H2 11
5.0 TREE MANAGEMENT 12
5.1 Arboricultural Assessment 12
5.2 Recommendations 12
6.0 DISCLAIMER 15

Tables

Table 1 BS5837: 2012 Tree Schedule
Table 2 Key to Tree Schedule

Figures

Figure 1 Site Location Map
Figure 2 Tree Survey
Figure 3 Proposed Development Plan
Figure 4 Tree Constraints Plan

Appendices

Appendix A References
Appendix B Guidance on Assessing the Potential Suitability of Development Sites to Support Bats
Appendix C Photographs

1.0 Introduction

1.1 Purpose and Scope of the Survey

Delta-Simons Environmental Consultants Ltd was instructed by Robert Doughty Consultancy Ltd on behalf of Executors of Queenie Dennis (the 'Client') to undertake a Tree and Hedgerow Survey to BS 5837:2012 standard. The survey was undertaken of land off Spalding Road, Gosberton in Lincolnshire (the 'Site'). The survey was undertaken on 8th November 2017 and was undertaken in order to inform a planning application.

The aims of the Tree Survey were to:

- Identify the individual tree species present at the Site by means of visual inspection;
- To define the approximate age, condition and canopy spread of all individual mature trees identified and the value of these within the development;
- To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the Site and recommend actions to remove this risk; and
- Recommend tree management or mitigation measures where appropriate.

The aims of the Hedgerow Survey were to:

- Identify the individual hedgerow species present at the Site by means of visual inspection;
- To define the approximate age, condition and size of all hedgerows identified at the Site and their value within the development;
- To identify any hedgerows that present a risk to existing or proposed foundations or other structures that may be constructed on the Site and recommend actions to remove this risk; and
- Recommend hedgerow management or mitigation measures where appropriate.

The Site location and the area surveyed are shown in Figure 1.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference TF 24377 31248, to the south of Gosberton in Lincolnshire. The Site covers an area of 1.7 hectares (ha) and comprises arable land in the south of the Site. Three farm buildings with associated hardstanding, occupy the north of the Site. Boundary hedgerows extend to the east, south and west of the Site with scattered broadleaved trees, with an understorey of broadleaved and coniferous trees to the north-east.

The Site is situated in a rural setting on the edge of Gosberton village, bordered by a bungalow to the north-east, open grazed land to the east and extending to the south, with further residential properties along the western boundary and Gosberton Baptist church to the north-west. The A152 runs along the northern Site boundary, beyond which are arable fields.

The Site layout and area surveyed is shown in Figure 2.

1.3 Proposed Development

It is understood that the Site will be developed for a residential end use with hard and soft landscaping. Furthermore, the hedgerows surrounding the Site are to be retained by the development.

2.0 Legislation and Policy

Trees

Local planning authorities look upon trees as being highly beneficial to the locality. To ensure that any important specimens, or significant groups of trees are retained, they may place Tree Preservation Orders (TPOs) on them. In other situations, villages or whole districts may be classified as conservation areas. In these instances, certain trees in the designated area will be protected. When trees are protected, legal procedures must be followed before any work is carried out.

When trees are protected by Preservation Orders, no work should be carried out on them without prior written consent from the Local Planning Authority (LPA). Once an application is made, the Authority personnel must inspect the trees, and make a decision within a statutory eight-week period as to whether work can go ahead. If no decision is made within the eight week period, the appellant can appeal to the Office of the Deputy Prime Minister for non-determination. If the Local Authority (LA) refuses the application the appellant still has the right to appeal.

If a tree protected by a Preservation Order is either killed or wilfully destroyed, the owners of the tree, and the contractor who did the work, can both be prosecuted. The fines for killing or wilfully destroying a tree can be high, i.e. the current maximum is £20,000 per tree, and there is an automatic requirement to re-plant. The current maximum for minor unlawful infringements, such as pruning, is £2,500.

Trees which are dead, dying, or dangerous are exempt from the legislation, although if such trees are removed, the onus on proving they fell into one of these categories lies with the tree owner. Whenever possible it is strongly recommended that the LA be given at least five days' notice before any work on such trees is carried out.

Hedgerows

The Hedgerows Regulations 1997 applies to any hedgerow which has a continuous length of, or exceeding, 20 m, or is less than 20 m but adjoins another hedgerow at each end. A hedgerow can be categorised as 'important' if it is 30 years old or older and satisfies at least one of the criteria listed in Part II of Schedule 1 of the Regulations. The removal of a hedgerow which is protected under these criteria is prohibited without appropriate measures being taken and it is an offence to intentionally or recklessly remove, or cause or permit another person to remove, a hedgerow in contravention of Regulation 5(1) or (9).

3.0 Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This Report has applied the methodology to all significant individual trees or groups of trees present at or near to the Site. Trees below 15 cm trunk diameter were generally excluded from the survey. All floral names follow the nomenclature of Stace (2010).

3.1 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 Trees in Relation to Design, Development and Construction. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction works) and the means of incorporating trees into the developed landscape.

Trees on or adjacent to the Site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within Table 1. This gives an indication as to the tree's importance in relation to the Site, the local landscape and, also, the value and quality of the existing trees on-Site. This assists informal decisions concerning which trees should be removed or retained should development occur. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below).

Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, the presence of any serious disease or tree–related hazard is taken into account. If the disease is considered fatal and/or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- Trees which are particularly good examples of their species, especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- Trees, or groups of trees, which provide a definite screening or softening effect to the locality in relation to views into or out of the Site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups); and
- Trees or groups of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): Trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;
- Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the Site and have little visual impact beyond the Site; and

- Trees with clearly identifiable conservation or other cultural benefits.

Category (C): Trees that could be retained but are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150 mm and may comprise:

- Trees not qualifying in higher categories;
- Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value and or trees offering low or only temporary screening benefit; and
- Trees with very limited conservation or other cultural benefits.

Category (U): Trees that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or removed for reasons of sound arboricultural management. Trees within this category are:

- 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;
- Trees that are dead or are showing signs of significant, immediate or irreversible overall decline; and
- 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.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

a) The health, vigour and condition of each tree;

b) The presence of any structural defects in each tree and its life expectancy;

c) The size and form of each tree and its suitability within the context of the proposed scheme; and

d) The location of each tree relative to existing Site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

Y: Young trees age less than 1/3 life expectancy;

SM: Middle age trees 1/3 – 2/3 life expectancy;

M: Mature trees over 2/3 life expectancy; and

OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule:

G **Good:** A sound tree or trees needing little, if any, attention;

F **Fair:** A tree or trees with minor but rectifiable defects or in the early stages of stress, from which it may recover;

P **Poor:** A tree or trees with major structural and physiological defects or stressed such that it would be very expensive and inappropriate to retain; and

D **Dead:** A tree or trees no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are becoming or have become dangerous.

Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:

Twigs and small branch material	-	Up to 5 cm in diameter.
Minor dead wood	-	5 cm to 10 cm in diameter.
Major dead wood	-	10 cm in diameter and above.

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

3.2 Potential for Protected Species

Potential bat roost locations are described within this Report using the methodology recommended by the Bat Conservation Trust (BCT), see Collins (ed, 2016) in references (Appendix A). Each tree of significant size assessed within this survey has also been assessed for its potential to provide roosting opportunities for bats (see Appendix B).

3.3 Tree Plans and Tree Schedules

The extent and positions of significant individual trees or groups of trees on or adjacent to the Site are shown on the Arboricultural Survey Plan (Figure 2). The Root Protection Areas (RPA) of the key trees of value identified for, or recommended for retention have been marked within the Constraints Plan (Figure 4) using the RPAs provided in the Tree Schedule within Table 1.

A summary that includes the trees identified on or near to the Site is included in this Report detailing information on each group of trees, which is summarised in Table 1. Within the summary table maximum RPAs (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The RPAs are formulated as described below and assist when designing layouts in relation to trees.

3.4 Root Protection Area

Below ground constraints to development are represented by the root plate around a tree, which needs protecting in order for the tree to be incorporated into a proposed scheme without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is illustrated by the RPA and is calculated according to the formula set out in BS 5837: (2012). This area is equivalent to a circle with a radius 12 x the stem diameter for single stem trees or the basal diameter for trees with more than one stem arising less than 1.5 m above ground level.

RPA (m²) = (stem diameter (mm) x 12 / 1000) ² x 3.142

This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides

Taken from Table 2: Calculating the RPA, BS 5837 (2005).

3.5 Hedgerows

An assessment of any hedgerows present at the Site, which may be adversely affected by the proposed development, was undertaken using the standard hedgerow surveying methodology outlined in the Hedgerow Regulations 1997. The purpose of the assessment was to ascertain whether the hedgerows are classified as 'nationally important' and, therefore, protected under the Hedgerow Regulations 1997. The assessment involves a scoring system which relies on particular features, number of woody and floral species present within the hedgerow habitat, and the age of the hedgerow.

The following hedgerow features were recorded:

- A bank or wall supporting the hedgerow for at least half its length;
- Gaps in the hedgerow not exceeding 10% of its length;
- An average of at least one standard tree per 50 m of hedgerow;
- The number of woodland plant species (as defined);
- A ditch along at least half the hedgerow;
- Connections (as defined by the Regulations) scoring four points or more; and
- A parallel hedge within 15 m of the hedgerow.

An assessment of a 30 m section was undertaken per 100 m of hedgerow length, which involved recording the number of woody species present. Where two or more sections of each hedgerow were surveyed, the average number of the species was calculated.

3.6 Limitations to the Survey

There were no limitations concerning access and weather conditions at the time the Survey was undertaken.

4.0 Results

4.1 Desk Study

The results of the desk search indicated that no trees on-Site, or immediately adjacent to the Site, are covered by a TPO, nor does the Site lie within a Conservation Area.

4.2 Survey Details

The tree inspection took the form of a walkover inspection completed by Steven Kemp NDFArb, TechArborA on 8th November 2017. Each individual tree of significance that could be impacted by any proposed development was identified and visually inspected and classified. The trees identified during the survey at the Site have been individually noted and identified within this Report and are shown in the Tree Survey Plan within Figure 2, and within the Photograph Section of this Report (Appendix C).

4.3 Trees

A total of 14 individual Trees (T) and three Tree Groups (TG) have been identified and assessed as part of the tree survey, all of which were between semi mature and mature in stature. All trees surveyed, with the exception of TG1 and T2 to T5, were within the Site boundary.

4.3.1 Species and their Arrangement in the Landscape

There are a range of tree species on and adjacent to the Site, with no dominant species. Norway maple *Acer platanoides*, holly *Ilex aquifolium* and ash *Fraxinus excelsior* are represented as occasional specimens. Silver maple *Acer saccharinum,* Lombardi poplar *Populus nigra italica*, Scot's pine *Pinus sylvestris*, pedunculate oak, *Quercus robur*, sycamore *Acer pseudoplatanus*, walnut *Juglans regia*, Norway spruce *Picea abies*, magnolia *Magnoliaceae sp*., Italian cypress *Cupressus sempervirens*, rowan *Sorbus aucuparia*, silver birch *Betula pendula* and apple *Malus sp*. are represented as single specimens. Lawson cypress *Chamecyparis lawsoniana* and Lleyland cypress *Cupresses x lleylandii* are present in numbers.

The distribution of the trees and tree groups across the Site is predominantly within the north and north-eastern extent with randomly dispersed occasional trees within the eastern, southern and western boundaries.

4.3.2 Height and Significance in the Landscape

TG1 and T2 to T5, immediately adjacent to the Site, though not of a significant height, are prominent when viewed from Spalding Road. These trees, whilst outside of the proposed development footprint, will require protection measures to ensure no impact occurs during the construction phase of works.

T6, TG7 and T8 to T16, at an average height of 13 m, offer a degree of visual screening to the Site. These trees will require protection measures to ensure no impact occurs during the construction phase of works.

4.3.3 Age and Condition

All trees present within the Site are semi-mature or mature. None of the trees within the Site boundary show signs of past management. All on-Site trees appear to be in fair condition except for T12 which is in poor condition.

4.3.4 Environmental Condition

Due to the Site's long-term agricultural use it is surmised that damage to the root systems of the on-Site trees to the eastern and western boundaries, may have been sustained through agricultural practices/any maintenance practices associated with crop growing.

Groundwater conditions are not assessed to be a significant factor in present or future growth or health of trees since the relatively flat Site appears to be well drained and this situation will probably improve further following completion of any development.

4.3.5 Bat Roost Potential

Three trees on-Site, T10, T12 and T15 were found to have low Bat Roost Potential (BRP), due to the presence of dense woody ivy *Hedera helix*, woodpecker holes and the presence of decay in old branch collars, that can conceal or provide roosting opportunities.

4.4 Tree Schedule

Table 1 – BS 5837:2012 Tree Schedule

	Tree Species		Measurements				Crown (m)					Tree Condition								Management
Tree Number	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Average Height	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works
TG1	Lawson cypress Holly Magnolia Maple	*Chamecyparis lawsoniana* *Ilex aquifolium* *Magnoliaceae* sp. *Acer* sp.	SM	6 AV	1	200 AV	1.8	2	1	2	1	No visual defects	Single stemmed. Vertical.	Fair	Previously topped	F	20-40	B	2.40	No works
T2	Maple	*Acer* sp.	SM	5	3	90 140 110	2	2	1	2	3	No visual defects	Vertical. Signs of decay	Unbalanced, weighted to west	Decay to stem on west	F	<20	C	2.40	No works
T3	Silver maple	*Acer saccharinum*	SM	4	1	200	1	2	1	2	3	No visual defects	Vertical	Unbalanced	Weighted to north	G	>40	B	2.40	No works
T4	Norway maple	*Acer platanoides*	M	7	1	560	2.5	4	3	4	4	Damage to west root system	Vertical	Balanced	Included union at crown break	G	>40	B	6.60	No works
T5	Holly	*Ilex aquifolium*	SM	7	1	420	2	2	2	2	1	No visual defects	Vertical	Balanced	Close to adjacent wall	G	>40	B	5.10	No works
T6	Lombardi poplar	*Populus nigra 'italica'*	M	11	1	680	0	1	1	1	1	No visual defects	Vertical	Balanced	Previously pollarded	F	<20	C	8.10	No works
TG7	Hawthorn Rowan Cherry Norway maple Silver birch Apple	*Crataegeous monogyna* *Prunus* sp. *Acer platanoides* *Betula pendula* *Malus* sp.	M	9 AV	1	280 AV	1	2	2	2	2	No visual defects	Vertical	Balanced	Unmanaged	G	>40	B	3.30	No works
T8	Scots pine	*Pinus sylvestris*	M	9	1	300	2	2	3	2	2	No visual defects	Vertical	Unbalanced	Weighted to east	G	>40	B	3.60	No works
T9	Pedunculate oak	*Quercus robur*	SM	10	1	420	1	7	6	5	5	No visual defects	Vertical	Spreading		G	>40	B	5.10	No works
T10	Sycamore	*Acer pseudoplatanus*	M	12	1	770	3	7	6	6	6	No visual defects	Vertical	Spreading	Ivy covered stem Low BRP	G	>40	B	9.30	No works
T11	Walnut	*Juglans regia*	SM	6	1	250	0.5	4	4	4	4	No visual defects	Vertical	Spreading		G	>40	B	3.00	No works
T12	Ash	*Fraxinus execelsior*	M	16	2	440 420	4	6	6	6	5	No visual defects. Sited on a bank	Vertical. Bifurcated at 0.3m	Crown dieback. Historical	Woodpecker hole at 10m Low BRP	P	<20	C	7.40	No works

													storm damage at 10 m						
T13	Norway spruce	*Picea abies*	M	8	1	300	2	3	2	2	2	No visual defects	Vertical	Previously topped	Ivy covered stem. Negligible BRP	F	20-40	B	3.60	No works
T14	Hawthorn	*Cratageous monogyna*	SM	6	1	280	1	2	3	3	2	No visual defects	Vertical	Balanced	Ivy covered stem. Negligible BRP	F	>40	B	3.30	No works
T15	Ash	*Fraxinus excelsior*	M	12	1	820	3	6	4	5	6	No visual defects	Vertical	Minor deadwood	Decay at old branch collar at 5m. Low BRP	F	20-40	B	9.90	No works
T16	Norway maple	*Acer platanoides*	M	10	2	260 240	2	4	4	4	4	No visual defects	Vertical	Balanced	Included union at crown break 0.5m	G	>40	B	4.20	No works
TG17	Leyland cypress	*Cupresses x lleylandii*	M	8	1	240 AV	1.5	2	2	2	2	No visual defects	Vertical	Unbalanced	Previously topped	F	<20	C	2.70	No works

Table 2 – Key to Tree Schedule

Key:	**Measurements**	**Age – Class**	**Overall Condition**	**BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category**	**Symbols:**
	MS – Multi-stemmed	Y - Young	G – Good	A – High	**<** = less than
	Ht - Height in metres	SM – Semi-Mature	F – Fair	B – Moderate	**~** = approximately
	Stem – Stem Diameter at 1.5m in mm	EM – Early-mature	P – Poor	C – Low	**>** = greater than
	Crown – Crown spread in metres	M – Mature	D – Dead	R – Trees for Removal	
	TD - Trunk division (height in metres)	OM – Over-mature **Est Yrs –** estimate of years remaining (>40 years; 20 –40 years; <20 years)		**Sub-categories:** **1** = mainly arboricultural values **2** = mainly landscape values **3** = mainly cultural values.	
RPA = Root Protection Area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).					

4.5 Hedgerows

A total of two hedgerows have been identified and assessed as part of the hedgerow survey. Whilst they were both assessed against the Hedgerow Regulations (1997) criteria, one was found to support an adequate number of woody species along a 30 m length to be given further consideration as an 'Important Hedgerow'. However, despite the number of woody species recorded within the hedgerow H1, the hedgerow did not support the number of features required to meet the criteria for an Important Hedgerow.

4.5.1 Hedgerow H1

Hedgerow H1 (Photographs 18 and 19), located along the eastern and southern extent of the Site, defines the eastern boundary of the Site. The hedgerow was species-rich and intact. The main body of the hedgerow was of an average height of 6 m and maximum width of 4 m. The hedgerow was un-managed and comprised dominant hawthorn with frequent rowan, ivy *Hedera helix*, elder *Sambucas nigra* and sycamore. Occasional specimens of yew *Taxus baccatta*, holly, wild cherry *Prunus avium*, twisted willow *Salix matsudana 'Tortuosa'*, purple plum *Prunus cerasifera 'Pisardii'*, silver birch, pedunculate oak, goat willow *Salix caprea,* Scots pine, and buddleia were also present in the hedgerow. The hedgerow supported at least seven 'woody' species along any 30 m length such that it qualified as an 'Important' hedgerow under the Hedgerow Regulations (1997).

4.5.2 Hedgerow H2

Hedgerow H2 (Photograph 20), defines the western boundary of the Site. The hedgerow was species-poor and intact. The hedgerow showed recent signs of management and had an average height of 6 m and a maximum width of 2 m. Hawthorn was the dominant species, with occasional hazel *Coryllus avellana* and privet *Ligustrum ovalifolium*, interspersed with ivy, elder and bindweed *Calystegia sepium*.

5.0 Tree Management

5.1 Arboricultural Assessment

Adjacent to the northern boundary of the Site is a tree group (TG1) that may be adversely impacted upon by the proposed development. TG7, T9 and T10 that stand along the eastern boundary, and T11 to T16 that stand along the western boundary, have crowns that extend into the Site and are anticipated to support a root system that extends over the Site boundary. It is proposed to retain these trees on Site and incorporate them into the landscaping scheme of the proposed development. However, to ensure that the root areas and canopy extremities of individual trees and tree groups are not damaged, a Constraints Plan has been prepared to show the locations where protective fencing should be erected for any trees selected for retention (see Figure 4).

Three of the trees were found to support potential features suitable for roosting bats T10, T12 and T15, such that further assessment would be required should they need any management works or removal.

It is proposed to retain the boundary hedgerows at the Site, and although management works would be required to H2, it would benefit from being gapped up with further native woody species following the development. The hedgerows at the Site were recorded to be a mixture of species-rich and species-poor, with the species-rich hedgerow supporting on average seven woody species along any 30 m length, such that it met the Hedgerow Regulations Criteria (1997), to qualify as an 'Important' hedgerow.

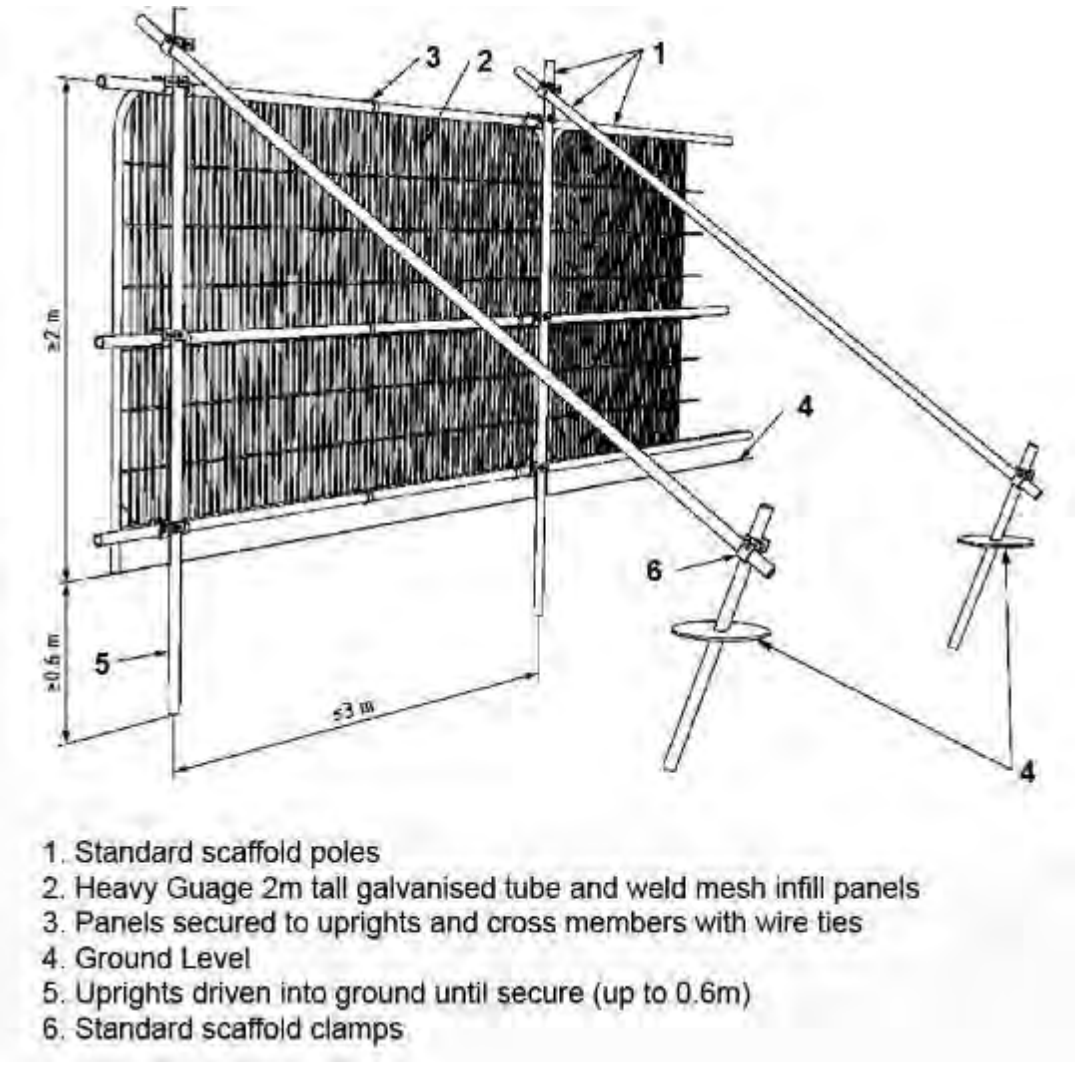
5.2 Recommendations

Recommendation 1 (Adequate Tree Protection)

Those trees identified within any development plan in proximity to the construction works will need to be adequately protected during any approved works. As a general rule, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPAs of individual trees to be retained should be marked out using the distances provided in the Table 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances would need to be made to accommodate this.

The best practice principles have been broadly summarised below:

- All trees retained adjacent to the Site should be protected by barriers or ground protection around the calculated RPA and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment;
- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor;
- Arrangements should be made for an arboriculturalist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points;
- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority;



1. Standard scaffold poles
2. Heavy Guage 2m tall galvanised tube and weld mesh infill panels
3. Panels secured to uprights and cross members with wire ties
4. Ground Level
5. Uprights driven into ground until secure (up to 0.6m)
6. Standard scaffold clamps

- All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on-Site and be inspected annually (where overall condition requires) or every two years and after any major storm events, with safety a priority;
- Fencing should be clearly visible and suitable for the location, type and proximity of construction activity;
- It may be appropriate on some sites to use temporary site offices as components of the protection barriers;
- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems;
- Once areas around trees have been protected by fencing, any works on the remaining Site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area;
- Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc where this is in close proximity to retained trees;
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10 m of a tree bole. No concrete mixing should be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree;

- No fires should be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire;
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree;
- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited, tree surgery be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturalist;
- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact;
- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development; and
- All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

Recommendation 2 (Bats)

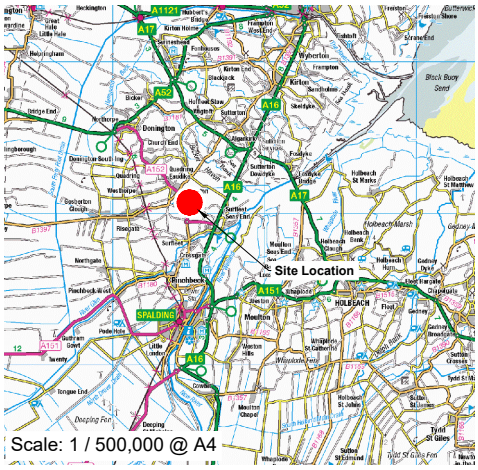
Three trees on Site T10, T12 and T15 were found to have low BRP due to the presence of dense ivy, woodpecker holes and branch collar decay, that can conceal or provide roosting opportunities. Therefore, should any of the trees require pruning works, further survey works should be undertaken by a licenced bat ecologist to ensure that the trees are not being used by roosting bats before any works are completed. Any works to the trees should only be completed during the active bat season (April- October, inclusive).

6.0 Disclaimer

The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Sections 1.0 and 3.0 of this Report, exercising the duty of care required of an experienced Environmental Consultant.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Figure 1 – Site Location Map



Scale: 1 / 500,000 @ A4

LEGEND

Site Boundary

Gosberton

Marsh

Nursery

Chain Bridge

White House

Zigzag Drain

Lode

Arosfa

Gosberton

Lowgate

Mill Lane (Track)

BOSTON ROAD

LOW GATE

RUTLAND GARDENS

MEDWAY CL

MILL LANE

LOWBRIDGE LANE

Zigzag

Hall

Recreation Ground

HALL DRIVE

FIELD CLOSE

Sch

A152

B1397

PW

HIGHBRIDGE LANE

Green Roofs

WHITEHALL

GODEREY AVE

Wargate Field

CUNSDIKE LANE

Hill House

Belnie Bridge

Wargate Way Farm

WARGATE WAY

Double Dike

BELCHMIRE LANE

Belchmire Dike

Sea Dike

SPALDING ROAD

Belnie House

Belnie

Works

Wargate

Wargate Bridge

Drain)

Cherry Holt

Gosberton Fen

WARGATE FIELD LANE

Star House

Tel Ex

Deepdene Farm

Garage

Rhencullen

SWEETLANDS WAY

Wargate Field

Bird's Drove

Scale: 1 / 10,000 @ A4

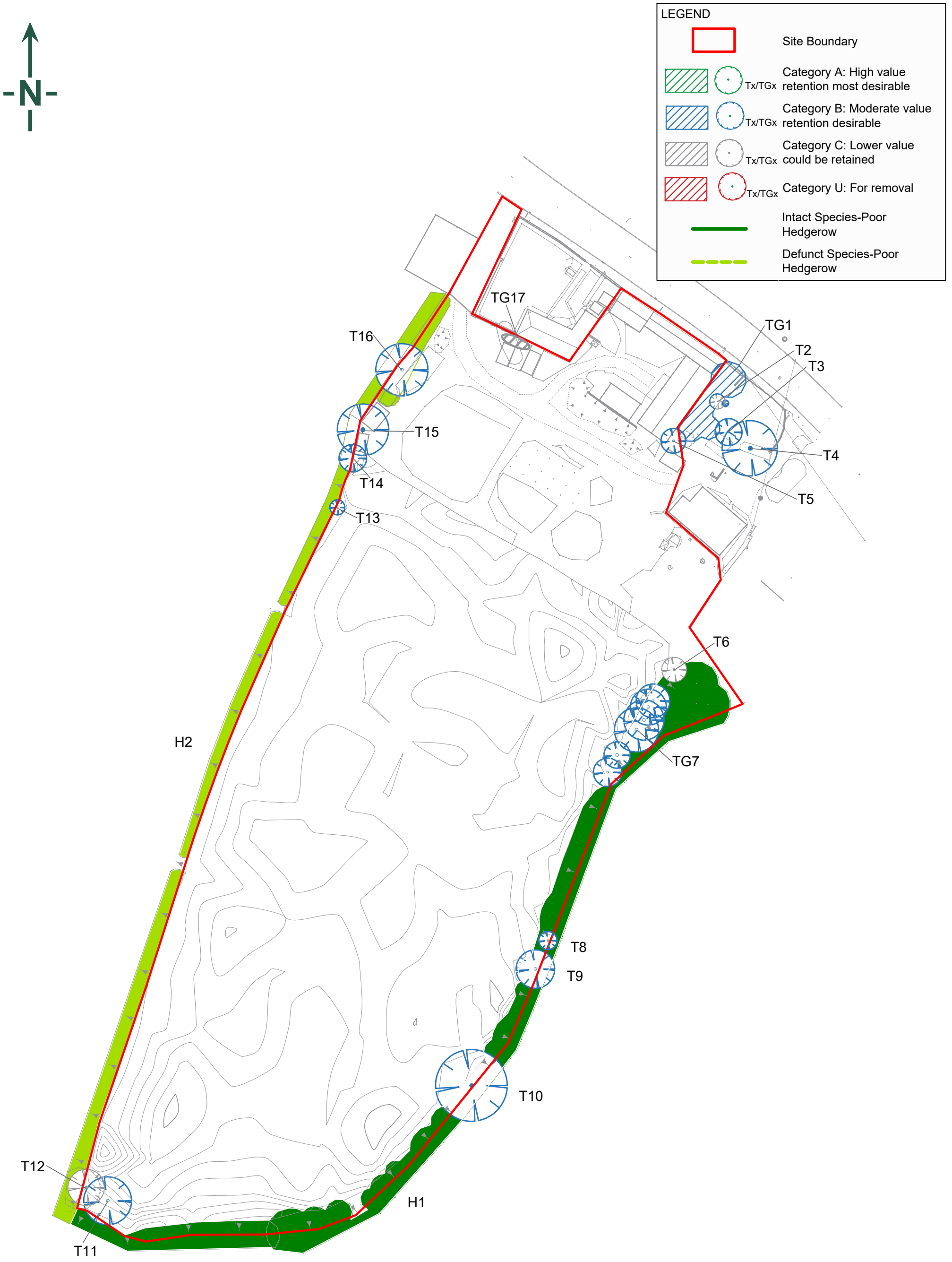
Contains OS data © , Crown Copyright and Database Right (2016/2017)

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Site Location Map
Land off Spalding Road
Gosberton

DRAWN BY:	SCALE:	PROJECT NO:
EN	To Scale@A4	17-1076.02
CHECKED BY:	REVISION:	FIGURE NO:
SK	1	1
DATE: 20 December 2017		

Figure 2 – Tree Survey



Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Survey
Land off Spalding Road
Gosberton

DRAWN BY:	SCALE:	PROJECT NO:
EN	Not to Scale	17-1076.02
CHECKED BY:	REVISION:	FIGURE NO:
SK	1	2
DATE:		
20 December 2017		

Figure 3 – Proposed Development Plan



Rev | By | Notes | Date

rdc
Robert Doughty Consultancy

Client:
Executors of Queenie Dennis

Project:
Land off Spalding Road, Gosberton

Drawing title:
Proposed Site Plan

Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Proposed Development Plan
Land off Spalding Road
Gosberton

DRAWN BY: EN	SCALE: Not to Scale	PROJECT NO: 17-1076.02
CHECKED BY: SK	REVISION: 1	FIGURE NO: 3
DATE: 1[illegible]ember 2017		

Figure 4 – Tree Constraints Plan

N

LEGEND

- Site Boundary
- Tx/TGx — Category A: High value retention most desirable
- Tx/TGx — Category B: Moderate value retention desirable
- Tx/TGx — Category C: Lower value could be retained
- Tx/TGx — Category U: For removal
- Intact Species-Poor Hedgerow
- Defunct Species-Poor Hedgerow
- (m) — Root Protection Area

TG17 (2.70)
T16 (4.20)
TG1 (2.40)
T2 (2.40)
T3 (2.40)
T15 (9.90)
T4 (6.60)
T14 (3.30)
T5 (5.10)
T13 (3.60)
T6 (8.10)
H2 (2.40)
TG7 (3.30)
T8 (3.60)
T9 (5.10)
T10 (9.30)
T12 (7.40)
H1 (2.40)
T11 (3.00)

Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Land off Spalding Road
Gosberton

DRAWN BY:	SCALE:	PROJECT NO:
EN	Not to Scale	17-1076.02
CHECKED BY:	REVISION:	FIGURE NO:
SK	1	4
DATE:		
20 December 2017		

Appendix A – References

References

Collins, J. (ed.) (2016) Bat surveys for Professional Ecologists: Good practice guidelines (3rd edition). The Bat Conservation Trust, London.

Stace, C. (2010). *New Flora of the British Isles 3rd edition*. University Press, Cambridge.

BSI Publication BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.

BSI Publication BS 5837:2005 Trees in Relation to Construction - Recommendations.

The Hedgerow Regulations 1997, HMSO

Appendix B – Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

(adapted from Collins, J. (ed)).

Suitability	Description	
	Roosting	**Commuting and Foraging**
Negligible	An inspected structure or tree which is considered to have no features of importance for roosting bats. No further constraints apply to the method or timing of proposed works.	Negligible habitat features on-Site to support commuting or foraging bats
Low	A structure with at least one or more features suitable to support opportunistic individual bats. However, inadequate space, shelter, protection and conditions, and the low suitability of surrounding habitats means that it is unlikely to be used as a maternity or hibernation roost site. A tree of adequate age and stature to support potential roosting features, however, either no features, or only features of limited potential recorded from the ground.	Habitat with potential to support low numbers of commuting bats due to its quality and connectivity. For example, a gappy hedgerow or unvegetated stream that is isolated from the surrounding landscape. Alternatively, suitable but isolated habitats suitable to support low numbers of foraging bats such as a lone tree or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that are of adequate size, shelter and protection, with suitable conditions and surrounding habitat to support a bat roost not of high conservation status (with respect to roost type not individual species conservation status).	Linear habitat continuity connecting to the wider landscape offering potential to support commuting bats, such as rows of trees and scrub or linked back gardens. Habitat such as trees, scrub, grassland or a waterbody with connectivity to the wider landscape offering foraging opportunities for bats.
High	A structure or tree with one or more potential roost sites that are suitable for use by large numbers of bats on a regular basis and for long periods of time due to their size, shelter, protection, conditions and the surrounding habitat.	Continuous high-quality habitat with strong connectivity to the wider landscape that is likely to be used by commuting bats on a regular basis, such as flowing waterbodies, hedgerows, rows of trees and woodland edges. High quality habitat with strong connectivity to the wider landscape that is likely to be regularly used by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to, and connected to, known roost sites

Appendix C – Photographs

Land of Spalding Road, Gosberton, Lincolnshire

Delta-Simons Project No. 17.1076.02



Photograph 1 – TG1



Photograph 2 – T2



Photograph 3 – T3



Photograph 4 – T4



Photograph 5 – T5



Photograph 6 – T6



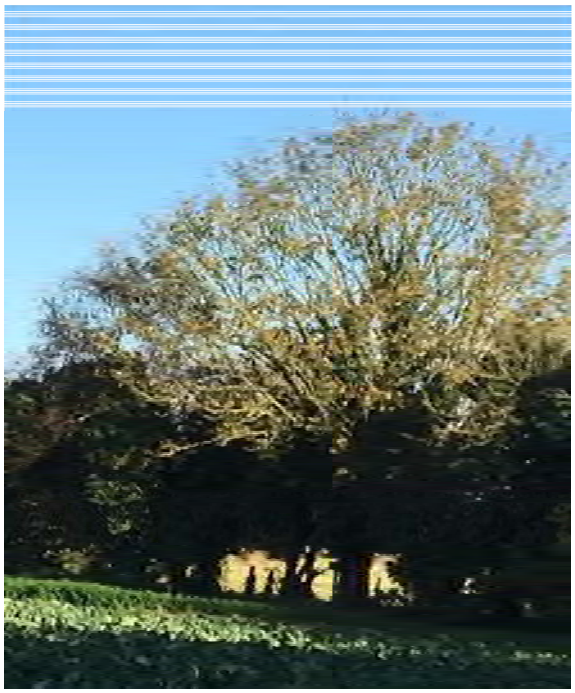
Photograph 7 – TG7



Photograph 8 – T8



Photograph 9 – T9



Photograph 10 – T10



Photograph 11 – T 11



Photograph 12 – T12



Photograph 13 – T13



Photograph 14 – T14



Photograph 15 – T15



Photograph 16 – T16



Photograph 17 – TG17



Photograph 18 – H1 east



Photograph 19 – H1 south



Photograph 20 – H2