IAN KEEN
LIMITED

TREE INFORMATION

Wilbury Hills Cemetery
Stotfold Road
Letchworth Garden City
Letchworth
SG6 4EG

Client

North Hertfordshire District Council
Council Offices
Gernon Road
Letchworth City Garden
Herts
SG6 3JF

Project reference: 9502-KC-XX-YTREE-TreeSurvey

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Introduction to Stages of Tree Information

Sustainable development requires the coordination between disciplines throughout the project, accordingly the package of arboricultural information supports the design process and follows through to construction ensuring effective tree protection.

Ian Keen Limited break the process down to coordinate with the key elements within both the RIBA Plan of Work (2013) and '*British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations'*, this is set out in the table and explained below.

Figure 1 - Ian Keen Limited staged approach with cross references to key guidance.

Ian Keen Limited – Information Stage	RIBA Stage	BS5837
Stage A – Tree Survey	2: Concept	4: Feasibility
Stage B – Impact Assessment	3: Developed design	5: Proposals
Stage C – Method Statement	4: Technical design	6: Technical Design
Stage D – Site Monitoring	5: Construction	7: Demolition and construction

This cross referenced approach ensures trees are a material consideration and those to be retained will be safeguarded.

Stage A – Tree Survey and Tree Constraints Plan

To inform the design and layout of the proposed development a tree survey has been undertaken to identify the size and quality of trees both within the site and immediately offsite. We have then used this information to prepare the Tree Constraints Plan drawing that shows the location of each tree, its size and the area around each tree that needs to be considered during the design process. Once prepared this information has been provided to the design team so that they know what constraints the trees pose.

Stage B - Impact Assessment and Tree Protection Plan

During the design process the design team has consulted with the arboriculturist to ascertain if constraints may be breached, consider options emerging from the design and what spaces for new trees are needed.

Once the design was finalised an impact assessment has been prepared to accompany the planning application. The impact assessment demonstrates the proposals meet national and local planning policy and guidance. It demonstrates the benefits of the retained trees and incorporates new tree planting.

Another essential element of any application is the Tree Protection Plan.

This plan shows what temporary protection measures are needed to safeguard the trees during the construction process.

The plan shows the positon and detail of protective barriers, ground protection and the use of specialist construction methods.

Stage C - Method Statement

This statement sets out in words how each element of work is undertaken in relation to the trees. It dictates when activities occur and the method that will be used to achieve them. It will also set out a scheme of monitoring and supervision.

Stage D – Site Monitoring Report

Following the receipt of planning consent, it is a requirement that the installation of the protective barriers and ground protection are supervised, together with operations such as excavations or surfacing close to trees.

This varies according to the intensity of development near trees, the process is set out to ensure what is planned for in the Tree Protection Plan and method statement is delivered.

Project information

Overleaf are the Project Information Tables which set out the key information including the drawings and information relied upon together with the report history.

Project Information Tables

Table 1 – Drawings and reports relied upon

Ian Keen Limited – Tree Constraints Plan	9502-KC-XX-YTREE-TCP01Rev0
Ian Keen Limited – Tree Protection Plan	To be provided at Stage B
Topographical survey drawing	GY/4552 1/001
Proposed scheme drawing(s) referred to	To be provided to inform Stage B
Landscape scheme proposals	To be provided to inform Stage B
Drainage scheme proposals	To be provided to inform Stage B
Services scheme proposals	To be provided to inform Stage B
Highways scheme proposals	To be provided to inform Stage B
Planning Consent reference	N/A

Table 2 – Background information

Client	North Hertfordshire District Council
Client address	Council Offices Gernon Road Letchworth City Garden Herts SG6 3JF
Site address	Wilbury Hills Cemetery Stotfold Road Letchworth Garden City Letchworth SG6 4EG
Local Planning Authority	Central Bedfordshire Council
Surveyor	Jago Keen
Survey date(s)	9 August 2017
Project arboriculturist(s)	Jago Keen, MSc, Dip.Arb., MArborA, MICFor
Project administrator	Sharon Osborne

Report Development Table

Table 3 – Report Issue and revisions

Issue/Revision	Date	Details	Author	Admin
Final	16th August 2017	For design team comments	Jago Keen	Sharon Osborne

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STAGE A - TREE SURVEY

Wilbury Hills Cemetery
Stotfold Road
Letchworth Garden City
Letchworth
SG6 4EG

A1 Objective

A1.1 To assess the condition of the significant trees and woody vegetation to provide sufficient information to enable decisions to be made on planning aspects of the site and its potential development.

A2 Scope

A2.1 The assessment was carried out from ground level from within the site or from any adjacent public place.

A2.2 The assessment has been carried out following the guidelines set out in *British Standard BS5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

A2.3 This survey is intended for planning purposes only and may not include all shrubs and small trees on site. The survey is not intended for the detailed design of foundations (further information upon vegetation can be provided upon request).

A2.4 Any tree works recommended as a result of this survey are preliminary only and relate to current site use. They are not intended as a schedule of works for any development scheme proposed or otherwise.

A2.5 Reliance has been placed upon the topographical survey supplied.

A3 Tree Identification and Details

A3.1 As annotated on the drawing. Please note that sketch drawings or drawings marked 'not to scale' are indicative only, and tree positions should not be relied upon for design or setting out.

A3.2 Details of the trees are recorded in the Tree Schedule at Appendix A1 of this report. Explanatory notes about the survey and categorisation process within BS5837 are set out at Appendix A2.

A3.3 Ian Keen Limited has checked online to ascertain if trees are protected by legislation. No records of Tree Preservation Order or that the site was located within a Conservation Area were found. No mention of tree protection is made in the pre-application advice dated 24th June 2014.

A4 Site Description

A4.1 The area subject to this survey consists of the existing Wilbury Hills Cemetery together with the adjoining arable field to the west.

A4.2 The cemetery is of recent construction and contains, within its grounds, a number of recently established trees of mixed species. Whilst none of these are of exceptional merit they have the propensity to grow on and provide attractive tree cover to the setting.

A4.3 The arable field is devoid of trees but is defined at the boundaries by hedgerows of varying quality and height but all consistently of predominantly hawthorn, field maple and other native species.

A5 Geology

A5.1 A detailed assessment of the soils on site has not been provided to Ian Keen Limited. In the absence of this information we have used an online resource which reveals the soil to be consistent with our observations on site.

A5.2 This information is obtained from the (online) 'Geology of Britain Viewer' that contains British Geological Survey materials © NERC [2017]. The geological information given in this report should not be relied upon by other parties who are advised to carry out their own assessment of the site conditions to suit their own needs.

Bedrock Geology

A5.3 Zag Chalk Formation - Chalk. Sedimentary bedrock formed approximately 94 to 100 million years ago in the Cretaceous Period. Local environment previously dominated by warm chalk seas.

Superficial deposits

A5.4 Glaciofluvial Deposits, Mid Pleistocene - Sand and gravel. Superficial deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions.

A6 General Guidance Notes for Development

A6.1 These notes are provided as a guide to the designer. They represent my personal views of the tree stock, which trees should be retained and how they should be protected. The views expressed have not been subject to consultation or discussion with any other party.

A6.2 The Ian Keen Limited Tree Constraints Plan drawing listed at Table 1 show the root protection areas prescribed by the guidance within BS5837 paragraph 4.6.2 and adjusted where appropriate as recommended in subsequent paragraph 4.6.3. The root protection area (RPA) is the minimum extent of rooting required to sustain the tree.

A6.3 On residential developments consideration must be given to future tree growth and orientation, i.e. adverse shading and blocked views from windows raise concerns for incoming residents, which may lead to pressure to fell or remove trees in the future. Wherever possible arrange fenestration away from tree canopies to lessen the conflict, or increase window size to accommodate ambient light.

A6.4 A hierarchical approach is advocated in order to achieve optimum use of the site and location of built structures. This is set out below:

Avoid

The starting point of site layout design should be to avoid the RPA. Ideally, building lines should be outside the root protection area to provide working space for construction however protection measures can be taken if such clearance, in isolated cases, is not achievable.

Mitigate

Where intrusion within the RPA is unavoidable then its impact on the tree can be mitigated by specialist measures:

a) Foundations that avoid trenching e.g. screw piles, suspended floor slabs or casting at ground level for lightweight structures such as bin and cycle stores.

b) Limited use may be made for parking, drives or hard surfaces within the root protection areas, subject to advice from a qualified arboriculturist. Cellular confinement systems that enable hard surfaces to be built above existing soil levels are acceptable methods.

c) Service runs that cannot be routed outside the root protection area(s) can be installed by, for example, thrust boring, directional drilling, air excavation or hand digging. These operations often require supervision by the project arboriculturist.

Compensate

Replacement planting can ensure the continuity of tree cover where tree removal is unavoidable. Offsite provision may be considered in some circumstances but this will require negotiation with the local planning authority.

A7 Site specific opportunities and constraints

A7.1 Much of the area surveyed is devoid of trees so they do not pose a constraint to development.

A7.2 Existing hedgerows act as useful low level screening for any proposals and their retention should be encouraged.

A7.3 Significant opportunity presents itself to plant new trees within a scheme of development to derive a nett increase in tree cover.

APPENDIX A1

TREE SCHEDULE

For land at

Wilbury Hills Cemetery
Stotfold Road
Letchworth Garden City
Letchworth
SG6 4EG

Key to Tree Schedule

Column Heading	Explanation
Tree No.	Unique number corresponding with number on plan
Species	English names
Ht (m)	Height in metres
Branch Spread	Crown radius in metres to cardinal points of the compass
Stem diameters (cm)	All measurements conform to Annex C of BS 5837:2012 Single stem - Stem diameter in centimetres measured at 1.5m above ground level. Multi-stemmed tree with 2 to 5 stems – Diameter of each stem Multi-stemmed tree with more than 5 stems – Average stem diameter and number of stems
Height of crown clearance	Height in metres between the ground and underside of canopy
Height of first major branch and direction of growth	Height from ground level to base of first major branch and the approximate direction of growth
Abbreviations as suffix to a dimension	*Suffix 'e' denotes an estimated dimension.* *Suffix 'av' denotes an average dimension*
Age class	Age Class definitions: Y = Young S = Semi-mature E = Early mature M = Mature O = Over mature
Category grading (see Appendix A2 for detailed explanation) and Estimated remaining contribution (yrs)	Summary of BS 5837: 2012 categorisation: 1. Trees that do not warrant consideration for retention: U = those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management. 2. Trees to be considered for retention: A1, 2 or 3 = trees of high quality and value (substantial contribution >40 yrs) B1, 2 or 3 = trees of moderate quality and value (significant Contribution >20 yrs) C1, 2 or 3 = trees of low quality and value (but adequate, ie >10 yrs or young trees – until new planting can be established)
Estimated remaining contribution	Useful estimated remaining contribution of the tree or tree group
Condition	Brief description including physiological and structural defects
Preliminary management recommendations	Describes current arboricultural requirement for the tree in its current context and should be undertaken as soon as reasonably practicable.
Root protection radius	Radius of minimum root protection area in metres calculated from section 4.6 and Annex D of BS5837:2012
Root protection area	Total area of minimum root protection area extrapolated from root protection radius

SURVEY OF TREES AT WILBURY HILLS CEMETERY, STOTFOLD ROAD, LETCHWORTH GARDEN CITY, LETCHWORTH

Tree No.	Species	Ht (m)	Branch Spread (m)				Stem diameters (cm)								Height of crown clearance (m)	Height of first branch (m) and direction (compass point)	Age class	Category grading	Estimated remaining contribution (yrs)	Condition Physiological / Structural	Preliminary management recommendations	Root protection radius (m)	Root protection area sq.m
			N	E	S	W	Single Stem	2-5 stems					More than 5 stems										
								Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	Mean dia	No. stems									
1	Mixed broadleaf hedgerow	1.5av	1av				2av								0	-	S	B2	>20	Recently established hedgerow growing between arable field and existing cemetery. Species include field maple, hawthorn, hazel, cherry, blackthorn and dog rose. Provides useful division between the two parcels of land.		0.24	0
2	Mixed broadleaf hedgerow	3av	2av				5av								0	-	E	B2	>20	Established hedgerow growing along northern edge of site. Predominantly hawthorn with occasional hazel, field maple, dog rose, elder, blackthorn. Some infilling has occurred in recent times and some stems are protected by spiral guards. The hedgerow is punctuated by occasional taller field maple to circa 5m in height.		0.60	1
3	Ash	11	2	5	5	5	56								3	3E	E	C1	>10	Extensive decay at base. Crown noticeably one sided. Has lost subsidiary stem on north-eastern side hence asymmetric crown. Coppicing would overcome the defects and allow long term retention if site use changes.		6.72	142
4	Mixed broadleaf hedgerow	4av	2av				10av								0	-	E	B2	>20	Established hedgerow growing along northern boundary. Occasional sparse gaps. Mix of field maple and hawthorn together with some hazel, blackthorn and elder.		1.20	5
5	Mixed broadleaf hedgerow	4av	2av				10av								0	-	E	B2	>20	Established hedgerow growing along northern boundary. Occasional sparse gaps. Mix of field maple and hawthorn together with some hazel, blackthorn and elder.		1.20	5

SURVEY OF TREES AT WILBURY HILLS CEMETERY, STOTFOLD ROAD, LETCHWORTH GARDEN CITY, LETCHWORTH

Tree No.	Species	Ht (m)	Branch Spread (m)				Stem diameters (cm)								Height of crown clearance (m)	Height of first branch (m) and direction (compass point)	Age class	Category grading	Estimated remaining contribution (yrs)	Condition Physiological / Structural	Preliminary management recommendations	Root protection radius (m)	Root protection area sq.m
			N	E	S	W	Single Stem	2-5 stems					More than 5 stems										
								Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	Mean dia	No. stems									
6	Predominantly hawthorn hedge	2av	1av				5av								0	-	E	B2	>20	Established hedgerow growing alongside road. Predominantly hawthorn with occasional field maple, goat willow and sycamore. Managed on a regular basis to contain its dimensions.		0.60	1
7	Sycamore	6	3	3	3	3		14	12	13					0	-	Y	C1	>10	Small multi-stemmed tree growing between edge and road.		2.71	23
8	Predominantly hawthorn hedge	2av	1av				5av								0	-	E	B2	>20	Established hedgerow growing alongside road. Predominantly hawthorn with occasional field maple, goat willow and sycamore. Managed on a regular basis to contain its dimensions.		0.60	1
9	Pair of Lombardy poplar	6av	1av				12av								0	-	Y	C2	>10	Pair of this fast growing species growing within grassed area.		1.44	7
10	Silver birch	7	2	3	2	1	14								0	-	Y	C1	>10	Small tree growing on grass bank.		1.68	9
11	Pair of aspen	6av	3av				13av								0	-	Y	C2	>10	Pair of close growing trees on grassed bank.		1.56	8
12	Group of aspen	9av	3av				15av								1	1S	Y	B2	>20	Established groupings of trees subdividing burial plots.		1.80	10
13	Row of Lombardy poplar	11av	2av				20av								0	-	Y	B2	>20	Established row of trees alongside pathway.		2.40	18
14	Predominantly hawthorn hedge	2av	1av				5av								0	-	E	B2	>20	Established and well maintained hedgerow growing along part of southern and all of eastern boundary.		0.60	1
15	Row of aspen and Lombardy poplar	10av	4av				25av								0	-	Y	B2	>20	Established row of trees growing close to Stotfold Road boundary.		3.00	28

SURVEY OF TREES AT WILBURY HILLS CEMETERY, STOTFOLD ROAD, LETCHWORTH GARDEN CITY, LETCHWORTH

Tree No.	Species	Ht (m)	Branch Spread (m)				Stem diameters (cm)								Height of crown clearance (m)	Height of first branch (m) and direction (compass point)	Age class	Category grading	Estimated remaining contribution (yrs)	Condition Physiological / Structural	Preliminary management recommendations	Root protection radius (m)	Root protection area sq.m
			N	E	S	W	Single Stem	2-5 stems					More than 5 stems										
								Stem 1	Stem 2	Stem 3	Stem 4	Stem 5	Mean dia	No. stems									
16	Group of silver birch	7av	3av				15av								0	-	Y	C2	>10	Loose collection of trees growing between burial plots.		1.80	10
17	Aspen	7	4	4	4	3	19								1.5	1.5S	Y	C1	>10	Isolated specimen of aspen possibly formed part of a row.		2.28	16
18	Group of cherry	5av	4av				20av								1	1S	Y	C2	>10	Collection of small trees growing adjoining entrance of driveway. Group also includes one buckeye.		2.40	18
19	Linear plantation of mixed broadleaves	7av	4av				15av								0	-	Y	B2	>20	Established recent planting in a broad belt along the northern boundary of site. Predominantly field maple with occasional hawthorn, ash, hazel, lime and birch. Southern face of belt is maintained as a series of hedgerow units.		1.80	10
20	Group of mixed broadleaves	7av	3av				20av								2	2N	Y	B2	>20	Established group of recent plantings growing amidst island between access driveway. Species include birch, cherry, field maple, hornbeam, ash, birch and buckeye.		2.40	18
21	Group of deodar cedar	5av	4av				25av								0	-	Y	B2	>20	Evergreen component of recent plantings. Of varying quality with some broad and squat and others taller.		3.00	28
22	Row of Leyland cypress	9av	3av				15av								0	-	S	C2	>10	Linear collection of conifers growing alongside ditch. Will require management in the near future to avoid the problems with stem failure associated with this species at maturity.		1.80	10
23	Mixed broadleaf hedgerow	5av	3av				15av								0	-	E	B2	>20	Established but outgrown hedgerow growing along boundary of site. Predominantly hawthorn with occasional elder.		1.80	10

APPENDIX A2

TREE SURVEY EXPLANATORY NOTES

The survey of trees has been carried out in accordance with the criteria set out in Chapter 4 of *British Standard 5837:2012 Trees in relation to design, demolition and construction-Recommendations* (BS5837). The survey has been undertaken by the qualified and experienced arboriculturist detailed at Table 1 of this report and they recorded information relating to all those trees within the site and those immediately adjacent to the site which may be of influence to any proposals.

The results are recorded in the Tree Schedule at Appendix A1.

Tree Schedule

Appendix A1 presents details of the individual trees, groups and hedgerows including heights, diameters at breast height, crown spread (given as a radial measurement of cardinal points from the stem), age class, comments as to the overall condition at the time of inspection, BS5837 category of quality and suitability for retention, and the root protection area information.

General observations particularly of structural and physiological condition for example the presence of any decay and physical defect and preliminary management recommendations have also been recorded where appropriate.

Details of the individual trees, groups and hedgerows

All trees were assessed for their quality and benefits within the context of proposed development in a transparent, understandable and systematic way.

Individuals

The default position is to record each tree as an individual for its unique contribution to the landscape

Groups and woodlands

Trees have been assessed as groups where it has been determined appropriate by the surveyor. The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally.

Hedges and shrub masses

We consider a hedgerow to typically comprise a line of trees or shrubs that currently is subject to, or has undergone, a pruning regime to contain its dimensions.

For the tree survey hedgerows and substantial internal or boundary hedges (including evergreen screens) have either been recorded in the Tree Schedule, including lateral spread, height and stem diameter(s), or indicated on the Tree Constraints Plan.

A tree survey in accordance with BS5837 does not assess hedgerows against *The Hedgerow Regulations 1997* or specifically from an ecological perspective, as such would be outside the scope of the British Standard assessment.

Shrub masses are collectives of woody plants, rather than trees, and are recorded where they are a significant feature of the site. They have either been recorded in the Tree Schedule or indicated on the Tree Constraints Plan.

Individual trees within groups, woodlands and hedges

An assessment of individual trees within the groups has been made where there has been a clear need to differentiate between them for example, in order to highlight significant variation between attributes including physiological or structural condition or where a potential conflict may arise.

BS5837 Categorisation

Trees have been divided into one of four categories based on Table 1 of BS5837, 'Cascade chart for tree quality assessment'. For a tree to qualify under any given category it should fall within the scope of that category's definition (see below).

Category U trees are those which would be lost in the short term for reasons connected with their physiology or structural condition. They are, for this reason not considered in the planning process on arboricultural grounds. Categories A, B & C are applied to trees that should be of material considerations in the development process. Each category also having one of three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural or conservation values accordingly.

Category (U)

Trees that have a serious irremediable structural defect such that their early loss is expected due to collapse and includes trees 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.

Trees that are infected with pathogens of significance to the health and/ or safety of other nearby trees or are very low quality trees suppressing adjacent trees of better quality.

Certain category U trees can have existing or potential conservation value which may make it desirable to preserve.

Category (A)

Shown green on Tree Constraints Plan: Trees that are considered for retention and are of high quality with an estimated remaining life expectancy of at least 40 years and with potential to make a lasting contribution. Such trees may comprise:

Sub categories

1) trees that are particularly good examples of their species, especially if rare or unusual, or are essential components of groups such as formal or semi-formal arboricultural features for example the dominant and/or principal trees within an avenue.
2) trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.
3) trees, groups or woodlands of significant conservation, historical, commemorative or other value for example veteran or wood pasture.

Category (B)

Shown blue on Tree Constraints Plan: Trees that are considered for retention and are of moderate quality with an estimated remaining life expectancy of at least 20 years and with potential to make a significant contribution. Such trees may comprise:

Sub categories

1) trees that might be included in category A but are downgraded because of impaired condition for example the presence of significant though remediable defects, including unsympathetic past management and storm damage.
2) trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.
3) trees with material conservation or other cultural value.

Category (C)

Shown grey on Tree Constraints Plan: Trees that are considered for retention and are of low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm. Such trees may comprise:

Sub categories

1) unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.
2) trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value or trees offering low or only temporary/transient screening benefits.
3) trees with no material conservation or other cultural value.

Devising BS5837 root protection areas

Default situation

The root protection area is a function of the stem diameter, it is multiplied by 12 to give a radius. For multi-stemmed trees the stems are combined to provide an effective diameter figure which is then multiplied.

Initially the root protection area should be plotted as a circle, and in many situation it remains a circle.

Influenced situation

Adjustments to the root protection area are made where pre-existing site conditions that would influence root distribution are present. Typically this will be buildings and retaining walls, lighter structures such a hard surfacing, sheds and garages generally do not have the same influence.

Ponds, rivers and watercourses will also influence root distribution as waterlogged soils are not conducive to root growth. Rainwater attenuation and ditches are likely to have a lesser impact if they are dry for significant periods.