



**Tree Survey and Report  
BS5837:2012  
The Cedars,  
Raynham Road,  
Helhoughton**

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<b>Survey scope :</b>	'Trees in relation to demolition, design and construction – Recommendations'
<b>Prepared on behalf of :</b>	Neil Langley NKF Planning Consultancy King's Lynn
<b>Report reference :</b>	2019.010_AIA_Plot 1
<b>Date of Report :</b>	05.06.19 08.10.2020 Revised

<b>Report prepared by :</b>	<b>Checked by :</b>	<b>Approved by :</b>	<b>Status :</b>
James Allitt (Dip Arb Level 4 (ABC))	D Blunt PD Arb (RFS)	Rachael Barber	ISSUE

*Bewick House, 22 Thorpe Road, Norwich, NR1 1RY, T: 01603 625540, F: 01603 598300.  
Norfolk Wildlife Services is a member of the Association of Wildlife Trust Consultancies (AWTC) which is also a corporate member of the Institute of Environmental Management and Assessment (IEMA).*

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## 1. Summary

1.1. Norfolk Wildlife Services was contacted by Neil Langley on behalf of NKF Planning Consultancy Ltd with regard to undertaking a tree survey to support a planning application as informed by BS 5837:2012 "Trees in relation to design, demolition and construction-Recommendations".

1.2. The proposed site is on land adjacent to The Cedars, Raynham Road, Helhoughton. An existing property at the location is due to be demolished and a new dwelling with an access road built on the adjacent land.

1.3. The survey site consists of 2 plots with separate applications within the planning process. Plot 1 refers to a proposed new dwelling and access drive along with demolition of existing farm buildings, whereas plot 2 refers to the demolition of the existing building. This report deals with the construction of the proposed new residential dwelling, new access drive and demolition of the existing farm buildings.

1.4. The client wishes to reinstate access to the field in the south eastern corner to allow management of the land regardless of any building proposals. They are hesitant to remove any trees at this point and prefer to lay down temporary ground protection to avoid damage to tree roots with a view to creating a permanent access drive at a later stage.

1.5. This updated report (08.10.2020) includes a slightly revised layout of the building and a driveway to the proposed new building from the original entrance to the Cedars.

1.6. This survey is not a tree condition survey and should not be used to identify tree hazard or risk or be used to provide information for risk indemnity purposes. If any trees are identified as being dangerous then comments shall be made with regards to the removal or retention according to the proposed development. A full inspection for Health and Safety purposes would identify faults and make relevant recommendations on appropriate schedule of future inspections for faults.

1.7. The survey work was completed by James Allitt (Dip Arb Level 4 (ABC) of Norfolk Wildlife Services on 29<sup>th</sup> April 2019.

1.8. The report addresses the following elements:

- A pre-development tree survey to assess the trees present on site and to assess the Root Protection Areas (RPAs) and canopy spreads.
- An Arboricultural Impact Assessment (AIA) which sets out the likely impact of the development on surrounding trees and provides recommendations for the protection of the trees during construction work based on BS 5837:2012 "Trees in relation to design demolition and construction- Recommendations".
- A Tree Constraints Plan (TCP) is produced to illustrate the potential restrictions the trees growing on site pose to the design of the development.

1.9. It is recommended that the site has an Arboricultural Method Statement to guide construction works. An arboricultural consultant should be present to supervise the construction works.

## 2. Approach

### 2.1. Statutory checks

2.1.1. It has been confirmed with North Norfolk District Council in an email dated 30<sup>th</sup> April 2019, that no trees were subject to a Tree Preservation Order or that the property is located in a Conservation Area.

## 2.2. Drawings

2.2.1. Plans supplied by the client were: -

- A survey drawing of the existing layout Ref: PLS - 183 - NKF Planning - The Cedars, Raynham Road, Fakenham – Overview dated 01.01.19.
- A survey drawing of the proposed construction Ref: HLHGHTN Landscape Plan dated 22.02.19. (Superseded).
- An updated proposed site plan drawing no. L-102 drawn by Ben Pentreath 22.02.2019.

2.2.2. When using the TCP for design purposes, the RPA's should be amended to reflect the actual site conditions. Where the circular RPA's extend under paved areas or existing buildings, that part of the RPA should be ignored and the RPA should be extended a suitable distance in the other direction. The modified area should be agreed by the Arboricultural Consultant and the Local Authority Tree Officer.

## 2.3. Surveying of trees

2.3.1. All trees which could be affected or have an effect on the proposal have been inspected and their details listed in Appendix 1.

2.3.2. Trees were surveyed at ground level and no climbing inspection was undertaken.

2.3.3. The survey was based upon the information collected and the conditions on that day. The survey details quantitative data on the following:

- Tree Species
- Tree Height
- Stem Diameter
- Height and Direction of first significant branch
- Crown Spread
- Age Class
- Brief qualitative assessment on tree condition and future potential

2.3.4. Appendix 5 gives a full gives a full explanation of the survey terminology.

2.3.5. No assessment of the soil has taken place as part of this report.

2.3.6. The British Standard states that a soil assessment should be carried out by a competent person to establish the structure, clay content and potential for volume change of the soil. A survey of this nature is considered outside the scope of this Arboricultural Assessment. For guidance on soil structure in relation to construction advice should be sought from a Structural Engineer.

## 2.4. Tree constraints

2.4.1. Following the guidance in BS5837:2012, an assessment of the trees present was carried out. Trees were categorised following the guidance in BS5837:2012 as Category A, B, C or U. A calculation was made for the theoretical RPA in meters (m).

2.4.2. A Tree Constraints Plan (TCP) was prepared. The tree numbers on the Tree Constraints Plan correspond to the numbers in the Tree Survey Schedule.

2.4.3. The Tree Constraints Plan was used as a basis for the assessment of the potential tree constraints and are represented in two areas:

### **Below ground constraints:**

2.4.4. The TCP shows the theoretical RPA for the trees as a circle, whose colour matches the retention category colour.

2.4.5. The RPA informs the closest positions of any future developments in relation to the protection of the minimum rooting area the tree requires to function.

### **Above ground constraints**

2.4.6. The Tree Constraints Plan shows the indicative crown spreads to allow their consideration as a direct constraint in design.

2.4.7. The branch spreads were measured for this survey, as per BS5837:2012, but these measurements are estimates only and should not be taken as definitive.

2.4.8. Where the crown spread exceeds the RPA in dimensions, the crown spread will be taken as the minimum area to protect.

## **3. Description of trees**

### **3.1. Distribution of trees and groups**

3.1.1. The site is mainly rough grassland with an area of garden surrounding the existing property. The majority of the trees grow around the boundary of the site and offer amenity as well as biodiversity value to the location.

3.1.2. The trees were classified by their amenity value and longevity as seen within their current growing environment. Trees that were classified as groups were done so as they had similar attributes such as species, height and growing condition. Often their crowns would be growing into each other.

3.1.3. Hedgerow trees grow around the west, east and southern boundary. Species mainly comprise of Hawthorn, Ash and occasional Oak. Prominent trees grow along the southern boundary which is bordered by field which is ploughed regularly.

3.1.4. A number of mature trees grow on the eastern boundary and surrounded by scrub and hedgerow trees. They offer a screen between the road and the proposed dwelling.

3.1.5. A Tree Constraints Plan showing the location of trees, the canopy spread and their RPA's is given in Appendix 2.

### **3.2. Assessment of trees**

3.2.1. A schedule of results is given in Appendix 1. The schedule contains all the information specified in section 4.4.2.5 of the British Standard.

3.2.2. Data for trees T19 – T28 and grouped trees G4 – G10 has been included within this report. Overall the arboricultural qualities were good. A summary is listed in table 1 below:

*Table 1: Summary of individual tree categories:*

Total no. of individual trees	Category A	Category B	Category C	Category U
10	0	9	1	0

3.2.3. The majority of the grouped trees associated with this application were classified as B2 because of their contribution within the landscape and conservation values. Trees that were of lower quality were given a lower classification as they had limited retention beyond 10+ years and poor amenity value.

3.2.4. Overall the boundary trees were of good arboricultural quality and capable of having longevity within the landscape. Some trees had undergone previous pruning work that affects the amenity value.

3.2.5. Trees within G9 had part of their RPA in the adjacent field which is ploughed regularly. A precautionary approach has been taken when calculating the RPA owing to the likelihood that the roots of these trees are affected by continual ploughing. The largest RPA of these trees has been adopted for all the trees within the group.

3.2.6. Tree T27 and Tree T27i is a prominent tree along Raynham Road and offers good amenity value. It is made up of an ash and an oak tree appearing as one tree due to the proximity of the stems and the crown growth.

3.2.7. Trees T24 and T25 grow in the south-east corner of the plot and along Raynham Road. They have moderate crown shape and but lack the qualities for a higher classification.

### **3.3. Retention of trees**

3.3.1. The majority of trees growing around the boundary should be retained as they offer a visual buffer of the development. These trees should be protected using appropriate methods set out in an Arboricultural Method Statement (AMS).

3.3.2. G4 and G9, T22, T23, T27 are prominent features within the landscape and should be retained.

### **3.4. Construction constraints**

3.4.1. Demolition of the existing buildings is in close proximity to G6.

3.4.2. Attention is brought to the access constraints to get machinery on or around site and make deliveries. In particular:

- Compaction and rutting of soft ground within RPA of retained trees.
- Proposed access is within the RPA of G9, T24 and T25.

3.4.3. There are no storage constraints to store materials once on they have been delivered to site.

3.4.4. No plans for utilities have been provided but they should consider the RPA of retained trees.

### **3.5. Landscaping constraints**

3.5.1. Raising or lowering levels within the RPA of retained trees shall be avoided.

3.5.2. The use of chemicals for vegetation control should be restricted and avoid being applied within the RPAs and adjacent areas.

3.5.3. Areas identified for future planting should take account of the potential for compaction and retain appropriate growing conditions.

## **4. Arboricultural Impact Assessment (AIA)**

### **4.1. Introduction**

4.1.1. The Arboricultural Impact Assessment sets out the likely impacts the development may have on trees, based on the design REF: HLHIGHTN Landscape Plan dated 02.02.19

4.1.2. The main impacts focus on the construction of the proposed new access drive which potentially enter into the RPA of retained trees.

4.1.3. It has been indicated that the original access was in the south east corner of the field, where the proposed access is to be reinstated. There is a bank that has built up over the years and excavation is required to reinstate the access drive. Damage to roots of trees T24

and T25 is likely. Further exploratory digging will be required to evaluate the potential damage to roots if access is to be installed between trees T24 and T25.

4.1.4. The access drive has yet to be finalized at this stage and may require the removal of 1 tree. The client is keen to retain as many trees as possible and enhance the area with extensive native tree planting.

4.1.5. Temporary ground protection will be required in the interim period to allow access from the south east corner to manage the land. This should be in the form of Groundtrax® or similar ([www.groundtrax.com/](http://www.groundtrax.com/)).

## 4.2. Potential implications

### 4.2.1. Trees requiring removal

4.2.1.1. Tree T25 may be required to be removed to allow access for the access drive. This is yet to be finalized.

### 4.2.2. Trees requiring works

4.2.2.1. The eastern most tree of G9 will require a slight crown lift by 2m to avoid vehicles and plant striking the tree.

4.2.2.2. Trees T24 and T25 will require a slight crown lift to 5m to allow vehicle access to manage the land.

4.2.2.3. The trees within G6 on the western boundary may require a crown reduction by 1m to clear enough space for demolition.

4.2.2.4. All tree work should follow guidance in BS3998:2010 Tree Work – Recommendations.

### 4.2.3. Potential incompatibilities

*Table 2: Potential incompatibilities between the retained trees and proposed layout including proposed mitigation.*

Proposed incompatibility	Potential Risk	Consequence	Mitigation
Temporary access to manage the land	Soil compaction and irreparable damage to roots.	Root damage and loss leading to decline in health of tree.	Use temporary ground protection - <a href="http://www.groundtrax.com/">www.groundtrax.com/</a> or similar. Installation should be after tree works but before any vehicles are allowed onto site.
Access road and front gravel parking within the RPA of retained trees within G9.	Compaction of soil within RPA of retained trees Excavation for sub base of proposed access road.	Root damage and loss	Use 'no dig' construction techniques leaving at least 1m from the trunk of any tree. Use permeable top layer. Work will follow an Arboricultural Method Statement (AMS) Install appropriate barriers and identify construction exclusion zones working to an AMS and TPP. Construction phase monitored by Arboricultural Consultant.
Gravel service yard / parking area within RPA of T27	Change of ground level Excavation for sub base	Root damage and loss	Use 'no dig' construction techniques. Use permeable top layer.

Proposed incompatibility	Potential Risk	Consequence	Mitigation
Driveway to the north of the proposed building	Root damage during excavation works to tree T17 & T18	Root damage and loss	Use 'no dig' construction techniques. Use permeable top layer.
Demolition of existing farm buildings	Compaction of soil within RPA of retained trees Tree strike from machinery	Root damage and loss Damage to bark	Install protective barriers to extent of RPA. Adopt 'top down, pull back' demolition technique working within footprint of existing building. Reduce crown by 1m on eastern side.

#### 4.2.4. Proximity of trees to structures

4.2.4.1. The front gravel parking area and the service yard enter in trees G9 and T27 RPA.

4.2.4.2. There were no details of utilities or services associated with the proposed development but it is thought with the early arboricultural input any incompatibilities will be avoided.

4.2.4.3. The proposed access is within 1m of the stems of trees T24 and T25. (To be finalized).

4.2.4.4. The proposed northern access is within 2m of tree T17.

4.2.4.5. The demolition of the existing farm buildings is in close proximity to hedgerow trees within G6.

#### Limitations to survey

4.2.4.6. There were no limitations to the survey

#### Limitations to Arboricultural Impact Assessment

4.2.4.7. There were the following limitations to the Arboricultural Impact Assessment that require rectification:

- Details of utilities not available at the time of writing
- Details of construction techniques that are significant to the development, e.g. construction materials.

## 5. Recommendations

### 5.0.1. Arboricultural Method Statement (AMS)

5.0.1.1. An AMS and Tree Protection Plan (TPP) will be required to guide the development and demonstrate that operations can be undertaken with minimal risk of damage to trees and their root system.

### 5.0.2. Supervision of works and on site monitoring

5.0.2.1. An Arboricultural Consultant should be involved with the construction stage of the project to avoid the proposal conflicting with any retained trees.

5.0.2.2. An auditable system of arboricultural site monitoring to ensure recommended tree protection is in place according to the AMS and TPP. This should be part of the conditions associated with the planning application.



### 5.0.3. Tree planting

5.0.3.1. Careful consideration to tree planting should be given within the conceptual design of the development. The ultimate height, spread, form, colour, and density shall all have a long-term effect on the surrounding landscape.

5.0.3.2. Where replacement planting is required tree biomass calculations are used to calculate replacement tree requirements. Categories A to E define categories of tree size and number of replacement trees as detailed in Table 2:

Table 2: Calculations of biomass replacement;

Category Tree	Crown Height	Crown Spread	No. of replacement trees
Category A	up to 7 metres	up to 5 metres	1 tree
Category B	8 to 14 metres	6 to 10 metres	2 trees
Category C	15 to 18 metres	11 to 15 metres	3 trees
Category D	19 to 29 metres	16 to 20 metres	4 trees
Category E	Over 29 metres	over 20 metres	5 trees

5.0.3.3. Subject to ongoing discussions it is estimated that 1 tree will be required to be removed (to be confirmed). According to the above table removal of T25 (category B) will require 2 trees to be planted as replacements.

5.0.3.4. Suggestions for tree species for replanting T24 and T25 could include Oak *Quercus robur* x2. Discussions with the landscape architect are ongoing and an extensive planting scheme is being produced.

5.0.3.5. New plantings should be heavy standard and follow guidance set out in BS8545:2014 Trees: from nursery to independence. A detailed planting specification should be requested and conditioned as part of the planning application.

## Appendix 1: Tree Survey Schedule

Table 2: Tree Survey Schedule, The Cedars, Helhoughton

Tree no.	Species	Scientific name	Diameter (mm)	Height (m)	Height above ground level of first branch	Crown Height (m)	Branch Spread (m)				Life Stage	Physiological Condition	Structural Condition	Comments & Preliminary Observations	Estimated Remaining Years	BS Category	RPA Radius (m)	RPA Area (M <sup>2</sup> )
							N	S	E	W								
T17	Deodar	<i>Cedrus deodara</i>	465	11.25	0.5N	0	4.5	3	3	4.5	m	good	good	Prominent tree growing south of existing property	40	A1	5.6	102
G3	Alder	<i>Alnus cordata</i>	264	11	1S	1	2.5	2.5	2.5	2.5	sm	good	fair	Group growing towards eastern boundary	20	B2	3.2	34
T18	willow	<i>Salix alba</i>	ms	5	0	1	3	3	3	3	sm	fair	fair	Multi stem at base	10	C1	2.0	14
G4	Birch, Cherry, Rowan	<i>Betula pendula</i> , <i>Prunus sp.</i> , <i>Sorbus aucuparia</i>	352	15	1N	1	3	3	3	3	m	good	good	Prominent group of trees in middle of plot	40	A2	4.2	55
G5	Cherry, Apple	<i>Prunus sp.</i> <i>Malus sp.</i>	175	4	1N	1	2	2	2	2	sm	good	good	Mixed species planting arrangement.	20	B2	2.1	14
T19	Ash	<i>Fraxinus excelsior</i>	340, 375, 290	16	2N	4	1	5	6	6	m	fair	fair	Growing on western boundary. Old coppice stool with veteran properties. pruning to northern canopy from power lines	20	B1	7.0	150
T20	Hawthorn	<i>Crataegus monogyna</i>	270, 150	9	0	0	3	3	3	3	m	fair	fair	Hedgerow tree	20	B1	3.7	41

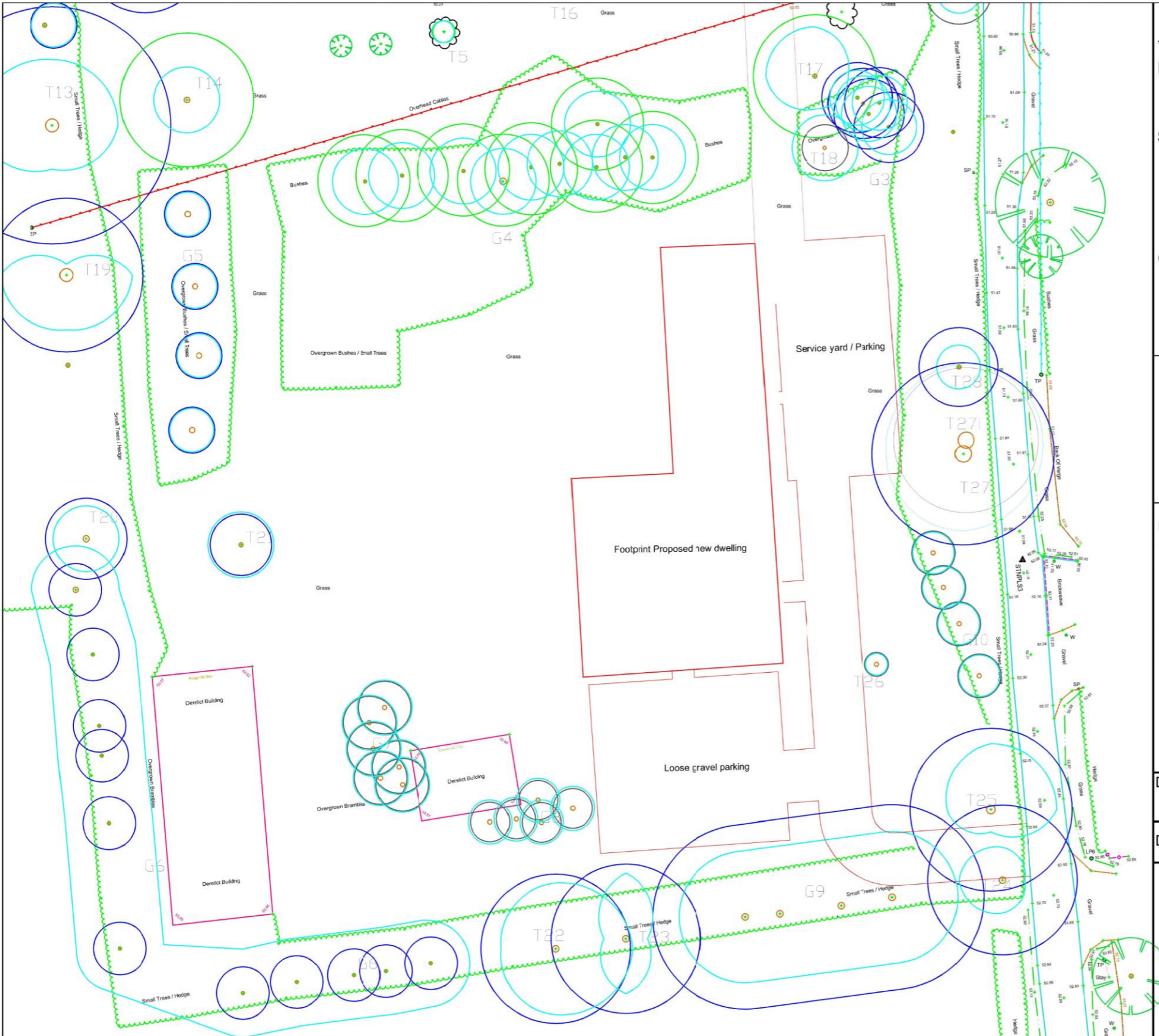
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G3	Alder	<i>Alnus cordata</i>	264	11	1S	1	2.5	2.5	2.5	2.5	sm	good	fair	Group growing towards eastern boundary	20	B2	3.2	34
T18	willow	<i>Salix alba</i>	ms	5	0	1	3	3	3	3	sm	fair	fair	Multi stem at base	10	C1	2.0	14
G6	Hawthorn	<i>Crataegus monogyna</i>	200	8	0	0	4	4	4	4	m	fair	fair	Growing in close proximity to existing building	20	B2	2.4	18
T21	Goat willow	<i>Salix caprea</i>	140, 120, 110, 100	7	0	1	3	3	3	3	sm	good	good	Multi stem from base	20	B1	2.8	23
G7	Field maple, cherry	<i>Acer campestre</i> , <i>Prunus sp.</i>	200	6	1	1	2.5	2.5	2.5	2.5	sm	fair	fair	Close proximity to exist in shed	10	C2	2.4	18
G8	Ash	<i>Fraxinus excelsior</i>	150	5	2	2	2	2	2	2	y	poor	poor	Self-sown young ash	10	C3	1.8	10
T22	Ash	<i>Fraxinus excelsior</i>	300, 350, 325	14	2.5n	3.5	6	6	7	5	m	fair	fair	Coppice boundary tree. Multi stem at 0.5m.	20	B1	6.8	150
T23	Oak	<i>Quercus robur</i>	390, 400	14	0.5N	4	6	5	2	2	m	fair	fair	Growing on southern boundary.	20	B1	6.7	137
G9	Ash	<i>Fraxinus excelsior</i>	700	16	1N	4.5	6	6	6	6	m	fair	fair	Prominent boundary group	20	B2	8.4	222

Tree no.	Species	Scientific name	Diameter (mm)	Height (m)	Height above ground level of first branch	Crown Height (m)	Branch Spread (m)				Life Stage	Physiological Condition	Structural Condition	Comments & Preliminary Observations	Estimated Remaining Years	BS Category	RPA Radius (m)	RPA Area (M <sup>2</sup> )
							N	S	E	W								
T17	Deodar	<i>Cedrus deodara</i>	465	11.25	0.5N	0	4.5	3	3	4.5	m	good	good	Prominent tree growing south of existing property	40	A1	5.6	102
G3	Alder	<i>Alnus cordata</i>	264	11	1S	1	2.5	2.5	2.5	2.5	sm	good	fair	Group growing towards eastern boundary	20	B2	3.2	34
T18	willow	<i>Salix alba</i>	ms	5	0	1	3	3	3	3	sm	fair	fair	Multi stem at base	10	C1	2.0	14
T24	Ash	<i>Fraxinus excelsior</i>	390, 200, 440	14	1N	6	3	3	2	4	m	fair	fair	Multi-stem at base.	20	B1	6.8	150
T25	Oak	<i>Quercus robur</i>	480, 390	11.2	3N	4	6	2	6	4	m	good	fair	Bias crown to north. Bark wounds from cutting ivy.	20	B1	7.4	177
T26	Ash	<i>Fraxinus excelsior</i>	90	4	1.5S	2	1	1	1	1	y	poor	poor	Self-sown. poor example	10	C1	1.1	5
G10	Hawthorn, Ash	<i>Crataegus monogyna</i> , <i>Fraxinus excelsior</i>	ms	5	2N	1	2	2	2	2	sm	fair	fair	Extension of hedgerow. Extensive bramble.	10	C2	2.0	14
T27	Ash	<i>Fraxinus excelsior</i>	200, 360, 370	14	2.5W	1.5	2	7	7	7	m	good	fair	Prominent tree on roadside	20	B1	6.6	137
T27i	Oak	<i>Quercus robur</i> ,	400, 560	14	2.5E	1.5	7	2	7	7	m	fair	fair	Prominent tree on roadside growing in close proximity to T27	20	B1	8.3	222
T28	Hawthorn	<i>Crataegus monogyna</i>	300	8	2E	2	2	2	2	2	m	fair	fair	Dense ivy	20	B1	3.6	41

# Appendix 1a: Revised Layout Oct 2020



**Appendix 2: Tree Constraints Plan**



**DRAWING TITLE:**  
**TREE CONSTRAINTS PLAN**  
**PROPOSED NEW BUILD**

**SITE:**  
 The Cedars, Helhoughton

**CLIENT:**  
 NKF Planning Consultancy



- LEGEND**
- RPA A
  - RPA B
  - RPA C
  - RPA U
  - CROWN SPREAD
  - PROPOSED NEW DWELLING AND ACCESS ROAD

**DRAWING REF:**  
 2019.010\_TCP\_plot 1

**DRAWN BY:** JA 08.10.2020



OFFICE@NORFOLKWILDLIFESERVICES.CO.UK  
 01603625540

## Appendix 3: Photographs



*Figure 1: Proposed new entrance viewed from Raynham Rd.*



*Figure 2: Proposed new entrance viewed from site. Southern boundary trees on RHS.*



*Figure 3: Looking north over plot to trees within G4.*



*Figure 4: Trees within G9 on the southern boundary.*



## Appendix 4: Explanations of tree survey schedule headings

**Tree No.:** This number identifies the trees and corresponds with the provided plans. Trees are prefixed T, groups G and hedges H. Where stumps are identified the suffix S will be used.

**Species:** The common name is given for each tree

**Ht: Height:** Estimated in metres

**SD: Stem Diameter:** Measured at 1.5m above ground level as per Figure C1a) of BS5837, or at an appropriate height, as per Figures C1b) to C1f) of BS5837. Recorded in millimetres.

# = estimated stem diameter.

μ = average stem diameter of trees with two or more stems.

**Age:** This refers to the age of the individual tree relating to the average life expectancy of each species in a similar environment:

NP Newly planted – a tree within 3 years after planting

YM Young Mature – a tree within its first one third of life expectancy

MA Middle-aged – a tree within its second third of life expectancy

M Mature – a tree in its final one third of life expectancy

OM Over Mature – a tree having reached its maximum life span and is declining in health and size due to old age

V Veteran – a tree that is of interest biologically, aesthetically or culturally because of its age, size and condition

**Crown Spread:** Estimated in metres and given at cardinal compass points.

**Branch Height:** Existing height above ground level of the first significant branch, recorded in metres. Direction of growth may be given as a cardinal compass point e.g. 3N.

**Canopy Height:** Existing height of the canopy from ground level, measured in metres.

**General Observations:** Various comments relating to the trees' previous and possible future management e.g. the trees' physiological and/or structural condition that may affect their estimated life expectancy; nearby structures and services where trees and their future growth may have an impact; previous pruning history.

**Recommended Works:** To mitigate significant issues with the trees' condition and vitality, or as part of pre-development works.

**ERC (Estimated Remaining Contribution):** Has been estimated by subtracting the current age from the life expectancy of a tree in same location and condition. Each tree is given a retention category according to BS5837:2012:

<10 years

10+

20+

40+

**Retention Category:** Based upon the categories in Table 1 of BS5837: 2012 regarding tree quality assessment and suitability for retention.

**RPA Radius:** Calculation based on the stem diameter(s), of the radius the Root Protection Areas (RPAs) to inform the scheme designer of each tree/group's area of sufficient rooting volume that should be retained and protected. See section 4.6 of BS5837: 2012 for details of the calculation