A41 Pioneer Road Roundabout, Graven Hill, Bicester

Arboricultural Impact Assessment

On behalf of

June 2020

Waterman Infrastructure & Environment Limited
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Client Name:	Graven Hill Village Development Company Ltd
Document Reference:	WIE11386-145-R-7-1-3-AIA
Project Number:	WIE11386-145

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
First	June 2020	Richard Harris Principal Arboricultural Consultant	Nick Jones-Hill Senior Associate Director	Nick Jones-Hill Senior Associate Director

Comments

Disclaimer

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Executive Summary

A site along the A41, to the south-east of Bicester (hereafter referred to as the 'Site') is being considered for development. The development proposals (hereafter referred to as the 'Development') are for the creation of a new roundabout at the junction of the A41 and Pioneer Road.

The Site is approximately 1 ha in area, centred on Ordnance Survey Grid Reference SP 5966 2075. The Site currently comprises a T-junction between the A41 and Pioneer Road, with associated soft landscape. Habitats present include amenity grassland, bare ground, hardstanding, hedgerows, semi-improved grassland, plantation mixed woodland, scattered trees and drainage ditches.

A tree survey of the Land Transfer Area 2 (LTA2) of the Graven Hill Village Development was undertaken between August and October 2018, and that survey was updated in June 2020 to include all trees relevant to the Site. The results of that tree survey exercise have been used to guide the design process. That tree survey and the recommendations made in this report follow the principles of BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations[1] (BS5837) and relevant Cherwell District Council planning policy.

A total of 68 individual trees, groups of trees and hedgerows are shown on **drawings 1** and **2** and are considered to be pertinent to the Development. Of these arboricultural features, 20No. were awarded a moderate B grade and 42No. were awarded a low C grade. The remaining 6No. were awarded a very low U grade and should be removed for reasons of sound arboricultural management irrespective of any development proposals.

At the time of writing this report, none of the trees present on the Site were afforded protection through the provisions of a Tree Preservation Order and no part of the Site is located within a Conservation Area.

The purpose of this Arboricultural Impact Assessment (AIA) is to evaluate the direct and indirect effects of the proposed design on the tree stock present both on and adjacent to the Site. In line with Annex B of BS5837, it also contains sufficient information to be submitted in support of any planning application pertinent to the Site and the design layout shown on **Drawing 2.**

A total of 55No. arboricultural features will be removed to facilitate the Development. Of these, 15No. were awarded a moderate B grade and 35No. were awarded a low C grade. A further 5No. U grade trees will be removed for reasons of sound arboricultural management.

Due to the living nature of trees and other site considerations, this report and any recommendations made within it are valid for a period of 18 months following the Site survey.

[1] British Standard Institution (2012) *BS5837 Trees in Relation to Design, Demolition and Construction - Recommendations*

1. Introduction

1.1. Waterman Infrastructure & Environment Limited (Waterman) was instructed by the Graven Hill Village Development Company Limited (hereafter referred to as the 'Applicant') to undertake an Arboricultural survey and Impact Assessment (AIA) of trees at an area of land along the A41, to the south east of Bicester, Oxfordshire (hereafter referred to as the 'Site'). The Site is currently being considered for development.

1.2. The Site is approximately 1 hectare (ha) in area and centred on Ordnance Survey Grid Reference SP 5966 2075. The Site currently comprises a T-junction between the A41 and Pioneer Road, with associated soft landscape.

1.3. The south western half of the Site falls within a wider area of land known as Land Transfer Area 2 (LTA2) of the Graven Hill Village Development which has outline planning permission for mixed use redevelopment of a former Ministry of Defence Site (ref. 19/00937/OUT) (hereafter referred to as the 'Wider Development'). Furthermore, the north-eastern half of the Site falls within an area of land known as Wretchwick Green, which is awaiting a decision on an outline planning application for mixed used development (ref. 16/01268/OUT).

1.4. A planning application is being submitted for the proposed development of a new roundabout junction at the Site to facilitate access to/from the Wider Development, Wretchwick Green and the existing A41.

1.5. The purpose of this AIA is to evaluate the direct and indirect effects of the proposed design on the tree stock present both on and adjacent to the Site. It includes recommendations for an appropriate level of mitigation and/or compensation where necessary.

1.6. It documents the findings of the baseline surveys of the arboricultural features on and immediately adjacent to the Site. The above and below ground constraints posed by the canopy shape and subterranean rooting area of the surveyed trees are described.

1.7. This report should be read in conjunction with the other documents, plans and technical studies submitted to support the proposed development of the Site.

1.8. Trees are a material consideration in the planning process and as such, the information within this report has been aligned where possible with the general policies and development objectives of the relevant planning policies and the principles set out in BS5837.

2. Site Description

2.1. The Site is approximately 1 hectare (ha) in area, centred on Ordnance Survey Grid Reference SP 5966 2075. The Site currently comprises a T-junction between the A41 and Pioneer Road, with associated soft landscape. Habitats present include amenity grassland, bare ground, hardstanding, hedgerows, semi-improved grassland, plantation mixed woodland, scattered trees and drainage ditches.

Photograph 1: View of the site looking south-east along A41

3. Tree Survey Methodology

3.1. A tree survey of the Site was carried out on 5th June 2020 and combined with previous recorded data of the wider LTA2 site which was collected between August and October 2018. The tree survey methodology followed the recommendations set out in BS5837.

3.2. The survey involved collecting the following information on all trees (both on and off-site) with a stem diameter over 75mm which have the potential to influence the proposed Development.

Tree Numbers

3.3. Individual trees surveyed were given the prefix 'T'. Trees have been grouped where they form cohesive aerodynamic (i.e. companion shelter), visual (i.e. screening) or cultural (i.e. parkland) arboreal features of similar quality, as identified by the prefix 'G'. Hedges and Woodland groups were given the prefixes 'H' and 'W' respectively.

Species

3.4. Species are listed by both their common name and Latin name in the schedule in **Appendix B** and by their common name in the body of the report.

Height

3.5. Tree heights are approximate and estimated in metres.

Stem Diameter

3.6. The stem diameter of single stemmed trees is measured at 1.5m above ground level and given in millimetres. The diameter measurement of multi-stemmed trees is shown as a measurement of each major stem present. Where stems fork or swell, the measurement is taken at the narrowest point below the fork or swelling. Where access to the trunk of a tree is not available, an estimation of the stem diameter is made and identified by '*' on the accompanying tree survey table.

Crown Spread

3.7. Radial crown spread is measured in metres to the nearest 0.5m (rounded up). These are recorded for each of the four cardinal points where access allows. Where access is not available the crown spread is a visual estimate derived from site-based observations and identified by '*' on the accompanying tree survey table. As such, the canopy shape for surveyed trees depicted on the accompanying plans accurately represents the canopy spread as measured on Site.

Height of Crown Clearance and Canopy

3.8. The height of crown clearance is the height above ground in metres of the first significant branch and the direction of growth. The height of canopy is the average height above ground in metres of the main canopy. These are measured to the nearest half metre (rounded up) for dimensions up to 10m and the nearest whole metre for dimensions over 10m.

Age Class

3.9. The age of each tree is defined as follows:

- Young (Y): Within the first 1/4 of useful life expectancy.
- Semi-mature (SM): Within the second 1/4 of useful life expectancy.
- Early Mature (EM): Within the third 1/4 of useful life expectancy.
- Mature (M): Within the fourth 1/4 of useful life expectancy.
- Over Mature (OM): Tree has exceeded normal life expectancy.
- Veteran (V) Tree displaying veteran characteristics [2].

Physiological and Structural Condition

3.10. The physiological or structural condition of each tree, tree group, hedgerow and woodland is described, highlighting specific features. The survey involved ground level examination of the external features of the trees. The structural condition for each tree is described as being Good, Fair or Poor and the physiological condition is described as Good, Fair, Poor, Moribund or Dead.

3.11. Where appropriate, notes on the structural integrity are provided on form, taper, forking habit, storm damage, decay, fungi, pests, etc. Where identified, signs of substantial defects or debility have been recorded. Where access to a tree was not possible, an estimation of physiological and structural condition has been made.

Estimated Remaining Contribution (ERC) in Years

3.12. The Estimated Remaining Contribution (ERC) for each tree is based on species and the existing physiological and structural condition of the tree. The ERC may affect proposed development layout because the longer the tree is likely to live, the greater the contribution it will make and the greater the need for retention.

Category Grading

3.13. Each individual tree was given a Category Grading in accordance with BS5837 to reflect their overall quality and value. Further details of the tree categorisation method can be found in **Appendix A** and Section 7 of this report.

Preliminary Management Recommendations

3.14. Any recommendations made for management of the trees (for example, tree surgery) prior to development are not a 'specification' for tree work. These recommendations are proposed on the basis that they are undertaken by a qualified arboricultural contractor, such as those listed in the Arboricultural Association's Approved Contractors Directory (www.trees.org.uk). Any work undertaken by the contractor should be in accordance with best practice, such as the European Tree Pruning Guide[3], or required by BS3998: 2010 'Tree work – recommendations'[4].

3.15. Where management recommendations are made, they are accompanied by a recommended timeframe in which they should be undertaken.

[2] http://www.ancienttreeforum.co.uk/ancient-trees/what-are-ancient-veteran-trees/
[3] European Tree Pruning Guide, 2001, Arboricultural Association
[4] BS3998:2010 'Tree work - recommendations', 2010, BSI

4. Root Protection Area

4.1. The Root Protection Area (RPA) of a tree is defined in BS5837 as a "*layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability and where the protection of the roots and soil structure is treated as a priority".* For single stemmed trees it is equivalent to a circle with a radius 12 times the stem diameter when measured at 1.5m above ground level. BS5837 outlines the calculation of RPA as follows:

$$\text{RPA}(\text{m}^2) = \left(\frac{\text{stem diameter (mm) @ 1.5 m} \times 12}{1\ 000}\right)^2 \times \pi\ (3.142)$$

4.2. Trees with more than one stem originating below 1.5m above ground level are given an aggregate stem diameter using either of the following two calculations as outlined in BS5837. This diameter is then used in the above calculation to estimate RPA:

a) For trees with two to five stems:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$

b) For trees with more than five stems:

$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

4.3. The RPA of existing tree stock is an important material consideration when considering site constraints and planning development activities.

4.4. Unless there is an overriding justification for them, construction activities, materials storage or changes in level should be avoided within the RPA of a retained tree. This is because these operations have the potential to damage or kill the tree, the safe retention of which may be a condition of planning permission. If operations are proposed within the RPA of a retained tree, it may be necessary to prove to the relevant Local Planning Authority that:

- All other alternative solutions have been explored and proven unviable;
- That the tree can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA;
- That mitigation measures can be put in place to improve the soil environment that is used by the tree (if necessary).

5. Limitations

5.1. This report is intended to assist with the planning and management of construction, refurbishment and/or demolition operations under current best practice guidance. It focuses on measures which will need to be implemented to ensure the protection of retained trees. It is the responsibility of the design team and site manager to ensure that any recommendations made also comply with all relevant health, safety and construction guidance and legislation.

5.2. This report is concerned with the arboricultural features of the Site only. Ground condition/history information has not been consulted as part of this assessment (such as history of ground disturbance, root damage, changes in soil levels, previous utility installations or changes in site conditions) unless otherwise stated.

5.3. All trees were visually inspected from ground level with no climbing, boring or core sampling undertaken. All measurements are metric and approximate. The comments made are based on observable factors present at the time of inspection.

5.4. Trees that were not directly accessible at the time of survey have been denoted with a '*' and detailed in the comments section within **Appendix B**.

5.5. The tree survey was based upon existing topographical information relating to the Site, produced by MK Surveys and provided by the Applicant (drawing ref. 20338 Rev 8 dated May 2015). For the purposes of this report, it is assumed that the detail of the topographical survey is accurate and correct.

5.6. The design and construction of foundations on Site should be informed by appropriate soil sampling and laboratory testing in accordance with Chapter 4.2 of 'Building Near Trees' of the National House Building Council's Standards 2019. This report does not specifically relate to risks associated with subsidence, heave or other forms of disturbance associated with tree root growth or tree removal.

5.7. This report is not intended to confirm the safety (or otherwise) of surveyed trees or tree groups. References to defects or potential safety issues are not exhaustive and are intended as a guide only to inform the provision of further resources / more detailed investigations. The persons(s) responsible for the management of trees surveyed as part of this report are recommended to commission a separate Tree Condition Survey by a suitably qualified and experienced person in order to manage the health and safety aspects of trees under their control and discharge their reasonable 'Duty of Care' owed under the Occupiers' Liability Act 1984[5].

5.8. Owing to the changing nature of trees as living, dynamic features and other Site circumstances, the baseline survey results are representative of the arboricultural features on the date of survey only and are subject to change. The impact assessment is based on development proposals as provided to Waterman IE and contained in Drawing/Appendix ??. Any alteration to the application Site or development proposals could change the current circumstances and may invalidate this report and any recommendations made.

[5] Occupiers' Liability Act 1957 and 1984. HMSO

5.9. Unless otherwise stated, trees should be inspected regularly to satisfy the 'Duty of Care' owed under the Occupiers' Liability Act 1984[6], or directly after heavy storms (i.e. force 6-7 and above on the Beaufort scale). It is recommended that advice from an ecologist is sought prior to carrying out any works to trees, in order to ensure these are carried out in accordance with (in particular) the protection afforded to wild birds and bats under The Wildlife and Countryside Act[7] and The Conservation of Habitats and Species Regulations[8].

[6] Occupiers' Liability Acts 1957 and 1984. HMSO
[7] The Wildlife and Countryside Act 1981 (as amended), OPSI
[8] The Conservation of Habitats and Species Regulations 2010, OPSI

6. Tree Preservation Orders and Conservation Areas

6.1. Under Part VII of the *Town and Country Planning Act 1990* and as amended in the *Town and Country Planning (Tree Preservation) (England) Regulations 2012*, local planning authorities are given the powers to protect trees, groups of trees and woodlands through the provisions of a Tree Preservation Order (TPO). TPOs prohibit:

- cutting down;
- topping;
- lopping;
- uprooting;
- wilful damage; and
- wilful destruction without the local planning authority's written consent.

6.2. All trees with a stem diameter above 75mm in diameter when measured at 1.5m above ground level are also afforded protection if they are located within a Conservation Area.

6.3. A check carried with Cherwell District Council has indicated that none of the trees present on the Site were afforded protection through the provisions of a TPO and no part of the Site is located within a Conservation Area.

7. Existing Tree Stock

7.1. The tree stock on the Site forms three distinct areas. A partly managed and partly unmanaged hedge forms the northern verge of the A41 and within that hedge are a number of small trees. To the south of the A41 is an area of maturing horse chestnuts, white willows and common limes which form a visually significant feature at the old entrance to the Graven Hill military base, however many of these trees have been found to be in a poor structural physiological condition, significantly shortening their useful life-expectancy. To the south-east of the Site is a developing woodland plantation.

7.2. Further details relating to the existing tree stock on or adjacent to the Site can be found in **Appendix B** and on **Drawing 1**.

Quality Category Grading

7.3. Each arboricultural feature was given a Category Grading in accordance with the principles of BS5837. The Category Gradings are defined according to the following criteria, which are further divided into sub-categories based on arboriculture, landscape and/or historic/cultural value, as defined within BS5837 and contained at **Appendix A**. Table 1 summarises the arboricultural features by category.

- **Category Grading A:** Trees of high quality and value (with an estimated remaining life expectancy of at least **40 years) (coloured green on** Drawing 1**).**
- **Category Grading B:** Trees of moderate quality and value (with an estimated remaining life expectancy of at least 20 years) (coloured blue on **Drawing 1**).
- **Category Grading C:** Trees of low quality and value (with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter less than 150mm) (coloured grey on **Drawing 1**).
- **Category Grading U:** Trees which are in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years (coloured red on **Drawings 1**).

Table 1 Summary of tree features by category

	Tree Numbers & BS5837 Categories				
	Cat A	Cat B	Cat C	Cat U	Total
Trees	N/A	T698, T699, T701, T703, T704, T729, T730, T732, T904, T905, T906, T907, T908, T919, T920, T921, T922, T943, T945	T697, T700, T731, T898, T899, T900, T901, T902, T903, T909, T910, T913, T914, T915, T916, T917, T918, T923, T924, T925, T926, T927, T928, T929, T931, T932, T933, T934, T935, T936, T938, T939, T940, T941, T942, T946, T947, T948, T949, T950	T702, T911, T912, T930, T937, T944	**65**
Groups	N/A	N/A	N/A	N/A	**0**
Woodlands	N/A	W649	N/A	N/A	**1**
Hedgerows	N/A	N/A	H951, H952	N/A	**2**
Total	**0**	**20**	**42**	**6**	**68**

8. Arboricultural Impact Assessment

8.1. The Development proposals as shown on the Tree Protection and Removal Plan (TPRP) which is contained as **Drawing 2** comprise the creation of a new roundabout to replace the existing T-junction and its associated footpaths and cycleways.

8.2. The proposed layout shown on **Drawing 2** was taken from theA41 Pioneer Road Roundabout General Arrangement Drawing (Drawing ref. WIE11386-145-03-001) which is contained as **Drawing 3**.

8.3. The relationship between the proposed Development and the existing tree stock has been assessed taking into account existing site-specific factors such as topography, waterbodies and existing built form.

8.4. **Table 2** identifies the impact of the proposed layout on those trees under the following headings**:**

i. **Trees to be removed**: Trees will need to be removed if they are directly under proposed structures; if they are so close to proposed works that the impact of the works on the roots or crowns of the tree will render the retention of the tree unviable; if they create an unacceptable constraint on occupants of the site post construction (shading, nuisance etc.); for reasons of sound arboricultural management;

ii. **Trees to be retained but requiring additional protection**: Trees fall into this category where the assessment has identified that they can be retained, but additional protection measures may be required to ensure their continued health and structural integrity. This is usually where works are proposed within their RPA or below their crowns; and

iii. **Trees unaffected by the development proposals**: These are trees which are unaffected by the works and can therefore safely be retained. These trees are still likely to require protection through the placement of Tree Protection Barriers.

Table 2 Arboricultural Impact Assessment

	Tree Numbers				
	Cat A	Cat B	Cat C	Cat U	Total
Trees unaffected by the development proposals	N/A	T698, T699, T701, T703, T704,	T697, T700, T947, T948, T949, T950, H951	T702	13
Trees to be retained but requiring additional protection	N/A	N/A	N/A	N/A	0
Trees to be removed	N/A	W649 (in part), T729, T730, T732, T904, T905, T906,T907, T908,T919, T920,T921, T922,T943, T945	T731, T898, T899, T900, T901, T902, T903, T909, T910, T913, T914, T915, T916, T917, T918, T923, T924, T925, T926, T927, T928, T929, T931, T932, T933, T934, T935, T936, T938, T939, T940, T941, T942, T946, H952 (in part)	T911, T912, T930, T937, T944	55
				Total	**68**

9. Proposed Tree Works

9.1. **Table 1** provides details of all trees and tree groups which will be removed to facilitate the Development.

9.2. These tree works will not be undertaken until a full planning approval has been granted for the proposed Development and they will be undertaken by a suitably qualified, experienced and insured tree works contactor with the works compliant with best practice, such as the European Tree Pruning Guide[9], or required by BS3998: 2010 'Tree Work – Recommendations'[10].

9.3. Tree work will be timed to avoid the bird nesting season and other potential ecological constraints with legally protected species, subject to consultation with an ecologist. If required, tree surgery work on trees with deadwood, cavities, split/lifted bark and dense ivy should be carried out under an Ecological Watching Brief. Care will be taken not to damage any surrounding vegetation to be retained.

[9] European Tree Pruning Guide, 2001, Arboricultural Association
[10] BS3998:2010 'Treework - Recommendations', 2010, BSI

10. Tree Protection Measures

Site Monitoring

10.1. A retained Arboricultural Consultant will be appointed prior to the commencement of any works on Site. Their purpose will be to ensure compliance with all agreed tree protection measures. As a minimum, a pre-commencement site meeting should be held with a representative of the appointed contractor(s), the retained Arboricultural Consultant and a representative of Cherwell District Council. The purpose of this meeting will be to agree the location and design of any tree protection barriers, as well as to agree the need for / frequency of any on-going arboricultural clerk-of-works visits.

Construction Exclusion Zone

10.2. Many of the retained trees will be in close proximity to construction work, and therefore tree protection will be required to mitigate for potential above and below ground impacts and ensure these trees are retained successfully. The factors which most commonly result in below ground damage affecting oxygen diffusion (and therefore must be avoided) include:

- Compaction of the ground;
- Any change in soil levels (even if temporary), including ground excavation and soil stripping;
- Covering the root zone with impervious surfaces;
- Changes in the water table level or ground saturation; and
- Damage by the direct toxicity of phytotoxic materials, dust and runoff.

10.3. A **Construction Exclusion Zone (CEZ**) will be established around these trees where no unauthorised access or construction operations (including Site compounds / facilities / storage of materials) are permitted to protect the ground from compaction or excavation and canopies from physical damage. This will be secured by means of temporary protective fencing with weatherproof signage.

10.4. Following the principles set out in section 6.2.2 of BS5837, these barriers should be "*fit for the purpose of excluding construction activity and appropriate to the degree and proximity of the work taking place around the retained trees*". In this instance, the tree protection barriers will consist of braced 2m tall weldmesh panels on rubber or concrete feet, with each panel being secured to the next by at least two couplers installed so they can only be removed from the inside. The feet and the braces will be secured to the ground using metal pins. An example of this fencing is contained in **Appendix C.**

10.5. All weather notices should be secured to the barrier, examples of which are contained in **Appendix D**.

Utility Connections

10.6. At the time of writing this report, the locations of any proposed service runs are not known. If for any reason services are required to be located within the RPAs of the retained trees, the following precautions will be followed:

- Mechanical trenching will not be permitted within the RPA.
- To limit the extent of any excavations, and where possible, any services will be located within shared ducts.
- The preference will be to install the services using trenchless technology, but where this isn't viable, the trenches will be dug using hand tools and under the supervision of the retained arboricultural consultant. Roots over 25mm in diameter will be retained. Where this is not possible, they will only be severed if approved by the retained arboricultural consultant.
- Any trenches within RPAs will be backfilled using the native material or another inert granular material.

11. Summary

11.1. For the reasons set out in this report, it is felt that the proposed Development will not have a long-term negative impact on the tree stock within the Site, provided that the recommendations contained in this report are followed,

11.2. A total of 68 individual trees, groups of trees and hedgerows are shown on drawings 1 and 2 and are considered to be pertinent to the Development. Of these arboricultural features, 20No. were awarded a moderate B grade and 42No. were awarded a low C grade. The remaining 6No. were awarded a very low U grade and should be removed for reasons of sound arboricultural management irrespective of any development proposals.

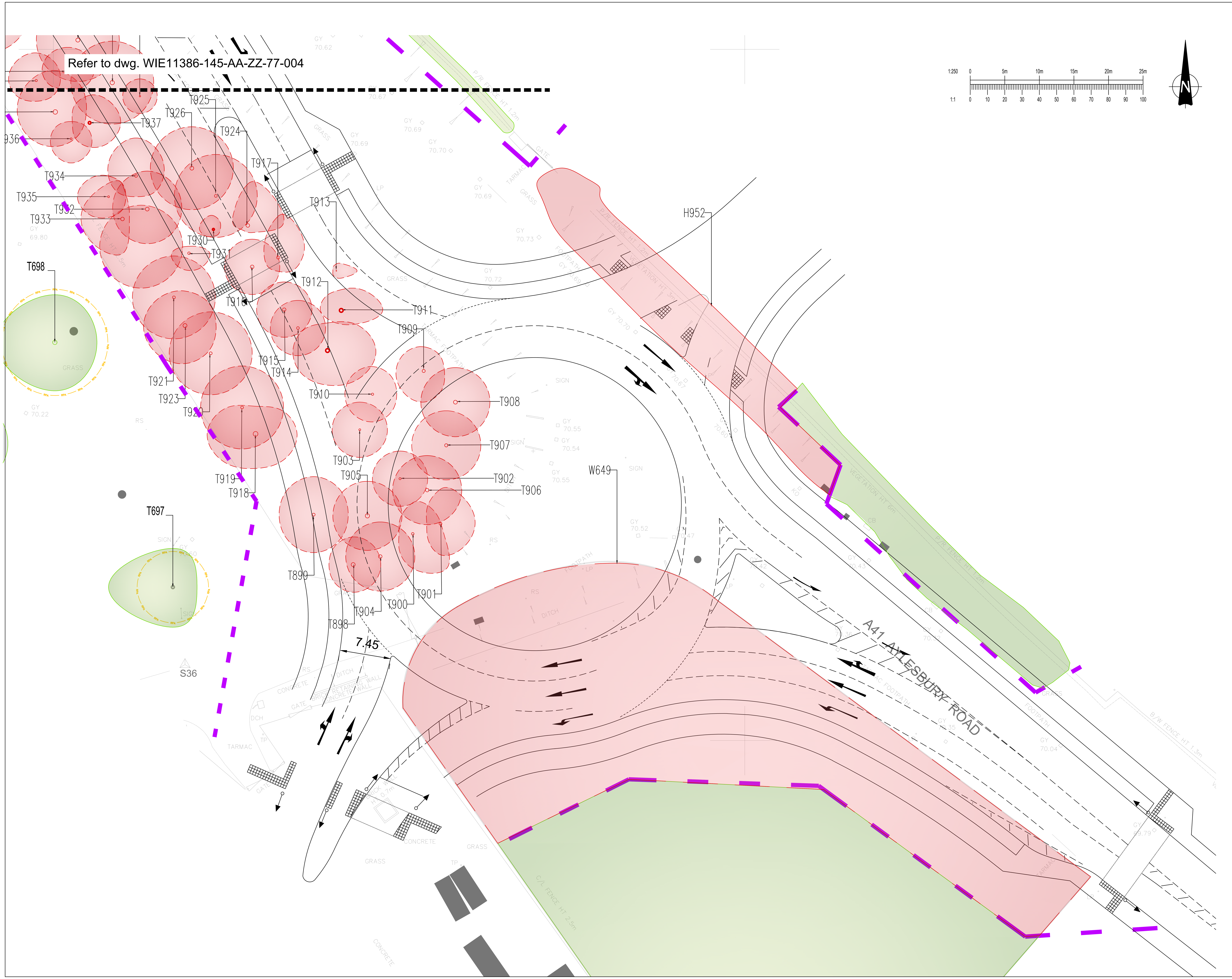
11.3. A total of 55No. arboricultural features will be removed to facilitate the Development. Of these, 15No. were awarded a moderate B grade and 35No. were awarded a low C grade. A further 5No. U grade trees will be removed for reasons of sound arboricultural management.

11.4. At the time of writing this report, none of the trees present on the Site were afforded protection through the provisions of a Tree Preservation Order and no part of the Site is located within a Conservation Area.

DRAWINGS

Drawing 1: Tree Survey Plan (Drawing ref. WIE11386-145-AA-ZZ-77-001 to 002)

Drawing 2: Tree Protection and Removal Plan (Drawing ref. Drawing ref. WIE11386-145-AA-ZZ-77-003 to 004)



LEGEND

- TREES, GROUPS OR HEDGES TO BE RETAINED
- TREES, GROUPS OR HEDGES TO BE REMOVED
- ROOT PROTECTION AREAS (RPA)
- TREE PROTECTION BARRIER

NOTES:

ROOT PROTECTION AREA
Root Protection Areas are calculated in accordance with BS5837: 2012. The precise morphology and disposition of roots may not be fully reflected by these areas, particularly where there are hard standings, however they provide a good indication of potential root constraint.

THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH WATERMAN TREE SURVEY REPORT

Rev	Date	Description	By
P01	26.06.20	PRELIMINARY	LT

Amendments

Project
A41 PIONEER ROAD AND ROUNDABOUT

Title
TREE RETENTION AND REMOVAL PLAN
SHEET 1 of 2

Client
Graven Hill Village Development Company Limited

Waterman

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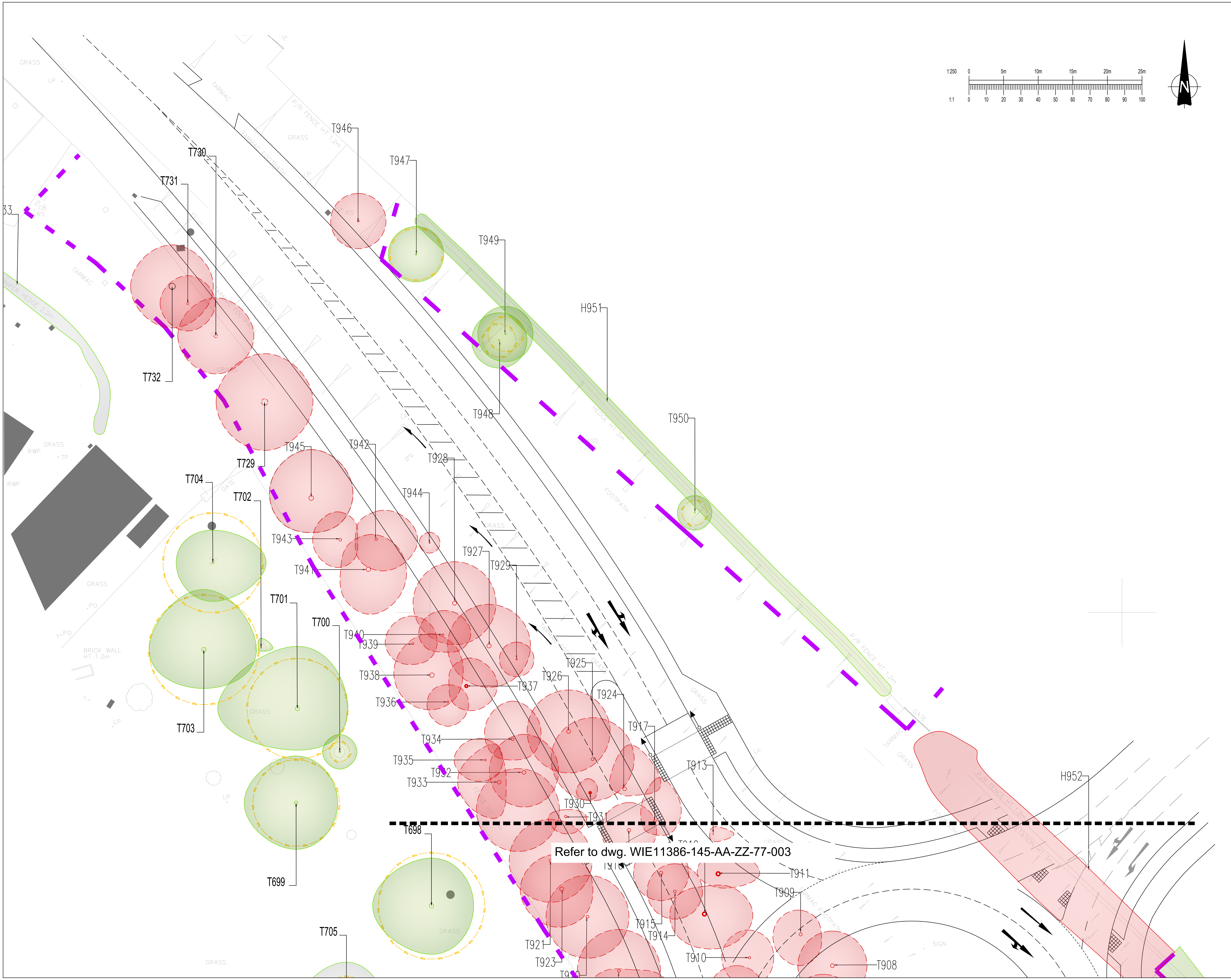
Drawing Status
PRELIMINARY

Designed by	RH/RA	Checked by	RH	Project No	WIE11386
Drawn by	LT	Date	JUNE 2020	Computer File No	WIE11386-145-AA-ZZ-77-002.dwg

Scales @ A1
work to figured dimensions only

Publisher	Zone	Category	Number	Revision
WIE	ZZ	77	003	P01

A1-Wat-S-GHVDC_X_Tree Survey_TCP Bicester



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Rev	Date	Description	By
P01	26.06.20	PRELIMINARY	LT

Amendments

Project
A41 PIONEER ROAD AND ROUNDABOUT

Title
TREE RETENTION AND REMOVAL PLAN SHEET 2 of 2

Client
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Drawing Status
PRELIMINARY

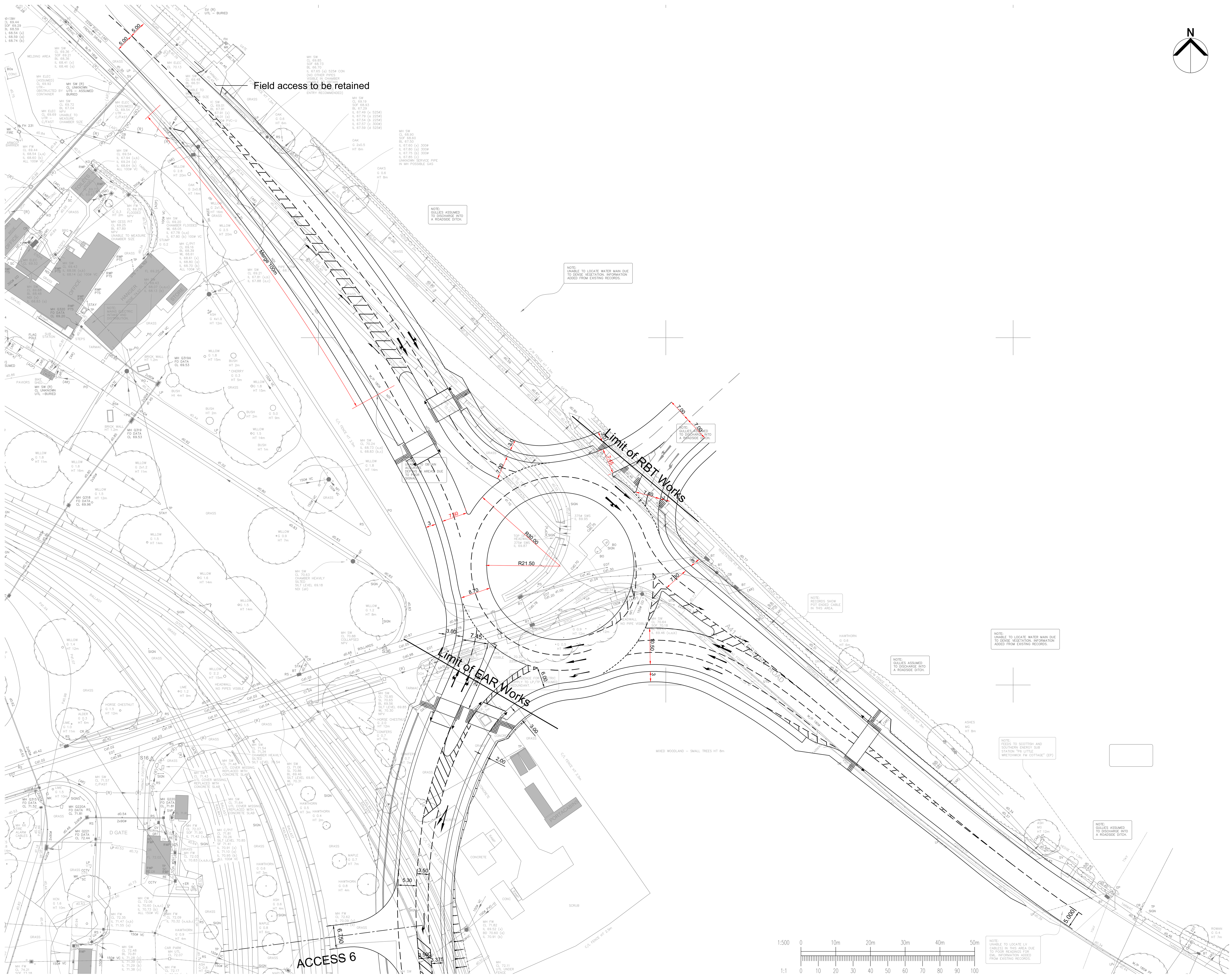
Designed by	RH/RA	Checked by	RH	Project No WIE11386
Drawn by	LT	Date	JUNE 2020	
Scales @ A1 work to figured dimensions only				Computer File No WIE11386-145-AA-ZZ-77-002.dwg

Publisher	Zone	Category	Number	Revision
WIE	ZZ	77	004	P01

A1-Wat-S-GHVDC, X_Tree Survey_TCP Bicester

File Path \\S-bm\wiel\Projects\WIE11386_GH0_LTA 2\#WO145_A41 ROUNDABOUT_Got PO7_CAD\77_Arb\

Drawing 3: Proposed Site GA Plan (Drawing ref. WIE11386-145-03-001)



GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEER'S, ARCHITECT'S OR OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
3. THE CONTRACTOR MUST ENSURE AND WILL BE HELD RESPONSIBLE FOR THE OVERALL STABILITY OF THE BUILDING/STRUCTURE/EXCAVATION AT ALL STAGES OF THE WORK.
4. ALL WORK BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.

FOR INFORMATION

Rev	Date	Description	By
A01	15.06.20	ISSUED	AN

Amendments

Project
GRAVEN HILL

Title
A41 PIONEER ROAD ROUNDABOUT
GENERAL ARRANGEMENT

Client
Graven Hill Village Development Company Limited

Waterman
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t 0121 212 7700
mail@watermangroup.com www.watermangroup.com

Drawing Status
PRELIMINARY

Designed by	AN	Checked by	DP	Project No
Drawn by	AN	Date	JUNE 2020	11386
Scales @ A1 work to figured dimensions only		1:500		Computer File No WIE11386-145-03-001-A41 Pioneer Rbt General Arrangement.dwg

Publisher	Zone	Category	Number	Revision
WIE	A41	03	001	A01

File Path \\H-bm\wiel\Projects\WIE11386_GH\0_LTA 2\#WO145_A41 ROUNDABOUT_Got PO\7_CAD\03_Preliminary\

A1-Wat-S-GHVDC, Combined Hway LTA2 Boundary, S38-RDB-CAD within HB a04, Site boundary, Survey R15 1106 MK-SERR

APPENDICES

A. Cascade Chart for Tree Quality Assessment (extract from BS5837)

TREES FOR REMOVAL				
Category and Definition	**Criteria**			**Identification on Drawing / Within Tree Schedule**
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• 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 trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning); • Trees that are dead or are showing signs of significant, immediate, and 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. NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve.			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
Category and Definition	**Criteria - Subcategories**			**Identification on Drawing / Within Tree Schedule**
	1 Mainly Arboricultural Values	2 Mainly Landscape Values	3 Mainly Cultural Values, including Conservation	
Category A **Trees of high quality** with an estimated remaining life expectancy minimum of at least 40 years	Trees that are particularly good examples of their species, especially if 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, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually 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	Trees with material conservation or other cultural value	MID BLUE
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	GREY

B. Schedule of Existing Trees

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
W649	*Ash,* Rose, Lime, English Oak, Cherry, Goat Willow , Bramble	7.0	75	N/A						Fair to Good	SM	Located outside of boundary fence adjacent to access road. Some redundant stakes and grading guards within. Some deadwood within.	Consider selective thinning to favour better specimens.	40+	B1 / 2
T697	Weeping Willow	10.0	430	5.6	5.8	3.5	9.3	2.5 (W)	2.0	Poor	SM	Located within mown grass. Located adjacent to a recently constructed path to the east. Canopy appears thin in comparison with adjacent trees of the same species. Deadwood present in lower canopy.	None.	10+	C1 / 2
T698	Silver Maple	8.0	640	6.9	7.0	6.1	8.5	Forks at 2.0	1.5 (SW)	Fair	EM	Located within mown grass. Epicormic growth appears to have been recently removed from stem.	None.	40+	B1
T699	Weeping Willow	10.0	520	6.8	6.7	6.0	7.5	1.8 (N)	2.0	Fair	EM	Located within mown grass. Historic pruning present with varying levels of wound wood development. Evidence of historic canopy lifting. Minor canopy deadwood present.	None.	20+	B1
T700	Spindle	4.0	120*	Av. 2.5				Forks at 1.7	2.0	Fair	SM	Located within mown grass. Forms a hedge at the base with a main leader rising from the centre. Lower 'hedge' portion maintained.	None.	20+	C1
T701	Weeping Willow	10.0	605	9.0	6.0	7.3	6.0	1.8 (W)	2.0	Fair	EM	Located within mown grass. Good buttress root development. Some deadwood and canopy dieback located within the lower canopy.	Monitor overall health via resurvey in 18 months.	20+	B1
T702	Cherry	6.0	90	1.4	0.5	1.7	0.4	Forks at 2.0	2.5 (N)	Poor	Y	Located within mown grass. Main trunk leans to the east. Poor form and poor foliage development.	Remove and replace.	<10	U

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
T703	Weeping Willow	9.0	660	8.7	5.6	7.6	7.9	1.8 (N)	2.5	Fair	EM	Located within mown grass. Some branch stubs and deadwood Noted in lower canopy.	None.	40+	B1
T704	Ash	10.0	M/S x 4, Av. 300	4.7	5.6	7.7	5.3	M/S from 0.3	1.5 (W)	20+	EM	Located within mown grass. Dense Ivy *(Hedera helix)* growth present to 9.0m up trunk and into canopy with limited visual access as a result.	Monitor for signs of Ash Dieback	20+	B1
T729	White Willow	13.0	950	Av. 7.0	#	#	#	1.7 (S)	1.8 (SW)	Fair	M	Located within mown grass. Several leaders present.	None.	40+	B1
T730	White Willow	12.0	M/S x 2, 410, 540	Av. 5.5	#	#	#	Forks at 0.3	2.0 (N)	Fair	EM	Located within mown grass. Canopy comprises low branching form.	None.	40+	B1
T731	English Oak	9.0	370	Av. 4.0	#	#	#	Forks at 1.5	2.0 (N)	Fair	Y	Located within mown grass. Being overshadowed by adjacent trees.	Consider removal in the longer term due to supressed nature.	20+	C1
T732	White Willow	16.0	900*	Av. 6.0	#	#	#	Forks at 1.75	1.7	Fair	M	Located within mown grass. A dead limb is present on the south side. Evidence of previous pollarding at approximately 8.0m Ht. Large would with decay present c.1.0m Ht. on NE side. Historic mower damage Noted to buttress and exposed shallow surface roots.	Monitor overall health via resurvey in 18 months.	20+	B1
T898	Common lime	11	580	4.0	4.0	4.0	3.5	3 (S)	1.5	Good	EM	Single trunk; basal growth; previously pollarded.	None.	40+	C1
T899	Common lime	13	415	5.5	5.5	5.0	5.0	3 (NE)	1.5	Good	SM	Twin stemmed from 2.5m with included bark union; surface roots with damage on upper sides.	None.	40+	C1
T900	Weeping willow	10	380	4.5	5.0	4.5	2.0	4 (SE)	1	Poor	SM	Single trunk; pruning wound on trunk at 2.5m; die back in crown; sparse leaf coverage.	None.	20+	C1
T901	Common Horse Chestnut	9	415	5.0	4.5	5.0	2.0	3 (SE)	2	Poor	SM	Single trunk; bleeding canker on trunk; wound on trunk from ground level to 2m.	None.	20+	C1 2

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
T902	Common Horse Chestnut	11	310	Av. 4				2 (SE)	2	Fair	Y	Pair of young trees; previously crown lifted.	None.	40+	C1 2
T903	Common Horse Chestnut	11	280	Av. 4				2 (SE)	2	Fair	Y		None.	40+	C1 2
T904	White willow	18	515	Av. 5				2 (E)	3	Fair	EM	Group of trees growing within grassed area adjacent to A41;#10 die back in crown;#10 included bark union at 4.5m;#10 pruning wounds on trunk;#11 previously pollarded.	None.	40+	B2
T905	White willow	18	615	Av. 5				2 (E)	3	Fair	EM		None.	40+	B2
T906	White willow	18	505	Av. 5				2 (E)	3	Fair	EM		None.	40+	B2
T907	White willow	18	470	Av. 5				2 (E)	3	Fair	EM		None.	40+	B2
T908	White willow	18	560	Av. 5				2 (E)	3	Fair	EM		None.	40+	B2
T909	Weeping willow	10	450	3.5	4.5	3.0	4.0	3 (S)	1.5	Poor	SM	Single trunk; woodpecker hole at 2.5m; sparse leaf coverage; die back in crown; previously pollarded.	None.	20+	C1 2
T910	White willow	15	330	4.0	4.0	3.5	4.0	4 (se)	5	Poor	Y	Single trunk; die back in crown; tear out wound at 6m.	None.	40+	C1 2

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
T911	White willow	11	530	3.0	2.0	6.0	3.0	3 (S)	2	Poor	EM	Single trunk; decay on trunk at 1.5m; previous limb failure; previously pollarded.	None.	>10	U
T912	White willow	17	550	4.0	5.0	7.0	5.0	3 (E)	4	Poor	EM	Decayed trunk extending into canopy; multi stemmed from 2.5m with poor unions; die back in crown.	None.	>10	U
T913	Goat willow	5	105	1.0	1.0	3.0	0.5	1	0.5	Poor	Y	Young scrubby tree.	None.	40+	C1 2
T914	White willow	16	390	Av.4				4	4	Poor	EM	Three trees growing in a row; die back in crowns; sparse leaf coverage.	None.	40+	C1
T915	White willow	16	490	Av.4				4	4	Poor	EM		None.	40+	C1
T916	White willow	16	520	Av.4				4	4	Poor	EM		None.	40+	C1
T917	White willow	11	450	6.0	2.0	3.5	2.0	2.5 (NE)	1	Fair	EM	Single trunk; previously pollarded; asymmetric canopy due to adjacent trees.	None.	40+	C1
T918	White willow	19	420; 420; 355	4.0	5.0	6.0	7.0	4 (W)	2	Poor	M	Three stemmed from 1m; sparse leaf coverage; die back in crown; surface roots with damage on upper sides.	None.	40+	C1
T919	Common lime	14	400	Av. 6				3	1.5	Good	EM	Four trees growing in a row; basal growth; surface roots with damage on upper sides.	None.	40+	B12
T920	Common lime	14	420	Av. 6				3	1.5	Good	EM		None.	40+	B12
T921	Common lime	14	420	Av. 6				3	1.5	Good	EM		None.	40+	B12
T922	Common lime	14	360	Av. 6				3	1.5	Good	EM		None.	40+	B12
T923	White willow	17	580	5.0	5.5	4.5	6.0	3.5 (W)	5	Poor	EM	Single trunk; evidence of cracking down length of trunk with woodpecker hole at 1.5m; sparse leaf coverage; die back in crown.	None.	20+	C1

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
T924	White willow	12	290; 360; 250	6.0	1.0	5.0	2.0	4 (N)	1	Fair	SM	Three stemmed from 1m; previously pollarded; decay on stem to SW from ground level to 5m.	None.	20+	C1 2
T925	White willow	15	410	Av. 6				4	2	Poor	EM	Four trees growing in a row adjacent to footpath; previously pollarded; sparse leaf coverage; poor pollard attachment points.	None.	40+	C1
T926	White willow	15	550	Av. 6				4	2	Poor	EM		None.	40+	C1
T927	White willow	15	620	Av. 6				4	2	Poor	EM		None.	40+	C1
T928	White willow	15	580	Av. 6				4	2	Poor	EM		None.	40+	C1
T929	Common Hawthorn	4	140; 150	Av. 2.5				1	1	Good	Y	Young scrubby tree; stem diameters measured at 0.5m above ground level.	None.	40+	C1 2
T930	White willow	11.5	280	2.0	1.0	1.0	2.0	3 (S)	3m	Poor	Y	Single trunk; wound with decay on trunk from ground level to 2m with evidence of cracking.	None.	>10	U
T931	White willow	14.5	375	1.0	2.5	3.0	2.5	4 (SW)	3	Poor	SM	Single trunk; die back in crown.	None.	>10	C1 2
T932	White willow	20	545	5.5	5.0	5.0	5.0	5 €	5	Poor	EM	Single trunk; die back in crown; dead wood in crown; large tear out wound at 5m with woodpecker hole.	None.	20+	C1 2
T933	White willow	16	520	5.0	5.0	1.0	6.0	6 (S)	6	Poor	EM	Single trunk; sparse leaf coverage; surface roots with damage on upper sides; epicormic growth on trunk.	None.	40+	C1
T934	Common Horse Chestnut	12	385	5.5	3.0	4.0	4.0	3 (N)	2	Fair	SM	Three stemmed from 2.5m; previously crown lifted.	None.	40+	C2
T935	Common lime	11	220; 165	3.0	3.0	2.5	4.5	2.5	2	Fair	Y	Twin stemmed from 1.2m; young tree.	None.	40+	C2
T936	Common lime	9	275	2.5	3.5	3.0	3.0	2.5 (S)	2	Fair	Y	Single trunk; surface roots with damage on upper sides; young	None.	40+	C2

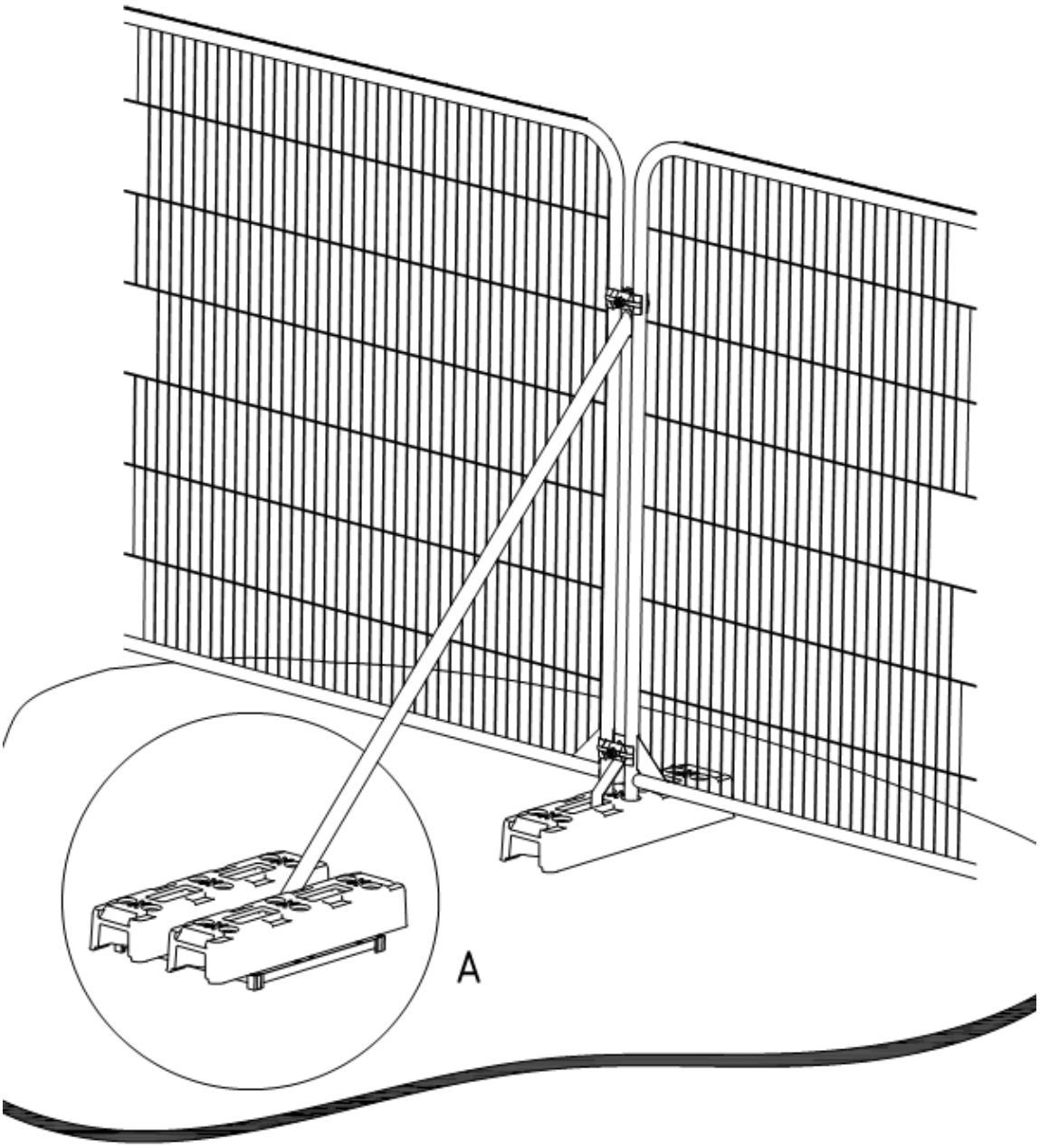
Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
												tree; large buttress roots, with wounding.			
T937	Common Horse Chestnut	14	390	4.0	3.5	4.5	2.5	2.5 (S)	2.5	Poor	Y	Single trunk; bleeding canker on trunk extending into canopy.	None.	>10	U
T938	White willow	18	430; 495	6.0	5.0	4.5	5.5	4 (S)	4	Poor	M	Twin stemmed from 1.5m; sparse leaf coverage; die back in crown; deadwood in crown.	None.	20+	C1
T939	Common lime	14	320	4.0	3.0	3.5	4.0	3.5 (N)	1.5	Fair	Y	Single trunk; twin stemmed from 3.5m; basal growth.	None.	40+	C2
T940	Common Horse Chestnut	12	260	3.5	2.5	4.0	3.5	2 (W)	2	Fair	Y	Single trunk; young tree; mechanical damage at base.	None.	40+	C2
T941	White willow	18	445; 480	5.0	6.5	5.5	4.0	4 (W)	3	Poor	M	Single trunk; sparse leaf coverage; die back in crown; wound on stem to NE from 2m to 6m; deadwood in crown.	None.	40+	C1
T942	Common Horse Chestnut	11	365	4.0	4.5	6.0	3.0	2 (E)	1.5	Fair	Y	Single trunk; young tree.	None.	40+	C2
T943	Common lime	12	405	4.0	4.0	2.5	4.0	3.5 (SW)	1.5	Fair	SM	Single trunk; basal growth; surface roots with damage on upper sides; leaning towards NE.	None.	40+	B12
T944	Goat willow	5.5	105; 65; 65; 100	Av. 1.5				1.5m	1.5	Poor	Y	young small tree in decline.	None.	>10	U
T945	White willow	17	680	7.0	5.0	6.0	6.0	2.5 (w)	1.5	Good	OM	Single trunk; previously reduced; readily visible in views from adjacent A41.	None.	40+	B12
T946	English oak	7	270	Av. 4				0.5m	0.5	Good	Y	Young roadside hedgerow trees.	None.	40+	C2
T947	English oak	7	270; 270	Av. 4				0.5m	0.5	Good	Y	Young roadside hedgerow trees.	None.	40+	C2
T948	English oak	7	200	Av. 4				0.5m	0.5	Good	Y	Young roadside hedgerow trees.	None.	40+	C2
T949	English oak	7	210	Av. 4				0.5m	0.5	Good	Y	Young roadside hedgerow trees.	None.	40+	C2
T950	Field maple	7	150	Av. 2.5				2m	1.5	Good	Y	Young hedgerow tree.	None.	40+	C1 2

Ref. No	Species	Estimated Height (m)	Stem Dia. (mm)	Canopy Spread (m) North	Canopy Spread (m) South	Canopy Spread (m) East	Canopy Spread (m) West	Direction of First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Age	Observations and Conditions	Preliminary Management Recommendations	Estimated Remaining Contribution (years)	Cat.
H951	Field maple, Blackthorn and Common Hawthorn	2.5	Av. 50	Av. 0,5				0.5m	0	Good	SM	Field boundary hedgerow.	None.	40+	C1
H952	Field maple, English elm, Common Hawthorn and Ash	7	Av. 75	Av. 2.0				0.5m	0	Fair	Y	Unmanaged hedgerow.	None.	40+	C1 2

Notes

- Any management recommendations in this report subject to presence of nesting birds or protected species (e.g. Bats) checks.
- Any tree surgery recommendations contained within this report to be undertaken in accordance with BS3998(2010) 'Tree work – Recommendations' (BS3998)
- Fieldwork survey information provided within this table is subject to seasonal/access constraints.
- N/A - measurement not accessible/applicable.
- '*' - estimated position of tree (not indicated on topographical survey);
- '^' – average value based upon average of remaining measurements or visual estimate.
- Unless otherwise stated, all group dimensions are an estimated average.
- This schedule should be read in conjunction with **Drawing 1.**

C. Example Specification for Tree Protection Barrier.



D. Tree Protection Signage (Example)

Waterman

UK and Ireland Office Locations