ArbWales

BS 5837 Development Site survey.

Maesydderwen, Cardigan, Ceredigion.

Contents

Appendix B	Tree constraints plan and BS categorization.
Appendix C	Root Protection Areas (RPAs) of retained trees.
Appendix D	Fence positioning and CEZ (construction exclusion zone)

1. Introduction

1.1 Terms of Reference

Arbwales was commissioned by Trevor Hopkins Associates to undertake a Tree Survey of all trees in the vicinity of a proposed development project at Maesydderwen, Cardigan, Ceredigion.

The survey has been produced in accordance with British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*
The Tree Survey is intended to inform and influence the design and layout of a new residential development. The aim of this survey is to provide information on the location, quality and condition of trees in order to ensure that the proposed scheme complies with the requirements of both BS5837:2012 and the Local Planning Authority with regards to minimising or where possible avoiding impact on the above and below ground parts of any retained trees, in particular those with existing statutory protection. It is also the aim of the survey and assessment to give pragmatic advice about the removal of trees or particular surgery works where deemed necessary to the successful delivery of the scheme.

1.2 Scope of Works

A survey of Maesydderwen was carried out on Saturday 9th May 2020 by Ian Jones MArborA, Arboricultural Consultant for Arbwales. Ian has 25 years of professional experience in Arboriculture, has completed the Level 4 Techcert in Arb, holds the Lantra Professional Tree Inspection qualification and is a Member of the Arboricultural Association. He manages large tree safety inspection contracts on behalf of local authorities and Welsh Government and is experienced in producing BS5837:2012 related tree planning work.

The weather on the day of the survey was sunny and warm. All of the trees on and adjacent to the proposed development site were inspected using the Visual Tree Assessment (VTA) methodology, detailed in "The Body Language of Trees" (*Mattheck & Breloer,* HMSO, 1994). This level of inspection does not involve any climbing. Each individual tree was inspected separately and an assessment made of its condition. Any problems with individual trees were noted and remedial work is recommended here only where it is deemed necessary.

Details of all trees are listed in the schedule below with quantitative and qualitative information included as required by BS 5837:2012 sections 4.4 to 4.6. The information has been used to create a Tree constraints plan, showing the location of the trees and BS categorization (Appendix B) A Tree retained trees plan, (Appendix C) indicates the Root Protection Areas (RPAs) for each of the trees and all other constraints that may impact on the design of the development. And (appendix D) showing the positioning of protective fencing to create the CEZ (Construction exclusion zone).

1.3 Site Description

Maesydderwen pumping is located to the north western part of the town of Cardigan, within the Mwldan catchment. The site is accessed via a padlocked gate at the north of the site through the Maesydderwen residential estate. To the south it borders a newly built hospital and integrated care centre. The site is a green field site formerly used for grazing, as such it, it is surrounded by maintained field hedges with scattered, mostly mature native trees.

1.4 Soils

The site has been subject to a change in levels, most notably on the eastern boundary, Soilscapes map of the United Kingdom (developed and hosted by Cranfield University) shows that the site is located within Soilscape 17 which is described as being 'Slowly permeable seasonally wet acid loamy and clayey soils'. It should be noted that a site-based soil assessment was not carried out as a part of this survey.

2. Tree Survey

This chapter is supported by the plans included in Appendix B, C and D of this report.

2.1 Designations

Legal constraints posed by the designation of Tree Preservation Orders or Conservation Area status **MUST** be clarified prior to any tree works taking place on site.

2.2 Tree categories

All trees on the property have been assessed and categorised in accordance with the guidelines in BS5837:2012. The following table includes a brief summary of the categories with more details provided in Table 1 of the British Standard (included in Appendix D).

Trees to be considered for retention	
Category A	Trees of **high** quality with an estimated remaining life expectancy of at least 40 years.
Category B	Trees of **moderate** quality with an estimated remaining life expectancy of at least 20 years.
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.
Trees unsuitable for retention	
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.

2.3 Root Protection Areas (RPAs)

The RPAs for the trees recorded by the tree survey have been calculated in accordance with the guidance in chapter 4.6 of BS5837:2012. For single stem trees, the RPA is equivalent to a circle with radius 12 times the stem diameter.

For trees with between two to five stems, the combined stem diameter is calculated by finding the square root of the sum of the stem diameters^2. For trees with more than five stems, the combined stem diameter is calculated by finding the square root of the sum of the mean stem diameter^2 multiplied by the number of stems.

2.4 Limitations

Tree locations were recorded by taking a GPS reading using a Trimble TCH100 Series handheld data collector with accuracy between 1-3m.

2.5 Schedule of Trees

The table below summarises the trees surveyed within the vicinity of the proposed development site at Wheathampstead Pumping Station. Please refer to Appendix A for a *Description of Terms*.

BS5837 Report

Ref	Species	Full Structure	Measurements	Spread	General Observations	Retention Category	RPA	Measurements2	Recommendations
T001	Oak (Quercus sp.)	Tree 2 stems	Height (m): 14 2 stems, avg.(mm): 600 Spread (m): 5N, 6E, 8S, 7W Lowest Branch (m): 4 Life Stage: Mature	N:5 E:6 S:8 W:7	Small mature Oak Tree in early senescence. Numerous large dead wood over 50mm visible in crown. No significant structural defects visible. Grade change and soil heaping at Base.	B1,2	Radius: 10.2m. Area: 327 sq m.	Other Reference: 0954 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Low	Pre construction: Dead wood (major greater than 25mm). During construction: Protect trees with protective barriers as shown on plans. Post construction: No action required.

T002	Oak (Quercus sp.)	Tree	Height (m): 9 Stem Diam (mm): 180 Spread (m): 32N, 2E, 2S, 2W Life Stage: Young	N:32 E:2 S:2 W:2	Young Oak Tree with upright compact form. Good visible condition.	A1,2	Radius: 2.2m. Area: 15 sq m.	Other Reference: 0924 Physical Condition: Good Amenity Value: Medium Bat Habitat: None	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans. Post construction: No action required.
T003	Oak (Quercus sp.)	Tree	Height (m): 10 Stem Diam (mm): 280 Spread (m): 2N, 2E, 5S, 5W Life Stage: Semi Mature	N:2 E:2 S:5 W:5	Turkey Oak in good overall visible condition. Good overall Physiological and Structural condition.	A1,2	Radius: 3.4m. Area: 36 sq m.	Other Reference: 0948 Physical Condition: Good Amenity Value: Medium Bat Habitat: Low	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans. Post construction: No action required.

T004	Oak (Quercus sp.)	Tree	Height (m): 11 Stem Diam (mm): 480 Spread (m): 4N, 7E, 6S, 6W Life Stage: Mature	N:4 E:7 S:6 W:6	Mature Oak Tree in reasonable condition. In early senescence with visible die back. Root exposure on eastern side resulting from hedgerow removal.	B1,2	Radius: 5.8m. Area: 106 sq m.	Other Reference: 0953 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Medium	Pre construction: Crown reduction by 20%. Dead wood (major greater than 25mm). During construction: Protect trees with protective barriers - as shown on plans. Post construction: No action required.
T005	Oak (Quercus sp.)	Tree	Height (m): 17 Stem Diam (mm): 1000 Spread (m): 3N, 5E, 10S, 8W Life Stage: Over Mature	N:3 E:5 S:10 W:8	Dead.	U	none - due to Retention Category of U.	Other Reference: 0925 Physical Condition: Dead Amenity Value: None Bat Habitat: Medium	Remove tree

T006	Oak (Quercus sp.)	Tree	Height (m): 12 Stem Diam (mm): 400 Spread (m): 4N, 6E, 5S, 7W Life Stage: Early Mature	N:4 E:6 S:5 W:7	Good overall Physiological and Structural condition.	B1,2	Radius: 4.8m. Area: 72 sq m.	Other Reference: 0924 Physical Condition: Good Amenity Value: Medium Bat Habitat: Medium	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans. Post construction: No action required.
T007	Oak (Quercus sp.)	Tree	Height (m): 9 Stem Diam (mm): 290 Spread (m): 2N, 6E, 5S, 4W Life Stage: Early Mature	N:2 E:6 S:5 W:4	Poor overall Physiological and Structural condition.	U	none - due to Retention Category of U.	Other Reference: 0950 Physical Condition: Poor Amenity Value: Low Bat Habitat: Low	Remove tree
T008	Oak (Quercus sp.)	Tree	Stem Diam (mm): 450 Spread (m): 6N, 7E, 6S, 5W Life Stage: Mature	N:6 E:7 S:6 W:5	Very poor overall Physiological and Structural condition.	U	none - due to Retention Category of U.	Other Reference: 0945 Physical Condition: Poor Amenity Value: Low Bat Habitat: Medium	Remove tree

T009	Common Ash x3 (Fraxinus excelsior)	Group 3 trees	Height (m): 15 3 stems, avg.(mm): 450 Spread (m): 5N, 5E, 5S, 5W Life Stage: Mature	N:5 E:5 S:5 W:5	Poor overall Physiological and Structural condition. severe grade change compounded by ash die back. Additional trees in this group include 1 dead Beech 1 live beech and an elm. all trees are being comprised by significant change in levels.	U	none - due to Retention Category of U.	Other Reference: 0930 Physical Condition: Poor Amenity Value: Low Bat Habitat: Low	Remove trees
T010	Oak (Quercus sp.)	Tree	Height (m): 18 Spread (m): 10N, 10E, 15S, 15W Life Stage: Over Mature	N:10 E:10 S:15 W:15	Very large mature Oak. Fair overall Physiological and Structural condition. Severe grade change with roots buried on western edge	B1,2,3	Radius: 12.0m. Area: 452 sq m.	Other Reference: 0931 Physical Condition: Fair Amenity Value: High Bat Habitat: Medium	Pre construction: Crown reduce elongated limbs towards development by 10%. During construction: Protect trees with protective barriers - as shown on plans.

T011	Common Beech (Fagus sylvatica)	Tree	Height (m): 14 Stem Diam (mm): 390 Spread (m): 6N, 7E, 6S, 8W Life Stage: Early Mature	N:6 E:7 S:6 W:8	Fair overall Physiological and Structural condition. Grade change but no root collar burial	B1,2	Radius: 4.7m. Area: 69 sq m.	Other Reference: 0936 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Low	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans.
T012	Common Beech (Fagus sylvatica)	Tree	Height (m): 12 Stem Diam (mm): 300 Spread (m): 3N, 3E, 3S, 4W Life Stage: Semi Mature	N:3 E:3 S:3 W:4	Fair overall Physiological and Structural condition. Originating from bank of culvert, so likely to be compromised in future.	U	none - due to Retention Category of U.	Other Reference: 0947 Physical Condition: Fair Amenity Value: Low Bat Habitat: Low	Remove tree
T013	Oak (Quercus sp.)	Tree	Height (m): 14 Stem Diam (mm): 500 Spread (m): 3N, 6E, 7S, 2W Life Stage: Mature	N:3 E:6 S:7 W:2	Poor overall Physiological and Structural condition. Cavity of indeterminate size at Base, however not significant as yet.	B1,2	Radius: 6.0m. Area: 113 sq m.	Other Reference: 0937 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Medium	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans.

T014	Common Ash (Fraxinus excelsior)	Tree	Height (m): 20 Stem Diam (mm): 580 Spread (m): 4N, 8E, 6S, 7W Life Stage: Early Mature	N:4 E:8 S:6 W:7	Fair overall Physiological and Structural condition. early onset of chalara evident.	C	Radius: 7.0m. Area: 154 sq m.	Other Reference: 0951 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Medium	Remove tree
T015	Oak (Quercus sp.)	Tree	Height (m): 20 Spread (m): 7N, 7E, 9S, 7W Life Stage: Mature	N:7 E:7 S:9 W:7	Reasonable overall Physiological and Structural condition for tree of this age and type.	B1,2	Radius: 6.0m Area:113 sq.m	Other Reference: 0952 Physical Condition: Fair Amenity Value: High Bat Habitat: Medium	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans.
T016	Common Ash (Fraxinus excelsior)	Tree	Height (m): 20 Stem Diam (mm): 530 Spread (m): 5N, 6E, 6S, 8W Life Stage: Mature	N:5 E:6 S:6 W:8	Poor overall Physiological and Structural condition. Early onset of chalara visible, numerous structural defects.	U	none - due to Retention Category of U.	Other Reference: 0934 Physical Condition: Poor Amenity Value: Low Bat Habitat: Medium	Remove tree

T017	Oak (Quercus sp.)	Tree	Stem Diam (mm): 490 Spread (m): 7N, 8E, 7S, 7W Life Stage: Mature	N:7 E:8 S:7 W:7	Good overall visible Physiological and Structural condition.	B1,2	Radius: 5.9m. Area: 109 sq m.	Other Reference: 0932 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Medium	Pre construction: No action required. Crown lift to 5.2 metres for vehicle access. During construction: Protect trees with protective barriers - as shown on plans.
T018	Oak (Quercus sp.)	Tree	Height (m): 22 Stem Diam (mm): 800 Spread (m): 5N, 9E, 10S, 8W Life Stage: Mature	N:5 E:9 S:10 W:8	Good overall Physiological and Structural condition. No significant structural defects visible. Leaning away from development.	B1,2	Radius: 9.6m. Area: 290 sq m.	Other Reference: 0938 Physical Condition: Fair Amenity Value: High Bat Habitat: Medium	Pre construction: No action required. During construction: Protect trees with protective barriers - as shown on plans.

T019	Oak (Quercus sp.)	Tree	Height (m): 17 Stem Diam (mm): 450 Spread (m): 5N, 8E, 8S, 4W Life Stage: Mature	N:5 E:8 S:8 W:4	Good overall visible Physiological and Structural condition. Codominant with neighbouring Ash tree.	B1,2	Radius: 5.4m. Area: 92 sq m.	Other Reference: 0935 Physical Condition: Fair Amenity Value: Medium Bat Habitat: Medium	Pre construction: No action required. Crown lift to 5.2 metres for vehicle access. During construction: Protect trees with protective barriers - as shown on plans.
T020	Common Ash (Fraxinus excelsior)	Tree	Height (m): 18 Stem Diam (mm): 450 Spread (m): 7N, 5E, 7S, 5W Life Stage: Mature	N:7 E:5 S:7 W:5	Poor overall Physiological and Structural condition. Cavity with decay advanced at base	U	none - due to Retention Category of U.	Other Reference: 0941 Physical Condition: Poor Amenity Value: Low Bat Habitat: Medium	Remove tree

3. Proposed Development

3.1 Outline Development Proposal

The proposed development at Maesydderwen involves the installation of Residential properties, access roads and associated services and thus necessitate significant ground disturbance, which has a potential to compromise the physiological condition of any retained trees.

3.2 Access

Site access is currently through the field gate to the north of the site.

3.3 Demolition

The development will require tree removals (further detailed below), and excavation. No other demolition activities are anticipated at this time.

4. Arboricultural Impact Assessment

4.1 Introduction

The following chapter assesses the existing condition, quality and location of trees in context with the development proposal. It identifies where trees will need to be removed and how this will be mitigated, and where retained trees have the potential to be affected by the development and how these are to be protected. It also includes a schedule of remedial tree works to be undertaken prior to commencement of demolition and construction activities.

4.2 Trees to be removed

The table below includes a list of all the trees that are to be removed as part of the development project, and the reason for their removal.

No.	Species	BS Cat	Location	Reason for removal
T005	Oak (Quercus sp.)	**U**	Boundary tree. See map	In acute decline, not worthy of retention..
T007	Oak (Quercus sp.)	**U**	Boundary tree. See map	In acute decline, not worthy of retention..
T008	Oak (Quercus sp.)	**U**	Boundary tree. See map	In acute decline, not worthy of retention..
T009	Common Ash x3 (Fraxinus excelsior)	**U**	Boundary tree. See map	In acute decline, not worthy of retention..
T012	Common Beech (Fagus sylvatica)	**U**	Boundary tree. See map	Positioning has compromised longevity, not worthy of retention..
T014	Common Ash (Fraxinus excelsior)	**C**	Boundary tree. See map	Early onset of Chalara and structural defect compromises long term viability.
T016	Common Ash (Fraxinus excelsior)		Boundary tree. See map	Early onset of Chalara and structural defect compromises long term viability.
T020	Common Ash (Fraxinus excelsior)		Boundary tree. See map	Significant structural defect prevents long term retention.

4.3 Evaluation of impact of tree losses

A number of trees will need to be removed in order to safeguard the safety of the site, these trees exhibit either acute symptoms of physiological decline or significant structural defects that limit their life expectancy and their safe retention on what will ultimately be a publicly occupied site. The removal of these trees will result in a significant loss of ecological function and landscape value.

This impact on the landscape and ecology would likely have occurred regardless, due to the ongoing decline of the trees highlighted due to disease (Ash die-back) and previous

earthmoving works (with have compromised the physiological function, through root burial).

The proposed development works present an opportunity to replace these lost features and associated ecological functions with an improved planting scheme utilising native trees and shrubs with consideration to local context, landscape value, biodiversity and climate resilience. **Therefore, the removal of these trees is considered to be acceptable but with a requirement for landscape mitigation.**

4.4 Mitigation of tree losses

The layout of the landscape mitigation scheme will be dependent on the final arrangement of the site. However, it is recommended that the scheme includes for a mixed native boundary hedgerow mix around the site, incorporating species commonly found in the local area (hawthorn, hazel, and holly etc) and including occasional native hedgerow trees (oak, beech and lime).

4.5 Trees to be retained

The following table identifies the trees that are to be retained as part of the development and suggests whether they are at risk from activities related to demolition, construction, or eventual operational use of the site.

Ref	Species	Measurements	Recommendation	Timescale	Retention Category	RPA
T001	Oak (Quercus sp.)	Height (m): 14 2 stems, avg.(mm): 600 Spread (m): 5N, 6E, 8S, 7W Life Stage: Mature	Remove major dead wood (greater than 25mm). Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 10.2m. Area: 327 sq m.
T002	Oak (Quercus sp.)	Height (m): 9 Stem Diam (mm): 180 Spread (m): 32N, 2E, 2S, 2W Life Stage: Young	Protect trees with protective barriers - as shown on plans.		A1,2	Radius: 2.2m. Area: 15 sq m.
T003	Oak (Quercus sp.)	Height (m): 10 Stem Diam (mm): 280 Spread (m):	Protect trees with protective barriers - as shown on plans.		A1,2	Radius: 3.4m. Area: 36 sq m.

		2N, 2E, 5S, 5W Life Stage: Semi Mature				
T004	Oak (Quercus sp.)	Height (m): 11 Stem Diam (mm): 480 Spread (m): 4N, 7E, 6S, 6W Life Stage: Mature	Crown reduction by 10% to mitigate root loss. Remove major dead wood greater than 25mm). Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 5.8m. Area: 106 sq m.
T006	Oak (Quercus sp.)	Height (m): 12 Stem Diam (mm): 400 Spread (m): 4N, 6E, 5S, 7W Life Stage: Early Mature	Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 4.8m. Area: 72 sq m.
T010	Oak (Quercus sp.)	Height (m):18 Stem Diam (mm): 1000 Spread (m): 10N, 10E, 15S, 15W Life Stage: Over Mature	Reduce elongated limbs extending towards development by 20%. Protect trees with protective barriers - as shown on plans.		B1,2,3	Radius: 12.0m. Area: 452 sq m.
T011	Common Beech (Fagus sylvatica)	Height (m): 14 Stem Diam (mm): 390 Spread (m): 6N, 7E, 6S, 8W Life Stage: Early Mature	Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 4.7m. Area: 69 sq m.
T013	Oak (Quercus sp.)	Height (m): 14 Stem Diam (mm): 500 Spread (m): 3N, 6E, 7S, 2W Life Stage: Mature	Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 6.0m. Area: 113 sq m.
T015	Oak (Quercus sp.)	Height (m): 20 Spread (m): 7N, 7E, 9S, 7W Life Stage: Mature	Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 8.4m. Area: 222sq m.

T017	Oak (Quercus sp.)	Stem Diam (mm): 490 Spread (m): 7N, 8E, 7S, 7W Life Stage: Mature	Crown lift to 5.2 metres. Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 5.9m. Area: 109 sq m.
T018	Oak (Quercus sp.)	Height (m): 22 Stem Diam (mm): 800 Spread (m): 5N, 9E, 10S, 8W Life Stage: Mature	Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 9.6m. Area: 290 sq m.
T019	Oak (Quercus sp.)	Height (m): 17 Stem Diam (mm): 450 Spread (m): 5N, 8E, 8S, 4W Life Stage: Mature	Crown lift to 5.2 metres. Protect trees with protective barriers - as shown on plans.		B1,2	Radius: 5.4m. Area: 92 sq m.

4.6 Protection of retained trees

The following paragraphs detail how the trees and tree groups identified as a concern above will be protected at the critical stages.

It is recommended that the crowns of retained trees are carefully reduced back sufficiently to install protective fencing prior to the commencement of construction work. This will also ensure that there is enough room for construction activities to take place without causing damage to the trees.

As the RPAs of the trees extend into the site and are potentially at risk from construction activities, it is recommended that prior to the commencement of any activities on site, protective fencing in accordance with BS5837:2012 is installed. Specification and layout of the fencing is detailed further in the Arboricultural Method Statement and Tree Protection Plan.

4.7 Conclusions

The proposed development of Maesydderwen will require the removal of a group of 7 mature trees and 1 group consisting of 6 trees. The loss of these trees will have an impact on the landscape, but with an appropriate landscape mitigation scheme has the potential to result in enhanced landscape quality with greater biodiversity, ecological and arboricultural value.

There are a number of retained trees that could be affected by the proposed development and potential construction activities. It will be possible to protect these trees from harm through the establishment of protective fencing to mark out construction exclusion zones and through an appropriate construction methodology. These considerations are set out in the Arboricultural Method Statement and on drawing ***Appendix D.***

5. Arboricultural Method Statement

This chapter is supported by *the* ***Tree constraints Plan*** included in Appendix B of this report.

5.1 Roles and Responsibilities

It is the responsibility of all contractors and sub-contractors involved in the project to be aware of this method statement and to use it when setting out the site and carrying out any operations in the vicinity of retained trees.

Prior to the commencement of works, all site personnel should be briefed by the Site Manager or appointed Arboricultural Consultant on the importance of the retained trees and the significance, rules and restrictions around protective measures implemented. All minutes from these 'Toolbox Talks' should be retained by the Site Manager for future reference.

5.2 Timing and order of operations

Operations on the development site related to trees should commence in the following order to ensure that retained trees receive an appropriate level of protection from potentially harmful activities. Monitoring will take place throughout these stages in accordance with paragraph 5.9 below.

1. Felling of trees and stump grinding (as set out in paragraph 4.2);

2. Preparatory tree works (as set out in paragraph 4.7);

3. Installation of Tree Protection Barriers to establish Construction Exclusion Zones in the vicinity of all retained trees (in accordance with the specific directions in the Tree Protection Plan);

4. Establishment of working site including storage of plant and materials outside of RPAs;

5. Demolition of structures (if required);

6. Construction commences;

7. Construction completed; removal of all plant and materials from site;

8. Removal of protective barriers and ground protection;

9. Implementation of landscape mitigation scheme.

5.3 Tree Works

5.3.1 TREE FELLING

The table in paragraph 4.2 lists all trees to be felled prior to the commencement of construction. All tree works should be carried out by competent Tree Surgeons in accordance with BS3998:2010 Tree Work – Recommendations. All works must take place outside of bird nesting season and in accordance with any specific ecological recommendations included in the report/s that accompany this plan.

5.3.2 PREPARATORY TREE WORKS

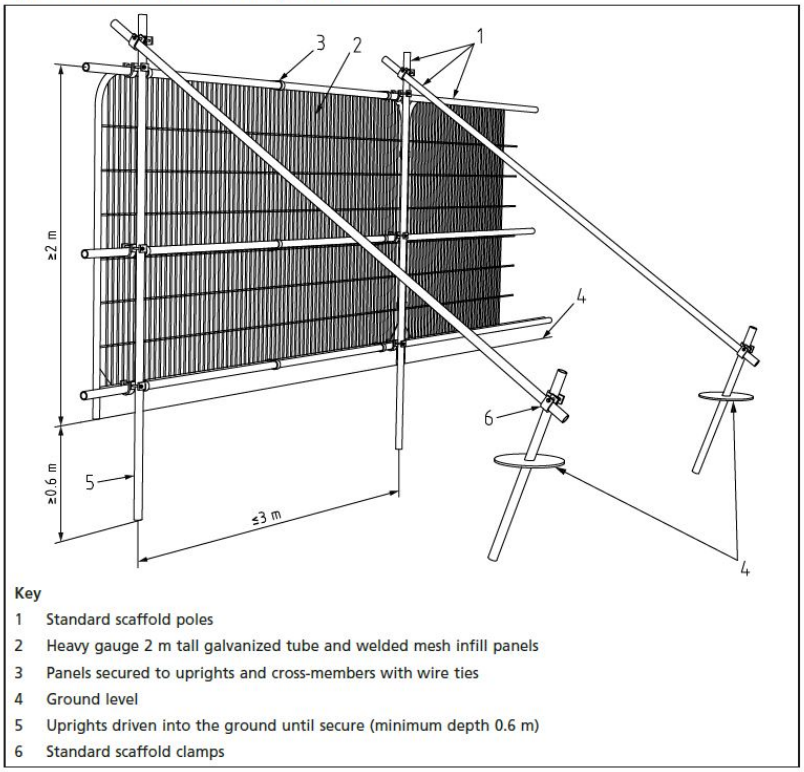
The table in paragraph 4.7 lists all trees that require remedial works prior to the commencement of demolition and construction. All tree works should be carried out by competent Tree Surgeons in accordance with BS3998:2010 Tree Work – Recommendations. All works must take place outside of bird nesting season and in accordance with any specific ecological recommendations included in the report/s that accompany this plan.

5.4 Setting out Barriers and Construction Exclusion Zone

Setting out of tree protection fencing should take place prior to the commencement of any demolition of construction activities, including the storage of materials on site. The setting out should take place under the guidance of the project Arboricultural Consultant.

Tree Protection Barriers should be supplied and erected in accordance with chapter 6.2.2 of BS5837:2012. This states that the default specification for protective fencing should comprise a scaffold framework with vertical tubes at maximum 3m intervals secured firmly into the ground and fixed with weldmesh panels, as set out on figure 2 below. An alternative specification would be a free standing scaffold support framework (I.e. Heras fencing) in accordance with figure 3 below.

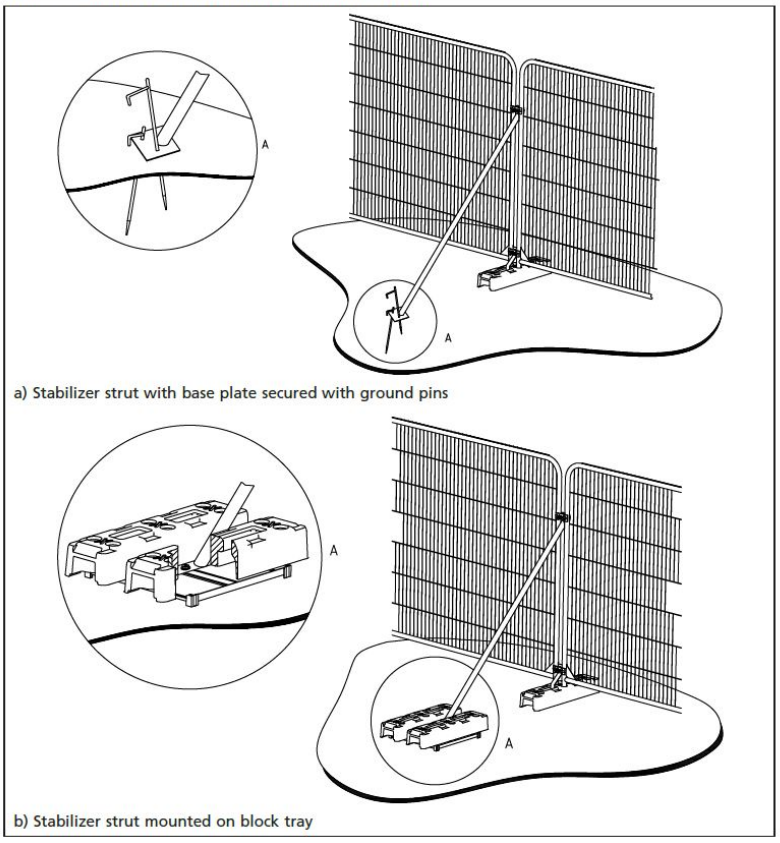
Figure 2 **Default specification for protective barrier**



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 3 **Examples of above-ground stabilizing systems**



The barriers should be fitted with all-weather notices containing the words "Construction Exclusion Zone – No Access" and should remain intact for the entirety of the

development project. It is not anticipated that there will be any need to access the Construction Exclusion Zones during demolition or construction phases. If access is required for any reason then this should be discussed with the Arboricultural Consultant.

5.5 Demolition

It does not appear that the development will require too much in the way of demolition activities. However, it is recommended that all demolition activities must take place only once tree works have been completed and protective barriers erected. This is to ensure that retained trees on site are not adversely affected due to lack of clear restrictions to movement and storage.

All plant and vehicles engaged in demolition works must use existing hard surfacing for all access, storage and operations where possible. Vehicular access to grass and landscaped areas should be minimised and incorporate ground protection where compaction and rutting is likely.

Plant operators must be made fully aware of the protection that surrounds retained trees and take due care with their machinery not to cause any damage to their crowns or stems. The line of protective fencing should be seen to extend vertically so that no plant accesses the aerial regions of the construction exclusion zone.

5.6 Tree roots

Given that the works will involve excavation of soils, it is possible that the roots of retained trees will be exposed, even though excavated is taking place outside of Root Protection Areas. If during any excavation works on site the tree roots of a retained tree are exposed, these should be immediately wrapped or covered in hessian to prevent desiccation and to protect them from temperature changes. Roots smaller than 25mm diameter may be pruned back using a clean, sharp cutting tool. Prior to backfilling, retained roots should be uncovered and surrounded with top soil or sharp builders' sand.

5.7 Prohibited activities

No plant, machinery, or materials should be stored within the Construction Exclusion Zones as described above and marked out on site. This also applies to any ancillary facilities associated with the construction such as welfare units.

Care must be taken when planning site operations to ensure that wide or tall loads, plant with booms, jibs and counterweights can operate without coming into contact with any of the retained trees. Where possible, plant and machinery with zero tail swing should be used when in close proximity to retained trees.

Any transit or transverse of plant in close proximity to the retained trees should be conducted under the supervision of a banksman to ensure that adequate clearance from the trees is maintained at all times.

The project Arboricultural Consultant should be consulted prior to any otherwise not approved operations within the Construction Exclusion Zones.

5.8 Monitoring

It is a requirement of BS5837:2012 that activities related to or in the vicinity of retained trees are monitored by the project Arboricultural Consultant. It is recommended that the following monitoring visitations take place:

1. Felling of trees and preparatory tree works;

2. Setting out and installation of Tree Protection Fencing;

3. Post-development monitoring visits (see 5.10 below).

It is recommended that on each monitoring visit a Works Recording Form is completed by the project Arboricultural Consultant to enable an auditable trail of visits, findings and recommendations.

5.9 Incident procedure

In the instance of any problems discovered on site or incidences affecting and/or causing harm to retained trees, the project Arboricultural Consultant should be consulted at the earliest opportunity to provide advice about rectifying issues. Any such occurrences should be recorded in an auditable incident register.

5.10 Post-Development

It is recommended that following completion of the development, a monitoring visit is carried out by the project Arboricultural Consultant in order to carry out a thorough assessment of the retained trees and any remedial works that may be required as a result of changes to the site and the potential indirect effects of construction.

Appendix A

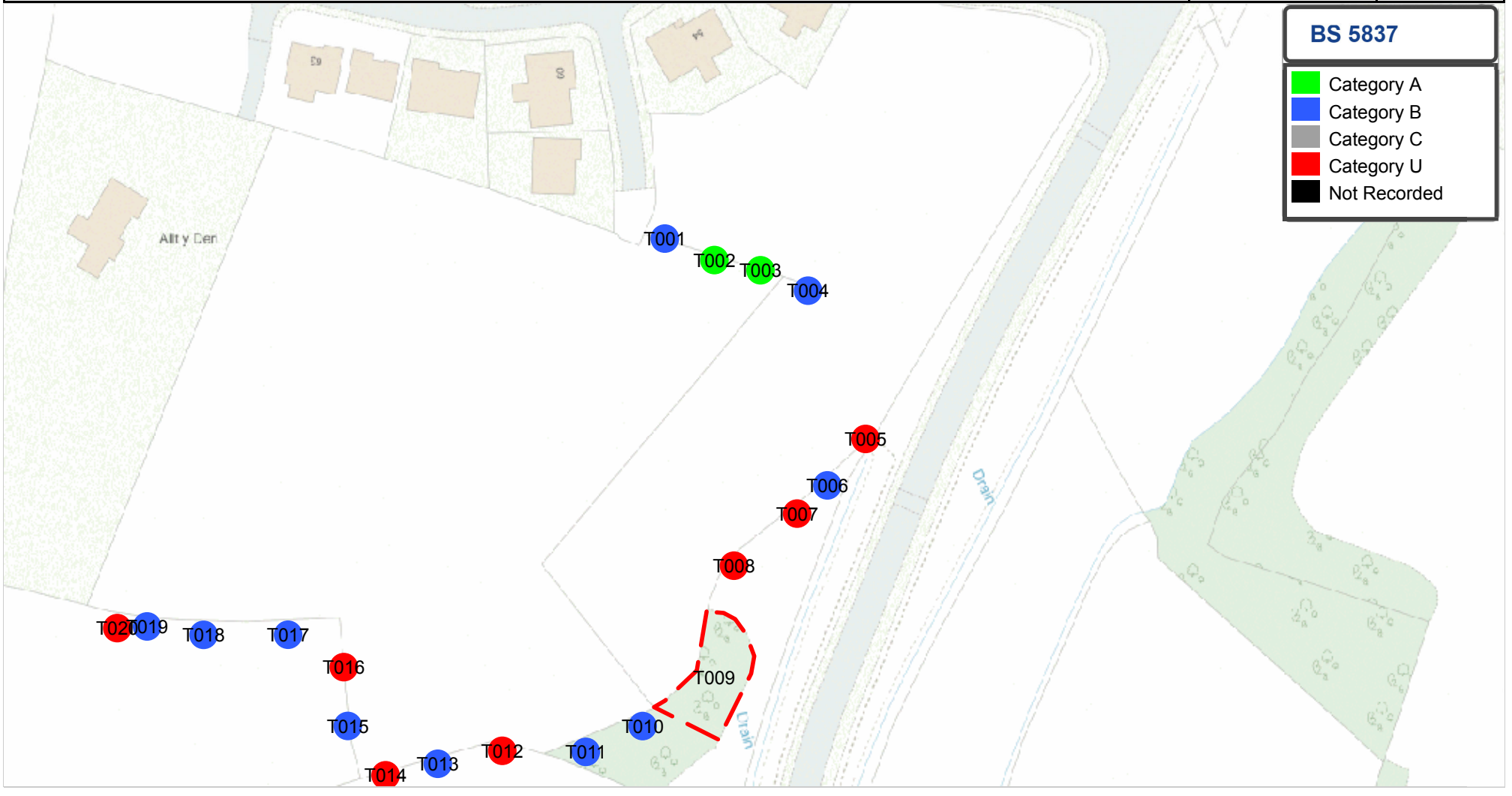
TREE SCHEDULE TERMS

TREE NO.	Code used to identify each tree on the Tree Survey Plan
SPECIES	The common name for each tree.
HEIGHT	The height of the tree in metres.
AGE	The age of the tree recorded as follows: Y Young – Recently planted or establishing tree; SM Semi-mature – Established tree which has yet to reach its full growing height; M Mature – A tree which has reached its likely maximum size; OM Over-mature – A mature tree which has ceased to grow or is in decline; V Veteran – An over-mature tree of high value due to age, size and other factors.
STEMS	Number of stems present (i.e. is the tree a multi-stemmed specimen).
DBH	The Diameter at Breast Height of the tree in millimetres; this figure is used to calculate the RPA.
RPA RADIUS	The radius of the tree's Root Protection Area in metres.
CROWN SPREAD	The extent of the tree's crown to the north, south, east and west, in metres.
CROWN HEIGHT	The height of the crown as measured from the ground to the north, south, east and west, in metres.
CONDITION	A general assessment of the tree's condition as either good, fair, poor or dead.
BS CAT	The BS 5837:2012 Category for the tree, in accordance with the table in paragraph 2.3 of this report and Appendix D.
GENERAL OBSERVATIONS	Any significant defects or other observations recorded as part of the survey.

Trevor Hopkins associates.
Maesydderwen, Cardigan, Ceredigion, SA43 1PE
Tree Constraints map.
Appendix B

10 m
50 ft
Scale = 1 : 750
Page size: A4

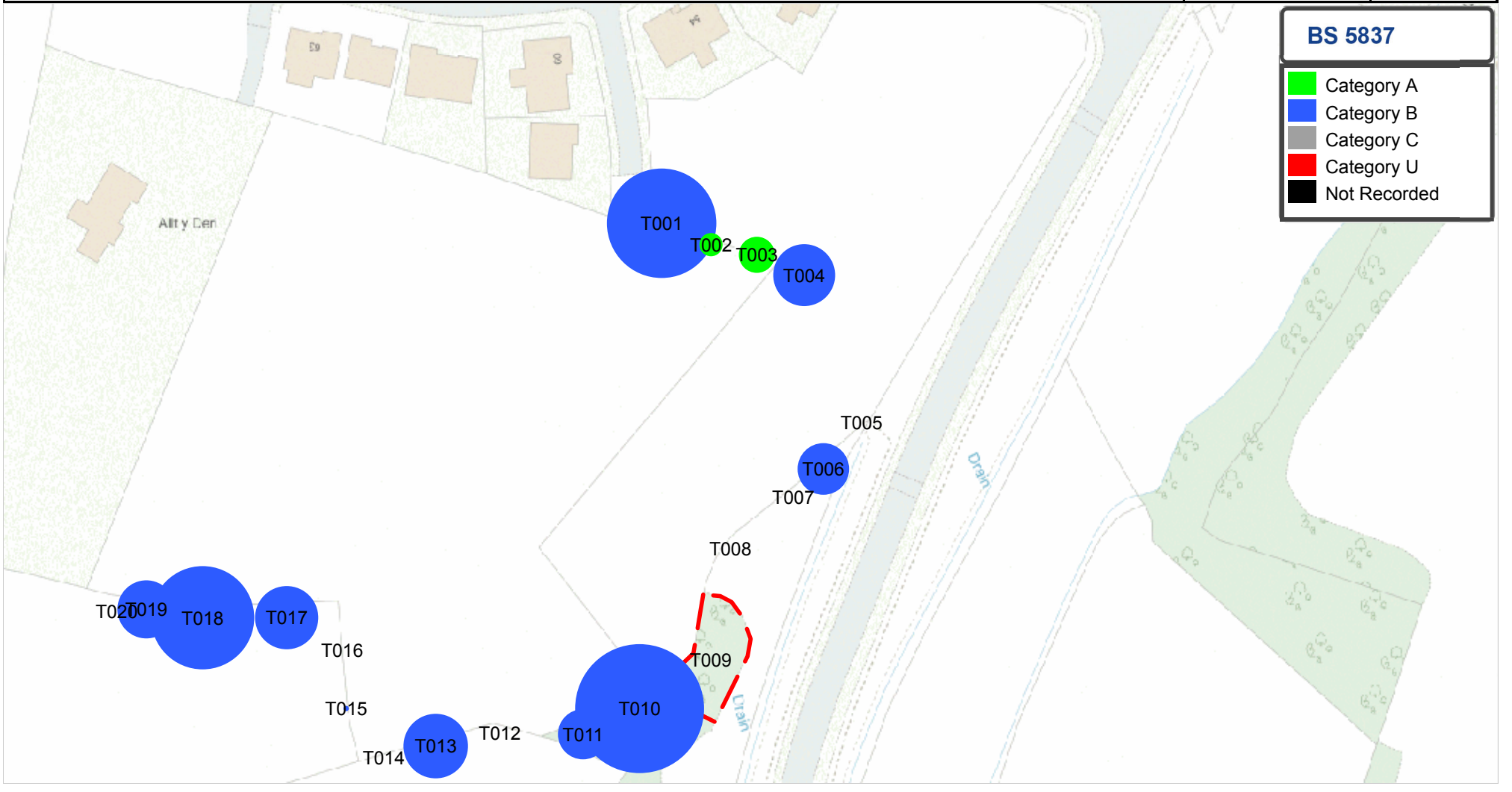
N



Trevor Hopkins associates.
Maesydderwen, Cardigan, Ceredigion, SA43 1PE
RPA. Root protection areas of retained trees.
Appendix C

10 m
50 ft
Scale = 1 : 750
Page size: A4

N



Trevor Hopkins associates.
Maesydderwen, Cardigan, Ceredigion, SA43 1PE
Fence positioning and CEZ (construction exclusion zone)
Appendix D

10 m
50 ft
Scale = 1 : 750
Page size: A4

N