Wern Reserve, Coppice Lane – BS 5837:2012 Arboricultural Report, Impact Assessment and Method Statement

Canal & River Trust

June 2023

Ecus Ltd

Report to: **Canal & River Trust**

Report Title: **Wern Reserve, Coppice Lane – BS 5837:2012 Arboricultural Report, Impact Assessment and Method Statement**

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Executive Summary

On behalf of Canal & River Trust (the Client), Ecus Limited (Ecus) has carried out a tree survey to BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* in April 2023 at Coppice Lane, Welshpool. This survey has formed the basis for an assessment of the impacts that development proposals may have on the existing tree cover and recommends methodologies that will need to be adopted to protect retained trees during development.

The survey recorded all significant trees within the site and those which may be affected by any development proposed within the site boundary, recording a number of parameters including species, crown spread and Root Protection Area (RPA).

The RPA of any given tree is calculated in accordance with BS 5837:2012 and is generally a circular plot centred on its stem. This area around each tree should not be disturbed by excavation, compaction, contamination or other related demolition and construction activities. Minor encroachment into the RPA may be possible if specific methodologies are put in place that reduce the likelihood of the tree being negatively impacted.

The survey recorded 14 individual trees, 10 tree groups and 6 hedgerows.

Powys Council has been contacted to confirm whether the site is located within a Conservation Area and whether any trees included in the survey are protected by a Tree Preservation Order (TPO). The approval of the Local Planning Authority should be sought before any works are carried out to protected trees.

Reference to the DataMap Wales website indicates that no Ancient Woodland is present within a 15.0 m buffer of the site boundary.

The Client proposes the construction of several retaining ponds adjacent to the Montgomery canal with an overflow weir, new underground pipes and site access. This will require the removal of 1 tree group (G020) and sections of 1 group (G011) within the site boundary and may also have an impact on the roots, stems and canopies of retained trees unless suitable protection measures are put in place.

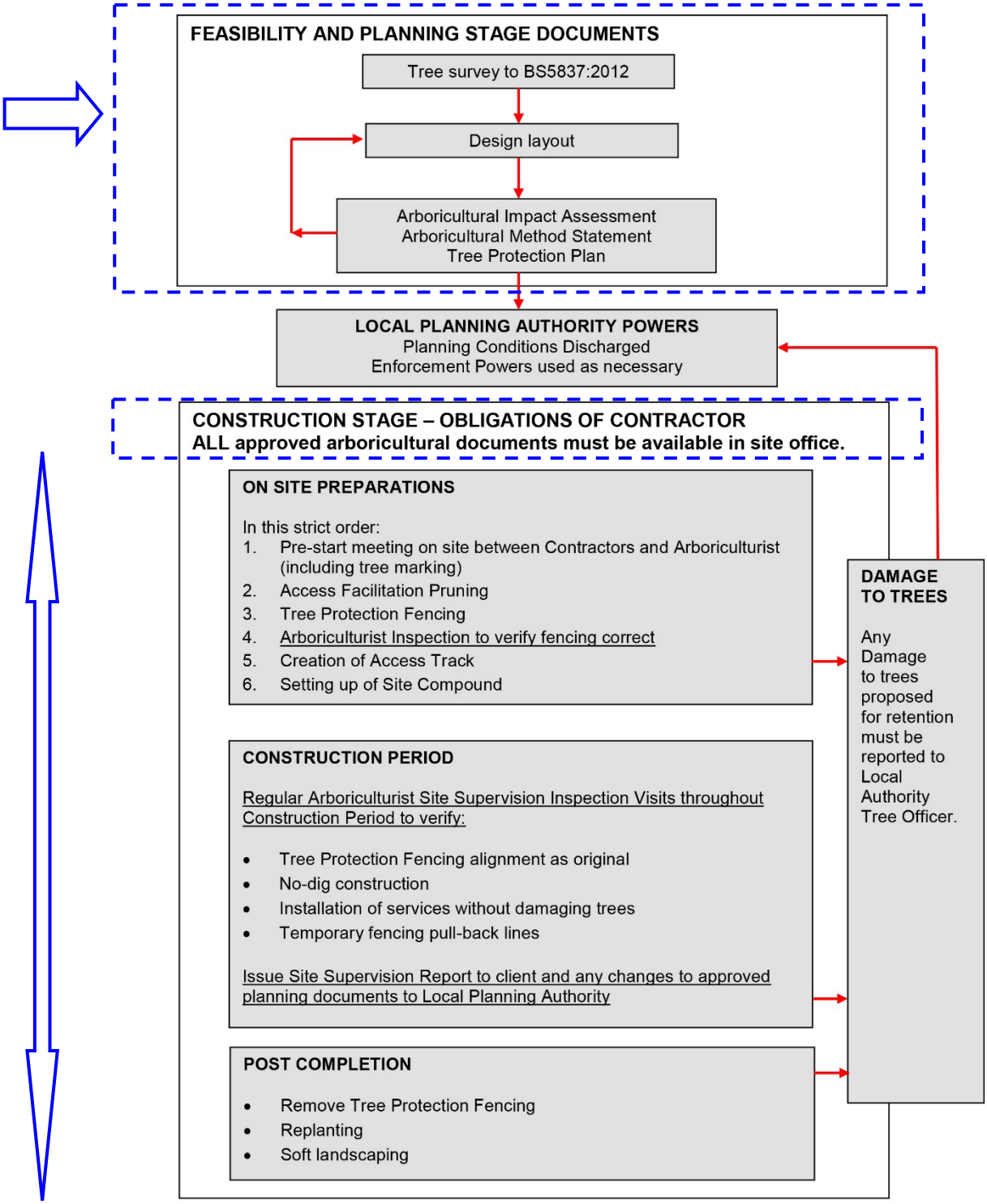
This report details the potential arboricultural impacts of development at the site and offers a range of protection measures and construction methodologies which should be adopted. These measures aim to prevent accidental damage and other adverse effects on the health of retained trees.

The report also makes recommendations for any measures to mitigate or compensate for the loss of trees within the site and the likely impact on the site and the wider local landscape.

1. Introduction

1.1 Context of this Report in the Planning System

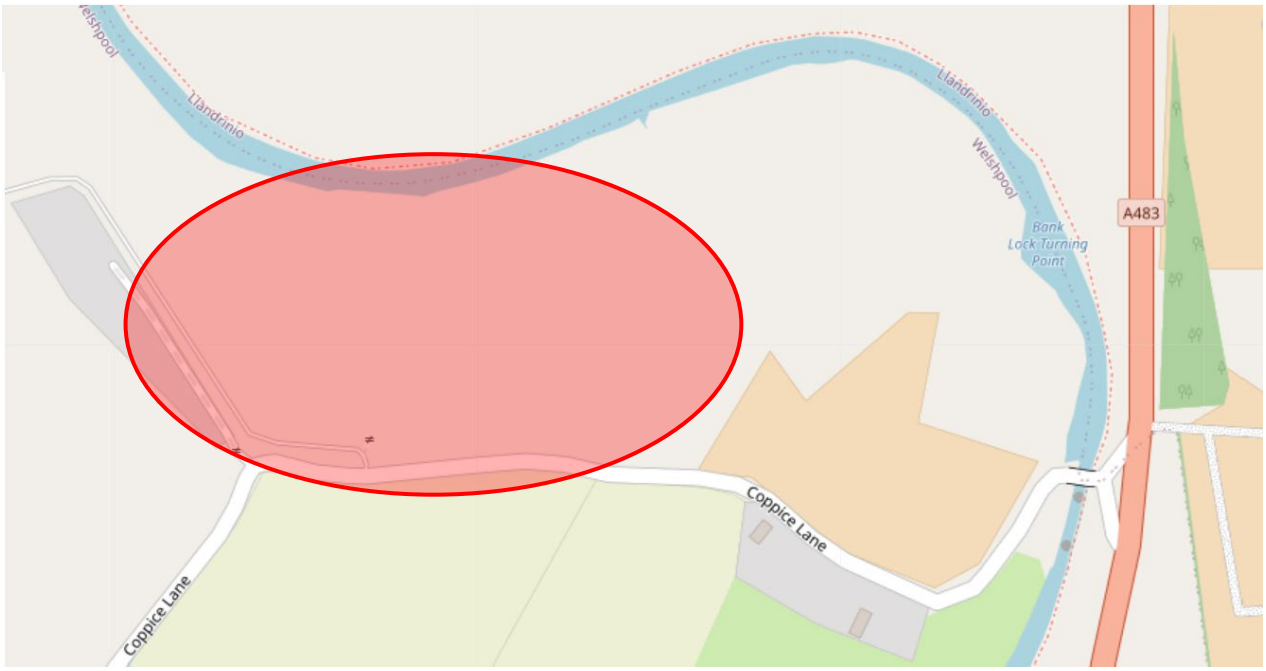
Figure 1: The Design and Construction Process and Tree Care



1.2 Location

1.2.1 Ecus Limited has been commissioned by the Client to undertake a tree survey of the site at Coppice Lane, Pool Quay, Welshpool, Powys, Wales, SY21 9JX, United Kingdom, Ordnance Survey UK Grid Reference SJ256129 and prepare the findings in a report. The site is called Wern Reserve and the location is shown in Figure 2.

Figure 2: Location Map



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1.3 Tree Designations

1.3.1 The Tree Officer at Powys Council has been contacted to confirm whether the site is located within a Conservation Area and whether any trees included in the survey are protected by a Tree Preservation Order (TPO). If any trees included in the survey are protected, Ecus will inform the Client once a response has been received.

1.3.2 The permission of the local planning authority must be sought before any works are carried out to protected trees. Potentially unlimited fines can be imposed for illegally carrying out any works to protected trees.

1.3.3 Reference to the DataMap Wales website indicates that no ancient woodland is present within a 15.0 m buffer of the site.

1.4 Protected Species

Bats

1.4.1 Mature trees can often contain cavities or hollows which provide potential roosting locations for bats. Bats and the places they use for shelter or protection (i.e. roosts) are protected under *The Conservation of Habitats and Species Regulations* 2017 (Habitats Regulations 2017). They also receive legal protection under the *Wildlife and Countryside Act* (WCA) 1981. Consequently, causing damage to a bat roost constitutes an offence.

1.4.2 Generally, should the presence of a bat roost be suspected whilst completing works on any trees on site then an appropriately licensed bat worker should be consulted for advice.

Birds

1.4.3 Trees and hedgerows can provide habitat for nesting birds which are protected under the *Wildlife and Countryside Act* (WCA) 1981. Some species are further protected by special penalties. This legislation makes it an offence to intentionally or recklessly damage or destroy an active bird nest or part thereof.

1.4.4 As the trees at the site provide potential habitat for nesting birds all tree work should ideally be completed outside the peak nesting bird season (Generally March to August inclusive).

1.4.5 If this is not possible then the vegetation should be subject to a nesting bird inspection by a suitably experienced ecologist prior to commencement of works. If active nests are identified then the vegetation, and a defined buffer zone, will need to remain in place until the young have fully fledged.

2. Tree Survey Methodology

2.1 Site survey

2.1.1 Ecus have undertaken the tree survey in accordance with BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*, to provide detailed and independent arboricultural advice in the context of potential development. The survey was a ground based visual inspection carried out by a suitably qualified arboriculturist. No trees were tagged as part of the survey.

2.1.2 The tree inspection was carried out in April 2023 by Andy O'Brien HND Arb, Arboricultural Consultant, when the deciduous trees were partially in leaf.

2.1.3 The weather on the day of the survey was light rain. This did allow for a thorough inspection of all trees included in the survey.

2.1.4 The survey recorded all trees with a stem diameter of 75 mm or more at a height of 1.5 m above ground level within the site boundary. Any significant trees outside the boundary which could be significantly affected by the future development of the site were also recorded.

2.1.2 The following characteristics were recorded:

- Species
- Stem diameter at 1.5 m above ground level (mm)
- Estimated height (m)
- Approximate crown spread (m) in North, East, South and West directions
- Estimate of the number of years that the tree is likely to remain suitable for retention
- Age class
- Condition category in accordance with BS 5837:2012. The categories are defined as:
    - 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
    - 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 150 mm
- Value subcategories where appropriate in accordance with BS 5837:2012. These are defined as:
    - 1 = Mainly arboricultural qualities
    - 2 = Mainly landscape qualities
    - 3 = Mainly cultural values, including conservation
- General notes about physiological and structural condition and any management recommendations

2.1.5 All survey data has been based on a topographical survey where possible, supplied by the client. Where topographical information has not identified tree positions or Ordnance Survey mapping has been utilised, trees and hedgerows have been positioned using GPS and aerial photography to provide approximate locations in relation to existing surrounding features. Further confirmation of

tree locations through a topographical survey of the site is recommended to ensure future design accuracy.

2.1.6 Some measurements for trees with limited accessibility may have been estimated. This is highlighted with a hash (#) symbol in the Tree Survey Schedule at Appendix 1.

2.1.7 Where trees formed a contiguous canopy they may have been grouped, in line with the guidance of BS 5837:2012. If densely wooded areas are not expected to be directly affected by development proposals only the significant trees at the woodland perimeter will have been surveyed.

2.1.8 Trees are living organisms that change over time. A re-survey of all trees should be carried out if there have been any significant storm events or more than 12 months have passed since the survey was carried out.

2.2 Calculation of Root Protection Area (RPA)

2.2.1 The Root Protection Area (RPA) is calculated according to the formulae set out in BS 5837:2012. This is 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 should be treated as a priority.

2.2.2 Due to the specific topography of the site and the presence of surrounding structures the RPA is likely to be a simplified representation of the actual morphology and disposition of tree roots. Any deviation in the shape of the RPA from the calculated circular shape will largely be based on conjecture and so should generally be avoided. However, where significant site features are present that could clearly influence the disposition of tree root growth (e.g. water courses, building foundations and retaining walls), the RPA may be amended to take these features into account.

3. Tree Survey Results

3.1 General Site Description

3.1.1 The site is currently used as agricultural land adjacent to the Montgomery Canal and is located approximately 6.2 km to the northeast of Welshpool.

3.1.2 The trees at the site were located predominantly close to the boundaries both within the site and on neighbouring land, with field hedging providing the most continuous cover around the site.

3.1.3 The most significant features of the site were a central grouping of trees that were concentrated near an old ground excavation to the south and a grouping of canal edged trees to the far northwest.

3.1.4 There were several notable trees of veteran status within the central grouping of trees.

3.2 Results of Tree Survey

3.2.1 The Tree Survey Schedule at Appendix 1 details the results of the tree survey and includes any management recommendations. The schedule should be read in conjunction with the tree plans at Appendix 3 which show the location of each tree, group and hedge surveyed and the extent of their canopies and RPA.

3.2.2 15 individual trees, 9 tree groups and 6 hedgerows have been recorded during the survey. A summary of the tree survey findings is shown in Table 1.

Table 1: Summary of Tree Survey Findings

Category A	Category B	Category C	Category U
Trees: 5 Groups: 0 Hedgerows: 0	Trees: 3 Groups: 1 Hedgerows: 0	Trees: 6 Groups: 8 Hedgerows: 6	Trees: 1 Groups: 0 Hedgerows: 0

3.2.3 The most significant trees were the large pedunculate oaks, T009, T012, T013 and T014. These were all visually prominent trees, with excellent arboricultural value. They were assessed using the Recognition of Ancient, Veteran & Notable Trees (RAVEN). T012 and T014 were of notable status and T013 and T014 were of veteran status. They had good future prospects and will add significant value to any new development.

3.2.4 These trees formed part of the largest grouping of vegetation on site which collectively had excellent amenity value. There were occasional field boundary trees that were connected around the site boundaries with a network of field boundary hedgerows.

3.2.5 Many of the trees were of low value, retention category C, and should not pose a significant constraint on the development potential of the site. However, these trees collectively provided moderate amenity value. Large scale tree removals should be avoided where trees are not in conflict with design proposals.

3.2.6 The ground area within the field boundary was generally free draining where the fields were elevated, with the lower levels of ground particularly to the northwest, being very wet and boggy. Within the elevated ground to the south, large level changes had taken place historically which will have affected several of the more established trees that were in close proximity to excavation.

3.2.7 Tree T006 had been categorised as retention category U, however in this instance it can be retained for the short term for the amenity and ecosystem service benefits that it will provide to the site.

3.3 Ash Die Back (*Hymenoscyphus fraxineus*)

3.3.1 Ash Die Back (ADB) also known as Chalara or Chalara Dieback of Ash, is a disease of ash trees caused by a fungus called *Hymenoscyphus fraxineus*. ADB causes leaf loss, crown dieback and bark lesions in affected trees. Once a tree is infected the disease is usually fatal, either directly or indirectly by weakening the tree to the point where it succumbs more readily to attacks by other pests or pathogens.

3.3.2 It is difficult to assign ash trees a retention category using the BS5837:2012 standards because of ADB. The general advice from public bodies is to retain ash trees and see how the disease develops within the local population. However, if clear signs of ADB are found on sites, it is highly likely that all the ash trees on that site will succumb in time. It could therefore be unreasonable to consider an ash tree a significant constraint to development.

3.3.3 The Tree Council has produced a document giving guidance to tree owners and managers on how to deal with ADB. *Ash dieback: an Action Plan Toolkit* (Summer 2019)[1]. This gives guidance on assessing the danger posed by trees infected with ADB. Ecus have adopted the Suffolk County Council Ash Health Assessment System (Appendix 4). The system categorises ash trees with ADB symptoms into 4 classes:

- Ash Health Class (AHC) 1 – 100% - 75% Live Canopy (Vitality Class 0)
- Ash Health Class (AHC) 2 – 75% - 50% Live Canopy (Vitality Class 1)
- Ash Health Class (AHC) 3 – 50% - 25% Live Canopy (Vitality Class 2)
- Ash Health Class (AHC) 4 – 25% - 0% Live Canopy (Vitality Class 3)

3.3.4 Many local authorities have concluded that any trees which fall within AHC 3 and 4 require management and it seems reasonable to follow a similar system. The priority of that management depends on the severity of the tree's condition, with trees declining from AHC 2 into AHC 3 requiring work as part of a program of regular works. As the trees decline towards AHC 4, action becomes more urgent to abate any hazard, assuming the tree is in a high-risk area.

[1] https://treecouncil.org.uk/wp-content/uploads/2019/11/Tree-Council-Ash-Dieback-Toolkit-2.0.pdf

4. Arboricultural Impact Assessment (AIA)

4.1 Introduction

4.1.1 A BS 5837:2012 Arboricultural Impact Assessment (AIA) has been carried out for all trees included in the survey. The AIA methodology evaluates the potential direct and indirect impacts the proposed development could have on the trees at the site. Where necessary mitigation measures are recommended.

4.1.2 BS 5837:2012 paragraph 5.4.2 states:

> *"The assessment should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed in the vicinity of retained trees. Such activities might include the removal of existing structures and hard surfacing, the installation of new hard surfacing, the installation of services, and the location and dimensions of all proposed excavations or changes in ground level, including any that might arise from the implementation of the recommended mitigation measures. In addition to the impact of the permanent works, account should be taken of the buildability of the scheme in terms of access, adequate working space and provision for the storage of materials, including topsoil."*

4.2 Development Proposals

4.2.1 The client proposes the construction of retention ponds adjacent to the Montgomery canal with an overflow weir, new below ground water pipes and site access.

4.2.2 This AIA is based on the development layout provided by the Client (ref: 10048826-ARC-XXX-XX-DR-CE-00003 dated 29th November 2022).

4.3 Tree Retention and Removal

4.3.1 The development proposals indicate that 1 tree group (G020) and sections of 1 group (G011) within the site boundary will need to be removed to facilitate the new development, as they are situated in the footprint of new structures or their retention and protection throughout the development is not suitable.

4.3.2 The trees that need to be removed are detailed in the Tree Survey Schedule at Appendix 1 and located on the Tree Impacts Plan at Appendix 3. A summary of the required tree removals is shown in Table 2.

Table 2: Summary of Required Tree Removals

Trees to be Removed			Trees to be Retained		
Category A	**Category B**	**Category C**	**Category A**	**Category B**	**Category C**
Trees: 0	Trees: 0	Trees: 0	Trees: 5	Trees: 3	Trees: 6
Groups: 0	Groups: 0	Groups: 1	Groups: 0	Groups: 1	Groups: 7
Hedgerows: 0	Hedgerows: 0	Hedgerows: 0	Hedgerows: 0	Hedgerows: 0	Hedgerows:6
Total: 0	**Total: 0**	**Total: 1**	**Total: 5**	**Total: 4**	**Total: 19**

4.3.3 Due to the low value of the trees to be removed the removals will have only a negligible arboricultural impact and loss of amenity value.

4.3.4 While there will be some loss of amenity value from the removals it will not significantly detract from the landscape value of the wider site. This loss can be mitigated through the planting of suitable species and is an opportunity to add substantial value with an enhanced landscaping scheme.

4.3.5 The development proposals have allowed space for the planting of replacement trees throughout the site once construction is complete. The planting of diverse tree species that are in keeping with the surrounding landscape character and tolerant of climate change can mitigate for the required removals and, in the longer term, increase the amenity value and ecosystem service benefits that the site's trees provide.

4.4 Tree Pruning

4.4.1 The pruning of trees should only be undertaken where essential, to prevent open wounds that can lead to bacterial or fungal infection. Pruning works should generally be undertaken during the winter months when the tree is dormant or during the summer months when the tree is fully active.

4.4.2 Any pruning works that are required to facilitate the development are detailed in the Tree Survey Schedule at Appendix 1.

4.4.3 Tree pruning should be carried out by a suitably qualified and insured arboricultural contractor and in accordance with the recommendations of BS 3998:2010 *Tree work – Recommendations.*

4.5 Impacts from Demolition/Construction Operations

4.5.1 Where proposed operations encroach beneath the canopy or into the RPA of retained trees there is the potential for damage to occur.

4.5.2 Excavations have the potential for decreasing ground levels within the RPA of the retained tree T012 and T009 as detailed on the Tree Impacts Plan at Appendix 3.

4.5.3 In this instance the encroachment into the RPA of T012 has been calculated to be approximately 18.7% however it should be noted that with the surrounding topography and current land use means the level changes may impact the tree's rooting area. The incursion into T009 is minor and due to current land use no significant roots are expected in the area of incursion.

4.5.1 It is recommended that T012 and T009 remain fully protected by fence protection until the ground excavations are required around the periphery edge of the RPA. The works must be fully supervised by the project arboriculturalist. This approach will have minimum impact around the outer edges of the trees potential RPA, which overall is deemed to contain sufficient roots and rooting volume, therefore preserving the tree's long-term viability.

4.6 Mitigation and Protection

4.6.1 The retained trees will need protecting from development operations to ensure that they are not negatively impacted during the development. This has been detailed as part of the Arboricultural Method Statement (AMS) at Appendix 3.

4.6.2 Where existing hard surfaces are present within the RPA of retained trees they should be kept in place where possible, even if they are not part of the design proposals. These hard surfaces will provide ground protection for any roots present beneath the hard surface during development works.

4.6.3 Any works that are proposed beneath the canopy or within the RPA of retained trees must be carried out as specified in the AMS. It is likely that these works will need to be supervised by the project arboriculturist so that any tree related issues that occur can be suitably dealt with.

4.6.4 To compensate for potential root damage and stress caused by construction activities, retained trees onsite should be mulched. The materials that may be used include wood chip, pulverized bark, or leaf mould. The mulched area should extend throughout the open ground within the RPA. The depth of an organic mulch should not be so much as to inhibit aeration of the root system or to cause overheating (Approximately 50 mm to 100 mm).

4.6.5 Where the removal of trees is required to facilitate the development, the planting of suitable replacement trees will be required as part of a wider landscaping scheme. It is recommended that tree planting follows a 5 – 10 – 20 - 30 formula (i.e. No more than 5% of any one cultivar, no more than 10% of any one species, no more than 20% of any one genus, and no more than 30% of any one family.) This gives any new tree population maximum resilience against pests and diseases.

4.6.6 Tree planting and establishment should be carried out in accordance with BS 8545:2014 *Trees: from nursery to independence in the landscape – Recommendations*.

5. References

BS 3998:2010 *Tree work – Recommendations*. ISBN 978 0 580 53777 6

BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. ISBN 978 0 580 69917 7

BS 8545:2014 *Trees: from nursery to independence in the landscape – Recommendations.* ISBN 978 0 580 713170

Littlefair P. (2011). *Site layout planning for daylight and sunlight: a guide to good practice (BR 209).* ISBN 978 1 84806 178 1.

Volume 4 National Joint Utilities Group (NJUG) *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*, Volume 4: Issue 2: 16/11/2007, www.njug.org.uk

Appendix 1: Tree Survey Schedule

Table 3: Tree Survey Schedule

Key:	Symbols Used	Age Class	SLE	Comments	Management	Category
	< = less than ~ = approximately > = greater than # = estimated	Young, Semi mature, Early mature, Mature or Over mature	Estimate of Safe Life Expectancy (<10 Years, 10+ Years, 20+ Years or 40+ Years)	AGL - Above Ground Level MS - Multi-Stemmed TD - Trunk Division (height in m) DED - Dutch Elm Disease ADB - Ash Die Back AHC (1, 2, 3 or 4) - Ash Health Class	*Tree works that are recommended regardless of future development are in Italics* **Tree works that are required to facilitate the proposed development are in Bold**	**BS 5837:2012 Retention Categories:** U - Unsuitable for retention A - High B - Moderate C - Low **Sub-categories:** 1 - Mainly arboricultural qualities 2 - Mainly landscape qualities 3 - mainly cultural value

Tree No.	Species	Height (m)	No. of Stems	Stem Dia. @ 1.5m (mm)	Crown Spreads (m)				Height of Crown Clearance (m)	Age Class	SLE	Overall Condition	Comments	Management	Category	RPA Radius (m)	RPA Area (m^2)
					N	E	S	W									
H001	Hawthorn *(Crataegus sp.)* Blackthorn *(Prunus spinosa)*	1	40	<80	See Plan				0	Young	40+ Years	Good	Sparsely planted boundary hedge with 1m stem spacings.	No action required	C2	-	-
G002	Holly *(Ilex sp.)* Pedunculate Oak *(Quercus robur)* Common Ash *(Fraxinus excelsior)* Hawthorn *(Crataegus sp.)*	5	30	300 avg	See Plan				1	Mature	20+ Years	Fair	Boundary edge group. Predominanlty growing road side above a dug out area of land. 3m stem spacings. Self-set Ash at eastern edge of group. Dense scrub undergrowth. Good canopy clearance roadside.	No action required	C2	-	-
T003	Pedunculate Oak (Quercus robur)	15	1	670	10	8	6	6	2	Early Mature	40+ Years	Fair	Large level changes to the south reducing Rooting zone in this area. Exposed buttress roots in the open bank. Large diameter deadwood. Asymetrical crown bias to the north.	No action required	B1	8	201
T004	Common Ash *(Fraxinus excelsior)*	17	1	550	5	10	8	5	1.5	Mature	<10 years	Fair	Large exposed root buttresses to the south and east due to large level changes. Large diameter deadwood.	No action required	C1	6.6	137

Tree No.	Species	Height (m)	No. of Stems	Stem Dia. @ 1.5m (mm)	Crown Spreads (m)				Height of Crown Clearance (m)	Age Class	SLE	Overall Condition	Comments	Management	Cate-gory	RPA Radius (m)	RPA Area (m^2)
					N	E	S	W									
T005	Common Ash *(Fraxinus excelsior)*	6	1	300	0	1	6	1	2	Semi Mature	<10 years	Poor	Growing from steep bank, major lean to the south. Fungal fruiting bracket Inonotus spp mid height of stem south.	No action required	C1	3.6	41
T006	Common Hawthorn (Crataegus monogyna)	3	1	200	0	0	0	0	0	Dead	Dead	Dead	- Stamding dead stem. Providing good habitat.	No action required	U	0	0
T007	Common Hawthorn *(Crataegus monogyna)*	4	6	120 avg	2	4	1	0	0.5	Mature	20+ Years	Fair	Un-manged boundary stems. Exposed buttress roots due to historic level changes. Deadwood throughout.	No action required	C2	3.5	38
G008	Elder *(Sambucus nigra)*	3	10	100 avg	See Plan				0.5	Mature	<10 years	Poor	Un-managed hedgerow with 1m stem spacings. Stems are at upper age limit. Standing dead stem and dieback within group.	No action required	C2	-	-
T009	Pedunculate Oak (Quercus robur)	17	1	2300	9	5	7.5	7	1	Veteran	40+ Years	Fair	Field boundary tree. Veteran status with associated features.	No action required	A1	15	707
G010	Common Ash *(Fraxinus excelsior)* Common Hawthorn *(Crataegus monogyna)*	6#	115	200 avg	See Plan				0	Semi Mature	40+ Years	Fair	Dense field boundary group with 2metre stem spacings.	No action required	C2	-	-
G011	Common Hawthorn *(Crataegus monogyna)* Common Ash *(Fraxinus excelsior)*	4#	51	250 avg	See Plan				0	Semi Mature	40+ Years	Fair	Dense field boundary group with 2metre stem spacings.	**Two sections of group to be removed to faciliate devlopment.**	C2	-	-
T012	Pedunculate Oak *(Quercus robur)*	27	1	1400	11	11	11	11	2	Over Mature	40+ Years	Good	Field boundary tree. Large deadwood in excess of 50mm in diameter. Provides excellent visual amenity / habitat, a notable specimen. Minor lower stem and exposed root surface damage.	No action required	A1	15	707

Tree No.	Species	Height (m)	No. of Stems	Stem Dia. @ 1.5m (mm)	Crown Spreads (m)				Height of Crown Clearance (m)	Age Class	SLE	Overall Condition	Comments	Management	Cate-gory	RPA Radius (m)	RPA Area (m^2)
					N	E	S	W									
T013	Pedunculate Oak *(Quercus robur)*	16	1	1100	8	5	6	5.5	1.5	Veteran	40+ Years	Poor	Field boundary tree. Veteran status with associated RAVEN features. Heavily retrenched crown with large stag head features and upper crown cavities. Large open cavity south at 2.5m agl. Excellent visual amenity and habitat.	No action required	A1	15	707
T014	Pedunculate Oak *(Quercus robur)*	16	1	1500	7	5	8#	9	1	Over Mature	40+ Years	Fair	Notable specimen with RAVEN features. Retrenched crown with large stag head features / deadwood and upper crown cavities. Substantial ground level change to the east. Historical the ground had been dug away leaving a steep sided bank and cliff edge to the south and east. Excellent visual amenity and habitat. Large and exposed buttresses to the east and south.	No action required	A1	15	707
T015	Pedunculate Oak *(Quercus robur)*	7	1	360	4	4.5	4.5	4	1.5	Young	40+ Years	Good	Livestock damage to main stem to south. Wounds occluding well. Minor deadwood.	No action required	B1	4.3	58
H016	Common Hawthorn *(Crataegus monogyna)*	1.5	200	90 avg	See Plan				0	Mature	40+ Years	Good	Managed boundary hedge. 0.5m spacings. Provides good amenity value.	No action required	C2	-	-
G017	Goat Willow *(Salix caprea)*	4	5	80	See Plan				0	Young	20+ Years	Fair	Coppice stool regrowth behind boundary fence, adjacent to the canal. 5 m spacings.	No action required	C2	-	-
G018	Common Hawthorn *(Crataegus monogyna)* Goat Willow *(Salix caprea)* Common Ash *(Fraxinus excelsior)*	8	10	200 avg	See Plan				2	Semi Mature	<10 years	Fair	Dense shrub understorey. Self-set stems within. Dense ivy clad stems. Overhang site boundary.	No action required	C2	-	-
G019	Goat Willow *(Salix caprea)*	4	20	90 avg	See Plan				0	Young	20+ Years	Fair	Coppiced regrowth at canal edge.	No action required	C2	-	-

Tree No.	Species	Height (m)	No. of Stems	Stem Dia. @ 1.5m (mm)	Crown Spreads (m)				Height of Crown Clearance (m)	Age Class	SLE	Overall Condition	Comments	Management	Cate-gory	RPA Radius (m)	RPA Area (m^2)
					N	E	S	W									
G020	Common Hawthorn *(Crataegus monogyna)* Elm *(Ulmus sp.)* Common Ash *(Fraxinus excelsior)*	5	24	150 avg	See Plan				0	Semi Mature	40+ Years	Fair	Partially managed hedge. Self-set Ash stems growing within. Dense bramble within hedge. 0.5m stem spacings.	**Remove to facilitate development**	C2	-	-
T021	Common Hawthorn *(Crataegus monogyna)*	5	1	350	2.5	2.5	2.5	2.5	0.5	Mature	20+ Years	Fair	Stem base surrounded by wet ground. Dense lower branches.	No action required	C1	4.2	55
T022	Common Hawthorn *(Crataegus monogyna)*	5	1	350	2.5	2.5	2.5	2.5	0.5	Mature	20+ Years	Fair	Dense lower branches.	No action required	C1	4.2	55
G023	Common Hawthorn x40 (Crataegus monogyna) Goat Willow x10 (Salix caprea) Pedunculate Oak (Quercus robur)	10	51	150 avg	See Plan				0	Early Mature	40+ Years	Good	Dense hawthorn group borders the canal. Coppiced willow to the north. Inaccessible due to topography and wetland.	No action required	B1	-	-
H024	Common Hawthorn *(Crataegus monogyna)*	1.5	200	90avg	See Plan				0	Early Mature	40+ Years	Good	Well maintained boundary hedge.	No action required	C2	-	-
T025	Common Ash *(Fraxinus excelsior)*	18	1	500	9	9	9	9	4.5	Mature	<10 years	Fair	Dense ivy throughout main stem and lower canopy. Main unions at 2.5m agl. Stem located within boundary hedge. High voltage line to the west.	No action required	C1	6	113
T026	Pedunculate Oak (Quercus robur)	14	1	300	7	7	7	7	3.5	Semi Mature	40+ Years	Good	Set back within boundary hedge. Minor deadwood.	No action required	B1	3.6	41

Tree No.	Species	Height (m)	No. of Stems	Stem Dia. @ 1.5m (mm)	Crown Spreads (m)				Height of Crown Clearance (m)	Age Class	SLE	Overall Condition	Comments	Management	Cate-gory	RPA Radius (m)	RPA Area (m^2)
					N	E	S	W									
H027	Elder *(Sambucus nigra)* Hawthorn *(Crataegus sp.)* Holly *(Ilex sp.)*	2	85	150 avg	See Plan				0	Mature	40+ Years	Fair	Well maintained and managed boundary hedge.	No action required	C2	-	-
H028	Hawthorn *(Crataegus sp.)*	1.5	30	100 avg	See Plan				0	Mature	40+ Years	Good	Well maintained hedge at entrance way to field.	No action required	C2	-	-
H029	Common Hawthorn *(Crataegus monogyna)*	1.5	1	150 avg	See Plan				0	Mature	40+ Years	Good	Well managed field boundary hedge.	No action required	C2	-	-
T030	Pedunculate Oak (Quercus robur)	21	1	1500	10	8	4	6	4.5	Veteran	40+ Years	Fair	Beyond red line boundary. Road side. Crown retrenchment and large open cavities to the south. Large deadwood east at 10m. Dense lower epicormic. Heavy crown bias to the north.	No action required	A1	15	707

Appendix 2: Site Photographs

Plate 1: Looking south toward G002.

Plate 2: Looking east towards T004, T005 & T006

Plate 3: Looking west towards T009

Plate 4: Looking west towards T012

Plate 5: **T012 left of frame & looking north towards G020**

Plate 6: **Looking west toward G011**

Plate 7: Historic ground excavations near T014.

Plate 8: G018 & G019 north boundary.

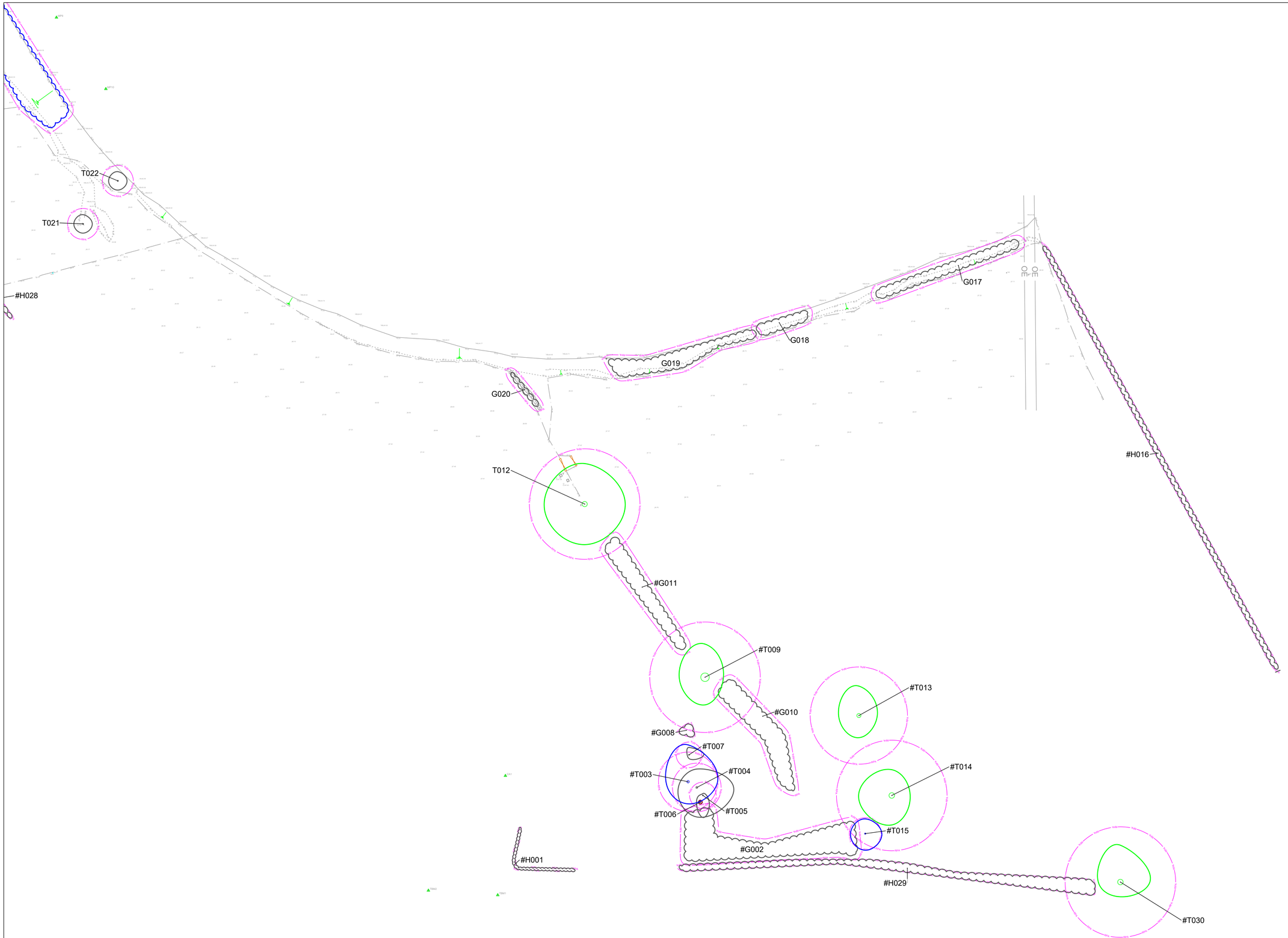
Plate 9: Looking west T021 left frame and G023 centre.

Plate 10: H024 with T025 far left of frame.

Plate 11: Looking west toward H027

Plate 12: Looking south toward H028

Appendix 3: Figures



GENERAL NOTES

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- Refer to arboricultural report produced by Ecus Ltd titled 'Coppice Lane – BS 5837:2012 Arboricultural Report, Impact Assessment and Method Statement'.
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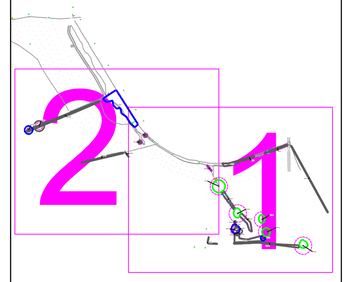
KEY

○ Stem Location # Location Estimated

Tree Categories (BS 5837:2012)

Category A Trees | Category B Trees | Category C Trees | Category U Trees

Root Protection Area (RPA)



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Tel. (0161) 3020280
www.ecusltd.co.uk

Job

21251 - Coppice Lane

Title

Figure 3 - Tree Constraints Plan (Sheet 1 of 2)

By	Date	Scale @ A1	Drg. no.
AOB	May 2023	1:500	21251-ARB-01

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N

0m 10m 20m 50m

SCALE BAR 1:500

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KEY

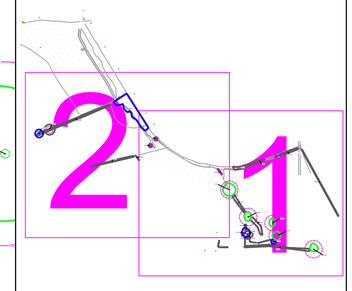
○ Stem Location # Location Estimated

Tree Categories (BS 5837:2012)

Category A Trees | Category B Trees | Category C Trees | Category U Trees

Root Protection Area (RPA)

G023
#H024
#T025
#T026
T022
T021
#H028
#H027
G020
T012



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Title

Figure 4 - Tree Constraints Plan (Sheet 2 of 2)

By	Date	Scale @ A1	Drg. no.
AOB	May 2023	1:500	21251-ARB-02

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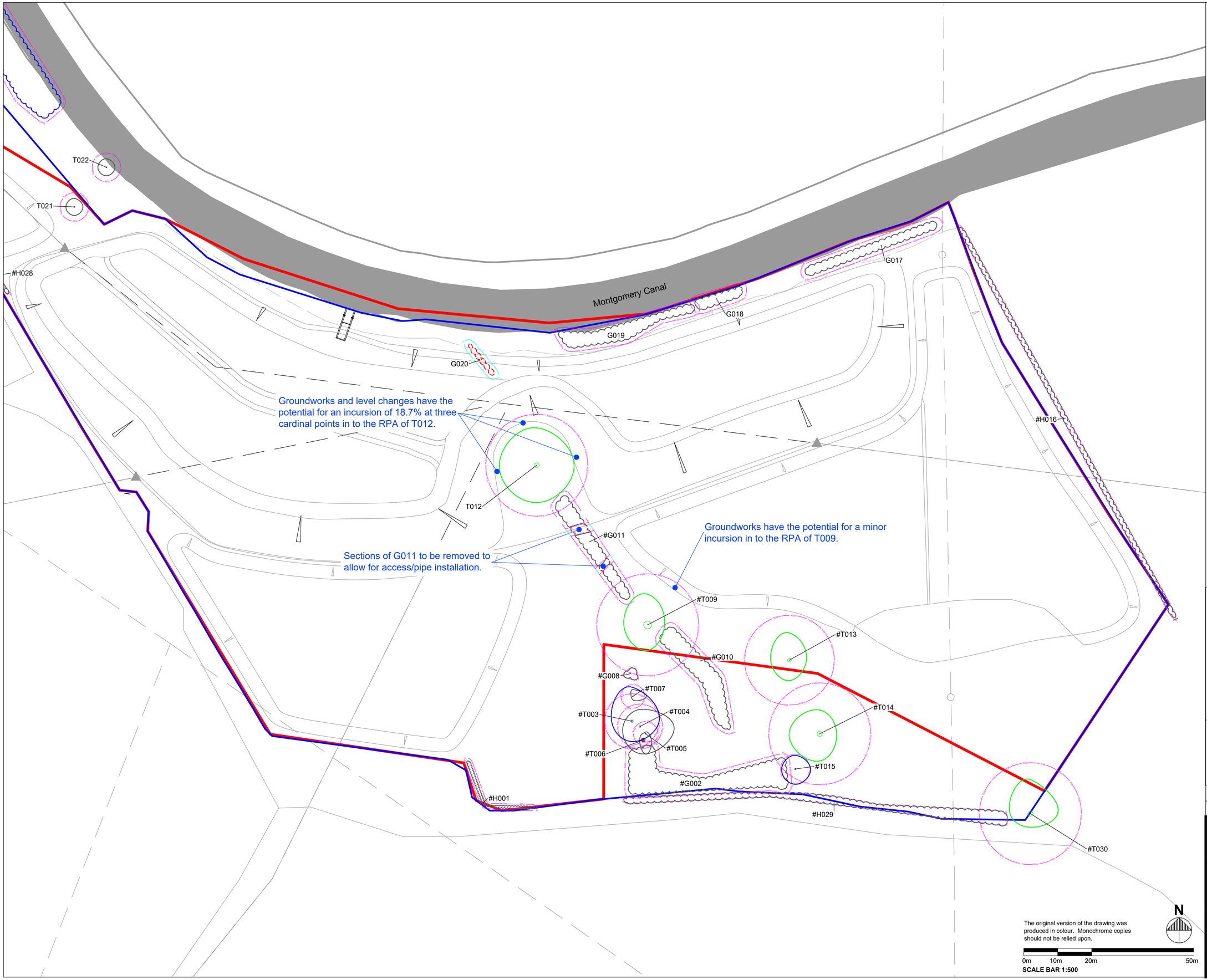
SCALE BAR 1:500



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KEY

○ Stem Location

Location Estimated

Tree Categories (BS 5837:2012)

Category A Trees | Category B Trees | Category C Trees | Tree to be Removed

Root Protection Area (RPA)

The original version of the drawing was produced in colour. Monochrome copies should not be relied upon.

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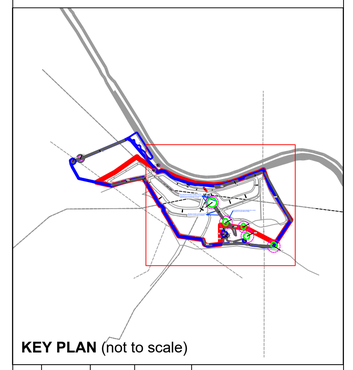
SCALE BAR 1:500



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Title

Figure 5 - Tree Impacts Plan (Sheet 1 of 2)

By	Date	Scale @ A1	Drg. no.
AOB	June 2023	1:500	21251-ARB-03

GENERAL NOTES

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KEY

○ Stem Location

Location Estimated

Tree Categories (BS 5837:2012)

Category A Trees

Category B Trees

Category C Trees

Tree to be Removed

Root Protection Area (RPA)

G023

#H024

#T025

#T026

T022

T021

#H027

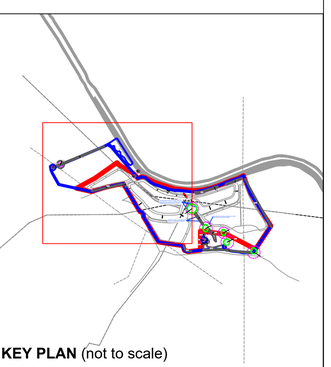
#H028

G020

T012

Groundworks and level changes have the potential for an incursion of 18.7% at three cardinal points in to the RPA of T012.

Sections of G011 to be removed to allow for access/pipe installation.



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Job
21251 - Wern Reserve

Title
Figure 6 - Tree Impacts Plan (Sheet 2 of 2)

By	Date	Scale @ A1	Drg. no.
AOB	June 2023	1:500	21251-ARB-04

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N

0m 10m 20m 50m
SCALE BAR 1:500

General

This Arboricultural Method Statement (AMS) details the specific measures to be adopted to ensure that the retained trees are suitably protected for the duration of the proposed development.

No equipment, machinery or materials shall be brought onto the site in connection with the development until this AMS has been submitted to and approved in writing by the Local Planning Authority.

Sequence of Events

For the purpose of protecting the retained trees, the development works on site should be completed in line with the following sequence of events:

- Pre-commencement site meeting
- Tree works
- Installation of tree protection measures
- Construction operations including the *excavations within the outer RPA edge of T12 and T9 which will require temporary access into the CEZ. All works are to de done under arboricultural supervision.*
- Removal of tree protection measures

Pre-Commencement Site Meeting

A pre-commencement site meeting should take place prior to any works being started, to finalise plans for the layout of the tree protection measures and to ensure that all potential issues are adequately considered.

The site developer and the project arboriculturist should be in attendance for the meeting. It may also be a requirement for the LPA tree officer to attend and so prior notification of the meeting should be provided to the LPA.

Tree Works

Prior to the commencement of any development operations and the storage of plant, machinery and materials on site, any required tree works should be carried out. The trees to be removed and any pruning works that are required to facilitate the development are detailed in the Tree Survey Schedule at Appendix 1 of the associated arboricultural report.

All tree works should be carried out by a suitably qualified and insured arboricultural contractor and in accordance with the recommendations of BS 3998:2010 Tree work – Recommendations.

It is recommended that trees should be checked in advance of any works by a suitably qualified ecologist to ensure there is no disturbance to nesting birds or roosting bats.

Tree Protection Fencing

Prior to the commencement of any development operations and the storage of plant, machinery and materials on site the tree protective fencing should be located as shown. Where possible this fencing should exclude all site activities from the RPA of retained trees, creating a sacrosanct Construction Exclusion Zone (CEZ).

It should be confirmed by the project arboriculturist that the fencing has been correctly set out on site, prior to the commencement of any other operations.

The default specification for tree protection fencing is shown here. However, where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority.

An example of an alternative specification is 2 m tall welded mesh panels on rubber or concrete feet. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should be attached to a base plate secured with ground pins or mounted on a block tray.

All-weather notices should be attached to the fencing to indicate that operations are not permitted within the CEZ, with words such as “CONSTRUCTION EXCLUSION ZONE – NO ACCESS”.

Once the tree protection fencing has been installed it should not be altered or removed without prior consultation with the project arboriculturist. If the tree protection fencing needs to be re-positioned to allow for development operations to continue, this must be carried out under the supervision of the project arboriculturist and with prior consent from the LPA.

The tree protective fencing must remain in place until all construction operations on site have been completed and all plant and machinery has been removed.

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

Removal of Existing Fencing

The removal of existing fencing is required within the RPA of the retained tree T12 and T9. The guidance below must be followed to remove the likelihood of damage to retained trees:

Rails or panels must first be removed using hand held tools only, working away from the trees and stacking the rails/panels beyond the RPA.

Posts should then be removed, either through the use of hand held tools or by machinery positioned outside of the RPA to lift the posts out of the ground. Any roots that become exposed must be covered with damp hessian sheet to avoid desiccation.

If any roots become damaged during the removal of the fence, they must be severed using a suitable sharp tool, leaving a clean wound with as small a surface area as possible. The severed root must then be immediately re-covered with earth.

The removal of fencing within the RPA should be carried out under the supervision of the project arboriculturist.

Arboricultural Site Supervision

Site monitoring and supervision by the project arboriculturist is likely to be required on a regular basis throughout the development. The specific site operations in close proximity of retained trees that will require supervision include:

- Tree removal and tree pruning works
- Installation of tree protection measures
- Alterations to tree protection measures.
- Excavations within the CEZ of T12 and T9
- Installation of any service runs in proximity to retained trees

A minimum of one week’s notice should be given to the supervising arboriculturist where possible before the start of any works within the RPA of retained trees, to allow the site visit to be scheduled.

All site visits will be recorded with the date and time along with any findings or comments relating to the tree protection measures and the specific operations supervised. These can be made available to the LPA tree officer on request.

Management of Exposed / Damaged Roots

Provided that works in close proximity to retained trees are carried out in line with the specifications detailed within this report the potential for damage to significant roots is low. However, on occasion approved works that are close to or within the RPA of retained trees can result in accidental root damage or roots becoming exposed.

If any exposed roots are smaller than 25 mm diameter they can be pruned back if required, however roots occurring in clumps or of 25 mm diameter and over should be retained where possible and worked around.

Where the severance of larger roots is unavoidable, the advice of the project arboriculturist must be sought, as such roots might be essential to the tree’s health and stability. It may be determined that the design layout must be slightly altered to allow for the retention and adequate protection of significant roots.

Roots that are heavily damaged or severed during approved works may need to be pruned back using a suitable sharp tool, such as secateurs or a handsaw. The cut must be made cleanly, leaving the smallest surface area possible, and beyond any obvious damage, towards the tree that the root is likely to have come from. If it is not clear which direction the root has grown from, the root should be pruned back to both sides of the damage/severance.

A health and safety assessment should be carried out or a regular monitoring regime put in place for trees that have incurred damage to roots in close proximity to their stems or where the damaged roots are 100 mm in diameter or greater. Such damage could lead to instability or a decline in health and condition.

Exposed roots or roots that have been pruned should be immediately recovered with earth to prevent desiccation. If this is not possible they should be wrapped in hessian sheets which are dry in winter, wet in summer. These should be removed prior to backfilling.

Landscaping Works

Where soft landscaping is proposed within the RPA of retained trees, excavations should be kept to the minimum required to provide adequate conditions for the establishment of new shrubs and trees. Excavations should be carried out carefully and by hand, avoiding the severance of any roots larger than 25mm diameter.

Ground levels within the RPA should generally not be altered to avoid the potential for damage to tree roots. Roots are considered to be primarily within the top 0.6 m of the soil. Any excavations have the potential to damage or remove part of the root system and could affect the vigour or stability of the tree. Conversely, increasing the ground level can compact the soil, potentially suffocating the roots and causing them to die off. If minor level changes are unavoidable as part of an approved landscaping scheme, the advice of the project arboriculturist should be sought.

Where fencing is to be installed within the RPA of retained trees this must consist of posts and panels or rails only, trenched footings are not acceptable within the RPA. The holes for posts should be kept to the minimum depth required and excavated using hand tools only.

Fence posts should be erected a minimum of 1.0 m from tree stems. The post locations may need adjusting if significant roots are uncovered, so that the roots remain intact. If wet concrete is to be used, post holes should be lined with an impermeable membrane to prevent soil contamination close to tree roots.

The fencing alignment should allow for a minimum distance of 0.5 m between any tree stem and the fence, providing sufficient room for future growth and minimising the risk of potential conflicts between the fence structure and tree stems.

Any landscaping works that are within the RPA of retained trees or will require the tree protection fencing to be temporarily breached should be carried out in consultation with the project arboriculturist.

Additional Precautions

Consideration should be given to site operations outside of the CEZ that could indirectly impact the retained trees, including the provision of adequate space for site cabins, welfare facilities and other temporary structures.

Site operations should take sufficient account of wide or tall loads in order that they can operate without coming into contact with retained trees. The movement of plant in proximity to trees should be supervised by a banksman, to ensure adequate clearance from trees is maintained at all times.

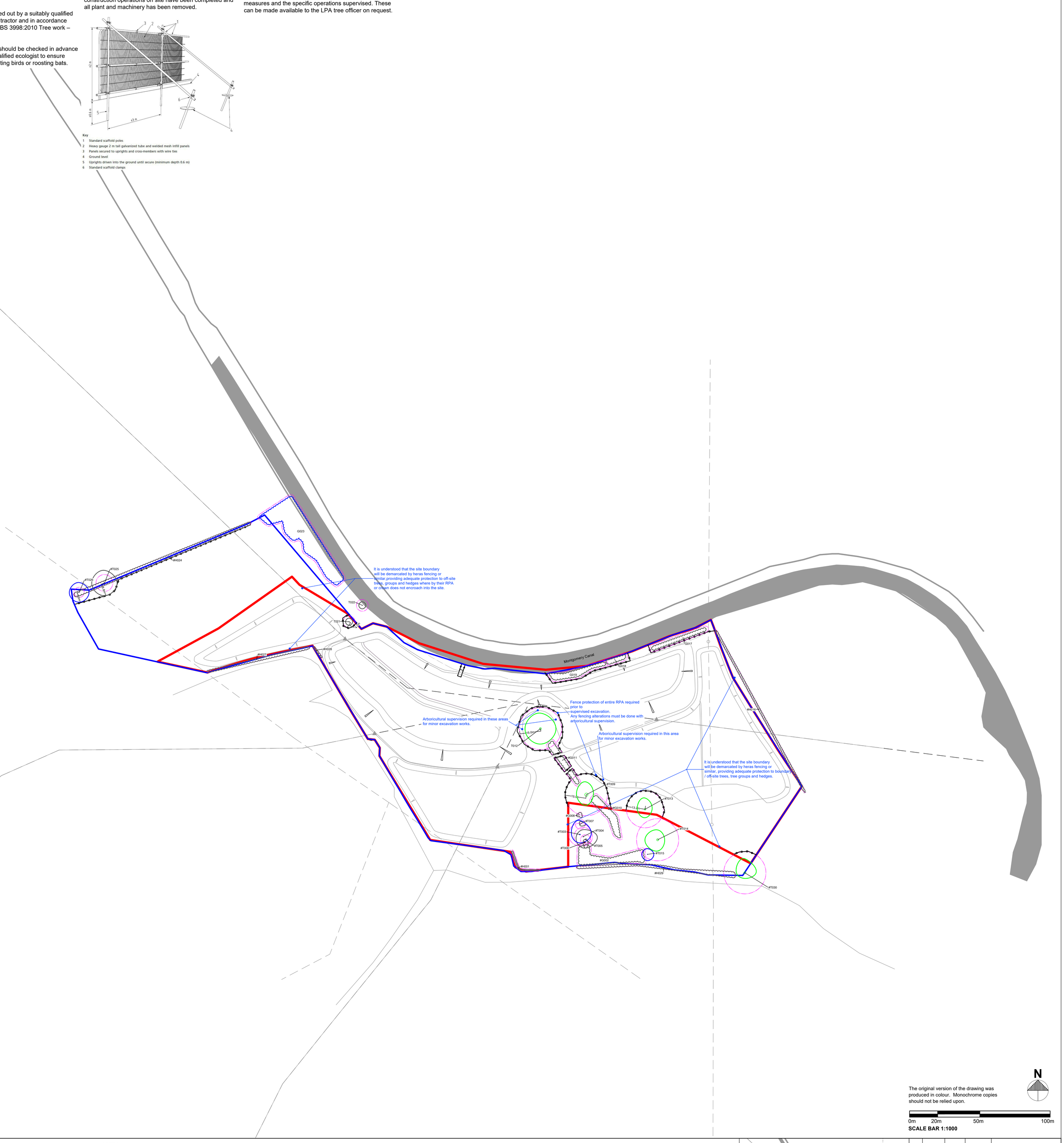
Fires on sites should generally be avoided. Where fires are unavoidable, they should not be lit in a position where heat could affect the foliage or branches of retained trees. The potential size of a fire and the wind direction should be taken into account when determining its location, and it should be attended at all times.

Any materials that could contaminate the ground around tree roots, such as fuels, oils or cement, should be stored and handled well away from the outer edge of the RPA.

Installation of Utilities and Services

Where possible all above and below ground utilities and services are to be directed away from the retained trees. Above ground services should be routed away from tree canopies, allowing sufficient space to allow for likely future crown growth. Below ground services should be grouped together and routed away from the RPA of retained trees.

Any below ground utilities or services that must be routed through the RPA should be installed in accordance with BS 5837:2012 clause 7.7.2 and NJUG 10: Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.



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N

0m 20m 50m 100m

SCALE BAR 1:1000

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KEY

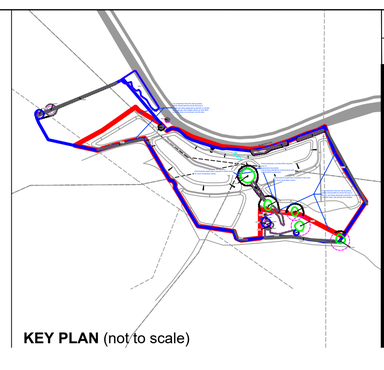
○ Stem Location
Location Estimated

Tree Categories (BS 5837:2012)

Category A Trees
Category B Trees
Category C Trees

Root Protection Area (RPA)
Tree Protection Fencing*

***See note on drawing**



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Job
21251 - Wern Reserve

Title
Figure 7 - Arboricultural Method Statement

By	Date	Scale @ A0	Drg. no.
AOB	May 2023	1:1000	21251-ARB-05

Appendix 4: Suffolk County Council Ash Die Back Canopy Description

Ash Tree Assessment

The Issue

Identifying the symptoms of Ash Dieback in large trees can be difficult, so a sysyem was needed to enable easy description of the current state of as Ash Tree. Tree Canopy assessment has been widely used since the late 1980's across Europe based on work produced in Switzerland in 1986. In 1990 the Forestry Commission produced a book – 'Assessment of Tree Condition' to enable a standard system for describing the condition of a tree based on the percentage of existing canopy remaining.

Using this methodology Suffolk County Council undertook to describe the health of an Ash in Suffolk.

The steps undertaken

During the summer of 2013/14 Suffolk County Council assessed and photographed Ash accross the county. They determined that there were 4 useful categories to describe Ash canopies. The categories chosen were

- 100% full canopy,
- 75% canopy,
- 50% canopy
- and 25% canopy.

These are represented photographically in the pictures at the end of this Case Study.

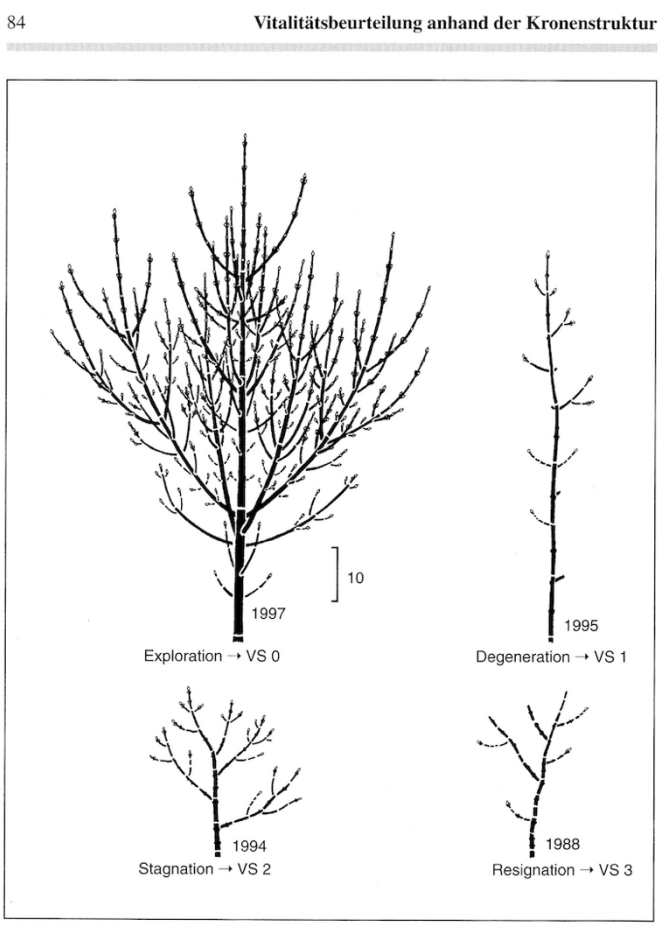
These 4 classes fit with work undertaken in Germany by Professor Andreas Roloff who has been describing the state of vitality of European Trees. He also uses 4 categories – described as

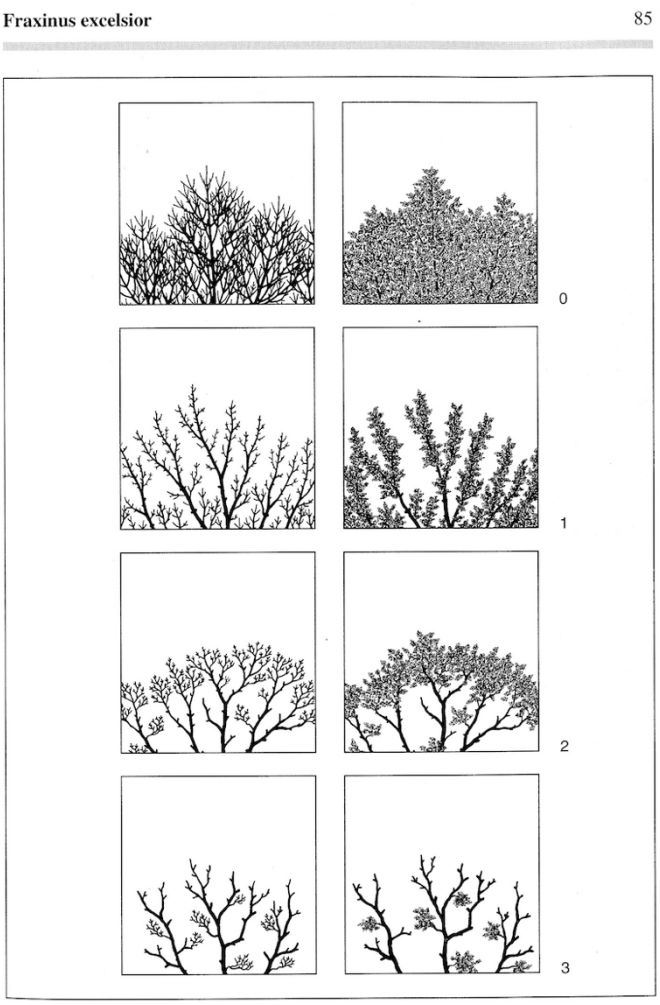
- Vitality Class 0: Healthy vigorous trees showing treetop shoots in the exploration phase: both the main axes and part of the lateral twigs consist of long-shoots. For this reason, a regular net-like branching pattern is developed, which reaches deep into the interior of the crown. The crowns are equally closed and domed, and do not show any greater gap unless a stronger intervention has occurred, such as pruning measures, because such a gap is closed quickly by the intensive ramification. In summer, a dense foliage arises without any greater gap.
- Vitality Class 1: Weakened trees show treetop shoots in the degeneration phase. Thus, spears/"fox tails" are formed, rising above the canopy. The leaves on these spears are dense and grow all around them (at the top of the lateral short-shoots or shortshoot chains). The crowns make a frazzled impression on the outside, and have a fastigiated appearance, because the airspace between the spears is not completely filled by leaves and twigs, and the crown has a spiky outline. Inside the crown, the branching pattern, and hence the foliage, is quite dense. In this vitality class, straight percurrent main axes of the treetop branches are still dominant, but the crowns no longer look as intact as in class 0 because of the spears shooting out of the canopy.
- Vitality Class 2: In obviously less vigorous trees, the treetop shoots begin to build short-shoots in the stagnation phase. The leafless state could be designated as the claw stage, because the short-shoot chains in the outside of the crowns grow longer, are predominant, and stretch claw-like to the light. These short-shoot chains, growing too long, break off in summer in thunderstorms and heavy rains, and strew the forest floor in

declining stands. Under normal circumstances, trees get rid of parts of their unimportant twigs in the inner and lower crown parts in this way. However, if the treetop shoots themselves are declining, the self-pruning of twigs progresses into the outskirts of the crown, and the crowns become thin from the inside outwards. The cause for this occurrence is not premature leaf fall, but broken short-shoot chains, a lack of shoots, and dead buds and twigs. The branching pattern shows a bushy and lumpy accumulation in the periphery of the crown. This accumulation causes summer and winter bushy crown structures and greater gaps. The crown periphery still has hardly any straight percurrent branches.

- Vitality class 3:, In considerably damaged or declining trees of the crowns finally fall apart by the breaking off of larger branches and the dieback of whole crown parts. The tree seems to consist only of more or less surplus sub-crowns, dispersed randomly in the airspace and forming whip-like structures. The treetop is often dying back or is already dead, because the treetop shoots grew in the retraction phase.

These 4 vitality classes are shown below for Ash.





The work in Germany and Suffolk complements each other and establishes the ability to be able to assisgn an ash tree to 1 of 4 categories, which describe the trees current health or vitality. This is a simple and useful method for describing the current state of an Ash's heatlh.

The Outcome

Using this 4 category framework, allows a tree to be assigned to a category, showing its current state of health, enabling data on the tree to be collected. The suggestion going forward is that these 4 classes are used as described as:

Ash Health Class 1 – 100 – 75% Canopy (Vitality Class 0)

Ash Health Class 2 – 75% -50% Canopy (Vitality Class 1)

Ash Health Class 3 – 50% - 25% Canopy (Vitality Class 2)

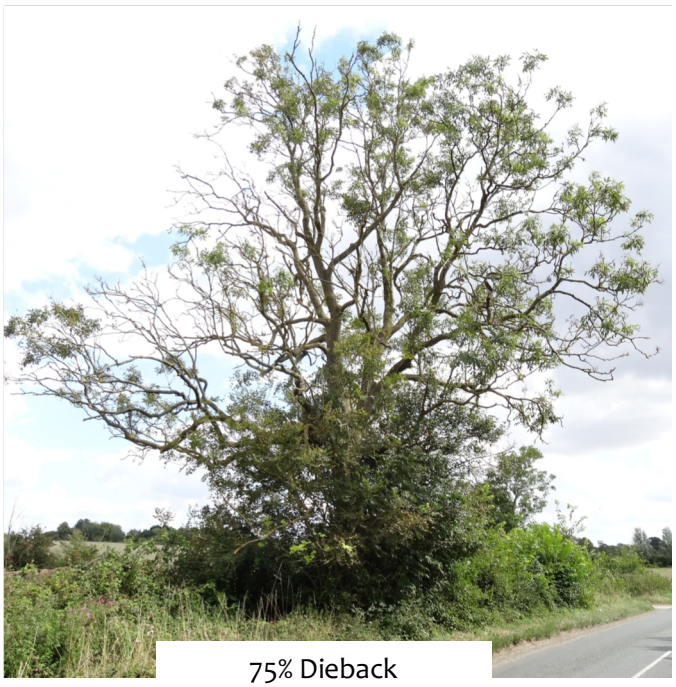
Ash Health Class 4 – 25% - 0% Canopy (Vitality Class 3)

Figure 1: Photos of Dieback of ash trees

0% Dieback - Healthy Crown

25% Dieback

50% Dieback



75% Dieback

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