County Tree Care Ltd
QUALIFIED ARBORISTS
Qualified in Arboriculture & Horticulture

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Project Name :

Hedgerow appraisal and arboricultural assessment at Broomfield, Midleton, Co. Cork

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Date : 15th September 2023

Prepared For :

Castlerock Homes Ltd.
Broomfield
Midleton,
Co. Cork

and

Forestbird Design Ltd.
Ballybranagh,
Cloyne
Co. Cork

Prepared by :

George Earle, *BSc Forestry*, *Dip Arb, MSIF, MArborA*

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1.1: Client Brief

County Tree Care Ltd was asked to carry out a hedgerow appraisal at a site in Broomfield, Midleton, Co. Cork. The brief was to provide an arboricultural assessment of the existing trees and vegetation on site, particularly those nearest the public road and water treatment facility. This report is to be read in conjunction with the Forestbird Design drawing *L203 – Vegetation Analysis*, which also addresses the scrub hedgerows.

1.2: Description Of Site

The site covers two field parcels directly north of the Broomfield estate in the town of Midleton. Bounding the site is the Midleton Water Treatment Facility, which is surrounded by tree lines that were planted as a screen. The remaining areas form a greenfield site framed by natural vegetation. There is a mix of native and non-native vegetation. There is also a mix of low growing vegetation and small trees that would normally be classed as understorey species. There are some large canopy tree species growing within the hedgerows, but are currently immature. The vegetation grows on different boundaries; sod ditches, sod/stone ditches and level ground.

1.3 : Diseased Trees

Former elm trees on site were decimated by Dutch Elm disease (Ophiostoma novo-ulmi) in the 1980's. Saplings continue to regenerate from the stump, but the pathogens are present throughout the soil and young trees soon die from the disease. There is no cure and this cycle will continue, with the consequence of never producing any mature trees.

The ash on site is now also infected with ash dieback disease (*Hymenoscyphus fraxineus*). Photographs from 2019 show that these trees were healthy only a few years ago. None of the ash on site appear to show resistance to the disease.

1.4 : Methodology

The methodology used was a visual appraisal that adopts the VTA – Method (Visual Tree Assessment) that was devised by Prof. Dr Claus Mattheck. This is an internationally recognised method for tree assessment. Trees are visually assessed beginning at the base. Starting first with the root zone and working up to the top of the tree. Features such as cavities, included bark, compressed unions, leaf colour or other features such as straight, well tapered stems and crown symmetry are all recognised and noted. Different features contribute to the overall hazard risk assessment of any particular tree. If there is an obvious defect that was observed during this tree appraisal then it is noted. This is not a tree survey. It is a general assessment of the trees and hedgerows that grow on the boundaries of the site. Trees were not tagged and no measurements were taken. The tree lines were categorised using the colour coding system devised for BS 5837 : 2010 standards as commonly used for tree survey and assessment for construction and demolition.

The coordinates of each end of the hedgerows were found using Google Earth and the *Universal Transverse Mercator (UTM).* For the most part these are accurate to about one metres or less but sometimes due to dense leaf coverage the GPS signal may have been deflected more than that. The hedgerows were assessed using a scoring system. The object

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of the methodology is to record the extent and floristic composition, content, physical structure, condition and management of the hedgerows as set out in the Hedgerow Appraisal System issued by The Heritage Council of Ireland

1.5 : Disclaimer

This tree appraisal should be regarded as a visual assessment of the trees and deals with the current condition as observed from the ground only. Any tree whether it has visible weakness or not, will fail if the force applied exceeds the strength of the tree or its parts. The details within this appraisal are based on the condition of the trees observed during one site visit only. No invasive or destructive evaluation techniques were used. All findings are based on the knowledge and expertise of George Earle. Trees are living organisms that are subject to the stresses of climatic extremes and attack from decay fungi and injurious diseases. There is no warranty or guarantee, expressed or implied in this appraisal that problems or deficiencies of the trees may not arise in the future. By examining the trees, rating their likelihood of causing damage and injury and recommending action to abate the hazard, we act to reduce but not eliminate the risks associated with the trees.

Signed 

1.6 : Relevant Legislation

There are no Tree Protection Orders (TPOs) on any of the trees on this site. However under Section 37 of the Forestry Act : 1946, it is illegal to uproot any tree over ten years old or to cut down any tree of any age (including trees which form part of a hedgerow), unless a Felling Notice has been lodged at the Garda Station nearest to the trees at least 21 days before felling commences. A felling license can be obtained by contacting the Dept of Agriculture, forestry section.

The requirement for a felling licence for the uprooting or cutting down of trees does not apply where :

- The tree in question is a hazel, apple, plum, damson, pear or cherry tree grown for the value of its fruit
- The tree in question is less than 100ft or 30m from a dwelling other than a wall or temporary structure
- The tree in question is standing in a County or other Borough or an urban district that is within the boundaries of a town council, or city council area
- The tree is considered dangerous and hazardous

Other exceptions apply in the case of local authority road construction, road safety and electricity supply operations. The Act is administered by the Forest Service, Department of

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Agriculture, Fisheries and Food. The Felling Section of the Forest Service is based in Johnstown Castle, Co. Wexford (053-9160200 or 1890-200223) Trees may contain bats. Bats are protected under Schedule 5 of the Wildlife Act 1976 and Schedule 1 of the European Communities (Natural Habitats) Regulations 1997. Professional advice from a licenced surveyor should be sought prior to any works commencing on trees.

1.7 : Terminology

Arboricultural Comments : Refers to the tree's condition and suitability for the site
Common name : Most widely used non botanical name
Co-dominant stems : Two branches assuming the role of leading stems. When growing close together may form a weak attachment (included bark) at their point of contact. Trees with this defect may be in danger of splitting at this weak attachment.
Included Bark : Pattern of development at branch junctions where bark is turned inward rather than pushed out
Crown spread : Measured in meters north, south, east, west
Decay Fungi : Refers to those species of fungi which degrade living wood and which may, depending on the degree of degradation, render the tree structurally unsound
Defects : Refers to cracks, storm damage and any other damage mechanical or biological
Girth : Diameter of the trunk (millimetres) at 1.5m above grade level. MS inserted after this measurement means multi-stemmed
Genus & Species : Refers to the botanical name for the tree
Height : Measured in meters given to the nearest .5m
Monitor : Refers to trees which need to be re-surveyed on a yearly basis to assess their condition. This timescale may be sooner where works or adverse weather conditions have impacted negatively on the trees
Overhaul : A reference to standard tree surgery work which consists of the removal of deadwood, crossing branches and balancing of the crown where appropriate
Recommendations : Indicates surgery work necessary for the retention or, where necessary, removal of the tree
Major deadwood : Dead branch/limb that is between 150mm – 250mm in diameter
Moderate deadwood : Dead branch/limb that is between 100mm – 150mm in diameter
Minor deadwood : Dead branch/limb that is between 50mm – 100mm in diameter
Basal Cavity : Cavity or opening located at the lower region of the tree at ground level
Stem Cavity : Cavity or opening located on the main stem/trunk of the tree
RPA : Root Protection Area, calculated as a circle with a radius of 12 times the diameter of the stem of the tree measured @ 1.5m. The RPA is then represented in m^2
ERC estimated remaining contribution that the tree can make if retained

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Terminology Continued

Age : Age cannot be exact unless invasive drilling technique are used. Therefore an estimate is given and categorised as

- Young (Y) - < 15 years old
- Early Mature (EM) -15-25 years old
- Mature (MA) – Tree has reached full maturity, over 25 years old
- Over Mature (OM) – Tree is over mature and showing signs of decline

Physiological Condition and Comments based on a three tier system :

- Good = Good health and vigour displayed
- Fair = Healthy and reasonable vigour
- Poor = Showing signs of decline, disease or decay

BS 5837 : 2012 determines four retention categories following assessment
Retention Category (RC)

- Category **A** : Trees whose retention is most desirable. Those of high quality and in such condition to make a substantial contribution
- Category **B** : Trees whose retention is desirable. Those of moderate quality and value so as to make a significant contribution
- Category **C** : Trees which could be retained. Those of low quality and value, but can make a contribution until new planting is established.
- For trees in categories A to C there are further subcategories (1,2,3)
- Subcategories 1,2 and 3 are intended to reflect arboricultural and landscape qualities and cultural values, respectively.
- Category **U** : Trees for removal. Trees that should be removed for reasons of sound arboricultural management

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1.8 : Colour Identification of Tree Categories

Tree Class	Colour Code
Class A	
Class B	
Class C	
Class U	

1.8: References

- BS 5837 : 2012. Tree in Relation to Design, Demolition and Construction
- BS 3998 : 2010. Tree Work Recommendations
- Principles of Tree Hazard Assessment and Management ; David Lonsdale
- Mattheck and Breloer (1994). The body language of trees
- Neil Foulkes, Janice Fuller, Declan Little, Shawn McCourt, Paul Murphy
  Hedgerow Appraisal System Best Practise Guidance on Hedgerow Surveying, Data Collection and Appraisal

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1.10: Hedgerow Classification

Hedge No.	Coordinates	Species	Height	Width	Age	Condition	Comments	Recommendations	Category Grading
1	51.9256794^{0}N -8.1757167^{0}W 51.9256081^{0}N -8.1760497^{0}W	Hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus*), stinging nettle (*Uritica dioica*), ivy (*hedera ilex*)	4 m	3 m	M	Poor	Poorly shaped hedge that is decimated due to loss of elm trees (70% of hedge), where some stems are in-situ; 3 no. hawthorn trees at the edge of the field boundary on a small raised earth ditch; all trees are in poor condition with poorly shaped canopies; dense field layer of stinging nettle, bramble and some elder coming through as an understorey	Plant new hawthorn whips to create a continuous cover and hedgerow that can be maintained every two years when whips grow to be strong plants	Historical –1 Species diversity - 2 Ground flora - 2 Structure - 1 Habitat Connectivity -1 Landscape - 2

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Hedge No.	Coordinates	Species	Height	Width	Age	Condition	Comments	Recommendations	Category Grading
2	51.9256081^{0}N -8.1760497^{0}W 51.9256081^{0}N -8.1760497^{0}W	Wych elm (*Ulmus glabra*) hawthorn (*Crataegus monogyna*), ash (Fraxinus excelsior), grey willow (Salix cinerea), bramble (*Rubus fruticosus*), stinging nettle (*Uritica dioica*), wild rose (*Rosa canina*) ivy (*hedera ilex*)	4 m	3 m	M	Poor	Low quality semi-mature/ mature hedge, 19 no. dead elm trees, 4 no. healthy hawthorn trees at southern end, 1 no. mature ash severely infected with ash dieback, grey willow saplings emerging in understorey; a 19m segment removed during recent road works; hedgerow looks poor and is broken up by the dead specimens; where present, the field layer is dense with good coverage	Fell the dead elms as a matter of urgency and dying ash within 1 year; regenerate the majority of hedgerow with native species to include hawthorn whips and allow to grow dense and layered	Historical –1 Species diversity - 4 Ground flora - 3 Structure - 3 Habitat Connectivity -2 Landscape - 2

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Hedge No.	Coordinates	Species	Height	Width	Age	Condition	Comments	Recommendations	Category Grading
3	51.9266700^{0}N -8.1758639^{0}W 51.9267451^{0}N -8.1743797^{0}W	Hawthorn (*Crataegus monogyna*), gorse (*Ulex europeaus*), bramble (*Rubus fruticosus*), stinging nettle (*Uritica dioica*), bracken (*Pteridium aquilinum*), ivy (*hedera ilex*)	4 m	3 m	M	Fair	A moderate quality hedgerow consisting of primarily understorey species (hawthorn, blackthorn, elder) and a thick field layer; growing in concert with a high-canopy double row of sycamores located 2m to the north (Hedgerow 7); root systems would be integrated with Hedgerow 7, but unlikely to venture too far south due to the tall ditch embankment	Plant new whips of blackthorn and hawthorn in among the bramble and try to encourage these species to fill out and add structure to the hedgerow, these trees can be maintained in the future as a hedge if need be	Historical –1 Species diversity - 3 Ground flora - 2 Structure - 1 Habitat Connectivity -2 Landscape - 2

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Hedge No.	Coordinates	Species	Height	Width	Age	Condition	Comments	Recommendations	Category Grading
4	51.9276953^{0}N -8.1741993^{0}W 51.9276637^{0}N -8.1754475^{0}W	Blackthorn (*Prunus spinosa*), wych elm (*Ulmus glabra*)	4 m	3 m	M	Fair	Line of blackthorn that were planted on a berm 3m north of the water plant perimeter fence; there are 4 no. dead elms at the Western end of the hedgerow and the blackthorn trees are growing as standards (stems) with few stems at ground level, this indicates that the hedgerow is relatively new and the blackthorn were purchased as nursery plants; the trees are healthy, but the line does not resemble a natural indigenous hedgerow in form or species diversity	Remove the dead elm trees; interplant the blackthorn trees with hawthorn and hazel whips that would create a dense hedgerow of mixed species to benefit the natural appearance and diversity of the hedgerow	Historical –1 Species diversity - 1 Ground flora - 0 Structure - 1 Habitat Connectivity -1 Landscape - 2

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Hedge No.	Coordinates	Species	Height	Width	Age	Condition	Comments	Recommendations	Category Grading
5	51.9273779^{0}N -8.1756400^{0}W 51.9266599^{0}N -8.1758995^{0}W	Wych elm (*Ulmus glabra*), hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), gorse (*Ulex europeaus*), bramble (*Rubus fruticosus*), stinging nettle (*Uritica dioica*), bracken (*Pteridium aquilinum*), ivy (*hedera ilex*)	5 m	3 m	M	Poor	Hedgerow on sod ditch located outside the treatment facility fence; this hedge has a close relationship to the taller sycamores within Hedgerow 6; at the northern end, a line of young wych elms (suckers) are reaching end of life; 1 no. mature sized ash tree that has been coppiced in the past, resulting in a multi-stemmed tree, is currently leafing out but is showing signs of ash dieback infection; there is a 55m gap between this ash tree and a large ash at the southwest corner; within the gap is a 6m cluster of young hawthorn and a long line of bramble; the ash at the corner is the largest ash on site, but is heavily infected with ash dieback disease	Fell and remove both ash trees and all of the elm trees; replant with hawthorn, blackthorn, and hazel whips to encourage the growth of a short native hedgerow that will act as a good screen and be beneficial for biodiversity	Historical –1 Species diversity - 2 Ground flora - 2 Structure - 1 Habitat Connectivity -2 Landscape - 2

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The following Hedges no. 6-10 are tree lines that represent hedgerows at or near the site boundary:

Hedge No.	Coordinates	Species	Height	Crown Spread	Age	Condition	Comments	Recommendations	Category Grading
6	51.9273405^{0}N -8.1755823^{0}W 51.9266971^{0}N -8.1758633^{0}W	Sycamore (*Acer pseudoplatanus*)	10 m	N 3 m S 3 m E 3 m W 3 m	EM	Fair - Good	A line of evenly spaced sycamore trees that were likely planted to serve as a screen, a fast growing species with large canopies; branches close to the fenceline have been cut back and there is no sign of occlusion (wound closing), still the trees seem healthy with no obvious signs of pathogen attack or poor health, the trees serve their purpose and in time will likely increase their canopy sizes and eventually reach heights of 20m; the sycamores are closely related to Hedgerow no. 5 and influence the growth and character of vegetation in that hedge	No work required presently	**B2**

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Hedge No.	Coordinates	Species	Height	Crown Spread	Age	Condition	Comments	Recommendations	Category Grading
7	51.9267000^{0}N -8.1757764^{0}W 51.9267715^{0}N -8.1744772^{0}W	Sycamore (*Acer pseudoplatanus*)	9 m - 17 m	N 3 m S 3 m E 3 m W 3 m	EM	Fair - Good	A double line of sycamore trees, with the inner row somewhat younger and likely planted to serve as additional screening, sycamore is a fast growing species with large canopies; 3 no. trees now measure 17m or more in height; the trees seem healthy with no obvious signs of pathogen attack or poor health; the trees serve as an important screen to the Water Treatment facility; the sycamore canopies provide shade and shelter to Hedgerow no. 3, limiting large canopy growth in that hedge	No work required presently	**B2**

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Hedge No.	Coordinates	Species	Height	Crown Spread	Age	Condition	Comments	Recommendations	Category Grading
8	51.9267742^{0}N -8.1744061^{0}W 51.9269675^{0}N -8.1743186^{0}W	Ash (*Fraxinus excelsior*)	14 m	N 3 m S 3 m E 3 m W 3 m	EM	Fair	A line of 6 no. ash trees on level ground, growing inside the fence line of the Water Treatment facility along its eastern boundary; they are early mature and of fair health; however, they all show early signs of ash dieback infection, recognisable by the curling of outer leaves at the newest growth tips and minor thinning of the crowns; these ash were likely purposely planted at the time of the sycamores and not indigenous to the site, thus the different rate of infection of ash dieback disease	Retain for the short term, monitor and re-inspect in 2024 and 2025 to assess any progression of disease infection; if disease has not significantly progressed by 2025, retain, manage and monitor; if it has measurably progressed, remove and replant with other lrger canopy native trees (Oak, Alder, Scots Pine)	**C2**

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Hedge No.	Coordinates	Species	Height	Crown Spread	Age	Condition	Comments	Recommendations	Category Grading
9	51.9270934^{0}N -8.1743052^{0}W 51.9276388^{0}N -8.1741369^{0}W	Sycamore (*Acer pseudoplatanus*)	12 m	N 3 m S 3 m E 3 m W 3 m	EM	Fair-Good	A single line of 9 no. early-mature sycamore trees whose canopies now touch, forming a contiguous tree row; the upper crowns illustrate some congestion with restricted branch development and some stems are not straight, all trees have been crown lifted with the lower branches cut back from the fence line, the health of the trees seems to be good with no visible signs of decay or infection	Retain, no further work required presently	**B2**

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Hedge No.	Coordinates	Species	Height	Crown Spread	Age	Condition	Comments	Recommendations	Category Grading
10	51.9276727^{0}N -8.1741966^{0}W 51.9276587^{0}N -8.1744688^{0}W	Ash (*Fraxinus excelsior*)	9 m	N 3 m S 3 m E 3 m W 3 m	EM	Fair	A line of 4 no. ash trees on level ground, growing inside the fence line of the Water Treatment facility along its northern boundary; they are early mature and of fair health; however, they all show early signs of ash dieback infection, recognisable by the curling of outer leaves at the newest growth tips and minor thinning of the crowns; these ash were likely purposely planted at the time of the sycamores and not indigenous to the site, thus the different rate of infection of ash dieback disease; the ash canopies cast some shade onto Hedgerow no. 4	Retain for the short term, monitor and re-inspect in 2024 and 2025 to assess any progression of disease infection; if disease has not significantly progressed by 2025, retain, manage and monitor; if it has measurably progressed, remove; replanting to occur within the adjacent Hedgerow no.4	**C2**

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2.0: Photographs


Fig 1: Hedgerow 1


Fig 2: Hedgerow 2


Fig 3: Hedgerow 3


Fig 4: Hedgerow 4


Fig 5: Hedgerow 5


Fig 6: Hedgerow 6


Fig 7: Hedgerow 7


Fig 8: Hedgerow 8


Fig 9: Hedgerow 9


Fig 10: Hedgerow 10

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2.1: Satellite maps

Fig 11: General Site Location

Fig 12: Location of trees on site

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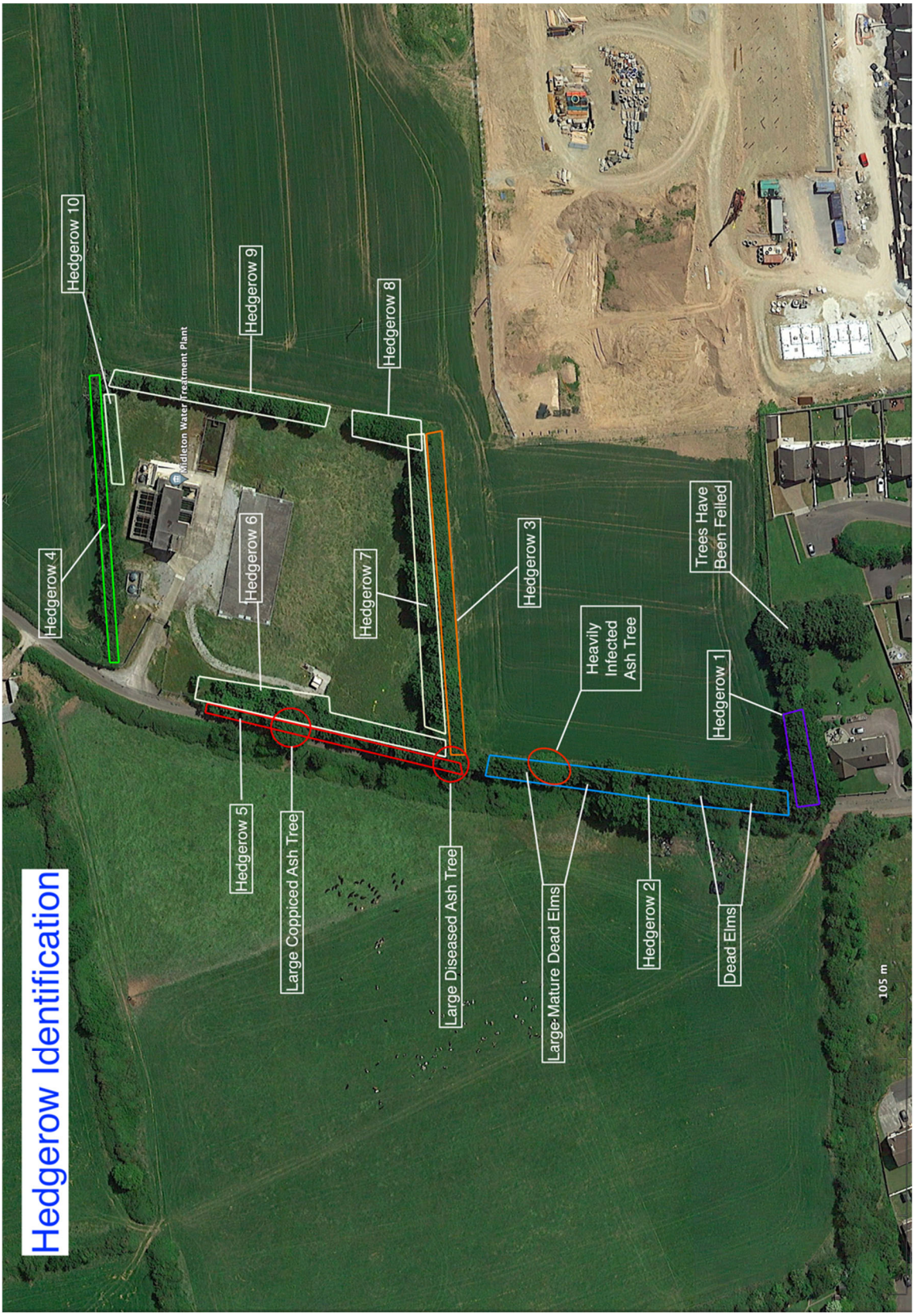

Fig 13: Hedgerow Identification and Tree Location

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2.2: Identification of Preliminary Tree Constraints

Root systems can be damaged in a number of ways as follows :

- Severance of a root will destroy all parts of the root beyond that point. The larger the root severed, the greater the impact on the tree. If the roots are damaged close to the trunk, the anchorage and stability of the tree can be affected.
- The root bark protects the root from decay and is essential for further root growth. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.
- Soil compaction, which may occur from storage of material or passage of heavy equipment over the root area, can restrict and even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Lowering the soil level will strip out the mass of roots near the surface

Below Ground Tree Constraints continued :

- Raising soil levels will have the same effect as soil compaction

- Incorrect selection and application of herbicide

- Spillage of oils or other harmful materials

Above Ground Constraints :

- The current and ultimate height and spread of the trees, in relation to any new building final position.

- The effect that construction requirements might have on the amenity value of trees, both on and near the site, including pruning to facilitate access and working space. This may be the case with the trees on the entrance driveway and neighbouring trees overhanging branches.

- The requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy.

- The proposed end use of the space adjacent to the retained trees.

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2.3: Tree Protection Plan

Protection of trees. A protective barrier, 2.3m high and comprising a vertical and horizontal framework of scaffolding, well braced to resist impacts and securely supporting weldmesh panels, (as illustrated in Fig 14 & Fig 15 supplied), shall be erected around the base of all trees to be retained on site. This barrier shall be clearly identified on site by the attachment of all – weather signs of suitable dimension stating : 'CONSTRUCTION EXCLUSION ZONE – NO ACCESS'. The line of this fence shall be at least the distance defined by the RPA if calculated. No construction traffic, materials or debris will be permitted within this zone of protection.

Access facilitation pruning. If it is deemed appropriate to trim back retained trees to provide adequate access to approved construction works, all such tree works should be undertaken by a competent and suitably qualified tree surgeon. Such works shall remedy any tree related conflict with proposed structures or access in a way that ensure that not less than 70% of live buds are retained within the tree canopy. The aim of the tree works shall be to retain the general form of the tree by a combination of crown thinning, reduction of end weight and the re-forming of the trees crown to create a pleasing and balanced crown. No branch, limb of trunk greater than 100mm diameter shall be cut in the process of reducing end weight.

Demolition within the zone of protection. If it is deemed necessary to carry out demolition works within a construction exclusion zone surrounding retained trees, for example to remove existing paths or kerbs, only pedestrian operated plant or low ground pressure plant that is less than 2 tonnes gross weight fully loaded shall be permitted. Such plant shall only be operated on existing hard surfaces, or where temporary surfaces have been established. No excavations within the root protection zone of these retained trees shall be permitted, except only under supervision, with the use of an air spade or by careful use of hand tools in a way that retains, without damage, all exposed roots with a diameter greater than 25mm.

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Scaffolding within zone of protection. Where scaffolding is to be established within the 'zone of protection' surrounding retained trees, the existing undisturbed ground surface shall be protected by a layer of sharp sand, approximately 50mm thick, overlaid with a geotextile membrane. Stout planks, such as closely side butted scaffold boards, will be laid over the geotextile membrane and scaffolding will be constructed on these planks with additional stays as directed by a competent person. Adequate protection fencing as illustrated in Fig 14 and Fig 15 will be maintained between scaffolding and adjacent trees.

Construction of hard surfaces close to retained trees. Where permanent surfaces are to be constructed close to retained trees, within the zone of protection as defined by BS 5837 : 2012, carefully remove accumulated organic material and loose soil, leaving existing topsoil in situ. Protect the root zone with a layer of sharp sand and geotextile membrane and a three dimensional cell product as defined by a competent Civil or Structural Engineer. Construct the paved area on this sub-base using established design guidelines and a no fines granular material with a porous surface finish such as pavers or porous bitmac

Alterations of levels on lands adjoining construction exclusion zones. Where it is deemed appropriate to lower ground levels on land adjoining a root protection zone established around a retained tree, all excavations and the subsequent construction supporting structures shall be managed in a way that excludes access by construction traffic to the construction exclusion zone. Where such alterations result in the lowering of existing surfaces, the existing ground water environment within the root protection zone shall be maintained by the insertion of a root barrier behind proposed supporting structures. This shall consist of a non-porous barrier carefully inserted in a way that maintains the existing soil moisture regime surrounding the retained tree. Where alterations result in the raising of levels, these shall be designed and detailed by a competent Civil of Structural Engineer to ensure no alterations to ground conditions within the root protection zones.

Landscaping within the root protection zone. If it is deemed necessary to carry out landscaping, planting or re-instatement works within a construction exclusion zone surrounding retained trees, only pedestrian operated plant, or low ground pressure plant that is less than 2 tonnes gross weight fully loaded, shall be permitted. Such works should be supervised by a competent Horticulturalist and be timed and designed to ensure that no soil compaction occurs. No excavations within the root protection zone of these trees shall be permitted, except under supervision using an air spade or by carful use of hand tools in a way that retains, without damage, all exposed roots with a diameter greater than 25mm

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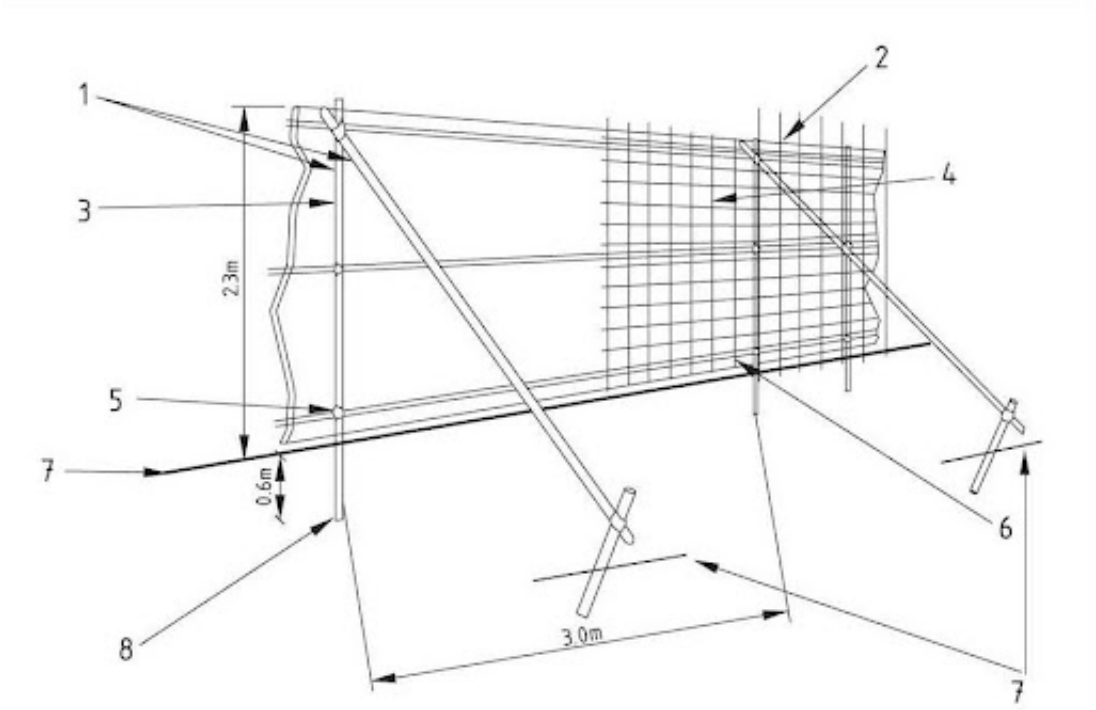

1 Standard scaffold poles
2 Uprights to be driven into the ground
3 Panels secured to uprights with wire ties and where necessary tandard scaffold clamps
4 Weldmesh wired to the uprights and horizontals
5 Standard clamps
6 Wire twisted and secured on inside face of fencing to avoid easy dismantling
7 Ground level
8 Approx. 0.6 m driven into the ground

Figure 14 : Tree Protective Barrier

The protective barrier will be appropriate to the degree and proximity of likely construction works. The default specification of BS 5837 : 2012 recommends a vertical and horizontal, scaffold framework, well braced to resist impacts, with vertical tubes at no more than 3m intervals. These should be driven into the ground. Weld mesh panels should be affixed to this framework with scaffold clamps – see Fig 14 and Fig 15. Heras fencing is a reliable option or a similar structure of sturdy, wooden construction would be acceptable. It should typically comprise of the following :

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Figure 3 Examples of above-ground stabilizing systems

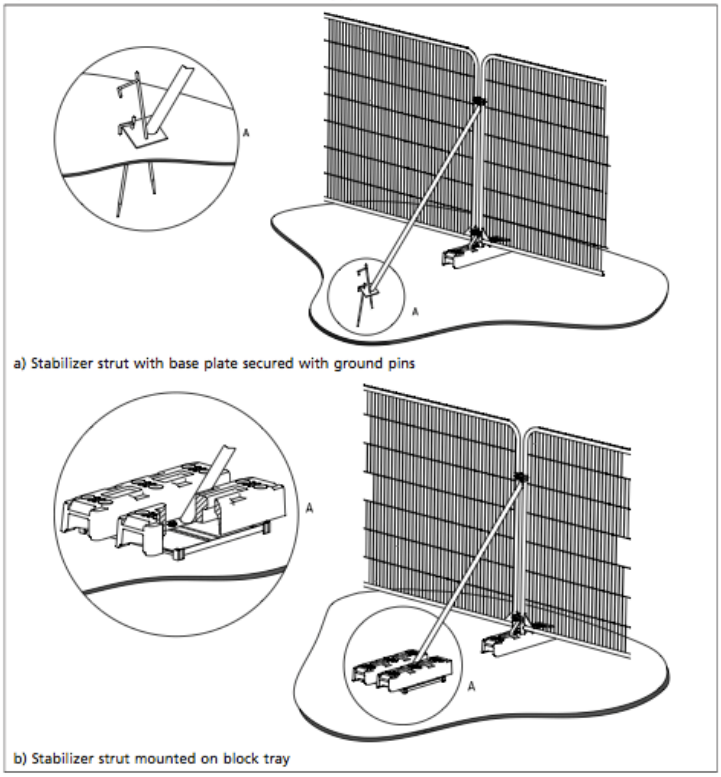

Figure 15

- Temporary protective fencing panels should be weldmesh Heras panels of at least 2.0m in height
- The panels shall stand on rubber or concrete feet
- The panels shall butt together and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence
- The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45^0 angle and extended back into the Construction Exclusion Zone and shall be attached to a base plate, which shall be secured to the ground with pins
- No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts
- A 600mm x 300mm warning sign reading 'Construction Exclusion Zone Keep Out' shall be fixed to every 10.0 metre length of protection fencing
- On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery or plant and materials, the Consulting Arboriculturist shall inspect the Temporary Protective Fencing

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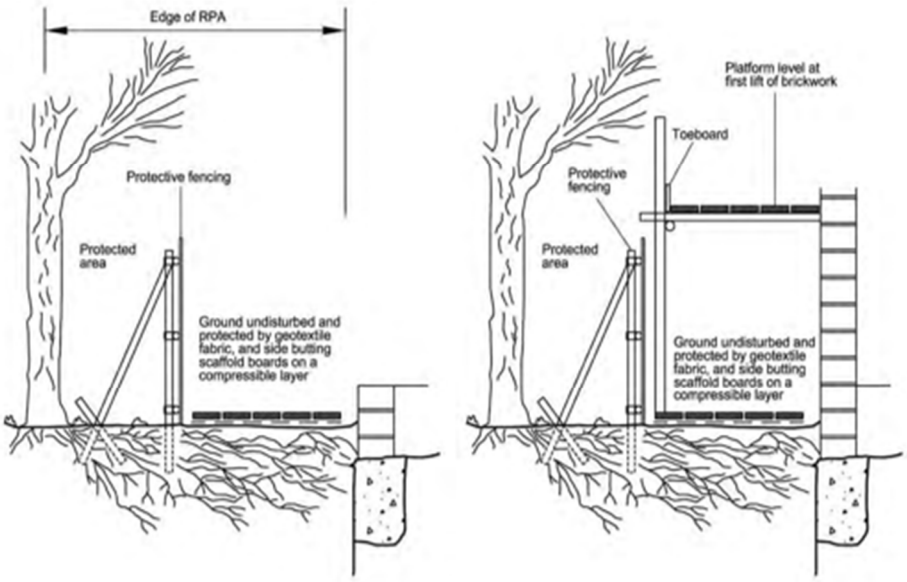

Figure 16

Temporary surfaces within zone of protection. Where temporary access is to be established within the 'zone of protection' surrounding retained trees, ground surfaces will be protected by a layer of sharp sand, approx. 50mm thick, overlaid with a geotextile membrane on which temporary surface of no fines granular material (compression resistant for example woodchip) at least 150mm thick is laid. Where traffic is turning on this surface, stout planks will be laid over the geotextile membrane and below the granular material.

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2.4: Arboricultural Method Statement

Roadway/Driveway

If the case arises whereby a driveway or roadway has to be moved or situated within the RPA of a tree then any proposal for new surfacing within the RPA must be able to demonstrate a minimal impact on soil structure and roots and this includes the ability for movement of water and air in and out of the soil. The use of no-dig cellular confinement systems using porous sub-base and finished surface materials can be acceptable in some circumstances.
Hand dig exploratory holes is suggested to try and locate feeder roots and or determine how much of a root system exists.

Plant/Machinery

Piling rigs, cranes and other high and wide plant and machinery have the potential to damage trees and site operations must be planned to take account of retained trees in advance of any potential conflict. Proposed locations and routes on and off the site should be supplied to the project arboriculturist.

Contamination

Accidental spillage of any materials which could cause damage to a tree even if outside of an RPA, including dust. Barriers and other protection must remain in place until all construction activity is complete and there is no realistic risk of damage to soil surfaces

It is the responsibility of the main contractor or assigned agent to ensure that details regarding tree protection are understood and followed by all site personnel and should be incorporated into site inductions.

The location of site facilities, areas for loading, unloading and storage of materials must be sited to ensure minimal impact on the tree. No discharge of potential contaminants should occur within 10m of any tree on the site or where there is a risk of run off into an RPA

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2.5: Arboricultural Assessment

All trees on site are located in boundary conditions, either as part of a hedgerow or a tree line. The trees either share a boundary with the Water Treatment facility or with the public road. There are no solitary trees in the fields. There is a clear distinction between vegetation types. The naturalised hedgerows on traditional sod/stone ditches have a high percentage of diseased trees (Ash Dieback and Dutch Elm diseases) interspersed with a few healthy small thorn trees (Hawthorn, Blackthorn). There is some native understorey diversity. The healthiest trees are the non-native sycamore on the Water Treatment facility site. These are all tree lines, but they form a habitat layer with the adjacent hedgerows on the sod/stone ditches.

As noted, many of the hedgerows are in poor condition. Hedges 1, 2 and 5 for example contain a few small hawthorns, while much of the hedgerow is comprised of small dead elms. They have a poor balance between understorey species (i.e. hawthorn, blackthorn, elder) and field layer species (i.e. stinging nettle, bramble, ivy) on this site. This imbalance is partially due to the elm suckers and recent demise of the ash. Additional field layer species are emerging through the recent gaps in hedgerows Some people would refer to these plants as weeds (defined as a plant that is growing where it is not wanted). But this native wild flora is welcome as they add to the diversity of the plant species and have their place within the ecosystem and the natural composition of our country's hedgerows. However, long term improvement to these requires management to improve biodiversity. This could take the form of heavy intervention or full removal and replacement. Either solution will lead to an improved hedgerow environment with negligible loss.

Recent road works disturbed a 19m section of Hedge 2, which has led to unearthing of seeds leading to a proliferation of growth in field layer species. This can also be said of hedgerow 5. These emerging layers are good indicators of the native seed bank on site. Any hedgerow improvement should utilise this existing soil and seed bank.

Hedge 3 is categorised as 'fair', but is the best example on site of a low growing boundary hedgerow. It is made up of hawthorn, blackthorn, gorse, stinging nettle, bramble and bracken. It grows beneath the overhanging canopy of the sycamores in Hedge 7. The two have grown to have a symbiotic relationship. Combined, they have the potential for quality fauna support. However, they have limited connectivity with other quality hedgerows, limiting their habitat potential.

Hedge 4 along the northern boundary consists of a row of blackthorn bushes that were planted on a low earth mound (berm) that runs East to West. These trees were not 'feathered' when they were purchased and so have stems as 'standards'. This means that they don't really look like they were self-seeded on the site, although a good choice of species and healthy. It is my opinion that this hedgerow could be enhanced by adding more native species in among them to create a more natural look and add to the diversity of species within the hedgerow. Hawthorn and elder are hardy and would adapt well to interplanting.

The largest trees on site are ash and sycamore. The sycamores were planted around the water treatment plant, likely as a visual screen. Most of them are healthy and could be expected to have long lives (in excess of a century). The branches have typically been pruned back to give clearance to the perimeter fence, but have responded well to the pruning and occlusion (healing) of the pruning wounds is underway, indicating good tree vigour. At this stage they are not too tall and pose no imminent hazard. Despite being non-native trees, they support a degree of biodiversity and serve their purpose well. Sycamores have resilient root zones. The trees should be protected, but can tolerate some disturbance.

There are a small number of ash trees along the western boundary (Hedges 2 and 5) and all are exhibiting advanced stages of Ash Dieback disease. Two of them are large, mature trees. However, they have advanced far enough with ash dieback that the trees cannot recover and it is recommended that they be removed in the near future, regardless of development.

The western boundary also includes a number of dead or dying elm trees (Hedges 1, 2, 4 and 5). Most are located adjacent to the upgraded public road and pose a hazard. All will need to be removed, including their rootballs and residual roots. This can be an invasive work that could impact adjacent planting.

The ash trees planted along the fence line at the eastern boundary of the water treatment facility were presumably installed at the same time as the sycamore. At a distance they appear healthy, but at close range are showing signs of the initial stages of ash dieback. These trees should be retained and monitored in the short term, but will likely require removal within the coming decade.

As an overview, it can be said that the sycamores that were planted around the water treatment plant are mostly doing well and in good health (Hedges 6-10). Despite being non-native trees, they should be protected for their screening and amenity value. The trees that that are part of older hedgerows or are naturally self-seeded are generally in poor condition (Hedges 1, 2, 4 and 5). To provide a biodiverse habitat and viable regenerative hedgerows in the future, these will require extensive intervention and replanting with a broad spectrum of native species.

If you have any questions please do not hesitate to contact me at the details below.

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