

TREE CONDITION AND ARBORICULTURAL IMPACT ASSESSMENT REPORT

AT:

ERDDIG HALL

FOR:

**NATIONAL TRUST WALES, ERDDIG,
WREXHAM**

lingard *styles*

REF 2882

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1.0 INTRODUCTION

- 1.01 Lingard Styles were commissioned by National Trust Wales in November 2015 to carry out a tree survey and assessment of the existing trees and prepare a report to support a planning application for development of the site. The inspection proceeds in line with the basic recommendations outlined in the British Standard '**Guide for Trees in Relation to Design, Demolition and Construction**' (BS 5837:2012) section '**Tree Surgery, Tree Categorisation and Tree Constraints Plan**' and is required as an essential part of the development planning process.
- 1.02 The issues to be addressed in this report include:
- The condition and amenity value of the trees within the site.
 - The relevant Planning Policy.
 - The impact of the proposed development on the tree resource.
 - Information on the protection of retained trees.
- 1.03 The survey involved a visual inspection of the 116no specimen trees, tree groups and hedges. Trees with a stem diameter of 75mm plus, unless otherwise stated in the tree schedule, were measured at a height of 1.5m above ground level. Trees less than this stem diameter are recorded as shrubs or hedges. Any multistem tree diameters were measuring the tree below the multistem break and are recorded as such in the tree structure. The visual inspection was carried out from ground level and aided by the use of binoculars to assist in the high level condition assessment of the trees. Trees were not climbed.
- 1.04 This report is to be read in conjunction with Lingard Styles drawings no Tree Survey Plan 2882.12.15.09.02.
- 1.05 Trees were not tagged at the inspection although a number of trees have been previously tagged by The National Trust. The tree tag numbers have been noted in the Tree Schedules.
- 1.06 Weather conditions at the time of the tree assessment were generally dull and overcast.

2.0 SITE DESCRIPTION

- 2.01 The site is an enclosed grassed public car park with tarmac access roads situated adjacent to the walled garden within the grounds of the National Trust property of Erddig Hall. The site is accessed from the Erddig Hall service road.
- 2.02 The eastern boundary fronts onto farmland and is contained with a 2m high mainly Hawthorn hedge (H35). Along this boundary within the site are a number of smaller fruit trees including a young tree specimen (T31) with good form. A public footpath runs along the boundary to the east of the hedge.
- 2.03 The southern boundary adjoins the Erddig Estate road and is secured at the west end with a lockable new timber field gate. A 2m high mixed native species hedge (H70) follows this boundary. The hedge is densely covered in places with rambling native Clematis. Within the site along this boundary is a range of specimen Apple and Pear trees of mainly low quality apart from Pear tree (T45) which is of moderate quality.
- 2.04 The northern boundary is defined with a 3m brick wall which forms the north. Along this wall are a number of older espalier fruit trees that have grown out. Some have traditional lead labels and a number have been tagged by the National Trust, recording their importance.
- 2.05 The western boundary consists of a 1.5m clipped Hawthorn hedge along 60% of the boundary. A 3m brick wall encloses the remaining length. Within this area are a number of large coppiced Hazels (T66, T67 and T69) together with larger, older specimen fruit trees with mistletoe growth (T73, T74 and T77).
- 2.6 Within the main site area a small orchard of mixed Apple and Pear trees form the main structure to the car park. Three large coppiced Hazels create a feature at the western end (T78, T79 and T80). Generally the trees in this area are of low quality apart from Apple trees T86 and T85 which are of moderate quality. A number of tree specimens have been damaged by prevailing winds from the south west.

A low clipped hedge (H116) forms a west to east division to the car park. Many of the Apple trees within this area have mistletoe growth.

In total 116no individual trees, trees groups and hedges were assessed.

3.0 EXISTING TREES

- 3.01 The quality and value of each tree or group of trees is recorded in the attached tree schedules. Each tree is allocated to one of four categories each of which is explained under the headings 'Tree Categorisation' in Section 4.0.

A	Good	Retain at all cost
B	Medium	Retain
C	Fair	Retain
U	Dead	Remove from site

The position of the trees is indicated on the attached Lingard Styles identification plan drawing number

- 3.02 Although this is not a condition survey, the general condition of the trees is recorded and management recommendation may be made particularly where safety issues may be of concern from this brief ground level inspection. Trees should be subject to regular tree condition inspections and appropriate management and a full tree condition inspection is recommended and particularly on completion of any development.

- 3.03 The survey involved recording each tree or group within the site boundary with a stem diameter of above 75mm when measured at a height of 1.5m above ground level. In addition, trees over this size growing on land adjacent to the site, which are at or within a distance equal to 12 times their stem diameter from the boundary (or 10 times the stem diameter in the case of multistemmed trees). This is to ensure that adequate consideration is given during site development planning to root zones and canopies from adjacent trees which may impact on the site.

Veteran trees should be afforded a larger Root Protection Area of 15 x specimen trees main stem diameter, in line with the recommendations as set out in the joint document between The Forestry Commission and Natural England.

- 3.04 Additional information recorded in the tree schedules includes the following:-
Number (No) The tree number provides reference to an individual tree whether by way of T1, T2 (tree 1 or tree 2) and relates to an attached plan showing their proximate positions or through a series of numbers.
Species The species is the given name of the tree which is usually provided both in common and scientific names.

Height (H) The height of the tree is measured in metres and is usually approximate. If the abbreviation 'Clinom' appears after the given measurement, it indicates the tree has been measured with an optical measuring instrument, a Clinometer and is accurate to within 5 metres

Diameter (D) The diameter for each tree is in millimetres based on the diameter or circumference of a height of approximately 1.5 metres above ground level unless otherwise stated. All measurements are approximate.

Crown Spread (CS) The crown spread of the tree is measured as the radius (from the centre of the stem) in metres and in most cases covering the four points of the compass.

Age The age of the tree is given based on its life expectancy. For example, an oak tree at the age of 100 years is perceived as early mature when a hawthorn at 100 years would be considered old. Age classes are given as follows

Young (age less than 1/3 life expectancy)

Semi mature (age between 1/3 – 2/3 life expectancy). Still growing vigorously but not as fast as a younger tree)

Early mature (age between 2/3 – 3/3 life expectancy).

Mature trees (above 3/3 life expectancy). Growth rates beginning to slow down at this stage)

Over mature tree (growth rates slow and possibly beginning to display signs of decline)

Veteran (decline is well set in but the tree may be of specific ecological value. The tree is likely to contain sufficient deadwood and decay that is a specific habitat for many rare invertebrates that are considered to be at risk from extinction)

Condition Column notes any defects, signs or symptoms of ill health, structural weakness or other problems that are easily and visibly recognised that may affect the physiology or structural integrity of the tree.

Recommendations The recommendations include the mitigating action appropriate action required for the specimen tree or group which includes considerations for future elements which may possibly risk or improve the physiology of the tree.

Estimated The estimated remaining life of each tree is recorded in four categories as follows:-

- less than 10 years
- between 10 - 20 years
- between 20 - 40 years
- more than 40 years

4.0 TREE CATEGORISATION

- 4.01 The primary purpose of this report is to provide an assessment of the trees and to determine their suitability for retention on any proposed development. To assist in this assessment the trees are categorised and given an appropriate grading. This grading is recorded on the attached tree schedules and by colour code on the tree survey drawing no 2882.12.15.09.02.

GRADE A (coloured green on drawing)

Trees of high quality with an estimated remaining life expectancy of at least 40 years.

These may include:

- A1 Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue).
- A2 Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.
- A3 Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wooded pasture).

GRADE B (coloured blue on drawing)

Trees of moderate quality with an estimated life expectancy of at least 20 years.

- B1 Trees that might be included in category **A** but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage, such that they are unlikely to be suitable for retention for beyond 40 years or trees lacking the special quality to merit the category **A** designation).
- B2 Trees present in number, usually growing in groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little impact on the wider locality.
- B3 Trees with material conservation or other cultural value.

GRADE C (coloured grey on drawing)

Trees of low quality and value with a minimum life span of 10 years or young trees with a stem diameter below 150mm.

- C1 Unremarkable trees or very limited merit or such impaired condition that they do not qualify in higher categories.
- C2 Trees present in groups or woodlands but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.
- C3 Trees with no material conservation or other cultural value.

GRADE U (coloured red on drawing)

Those trees in such a condition that they cannot realistically be retained as a living tree in the context of the current land use for longer than 10 years.

- U1 Trees that have a serious structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category **U** trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning).
- U2 Trees that are dead or are showing significant, immediate and irreversible overall decline.
- U3 Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality.

Note Category **U** trees can have existing or potential conservation value which it might be desirable to preserve.

- 4.02 Where young trees occur as individual specimens i.e. trees with stems less than 150mm diameter at 1.5m above ground level they should be graded as C trees. Although these trees may have the potential to develop into mature specimens, as is the case with Ash or Oak, they should not be allowed to dominate site layout considerations.

5.0 TREE CONSTRAINTS

5.01 Roads, footpaths and car parking spaces can be constructed close to the trees provided that the construction is above existing ground and there is no significant excavation of the surface. Guidance on the type of materials and method of construction can be found in the following extracts.

5.02 BRITISH STANDARD BS 5837:2012

Development Near Trees

British Standard BS 5837:2012 *Guide for Trees in relation to Design, Demolition and Construction* - recommends that the Root Protection Area (RPA) should accord to the principle that the tree and soils structure take priority and the most reliable way to ensure this is to preserve the Root Protection Area completely undisturbed. This is a protected area in which any activity which could damage roots should be avoided. This often means that construction within this area is prohibited.

5.03 If the guidelines set out below are followed, installation of access driveways and parking for light vehicles should be possible without significant permanent damage to adjacent trees. Expert arboricultural advice may need to be sought to determine whether this technique is suitable for particular sites. In addition, the health of trees should be professionally assessed, as old and declining trees may be less able to withstand even sympathetic construction.

5.04 Engineering Needs

Roads, footpaths and parking areas must be built with a firm stable base. Engineers usually achieve this by extracting the soil to a depth of about .5m, compacting the base if necessary and backfilling with an inert material that can be compacted. The edges of the excavation act as the supporting formation and kerbs or edging boards may be used to retain the surface material. However, such excavations will sever roots and should be avoided, particularly within the protected area.

It should be possible to construct an adequately supported access drive and retain trees, if a no-dig system of construction is adopted within the protected area.

5.05 Protection and Construction

For the roots to remain undamaged there must be no excavation, soil-stripping or site grading within the protected area. This means that construction will have to be above the existing ground level. Passage of

vehicles across the unprotected soil surface must also be avoided, especially when the soil is wet, as this will cause breakage of the surface roots, soil compaction and consequently reduced soil aeration. Surviving roots may not be able to grow through the compacted soil. It is essential therefore that all but the immediate area of the development is protected from construction operations by fencing as recommended in BS 5837:2012.

5.06 **No-Dig Construction**

Successful retention of trees even when adopting a no-dig method, particularly within the protected area, depends upon the condition of the tree(s), which should be assessed by a qualified arboriculturist and adherence to the following:

- Roots must not be severed.
- Soil must not be compacted.
- Oxygen must be able to diffuse into the soil beneath the engineered surface.

6.0 ARBORICULTURAL METHOD STATEMENT

- 6.01 Once layout proposals have been finalized the British Standard recommends a Tree Protection Plan (TPP) is prepared.

All retained trees will be protected with stout fencing in accordance with BS 5837:2012 prior to commencement of site construction works (see appendices) and in agreement with the Local Planning Authority Arboricultural Officer.

6.03 The Root Protection Area (RPA)

This is established using Table 2 from the standard BS 5837:2012 which is a 12 x multiplier of the stem diameter when measured at a height of 1.5m above ground level or 10 x in the case of multi stemmed trees. The precise distance required by each tree as a Root Protection Area expressed as a radius is indicated on the attached tree schedules and will be shown on the survey drawing which supports the layout proposals. These distances provide an Exclusion Zone for site construction works. The erection of a substantial temporary barrier is required at these distances and the type of suitable fencing is indicated in Figure 1. These measurements or distances are provided in metres as a radial measurement, unless otherwise stated, which is taken from the centre of the stem.

In addition it is recommended that veteran trees should be afforded a larger Root Protection Area of 15 x specimen trees main stem diameter, in line with the recommendations as set out in the joint document between The Forestry Commission and Natural England.

6.04 Rationale for Tree Protection

The part of the tree most susceptible to damage is the root system, which because it is not immediately visible, is most frequently ignored, although the stem and branches are also vulnerable. Damage or death of the root system will affect the health, growth, vigour, life expectancy and safety of the rest of the tree. This is because the majority of the tree's root system is found within the top 600mm of the soil profile, extending radially for a distance frequently in excess of the tree's height.

The parts of the root system which are active in water and nutrient uptake are very fine, typically less than 0.5mm diameter. It is essential that the conditions in the soil remain conducive to healthy growth of these fine roots so that water and nutrients necessary for healthy tree growth can be absorbed, in addition

to water and nutrients, roots, in order to function, require oxygen from the soil for the purpose of respiration. Diffusion between the soil and the atmosphere is essential. Anything which disturbs this balance will affect the condition of the root system and in turn the health of the tree. Compaction of the soil within the rooting zone of a tree will create long term damage through preventing respiration and the percolation of water. Vehicles tracking over the soil are responsible for such damage and such action must be reduced or avoided during construction works.

- 6.05 On establishment of the RPA a 'Protective Barrier' is to be erected at the calculated distances. Protective Barriers to the specification set out in figure 1 shall be erected at the locations shown on the Tree Protection Plan and prior to development completion will be dismantled. Such fencing will offset injury or damage occurring to the critically functioning roots of the retained tree from construction injury. When considering the activities of a construction site it is necessary to use robust materials that can withstand the day to day working practices through the duration of the development. A suitable 'Protective Barrier' is recommended within BS 5837:2012 which is reproduced in Figure 1. The barrier should consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impact, with vertical tubes spaced at a maximum interval of 3m. Onto this, wire mesh panels should be securely fixed with wire or scaffold clamps. This type of fencing is preferred because it is readily available, resistant to impact, can be re used and enables unhindered inspections of the protected area. (Weld mesh panels on rubber or concrete feet are not resistant to impact and must not be used).
- 6.06 On completion of the exclusion zone protection by barriers and/or ground protection construction works can commence. All weather notices should be erected on the barrier with words such as 'Construction Exclusion Zone – Keep Out'. A qualified and experienced person will visit the site to check the tree protection barriers until the protection fencing is removed.
- 6.07 In addition the following should be addressed or avoided:
- a) Care should be taken when planning site operation to ensure that wide or tail loads, or plant with booms such as jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible. Consequently any transit or traverse of plant in

close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance of trees is maintained at all times. In some circumstances it may be impossible to maintain adequate clearance thus necessitating access facilitation pruning.

- b) Material which will contaminate the soil e.g. concrete mixings, diesel oil and vehicle washings should not be discharged within 10m of the tree stem.
- c) Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or stem. This will depend on the size on the size of the fire and the wind direction.
- d) Notice boards, telephone cables or other services should not be attached to any part of the tree.
- e) Trees to be felled that are adjacent to, or, that lie within a continuous canopy of trees to be retained will be removed with particular care. In some cases a tree may have to be removed in section to avoid damage.

6.08 Maintaining the Protective Barrier

Special attention should be given to maintain the 'Protective Barrier' during the construction phase ensuring that it remains rigid and complete. In order to avoid disturbances to the Protective Barrier once it is installed it should be inspected on a daily basis. Repairs shall be made immediately should it be damaged or not fit for the purpose intended.

6.09 Site Construction Area

Position to be outside the Root Protection Areas (RPA's) with access from Erddig Estate Road.

6.10 Contractors Car Parking

Position to be outside the Root Protection Areas (RPA's) with access from Erddig Estate Road.

6.11 Intensity and nature of Construction Activity

It is anticipated that construction activity will be high. All Construction Exclusion Zones must be fenced off prior to commencement.

6.12 Phasing of Construction Works

The phasing plan must include reference to the maintenance of tree protection zones particularly with material storage and service runs.

6.13 Space required for all Foundation Excavation and Construction Works

All proposed excavated materials are to be stored well outside the RPA's of the retained trees. Position to be agreed prior to site works commencement.

6.14 Special Techniques

The location and routes for the existing services are outside the protection area for the trees. Any new services lines within the RPA's will be routed beneath tree roots without damaging them utilizing hand dug trenches or a 'mole'.

To avoid damage to shallow feeder roots all changes of level will be minimized and monitored during site operations.

Vegetation to be removed on existing soil surface will be eliminated using an appropriate systemic herbicide such as Glyphosate.

All excavations close to retained trees will be undertaken by hand to avoid damage to bark and roots. All exposed roots with a diameter of greater than 50mm are to be surrounded with sharp sand and backfilled and temporarily protected with damp hessian.

6.15 The Location needed for all Service Runs

As part of the proposals all service runs to include foul water and surface water drains, land drains, soakaways, gas, oil, electricity, telephone, television or other communication cables will be kept outside all established RPA's of any 'retained trees'. It is anticipated that all service runs will enter from the adjoining highway in any event. All service runs should be routed so to avoid the RPA and in the unlikely event that this is not possible work should not commence with any service installation until such time a 'Method Statement' is produced offsetting the likelihood of damage occurring to major roots. To be undertaken in compliance with the latest National Joint Group Utilities guidelines.

6.16 Changes in Ground Level

There are no significant level changes proposed within any of the established RPA's of retained trees at the time of writing this report.

6.17 Space for Cranes, Plant and Scaffolding

The limited factors in terms of these considerations are the trees and the size and weight of the equipment. Often tall vehicles collide and cause collision injury to trees environment and the tree's physiology. For this reason, care must be taken when operating cranes to avoid collision injury occurring. All

plant must be tracked on, off and around the site avoiding the established RPA's. Where there is no alternative and with acceptance of a Method Statement by the LAP tracking over root plates may be possible, if load bearing ground plates are used and are sufficient to support the spread and load of the plant equipment. This may not be possible on sloping ground.

6.18 Space for site Huts, Temporary Latrines and other Structures.

Site huts and latrines are to be located within an area of the site that is outside the RPA's.

6.19 The Type and Extent of Landscaping Works required within Tree Protection Areas.

Any landscape design should take account of the existing trees and planting within their RPA's should be avoided along with vegetation that may conflict with them and prevent the establishment of retained trees.

6.20 Space for Storing Materials, Spoil and Fuel and for the Mixing of Cement and Concrete.

Such activities can have implications on tree health if they occur within the established RPA or if they have the ability to run into a RPA. All such activities will be kept clear of such special areas. A 'Cement Washing Zone' should be created at least 15m away from any retained tree.

6.21 The Effects of Slope on the Movement of Potentially Harmful Liquid Spillage on or into Protected Areas.

It is essential that allowances will be made for the slope of the ground so that damaging material such as concrete washings, mortar or diesel oil cannot run towards tree root zones. In such areas a ground level barrier of timbers covered with heavy duty PVC dug into the ground outside of the tree root zones will be required. This barrier will require daily inspection to monitor its integrity. In all cases site operations are to take account of this requirement in site planning, set up and operation.

6.22 Arboricultural Considerations.

Site supervision during any proposed tree work operations are to be undertaken in conjunction with the National Trust head gardener. The most important trees and boundary hedges will be retained as part of the development proposals but replacement fruit trees and ornamental and native trees and shrubs will be planted as part of the landscape scheme for the site.

All National Trust tagged trees T04 Apple, T08 Apple, T11 Apple, T12 Apple, T18 Prunus, T21 Pear, T100 Apple and T101 Pear will be retained together with a number of named varieties of Apple and Pear as identified by the head gardener.

- 6.25 There was no evidence of Ash Die Back disease (*Chalara fraxinea*) at the time of the survey but it is recommended that this is monitored on an annual basis and appropriate action taken if the disease is recorded. It should be noted that *Chalara fraxinea* is now being treated as a quarantine pest under national emergency measures and any suspected sightings must be reported.

7.0 LEGAL AND PLANNING CONSTRAINTS REGARDING TREES ON SITE

- 7.01 The legal considerations referred to are general constraints that relate to arboriculture and do not cover any other legal matters that may be relevant on this site.
- 7.02 **The Wildlife and Countryside Act 1981** protects nesting birds and to disturb nesting birds can be a criminal offence. Therefore, if tree works are programmed during the nesting season, between March and August. Should nesting birds be present then all but essential works will be postponed. If in undertaking essential works a nest or nests are found to be present, then further advice will be sought from the relevant authority.
- 7.03 **Tree Preservation Orders and Conservation Area Status.**
The law on TPOs is in **Part VIII of the Town and Country Planning Act Town and Country Planning (Trees) Regulations 1999**. When any tree is protected by a TPO or are situated within a Conservation Area it is an offence (1) cut down (2) uproot (3) top (4) lop (5) wilfully damage or (6) wilfully destruct a tree without the express written permission from local Planning Authority (LPA), there are no exceptions.
- 7.04 **Wildlife and Countryside Act (as amended) Conservation (Natural Habitat) Regulations (1994) 5.1** In Britain, all bats and their roost sites are currently protected by law. The part that protects them is found within the Wildlife and Countryside Act 1981 and as amended by schedule 12 of the Countryside and Rights of Way Act 2000 and by the conservation Regulations 1994 under Section 39 (1).
The legislation makes it an offence to intentionally or recklessly damage, destroy or obstruct access to a site used by bats whether bats are present at the time or not. This can include work on trees whether it is surgery, felling, the covering or filling of cavities or the installation of rod braces and flexible cable braces where a bat roost is present.
There are some 16 species of bat native to the British Isles, all are insectivorous and depend to some extent on habitat in which trees are a significant element. Bats are a protected species and are in decline both globally and nationally. Therefore, they are to be fully considered before any tree work commences and particularly if the trees are mature. If a bat roost is known to be in any tree that is to be removed or worked on, a licence must be obtained from Natural England/Natural Resources Wales..

Where there is a risk that bat roosts may be present, it is incumbent upon the owner to commission a specialist bat survey to identify bat roosts before instruction for tree surgery to commence. Failure to do so and in the event of disturbing a roost site and upon conviction is an offence. Maximum penalties for committing offences relating to bats or their roosts can amount to imprisonment for a term not exceeding six months or to fines of up to Level 5 on the standard scale under the Criminal Justice Act 1982/1991 (i.e. £5,000 in April 2001) per roost or bat disturbed or killed or both.

7.05 Statute and Common Law

A landowner should be aware that both statute and common law dictates regular inspections of trees on land in their control are necessary where such trees could cause injury or damage in the event they should fall or shed any parts. A person suitably qualified in arboriculture should undertake such routine inspections and any remedial tree works recommended within the time constraint specified, to prevent injury or damage occurring. A landowner should retain records of all inspections and any remedial tree works that have resulted from such inspections.

8.0 REPORT LIMITATIONS

- 8.01 This report is a pre-development survey and is not a risk assessment or a detailed report on the health and condition of the trees.
- 8.02 Every attempt has been made to provide a realistic and accurate assessment of trees and their condition at the time of this inspection. No responsibility can be accepted for a damage or injury as a result of the failure of any tree or its parts due to faults not apparent upon a visual inspection carried out at this session, or for faults developing subsequent to the survey. Similarly, no liability can be accepted for the condition of the trees that are obscured in part or whole e.g. neither by dense ivy or other foliage nor for any that proved inaccessible. Certain features which might provide evidence of ongoing decay or decline e.g. seasonal fruiting bodies, damage to foliage, insect emergence holes may not be in evidence. Only those features present at the time of the inspection could be assessed.
- 8.03 Reference is made in this report for the possibility of additional assessment of specimen trees particularly with reference to long term safety and stability. This assessment could be assisted by the use of a Tomograph such as the PICUS sonic Tomography which assesses the internal condition of the tree by using sonic waves. The standard technology involves the attachment of sensors to measuring mails. Tomograph images are generated as soon as measurements are completed. Measurements of residual walls and extent of any decayed areas can be taken directly from the Tomographic image.
- 8.04 This report is based on the tree circumstances and condition at the time of the survey. It must be recognized that the circumstances may be altered radically over the course of any developmental process and that such changes cannot be accurately predicted, i.e. such a change could be the effect of localised wind turbulence created by the new development. As trees grow they respond and mechanically adapt to their surroundings and exposure limits. Unless stated in writing the inspection shall not include any underground parts of the tree. It does not consider damage resulting from the extraction of moisture from shrinkable clay soils by tree root causing subsidence or by heave occurring through soil rewetting following removal trees on the site. Recommendations relating to foundation design or material specification are beyond the scope of this report.

- 8.05 The position of the specimen trees and hedges are accurate in accordance with the topographical survey carried out

9.0 APPENDICES

- 9.1 Tree Schedules
- 9.2 Tree Photographs Photos 1-7
- 9.3 Glossary of Terms
- 9.4 Bibliography
- 9.5 Tree Survey Plan
- 9.6 Tree Protection Plan

9.1 TREE SCHEDULES

CLIENT: NATIONAL TRUST PROJECT: ERDDIG HALL ERDDIG, WREXHAM	SURVEY DATE: 9 DECEMBER 2015 DWGS NO: 2882.12.15.09.02	COLUMN KEY H Height D T Stem diameter & type CS Crown Spread CC Crown Clearance YR Years Remaining GR Grade RPA Rad Root Protection Area Radius RPA m² Root Protection Area Square	AGE Y Young SM Semi mature EM Early mature M Mature OM Over mature V Veteran	GR – GRADE A – Good quality. B – Moderate quality. C – Low quality U – Unsuitable. Remove.
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NO	SPECIES	H m	D mm T	CS (m)				CC (m)	AGE	YR	GR	CONDITION	RECOMMEND	RPA Rad.	RPA M ²
				N	S	E	W								
H 01	Hawthorn Hedge (<i>Crataegus</i>)	2.0		N/A					EM	20+	C2	Single species Hawthorn hedge. Pruned to 2m height	Good screen to compost area. No work	N/A	N/A
T 02	Willow (<i>Salix sp</i>)	3.0	N/A	0.8	0.8	0.8	0.8	N/A	Y	N/A	U	Emergent sapling between brick boundary wall and compost bin	Remove	N/A	N/A
T 03	Apple (<i>Malus var</i>)	5.0	200 A	1.7	1.6	1.5	1.4	3.0	M	10-	C1	Poor specimen on wall (Espalier form)	Extensive decay at 2m to S. Insect boreholes. No work	2.4	18
T 04	Apple (<i>Malus var</i>) Tag: 732	6.0	270 A	1.0	3.0	2.8	2.0	1.5	M	10-	C1	Poor specimen on wall. Decay to S with insect holes. Poor structure and SULE. Occluded wounds. Damage to base on S side.	Remove shoots from pruning wounds. Lead label on wall 'Nouvelle Fulvie'	3.30	34
T 05	Apple (<i>Malus var</i>)	5.0	255 A	0.8	4.2	1.6	1.2	2.0	M	10+	C1	Occluded wound shoots. 45° lean to S. Decay holes to main stem	Remove shoots	3.0	29
T 06	Apple (<i>Malus var</i>)	3.0	N/A	0.7	1.6	1.0	1.2	N/A	Y	20+	C1	Young specimen	No work	3.6	28
T 07	(<i>Prunus var</i>)	3.0	N/A	0.7	1.6	0.9	1.0	N/A	EM	N/A	U	Damage to base S side. 1m decayed stump to S.	Remove decayed wood	N/A	N/A

												Occluded wounds			
T 08	Apple (<i>Malus var</i>) Tag: 729	4.5	100 + 185 E	0.5	2.8	1.0	0.9	2.5	M	10+	C1	2 stems at 900mm. Elder at base. Basal suckers. 45° lean to S	Remove basal shoots and Elder	3.3	34
T 09	Apple (<i>Malus var</i>)	3.0	N/A A	1.0	1.0	2.0	2.0	N/A	Y	10+	C1	Small young specimen on wall	No work	N/A	N/A
T 10	Apple (<i>Malus var</i>)	3.0	N/A	0.6	1.0	0.9	0.9	1.0	Y	10+	C1	Newly planted specimen. Good shaped crown	No work	N/A	N/A
T 11	Apple (<i>Malus var</i>) Tag:728	4.5	125 A	0.8	1.0	2.5	0.5	2.0	M	10+	C1	Poor specimen. Disfigured with 500mm dead head	Remove dead wood	1.5	7
T 12	Apple (<i>Malus var</i>)	6.0	175 A	1.5	3.0	4.0	1.0	3.0	M	10-	U	45° lean to S. Crown growing into adjoining tree no T13. Unstable with poor SULE	Remove	2.1	14
T 13	Apple (<i>Malus var</i>)	6.0	300 A	0.7	1.6	1.0	1.2	1.5	M	10+	C1	2 stems. One reduced to 1.8m height. Extensive ivy growth precludes full assessment. Main stem forks into 2 at 2m 15° lean to S. Good wildlife potential.	Reduce ivy growth	3.6	41
T 14	Apple (<i>Malus var</i>)	3.0	N/A	0.5	1.5	1.5	1.5	0.6	Y	10+	C1	Newly planted specimen. 40° lean to S. Poor specimen	No work	N/A	N/A
T 15	Pear (<i>Pyrus var</i>)	10.0	270 A	1.0	3.4	1.4	1.7	1.2	M	20+	C1	A prominent specimen in car park.	No work	3.3	34
T 16	(<i>Prunus var</i>)	6.0	N/A	0.8	1.2	1.2	0.9	N/A	Y	20+	C1	Specimen planted against wall	No work	N/A	N/A
T 17	Apple (<i>Malus var</i>)	4.0	95 A	0.5	2.5	0.7	2.0	1.0	Y	20+	C1	Basal shoots	Remove shoots	1.2	5
T 18	(<i>Prunus var</i>) Tag: 724	5.0	190 A	0.6	2.2	1.4	1.2	1.2	EM	10-	C1	Damaged leader. Recently pruned. Poor SULE	No work	2.4	18

T 19	Apple (<i>Malus var</i>)	4.5	185 A	1.0	3.0	1.8	2.0	1.5	EM	10+	C1	Damage to main stem N. Occluded wounds. 40° lean to S	No work	2/1	14
T 20	Apple (<i>Malus var</i>)	4.0	95 A	0.7	2.4	2.0	1.2	1.8	Y	10+	C1	Damage to main stem at 300mm N	No work	1.2	14
T 21	Pear (<i>Pyrus var</i>) Tag: 723	8.0	270 A	0.7	2.4	0.0	3.5	1.5	M	10+	C1	Damage to main stem at 2.5m. Decay at 2.5m. Disfigured crown. Recently pruned. Included growth. Small witches broom growth to E	Check decay	1.2	5
T 22	Pear 'Passe Crassane' (<i>Pyrus var</i>)	4.0	190 A	3.0	3.0	2.5	3.0	1.5	Y	10+	C1	30° lean to S. Basal shoots. Recently pruned	Remove shoots	3.3	34
T 23	Pear (<i>Pyrus var</i>) Tag: 722	6.0	200 A	0.4	1.6	1.6	1.2	N/A	Y	10+	C1	Basal shoots. Damage to main stem at 300mm N	Remove shoots	2.4	18
T 24	Apple (<i>Malus var</i>)	5.0	135 A	0.7	2.2	3.4	1.2	2.0	EM	10+	C1	Damage to stem at 300mm S. Occluded wounds	No work	1.5	7
T 25	Apple (<i>Malus var</i>)	3.0	N/A	3.2	1.2	2.6	0.9	1.2	Y	10+	C1	Newly planted	No work	N/A	N/A
T 26	Apple (<i>Malus var</i>)	3.0	105 A	1.0	1.5	1.7	0.6	1.0	Y	10+	C1	45° lean to E. Recently pruned	No work	1.2	5
T 27	Apple (<i>Malus var</i>)	5.0	180 A	1.8	3.0	2.4	2.4	1.2	M	10+	C1	Recently pruned	No work	2.1	14
T 28	Apple (<i>Malus var</i>) Tag: 721	5.0	215 A	2.5	3.2	4.0	2.0	1.5	M	10+	C1	30° lean to E. Dense crown	No work	2.7	23
T 29	Apple (<i>Malus var</i>)	2.5	N/A	1.0	1.0	1.0	1.0	N/A	Y	10+	C1	Poor specimen. Basal shoots. Recently pruned	No work	N/A	N/A
T 30	Apple (<i>Malus var</i>)	4.0	N/A	1.8	1.2	2.5	0.8	1.2	Y	10+	C1	Recently planted	No work	N/A	N/A
T 31	Oak (<i>Quercus sp</i>)	10.0	260 A	4.0	5.0	4.0	3.0	2.5	Y	30+	C1	Good young specimen. In growing plastic support tie at 2.5m	No work	3.0	28

T 32	Apple (<i>Malus var</i>)	5.0	125 at 600 C	1.0	2.4	3.6	0.5	1.5	Y	10-	C1	Two stems at 750mm. Damage to main stem N side. 40° lean to S	No work	1.5	7
T 33	Tree/shrub group	15.0	N/A						M	20-	C2	Mixed species; Elder, Beech, Laurel, Hazel, Holly. Good screen	No work	N/A	N/A
T 34	Holly (<i>Ilex var</i>)	7.0	180 A	4.0	1.8	2.4	1.5	2.0	EM	20-	C1	Within hedge. 45° lean to N	No work	2.10	14
H 35	Hawthorn hedge (<i>Crataegus</i>)	2.0	N/A						M	10+	C1	Hawthorn hedge with Ivy, Yew and Holly	No work	N/A	N/A
T 36	Apple (<i>Malus var</i>)	5.0	75 A	1.2	2.0	3.0	1.2	1.5	Y	10+	C1	Newly planted. Good specimen.	No work	0.9	3
T 37	Apple (<i>Malus var</i>)	2.5	N/A	1.0	0.8	0.5	0.5	1.5	Y	10+	C1	Newly planted. Good specimen	No work	N/A	N/A
T 38	Apple 'Dr Hogg' (<i>Malus var</i>)	3.0	N/A	1.0	1.0	1.0	0.7	1.5	Y	10+	C1	Newly planted	No work	N/A	N/A
T 39	Hazel coppice	2.5	N/A	0.5	0.5	0.5	0.5	N/A	EM	10+	C1	Coppiced	No work	N/A	N/A
T 40	Apple (<i>Malus var</i>)	2.5	N/A	0.5	1.5	1.5	0.6	1.2	Y	10+	C1	Young specimen	No work	N/A	N/A
T 41	Apple (<i>Malus var</i>)	6.0	N/A	1.0	2.5	2.3	1.2	1.2	Y	10-	C1	Damage to main stem at 1.2m. Poor specimen. Occluded growth. 20° lean to S	No work	N/A	N/A
T 42	Apple (<i>Malus var</i>)	4.0	145 +65 at 300 E	1.4	2.5	2.4	1.2	2.0	EM	10+	C1	2 stems. Hollow main stem, Recently pruned. Occluded wounds. Poor specimen	Consider removal	2.4	18
T 43	Apple (<i>Malus var</i>)	3.0	N/A	2.5	1.2	1.5	0.6	1.2	Y	10+	C1	Recently planted	No work	N/A	N/A
T 44	Pear (<i>Pyrus var</i>)	7.0	135 A	3.0	2.4	5.0	3.5	1.5	M	10+	C1	Damage to main stem at base S side. Exposed roots	No work	1.5	7

												W. Occluded wounds with holes			
T 45	Pear (<i>Pyus var</i>)	11.0	420 + 420 at 1.2 E	4.0	3.5	3.7	3.6	1.5	M	10+	B1	2 stems at 1.2m. Minor dead wood. Good specimen	Remove dead wood	10.2	327
T 46	Apple (<i>Malus var</i>)	5.0	190 A	3.7	2.6	1.4	2.3	1.5	EM	10+	C1	Damage to base w. Occluded wounds	No work	2.4	18
H 47	Hedge	2.0	N/A						M	10+	C1	Mixed species 80% Hawthorn with Ivy, Holly, Hazel and Yew	No work	N/A	N/A
T 48	Apple (<i>Malus var</i>)	3.0	125 A	2.2	1.2	2.8	1.4	1.5	EM	10+	C1	45° lean to E. Recently pruned	No work	1.5	7
T 49	Apple (<i>Malus var</i>)	3.0	N/A	1.0	1.0	1.0	1.2	1.5	Y	10+	C1	Young specimen	No work	N/A	N/A
T 50	Apple (<i>Malus var</i>)	4.0	100 A	2.0	2.5	2.2	2.2	1.5	Y	10+	C1	Occluded wounds	No work	1.2	5
T 51	Apple (<i>Malus var</i>)	2.5	N/A	1.0	1.0	1.0	1.0	0.8	Y	10+	C1	Newly planted	No work	N/A	N/A
T 52	Apple (<i>Malus var</i>)	3.5	75 A	1.2	1.0	2.3	0.5	1.2	Y	10+	C1	40° lean to E	No work	0.9	3
T 53	Apple (<i>Malus var</i>)	4.0	145 at 900 C	2.0	1.6	2.0	1.6	1.0	M	10-	U	Poor specimen. Extensive decay to main stem. Holly stem. Poor SULE.	Remove	1.8	1.0
T 54	Apple 'Red Court Pendu Plat' (<i>Malus var</i>)	5.0	115 A	2.4	1.6	1.8	2.0	1.5	EM	10+	C1	Occluded wounds	No work	1.2	5
T 55	Apple (<i>Malus var</i>)	3.0	N/A	0.6	1.0	2.8	0.5	1.5	Y	10-	U	Poor specimen. 70° lean to E	Remove	N/A	N/A
T 56	Apple (<i>Malus var</i>)	6.0	175 at 1.2	2.6	2.6	2.0	2.5	1.5	EM	20+	C1	Good specimen with rounded form. 2 stems at 1.2m. Mistletoe growth	No work	2.1	14

			C												
T 57	Apple (<i>Malus var</i>)	4.5	110 A	0.5	3.0	3.2	1.2	1.2	EM	10-	C1	50° lean to SE. Poor specimen. Mistletoe growth	No work	1.2	5
T 58	Apple (<i>Malus var</i>)	2.0	N/A	0.4	0.8	2.7	0.3	1.0	Y	10+	C1	Newly planted. 85° lean to E. Poor specimen	Consider removal	N/A	N/A
T 59	Apple (<i>Malus var</i>)	5.0	190 A	3.0	3.5	3.5	2.0	1.5	M	20+	C1	Occluded wounds	No work	2.4	18
T 60	Apple (<i>Malus var</i>)	2.5	N/A	0.5	0.8	1.4	0.5	N/A	Y	10+	C1	Newly planted	No work	N/A	N/A
T 61	Apple (<i>Malus var</i>)	4.0	N/A	0.3	0.3	0.3	0.3	N/A	Y	10+	C1	Newly planted	No work	N/A	N/A
T 62	Apple (<i>Malus var</i>)	2.5	N/A	0.5	0.5	0.6	0.2	N/A	Y	10+	C1	Newly planted	No work	N/A	N/A
T 63	Apple (<i>Malus var</i>)	6.0	8.5 A	0.6	2.2	1.5	0.3	N/A	EM	10+	C1	Recently pruned	No work	0.09	3
T 64	Hazel Coppice	2.0	N/A	1.5	1.5	1.5	1.5	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 65	Hazel Coppice	2.0	N/A	1.5	1.5	1.5	1.5	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 66	Hazel Coppice	2.0	N/A	1.5	1.5	1.5	1.5	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 67	Hazel Coppice	2.0	N/A	1.5	1.5	1.5	1.5	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 68	Holly (<i>Ilex var</i>)	8.0	310 + 220 E	3.5	3.5	3.5	3.0	18. 0	EM	20+	C1	2 stems at ground level. Specimen in hedge	No work	6.3	124
T 69	Hazel Coppice	2.0	N/A	1.0	1.0	1.0	1.0	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
H 70	Hedge mixed	2.0	N/A						M	10+	C1	Mixed species; Hawthorn, Ivy, Elder, Clematis	No work	N/A	N/A
H 71	Hawthorn Hedge (<i>Crataegus var</i>)	1.5	N/A						M	10+	C1	Hawthorn and Ivy hedge	No work	N/A	N/A
T 72	Apple (<i>Malus var</i>)	3.0	N/A	2.0	1.3	1.4	1.2	2.0	Y	10+	C1	Newly planted	No work	N/A	N/A

T 73	Apple (<i>Malus var</i>)	7.0	150 x 6 E	3.0	4.5	3.0	2.0	2.0	M	10+	C1	Old specimen with 6 stems at ground level. Recently pruned. Occluded wounds. Exposed roots to W. Dead wood. Mistletoe growth	Remove dead wood	10.8	3.66
T 74	Apple (<i>Malus var</i>)	90	240 A	4.0	3.8	4.0	2.4	2.0	M	10+	C1	Large specimen with Mistletoe growth	No work	3.0	28
T 75	Holly (<i>Ilex var</i>)	6.0	115 +118 at 1.2 E	2.2	2.5	1.8	2.3	1.5	M	10+	C1	Specimen in hedge with 2 stems at 1.2m	No work	2.7	23
T 76	Hawthorn (<i>Crataegus var</i>)	4.5	110 A	3.5	2.0	1.5	2.5	2.0	M	10+	C1	Specimen in hedge	No work	1.2	5
T 77	Apple (<i>Malus var</i>)	5.0	125 A	1.5	1.7	1.0	1.2	2.0	M	10+	C1	Specimen in hedge	No work	1.5	7
T 78	Hazel Coppice	7.0	N/A	4.0	4.0	3.8	4.0	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 79	Hazel Coppice	4.0	N/A	2.5	2.3	2.8	2.2	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 80	Hazel Coppice	4.0	N/A	2.5	2.5	2.6	2.5	N/A	M	10+	C1	Coppiced	No work	N/A	N/A
T 81	Apple (<i>Malus var</i>)	7.0	150 A	3.0	2.5	2.0	1.4	2.0	M	10+	C1	Specimen with Mistletoe growth	No work	1.8	10
T 82	Apple (<i>Malus var</i>)	2.5	N/A	0.8	0.6	1.6	1.6	1.2	Y	10+	C1	Young specimen	No work	N/A	N/A
T 83	Apple (<i>Malus var</i>)	7.0	170 A	3.5	2.8	2.2	2.8	2.0	M	10+	C1	Extensive decay at base to S. Poor SULE. Mistletoe growth	No work	2.1	14
T 84	Apple (<i>Malus var</i>)	3.0	120 A	2.4	1.4	3.8	1.2	1.5	EM	10+	C1	Occluded wounds. Decay @ base to S side.	No work	1.5	7
T 85	Apple (<i>Malus var</i>)	4.5	N/A	1.6	1.4	1.2	1.2	N/A	Y	10+	C1	Small specimen	No work	N/A	N/A
T 86	Apple (<i>Malus var</i>)	8.0	440 at 750 C	4.5	4.8	5.0	4.0	2.5	M	20+	B3	Good specimen with 3 main limbs. Extensive Mistletoe growth	No work	5.4	92

T 87	Apple (<i>Malus var</i>)	2.0	N/A	0.5	1.3	1.2	0.4	N/A	Y	10-	C1	Newly planted	No work	N/A	N/A
T 88	Apple (<i>Malus var</i>)	2.0	N/A	0.8	0.2	2.2	0.2	1.2	Y	10-	C1	75° lean to E. Poor specimen	Consider removal	N/A	N/A
T 89	Apple (<i>Malus var</i>)	3.5	N/A	1.5	0.8	2.0	1.0	2.0	Y	10+	C1	Young specimen	No work	N/A	N/A
T 90	Apple (<i>Malus var</i>)	4.0	175 A	2.8	1.6	1.0	2.6	1.2	EM	10+	C1	Damage to canopy	Remove damaged growth	2.1	14
T 91	N/A	3.0	185 A	1.0	1.8	3.0	0.5	1.2	N/A	N/A	U	Dead specimen	Remove	N/A	N/A
T 92	Apple (<i>Malus var</i>)	2.5	N/A	1.4	1.8	1.4	1.0	1.2	Y	10+	C1	Newly planted	No work	N/A	N/A
T 93	Apple (<i>Malus var</i>)	2.5	N/A	0.5	1.0	0.4	1.4	1.2	Y	10-	U	Damage to main stem to base. Poor specimen	Remove	N/A	N/A
T 94	Crab Apple (<i>Malus var</i>)	4.0	85 A	1.4	2.4	1.8	1.0	2.0	EM	10+	C1	Good specimen	No work	0.9	3
T 95	Apple (<i>Malus var</i>)	6.0	170 A	4.2	3.4	4.0	2.2	1.8	M	10+	C1	Good specimen	No work	2.1	14
T 96	Apple (<i>Malus var</i>)	6.0	120 A	2.0	2.0	2.2	1.0	1.5	M	10+	C1	Damage to main stem at base W. Mistletoe growth	No work	1.5	7
T 97	Apple (<i>Malus var</i>)	3.0	90 at 1.0 C	1.6	1.0	1.5	2.0	1.5	M	10+	C1	Poor shaped specimen	No work	1.2	5
T 98	Apple (<i>Malus var</i>) Tag: 708	8.0	295 A	3.0	2.8	3.2	2.8	2.0	M	10+	C2	Part of group. Hollow main stem. Large cavity to S at 700mm. Large decayed cavity to N at 1m. Poor SULE. Mistletoe growth. Good wildlife potential.	Check decay	3.6	31
T 99	Pear (<i>Pyrus var</i>) Tag: 709	14.0	415 A	3.5	4.0	6.0	1.2	2.5	M	20+	B2	Part of group. Occluded wounds	No work	5.1	81
T 100	Apple (<i>Malus var</i>) Tag: 719	10.0	410 A	4.0	2.2	3.0	2.0	2.0	M	10+	C2	Part of group. 30° lean to E. Recently pruned. Ivy growth	Reduce ivy	4.8	72

T 101	Pear (<i>Pyrus var</i>) Tag: 720	16.0	550 A	2.2	3.4	4.0	2.2	N/A	M	20+	B2	Part of group. Damage to main stem @ base	No work	6.6	13.7
T 102	Apple (<i>Malus var</i>)	5.0	220 A	2.4	3.2	3.4	3.0	1.5	M	10+	C1	Good specimen	No work	2.7	23
T 103	Apple (<i>Malus var</i>)	4.0	110 at 900 C	0.5	2.5	1.0	0.3	1.0	EM	10+	C1	40° lean to E	No work	1.2	5
T 104	Apple (<i>Malus var</i>)	4.0	105 at 1.2 C	3.0	1.8	2.0	2.8	1.0	EM	10+	C1	Damage to main stem at base N. 40° lean to N. Poor specimen	Consider removal or raise canopy to facilitate proposed development	1.2	5
T 105	Apple (<i>Malus var</i>)	6.0	180 A	2.2	4.2	3.0	2.6	2.0	M	10+	C1	Extensive damage to main stem at base N. 40° lean to S. Mistletoe growth	Consider removal	2.1	14
T 106	Apple (<i>Malus var</i>)	6.0	235 at 1.2 A	3.5	3.0	3.6	2.0	1.8	M	10+	C1	Main stem breaks into 2 at 1.2m. Good for wildlife potential. Mistletoe growth.	No work	2.7	23
T 107	Apple (<i>Malus var</i>)	4.5	140 A	1.6	2.0	2.8	1.8	1.8	M	10+	C1	Good specimen	No work	1.8	10
T 108	Apple (<i>Malus var</i>)	4.0	175 at 1.2 A	4.6	2.0	3.0	2.2	1.5	M	10+	C1	50° lean to N. Occluded wounds. Damage to canopy. Dense growth	No work	2.1	14
T 109	Apple (<i>Malus var</i>)	5.0	145 A	2.5	1.4	2.8	1.6	1.8	M	10+	C1	Occluded wounds	No work	1.8	10
T 110	Apple (<i>Malus var</i>)	8.0	195 A	2.4	3.4	3.0	3.2	2.0	M	10+	C1	Good form. Extensive Mistletoe growth	No work	2.4	18
T 111	Apple (<i>Malus var</i>)	5.0	165 A	1.8	3.0	1.8	2.8	1.8	M	10+	C1	40° lean to E. Mistletoe growth	No work	2.1	14
T 112	Apple (<i>Malus var</i>)	4.5	145 A	1.8	2.8	3.2	1.2	1.8	M	10+	C1	40° lean to E. Mistletoe growth	No work	1.8	10

T 113	Apple (<i>Malus var</i>)	2.5	115 A	0.8	1.6	1.4	1.0	1.8	EM	10+	C1	Poor specimen. Damaged canopy. 40° lean to S	Cut back damage to canopy	1.5	7
T 114	Apple (<i>Malus var</i>)	6.5	235 A	2.2	3.6	3.0	3.6	1.8	M	10+	C1	Damage to main stem at 1.2m S	No work	2.7	23
T 115	Apple (<i>Malus var</i>)	4.0	95 to 1.2 C	1.6	2.0	2.6	1.2	1.2	EM	10+	C1	Poor specimen	No work	1.2	5
H 116	Hedge	1.5	N/A						M	10+	C1	Clipped Holly/Hawthorn/Ivy hedge	No work	N/A	N/A

9.2 TREE PHOTOGRAPHS



01

General view of north east corner of site with Oak tree T31



02

View looking south to tree group T97, T98, T99, T100 and T101



03

View looking south east to hedge H116 and trees nos T102, T103 and T104



04
General view of car park looking west



05
View looking south to hedge no H71 at entrance



06
View looking north east to tree no T110



07
View to north to Hazel coppice T78



08
General view of car park looking north



09
View to west to Holly T68 in hedge

9.3 GLOSSARY OF TERMS

Arboriculture:	The culture and management of trees as groups or individuals, primarily for amenity and urban forestry excluding commercial purposes.
Aerial inspection:	The crown is assessed by a climber who inspects defects at close range.
Architecture:	In a tree, a term describing the pattern of branching of the crown or root system.
Arboricultural Implication Assessment (AIA):	Study undertaken by an arboriculturist to identify, evaluate and possibly manage the extent of direct and indirect impact on existing trees that may arise as a result of the implementation of the site layout.
Arboricultural Method Statement:	Methodology for the implementation of any aspects of development that has the potential to result in the loss or damage to a tree.
Assessment:	In relation to tree hazards, the process of estimating the risk which a tree or group of trees poses to persons or property
Branch:	A limb extending from the main stem or parent branch of the tree
Construction Exclusion Zone:	Area based on the RPA (metres as a radial measurement and sometimes a m ²). Identified by the use of barriers and/or ground protection for the purpose to ensure the successful; long term retention of a tree.
Crown:	Total volume occupied by the foliage
Crown thinning:	Removal, pruning of selected branches throughout the crown of the tree.
Crown reduction:	Pruning the height and overall crown spread to achieve a smaller crown size.
Crown cleaning:	Removal of all dead twigs and small dead branches, diseased wood, cracked and damaged wood and rubbing branches.
Defect:	In relation to tree hazards, any feature of a tree that detracts from the uniform distribution of mechanical stress or which makes the tree mechanically unsuited to its environment.
Dysfunction:	In woody tissues, the loss of physiological function, especially water conduction.
Epicormic sprouts:	New branches that grow from dormant buds just beneath the bark. They are usually associated with lopping or topping cuts.
Failure:	In connection with tree hazards, a partial or total fracture within woody tissues or loss of cohesion between roots and soil.
Flush Cuts:	Where a branch has been cut very close to the stem, removing the branch collar. This can also be very injurious, allowing decay to enter.
Fluted stem:	A stem that has distinct raised ribs at the buttress.
Group:	The term 'group' is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues

or screens or **culturally** including for biodiversity (e.g. parkland and wood pasture).

Hanger:	A branch that has completely broken and is hanging in the crown.
Heave:	In relation to a shrinkable clay soil, expansion due to re-wetting , sometimes after felling or root severance of a tree which was previously extracting moisture from the deeper layers; also in relation to root growth, the lifting of pavements and other structures by radial expansion; also, in relation to trees stability, the lifting of one side of wind-rocked root plate.
Included bark:	Where a branch and stem or two stems have a very tight union, bark presses on bark and becomes ingrown. The result is structurally a weak junction.
Internal inspection:	Can be undertaken by invasive drilling techniques or by the use of ultra sound technology
Leader:	Leading shoot or stem – usually applied to a single stemmed tree.
Occluded:	A cavity or wound where new bark has completely sealed the wound.
Preventative action:	In a tree hazard management, action that helps to prevent injury to persons or damage to property,
Pruning:	The removal or cutting back of twigs, branches or roots; in some contexts applying only to twigs or small branches only, but more often used to describe all kinds of work involving cutting.
Retained Tree:	A tree that has been considered suitable by an Arborist for retention and which during the design stage is selected for retention and incorporated within the development.
Risk:	The likelihood of the potential harm from a particular hazard becoming actual harm.
Ribs:	A protrusion of reactive wood growth that has formed over a crack or other anomaly.
Root Protection Area:	Layout design tool indicating the area surrounding a tree that contains sufficient rooting volume to ensure the survival of the tree shown in plan form in m ² .
Sprouts:	These are re-growth branches that grow rapidly from large wounds, more so on some species such as poplar and lime. They do not have a strong union with the stem and tend to break out when they grow large.
Stem	The single main stem of a tree.
Subsidence:	In relation to soil or structures resting in or on soil, a sinking due to shrinkage when clay soils dry out sometimes due to extraction of moisture by tree roots.
Suppression:	A tree which is beneath the crown(s) of another canopy and is being restricted by it.
Sucker:	Shoots that grow from roots, often at the base of the tree
Targets:	In a tree hazard assessment (and with somewhat incorrect technology), persons or property or other things of value, which might be harmed by mechanical failure of the tree or by objects falling from it.

Tipping:	Cutting the ends of branches between nodes.
Topping:	Indiscriminate reduction of height leaving a large wound. Can be very injurious to tree health.
Tree constraint Plan (TCP):	Plan prepared by an arboriculturalist or similar qualified person for the layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have layouts through shade dominance etc.
Tree Preservation Order:	In Great Britain, an order made by a local authority, whereby the authority's consent is generally required for the cutting down, topping or lopping of specified trees.
Tree Protection Plan:	Scale drawing prepared by an arboriculturalist showing the final layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS) which can be shown graphically.
Vigour:	In tree assessment, an overall measure of the rate of shoot production, shoot extension or diameter of growth.
Visual tree Assessment (VTA):	In addition to the literal meaning, a system expounded by Mattheck & Breloer (1995) to aid the diagnosis of potential defects through visual signs and the application of mechanical criteria.
Wind exposure:	The degree to which a tree or other object is exposed to wind, with regard both to duration and velocity.
Wind pressure:	The force exerted by wind on a tree or other object.
Wind snap:	The breaking of a tree by a stem by wind.
Wind throw:	The blowing over of a tree at its roots.

The surgery works should be to the minimum standards of BS 3998:2010

“Recommendations for Tree Work”

9.5 BIBLIOGRAPHY

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Annex C
(normative)

Measurement of tree stems

Diameters of single stem trees on level ground should be measured in accordance with Figure C.1a). Diameters of other commonly encountered tree stems should be measured in accordance with Figures C.1b) to C.1f).

NOTE The thick black line indicates where the measurement is taken.

Figure C.1 Measurement of tree stems

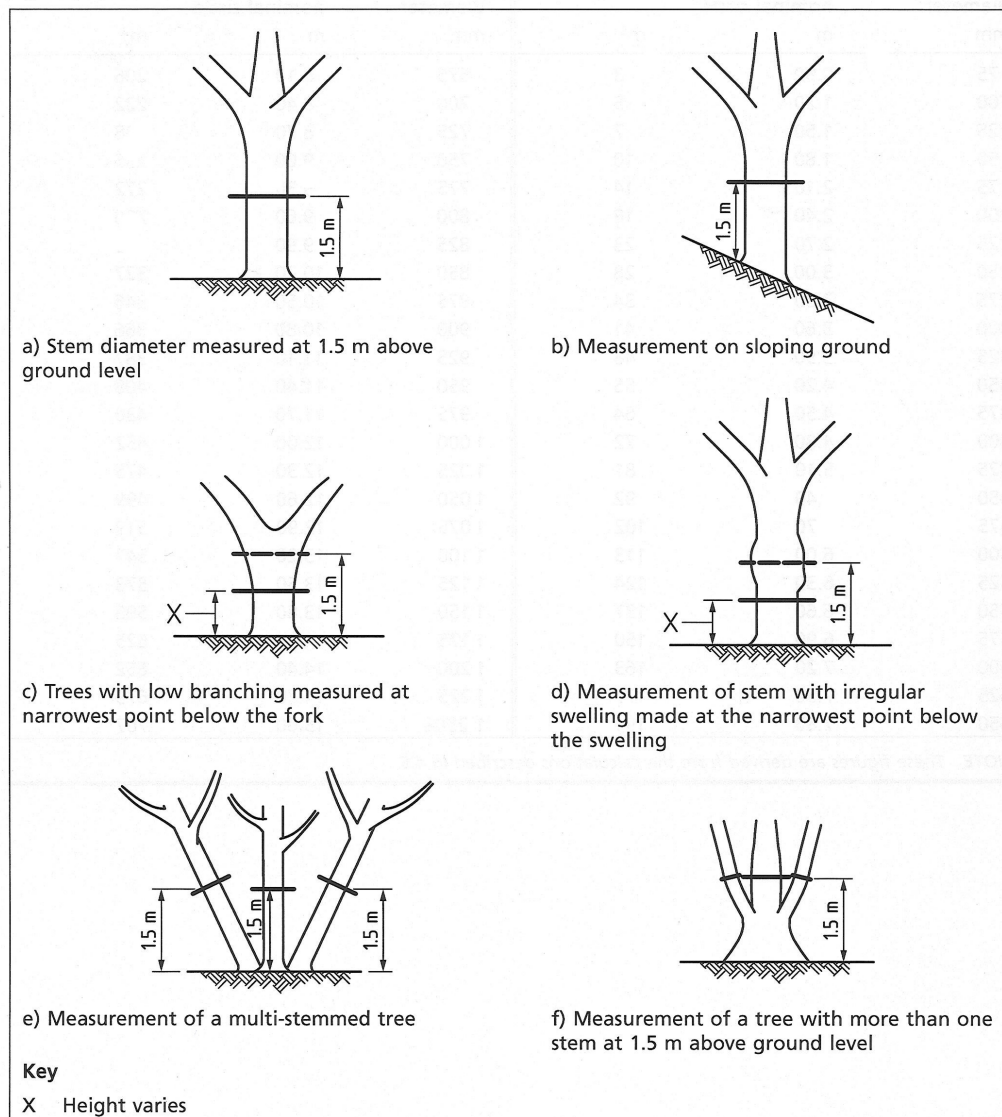
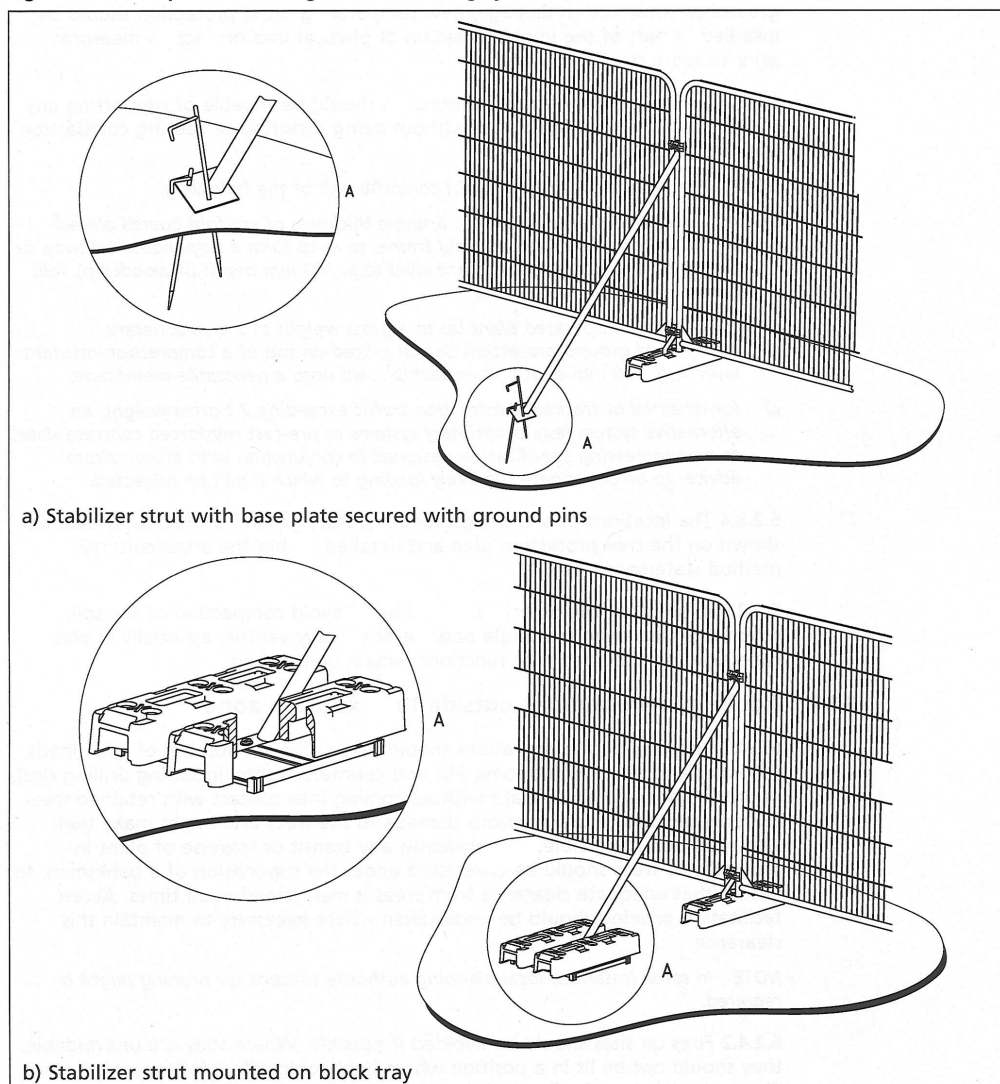


Figure 3 Examples of above-ground stabilizing systems



6.2.3 Ground protection during demolition and construction

6.2.3.1 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier. In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed during demolition. The suitability of such surfacing for this purpose should be evaluated by the project arboriculturist and an engineer as appropriate.