

Arboricultural Implications Assessment

In accordance with
BS: 5837:2012

At
Quakers Yard Station
Near Merthyr

On the instructions of RSS Infrastructure
(Representing Amey Infrastructure Wales, AIW)

Dated: February 2023



Inspected by Mr.V.Lewis. Tech.Cert.Arbor.A.

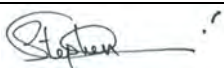
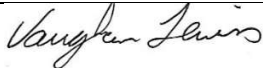
Assessed & approved by Mr. S J Ambler. Tech.Arbor.A, Dip.Arb. (RFS). F.ARBOR.A.

Of

Steve Ambler and Sons Tree Specialists Ltd.

Email - steve@steveamblertrees.com

Website- www.steveamblertrees.com

Signed Steve Ambler		Signed Vaughan Lewis	
Date	12 th February 2023	Date	3 rd Feb 2023

CONTENTS

INTRODUCTION, SCOPE AND BACKGROUND.....	3
PLANNING CONDITIONS	4
SITE DESCRIPTION.....	4
ARBORICULTURAL IMPLICATIONS ASSESSMENT	5
TREE PRESERVATION ORDER AND CONSERVATION AREA PROTECTION	5
TREES - THE ABOVE AND BELOW GROUND CONSTRAINTS.....	5
THE PROPOSED DEVELOPMENT FOOTPRINT AND TREE LOSSES	9
INFRASTRUCTURE REQUIREMENTS AND SERVICE SUPPLIES.....	10
WHETHER DESIGN CAN BE MODIFIED TO ACCOMMODATE TREE RETENTION.....	13
WHETHER TREE LOSSES FROM THE DEVELOPMENT PROPOSAL CAN BE MITIGATED	13
THE EFFECTS THAT DEVELOPMENT PROPOSALS MAY HAVE ON THE AMENITY VALUE OF THE TREES	15
THE END USE OF THE SPACE	15
PREPARATORY WORKS FOR NEW LANDSCAPING.....	16
GENERAL COMMENTS AND OBSERVATIONS.....	18
FURTHER ARBORICULTURAL INPUT.....	19
RECOMMENDATIONS	19
REPORT LIMITATIONS.....	20
LEGAL CONSTRAINTS.....	20
REFERENCES.....	22
APPENDICES.....	22
FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.....	23
TREE PRESERVATION ORDER PLAN.....	24
TREE CONSTRAINTS PLAN	25
TREE LOSS, RETENTION & PROTECTION PLAN	25

INTRODUCTION, SCOPE AND BACKGROUND

This assessment is undertaken by Vaughan Lewis (Director of Consultancy) who has worked within the arboricultural and forestry sectors for over 25 years, most recently as a principal arboricultural and woodlands officer for a local authority. Vaughan holds the following arboricultural qualifications:

- a) Professional Technician in Arboriculture (Arboricultural Association)
- b) Professional Member of the Arboricultural Association.
- c) Landscape Science, Higher National Diploma -Distinction. (Pencoed College (University of Glamorgan)
- d) Woodland Management, National Diploma - Distinction (Hereford College of Agriculture)
- e) Rural Studies, Btec First Diploma – Distinction (Pencoed College)
- f) Lantra Award, "Bats and Arboriculture – A Guide for Practitioners" developed by The Bat Conservation Trust.
- g) Professional Tree Condition Certificate (Lantra Awards)

This assessment is reviewed and approved by Stephen Ambler, the Company founder, a professional arboriculturalist and a Fellow of the Arboricultural Association with over 40 years' experience in the arboricultural industry, serving 19 of those years in local government as a principal arboricultural and woodlands officer. His Consultancy Practice was established in 1999 and later expanded in 2006 with the launch of a specialist 'Tree Contracting Unit' under the revised name - Steve Ambler & Sons Tree Specialists Ltd. Stephen holds the relevant qualifications: -

- a) Certificate in Arboriculture (Royal Forestry Society)
- b) Professional Technician in Arboriculture (Arboricultural Association)
- c) Professional Diploma in Arboriculture (Royal Forestry Society)
- d) Fellow Member of the Arboricultural Association.

This Arboricultural Implications Assessment (AIA) is a study to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on trees, in relation to the current development proposal. It follows on to an earlier Tree Survey, Tree Categorisation, and Tree Constraints Plan¹ in which the trees were scored and assessed for their suitability for retention within the proposed development. The retained trees are clearly marked on the Tree Loss, Retention & Protection Plan within the Appendices.

IMPORTANT NOTE:

It is notable that tree felling has already occurred in advance of the newly constructed footbridge over the railway line & on-going platform extension work.

An Arboricultural Implications Assessment should be written in advance of such work, and form part of a Planning Application submission, in accordance with BS5837 Trees in relation to design, demolition and construction – Recommendations (2012). In this instance, the Report has been produced with development in an advanced stage, and with limited design layout information provided.

Tree losses are indicatively shown as red hatched areas in the Tree Loss, Retention & Protection Plan, found in the Appendices (based on the Tree Constraints Plan & Aerial Photography).

¹ S. Ambler - Tree Survey, Tree Categorisation, and Tree Constraints Plan at Quakers Yard - Feb 202.

This assessment is carried out using information provided on drawings:-

- TRANO-KAW-R1-MER-DDR-C-CV-000055-D3-A01
- TRAN01-KAW-ZZ-CVL-DDR-C-CV-000112 (PR-Mods)

The boundary surrounding the proposed development site and identified by plan attached hereto, in which the trees are contained and form the contents of this Report, is hereafter referred to as 'the site' .

The provision and acceptance of this Report are subject to the general terms and conditions of Steve Ambler & Sons Tree Specialists Ltd.

PLANNING CONDITIONS

Currently there are no Planning Conditions applicable (Pre-planning application stage) .

SITE DESCRIPTION

The site is situated adjacent to a residential road (Taff Vale Estate) and shares a boundary with residential properties in the Northeast area of site. This boundary is screened by coniferous hedgerows (refer to Tree Constraints Plan in the Appendices).

The northern area of the site consists of a steep railway embankment, with sporadic tree coverage bordering the residential street. To the south of the site, the land descends westwards into publicly accessible land, comprising of woodlands and fields.

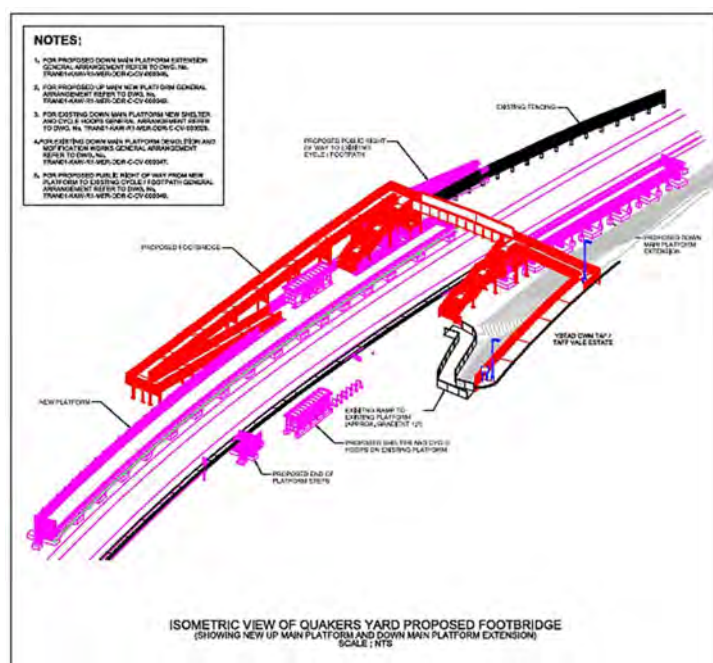
Ordnance National Grid Reference: ST 08577 96573

Nearest Post Code: CF46 5NJ

What3words: ///recoup.dries.because

The development includes elements of demolition; platform extension; footbridge construction; ramps; new shelters & cycle hoop installations (Refer to Plan Excerpt below).

Plan Excerpt 1.



ARBORICULTURAL IMPLICATIONS ASSESSMENT

The following matters are considered under this Arboricultural Implications Assessment, subject to the type of development-

- A) Site Designation - Tree Preservation Order and Conservation Area protection
- B) The above and below ground constraints.
- C) The construction of the proposed development
- D) Whether design can be modified to accommodate tree retention
- E) Infrastructure requirements, easements for above or below ground services; highway safety and visibility splays and other infrastructure provisions such as lighting, CCTV and signage.
- F) The end use of the space
- G) Whether tree losses from the development proposal can be mitigated
- H) A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.
- I) The relationship of windows to trees which may obstruct light taken into account .
- J) Large trees can sometimes cause apprehension to occupiers of nearby buildings especially during windy weather.
- K) Leaves of some species may cause problems, particularly in autumn by blocking gullies and gutters. Fruit can cause slippery patches and the accumulation of honeydew may be damaging to surfaces and vehicles.
- L) The effects that development proposals may have on the amenity value of the trees both on and near the site.

TREE PRESERVATION ORDER AND CONSERVATION AREA PROTECTION

According to Merthyr Council' s Maps website, there are no trees subject to protection under a Tree Preservation Order within the vicinity of the footbridge and therefore none have been lost as a result of the development. There is a woodland to the east on neighbouring land, adjoining the site boundary which is protected under a Tree Preservation Order (referenced as W1 in the Tree Constraints Plan found in the Appendices)

TREES - THE ABOVE AND BELOW GROUND CONSTRAINTS

The constraints of trees below ground are equal to the Root Protection Area (RPA) of all retained trees, and the distance for each tree or group is provided within the Tables in both the Tree Constraints Plan and Report ¹. The table is reproduced below, and the column highlighted in yellow provides the RPA as a radial distance, which should be measured from the centre of the tree stem. The above ground constraints are equal to the stem and crown spread. **Protection measures must consider the stem, root protection area and crown spread, whichever the greater.**

Figure 1 – Table

In the Tree Loss, Retention & Protection Plan (Appendices), the RPA' s are shown as solid orange lines whilst the canopy spreads of the trees are shown as solid green, blue or grey lines (subject to their category rating).

Table Key

- U Category Trees (unsafe to retain) = Red text

Ref.	Species	Height (m)	Effectual Diameter (mm)	Crown Spread (m)				Lowest Branch	Canopy Clearance (m)	Life Stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	RPA Area (m3)	RPA Radius (m)
				N	E	S	W									
G1	Common ash	12.0	200	5.0	2.0	2.0	2.0	2(E)	2.0	Early Mature	Ash Dieback Disease (<i>Hymenoscyphus fraxineus</i>) health stage 2.	Monitor crown health annually in summertime.	10-20	C2	18	2.4
G2	Hazel	8.0	100	4.0	4.0	4.0	4.0	1(E)	1.0	Early Mature	Group of coppices providing good screening between the footbridge/road and residential gardens.	No action required at this time.	20-40	C2	5	1.2
H1	Leyland cypress	7.0	450	1.5	1.5	1.5	1.5	1(W)	1.0	Early Mature	Hedge seemingly belonging to neighbouring property, provides good screening between site and property. Rooting area confined to neighbouring property due to hard surfacing.	No action required at this time.	20-40	C2	92	5.4
H2	Leyland cypress	7.0	200	1.5	1.5	1.5	1.5	0(S)	0.0	Early Mature	Boundary hedge providing excellent screening to neighbouring property.	No action required at this time.	20-40	C2	18	2.4
W1	Silver birch Pedunculate oak	20.0	450	8.0	8.0	8.0	8.0	8(N)	8.0	Mature	Protected by a Tree Preservation Order Mixed aged woodland downhill from site providing very good screening between the railway line and domestic property to the south. Viewed from a distance.	Implement a management plan to provide an annual detailed inspections of trees near the railway lines.	20-40	B2	92	5.4
T1	Silver birch	10.0	150	2.0	2.0	2.0	2.0	4(S)	4.0	Early Mature	Unremarkable tree of average form on the railway embankment providing minimal screening.	No action required at this time.	20-40	C2	10	1.8
T2	Common ash	10.0	150	0.0	4.0	4.0	4.0	3(SW)	3.0	Early Mature	One of two stems has been removed leaving a grossly asymmetrical crown. Ash Dieback Disease (<i>Hymenoscyphus fraxineus</i>) health stage 2.	Monitor crown and crown health during summertime.	10-20	C3	10	1.8

Ref.	Species	Height (m)	Effectual Diameter (mm)	Crown Spread (m)				Lowest Branch	Canopy Clearance (m)	Life Stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	RPA Area (m ²)	RPA Radius (m)
				N	E	S	W									
T3	Common ash	4.0	80	1.0	1.0	1.0	1.0	0.5(NE)	0.5	Young	Ash Dieback Disease (<i>Hymenoscyphus fraxineus</i>) health stage 3.	Fell to ground level.	<10	U	0	0.0
T4	Common ash	4.0	80	1.0	1.0	1.0	1.0	0.5(NE)	0.5	Young	Ash Dieback Disease (<i>Hymenoscyphus fraxineus</i>) health stage 3.	Fell to ground level.	<10	U	0	0.0
T5	Goat willow	15.0	500	5.0	2.0	5.0	5.0	4(W)	4.0	Mature	Tree of seemingly average form. Inspected from a distance due to its proximity to railway lines. Multiple stems diverge from a congested fork union approximately 3m above ground level.	Carry out a detailed tree condition inspection.	20-40	C2	113	6.0
T6	Silver birch	10.0	250	2.0	2.0	2.0	2.0	4(S)	4.0	Early mature	Unremarkable tree of average form next to the railway line. Inspected from a distance due to its proximity to railway lines.	Carry out a detailed tree condition inspection.	20-40	C2	28	3.0
T7	Silver birch	10.0	150	2.0	2.0	2.0	2.0	4(S)	4.0	Early mature	Unremarkable tree of average form next to the railway line. Inspected from a distance due to its proximity to railway lines.	Carry out a detailed tree condition inspection.	20-40	C2	10	1.8
T8	Pedunculate oak	9.0	150	2.0	2.0	2.0	2.0	4(S)	4.0	Early mature	Unremarkable tree of average form next to the railway line. Inspected from a distance due to its proximity to railway lines.	Carry out a detailed tree condition inspection.	20-40	C2	10	1.8
T9	Silver birch	12.0	550	5.0	5.0	5.0	5.0	4(E)	4.0	Mature	Tree situated on neighbouring land. Decay cavity observed on south side of the base with significantly decayed buttresses. 35° stem lean to the north.	Liaise with neighbouring landowner to discuss removal.	<10	U	0	0.0
T10	Common ash	12.0	550	5.0	5.0	5.0	5.0	4(E)	4.0	Mature	Tree situated on neighbouring land Subordinate to T9. Grossly asymmetrical crown and 45° stem lean to northwest due to phototropic tendencies. Proposed removal of T9 would cause altered exposure to this tree.	Liaise with neighbouring landowner to discuss removal.	<10	U	0	0.0

Ref.	Species	Height (m)	Effectual Diameter (mm)	Crown Spread (m)				Lowest Branch	Canopy Clearance (m)	Life Stage	General Observations	Preliminary Management Recommendations	Remaining Contribution (years)	Retention Category	RPA Area (m ³)	RPA Radius (m)
				N	E	S	W									
T11	Common hawthorn	5.0	150	2.0	2.0	1.0	0.0	2(S)	2.0	Early Mature	Unremarkable tree of average form.	No action required at this time.	20-40	C2	10	1.8
T12	Pedunculate oak	12.0	550	5.0	5.0	5.0	5.0	4(E)	4.0	Mature	Tree situated on neighbouring land subordinate to T9. Grossly asymmetrical crown and 10° stem lean to northwest due to phototropic tendencies. Proposed removal of T9 and T10 would cause altered exposure to this tree which overhangs the railway line.	Liaise with neighbouring landowner to discuss removal.	<10	U	0	0.0
T13	Silver birch	6.0	100	2.0	2.0	2.0	2.0	4(S)	4.0	Young	Unremarkable tree of average form.	No action required at this time.	20-40	C2	5	1.2
T14	Silver birch	6.0	100	2.0	2.0	2.0	2.0	4(S)	4.0	Young	Unremarkable tree of average form.	No action required at this time.	20-40	C2	5	1.2
T15	Silver birch	6.0	100	2.0	2.0	2.0	2.0	4(S)	4.0	Young	Unremarkable tree of average form.	No action required at this time.	20-40	C2	5	1.2
T16	Silver birch	6.0	100	2.0	2.0	2.0	2.0	4(S)	4.0	Young	Unremarkable tree of average form.	No action required at this time.	20-40	C2	5	1.2
T17	Silver birch	10.0	150	1.0	4.0	4.0	4.0	3(SW)	3.0	Early Mature	Heavy pruning has occurred on the north side due to the proximity to BT lines leaving a grossly asymmetrical crown. Very low target potential	No action required at this time.	10-20	C3	10	1.8

THE PROPOSED DEVELOPMENT FOOTPRINT AND TREE LOSSES

I am advised that the on-going construction activities are '*mostly now occupying the area to be fully developed. Though they' re still some way off completing the new platform, extension to existing platform and various other fencing, troughing*' (Principal Environmentalist - Environment and Sustainability, Amey Consulting). However, I am advised that no further tree losses are anticipated, other than those already lost to the current development, which is estimated below. Anecdotally our Arboricultural Surveyor was also advised by the Site Manager at the time of surveying, that no further tree losses are proposed as a direct result of development. Tree removal associated with their statutory obligations may occur along the immediate railway line, subject to operational requirements.

- **Estimated Loss of Trees to Development = 1838-m2**
(If we assume stem spacings of 2m, then this equates to approximately to 450 trees/shrubs, lost to development)

This has been calculated and shown in the Tree Loss, Retention & Protection Plan, found in the Appendices. This was produced by overlaying the Tree Constraints Plan (current tree cover) over aerial photography, that pre-dates (20/7/2021) the recent tree losses.

Whilst a few stumps were recorded in the Tree Constraints Plan, many others had been removed, and therefore the counting of stumps does not reflect the number of trees lost. Some recent site photographs (1,2) can be seen below.

Photograph 1.



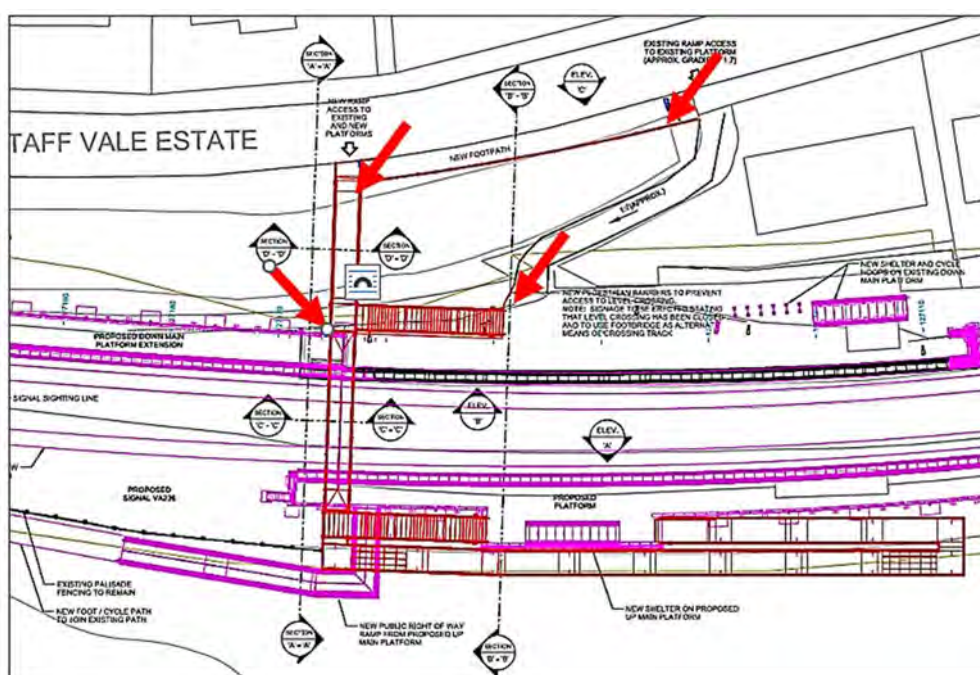
Photograph 2.



INFRASTRUCTURE REQUIREMENTS AND SERVICE SUPPLIES

The supplied drawings do not provide service run details, either existing or proposed. However it is assumed that services are already present, and that the only service-related operations that may come into close proximity with trees, is shown on the plan excerpt below, in relation to the relocation, or removal of streetlighting columns, as indicated approximately with the annotated red arrows:-

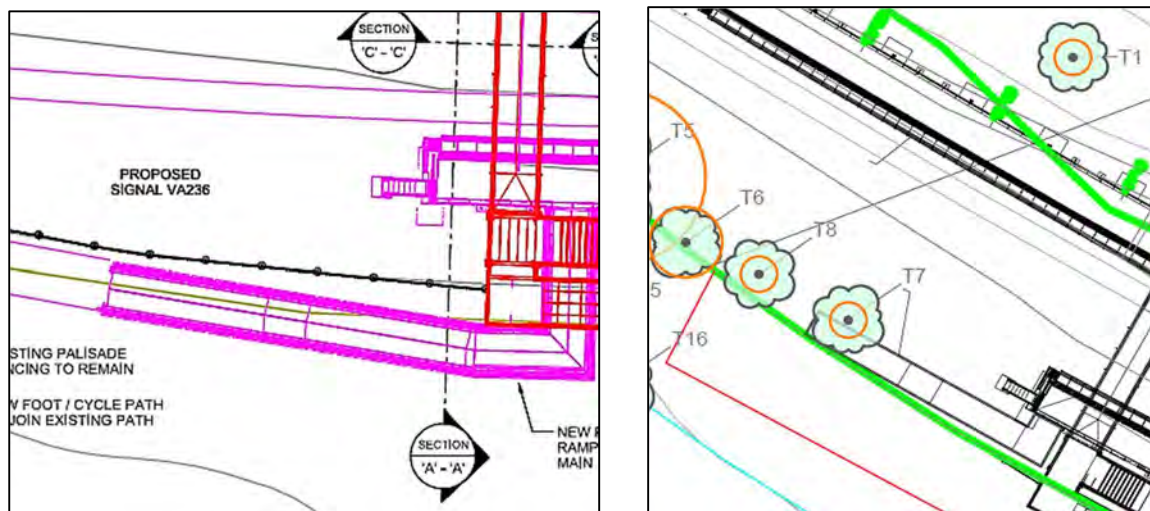
Plan Excerpt 2.



Elevation C is close to Group 2 & T2, and whilst lamp column relocation positions are unknown, it seems highly likely that they will remain within the curtilage of pathways, with exiting power cables present, and therefore connections should not infringe upon the trees. Should this not be the case, then refer to the section below called 'Services'.

Two new signals are to be installed with the east one (VA223) being sited well away from any trees. However, the western one (VA236) is relatively near trees 7 & 8 (C Category), although the plan only has a label with no arrow to show its exact location (refer to the two Plan Excerpts below). Should works occur on close proximity to T7 or T8 then refer to the section below called 'Services'.

Plant Excerpts 3 & 4.



Services

Tree roots can be damaged where services are installed within the RPA of any retained tree. Also, disruption to underground services may occur if they are placed within the root-plate zone as tree roots can cause damage to them. The RPA therefore should be taken as a minimum constraint to the development with regards the installation of underground services and greater distances should be allowed where possible.

The trees crown is also a constraint to the development and should be considered when seeking to install services or when operating plant and equipment. Sometimes the crown of a tree exceeds the RPA. Both matters should be considered in detail within an Arboricultural Method Statement.

IMPORTANT NOTE.

The National Joint Utilities Guidance 4 (NJUG), which is a guide for utility companies when installing services, is not relevant under Planning Conditions, and the more stringent protection measures under Section 7.7. of BS5837 Trees in relation to design, demolition and construction – Recommendations (2012), apply. Utility companies must be instructed accordingly and follow the above-mentioned British Standard.

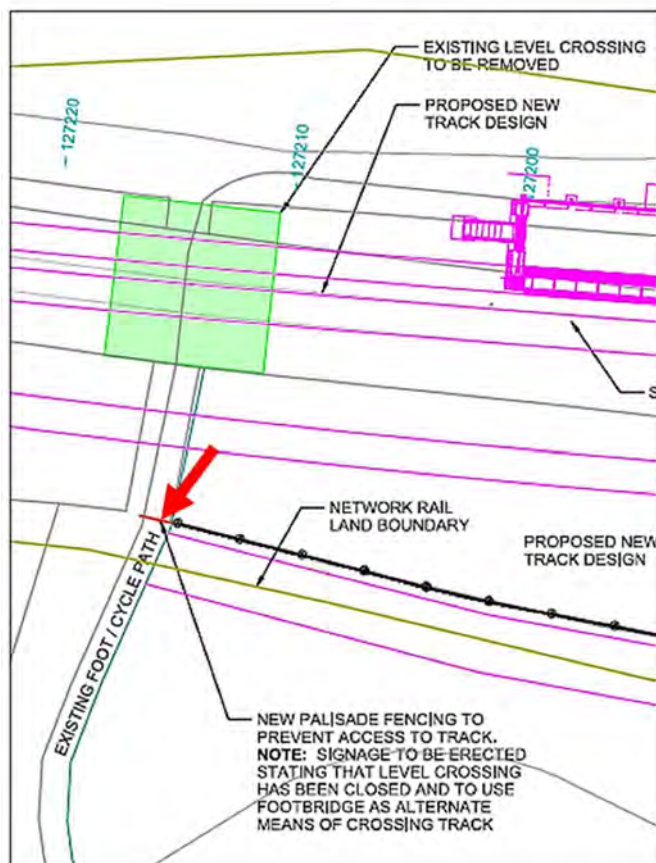
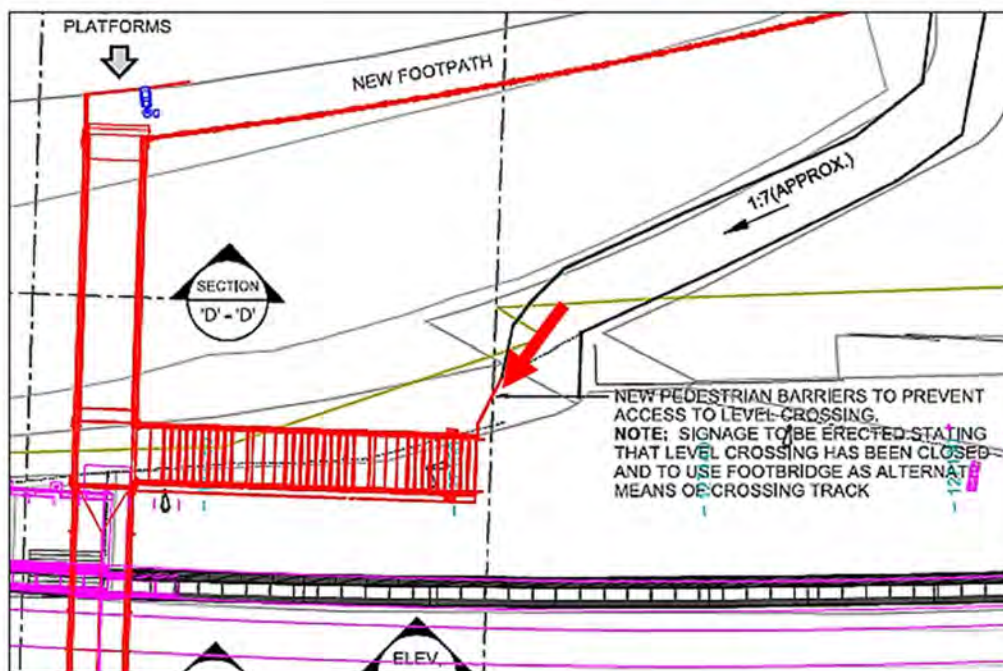
CCTV

I am not provided with any detail in relation to the need for CCTV and therefore this is not considered any further.

Signage.

There are two proposed signage locations indicatively shown on the plans; the first being near the steps off Taff Vale Estate, and secondly near the former level crossing (due for demolition), (refer to the two Plan Excerpts below). The first is near Tree 2 (C Category), and the second is potentially near Tree 11, also C category.

Plan Excerpts 5 & 6.



Vision Splays

Not applicable.

Level Changes

I am not provided with any level plans, either current or proposed and therefore I am unable to assess any potential impact upon the trees.

Drainage Ditches & Swales etc.

I am not provided with any drainage or swale plans, and therefore I am unable to assess any potential impact upon the trees.

WHETHER DESIGN CAN BE MODIFIED TO ACCOMMODATE TREE RETENTION

Tree removal in relation to the proposed design layout has been completed and therefore design modifications are a unlikely in relation to trees.

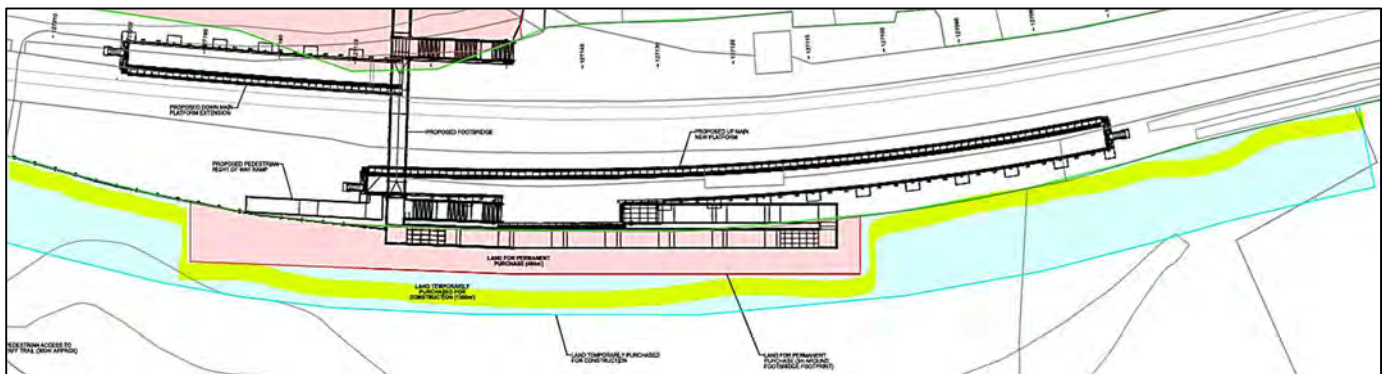
WHETHER TREE LOSSES FROM THE DEVELOPMENT PROPOSAL CAN BE MITIGATED

Tree losses occurring as a direct result of this scheme are detailed on the Tree Loss, Retention & Protection Plan (Appendices) .

I am advised by Amey Consulting that mitigation measures, which includes new tree planting, will be detailed within the planned Biodiversity Plan, and Landscape & Visual Impact Assessment Report.

There is certainly scope for mitigation planting with a native woodland mix of trees and shrubs along the southern boundary of the site. This planting would occur on land which is identified on the plan excerpt below as '*land temporarily purchased for construction*' , with the indicative planting area highlighted with a yellow marker by the client .

Plan Excerpt 7.



Planting should only consist of native species and aim to improve connectivity between the woodland (W1) to the east and enrich the existing trees to the west (T5 – T16). Plants should be protected with tree and shrub guards and maintained until established (approximately year 5). Missing, vandalised, dead or dying plants, supports or guards should be replaced annually, following an assessment by a suitably qualified arborist or forester. It is noted that historic fires have occurred in the area, and any dry, dead plant matter (particularly bracken or gorse) should be removed prior to planting and during the establishment period, to limit the risk of fires being lit, and plants being destroyed.

Some additional screen planting may be considered within the Landscape & Visual Impact Assessment Report, in light of increased exposure for the immediately adjoining properties with site-lines to and from the new footbridge.

IMPACT ASSESSMENT OF DEVELOPMENT ON TREES.

A realistic assessment of the probable impact of the proposed development on the trees and vice versa with due allowances for their future growth and maintenance requirements.

With regards to potential damage occurring to any proposed development because of existing trees, this would consider several types of potential damage which are (a) indirect damage through subsidence or heave (a matter related to geology), (b) Direct damage, physical damage caused by incremental growth, (c) The disruption to underground services, (d) Displacement, lifting or distortion, (e) The impact on branches on the super structure or (f) Structural failure of a tree. These are discussed below -

- a) **Indirect Damage – Highly unlikely.** The likelihood of damage occurring to the structure as a result of ground movement occurring through soil swelling and shrinking is dependent on local geological conditions and the presence of shrinkable clay soils beneath the foundations. This report has not considered the soil type in any detail or undertaken a laboratory soil analysis as part of this brief. The potential for direct damage should be taken into consideration throughout the design and construction process. For guidance on avoiding indirect damage by trees to structures, refer to NHBC Chapter 4.2.
- b) **Direct Damage – Unlikely.** This can sometimes occur through the annual incremental growth of the trunk or root buttresses through a process called ‘secondary thickening’ . The greatest risk of direct damage occurs when trees are close to building structures and occur with the expanding growth of the main trunk and roots although any likelihood of such damage diminishes rapidly with distance. Table A.1 of BS:5837 is produced below and provides advice on minimum distances to avoid damage.
- c) **Displacement, lifting or distortion – Possible along the existing path off Taff Vale (H2, G2, T1)..** This can occur where lightweight structures are within influencing distance of trees and annual incremental growth of roots and buttresses have the ability to disturb paving, walls, porches, and garages. Advice in Table A1 should be followed (see below) when planting new trees or controlling seedling growth.
- d) **The impact of branches on the super structure – Highly unlikely.** Where development occurs close to trees and branches interfere or have the ability to interfere at a later date due to their growth, can cause the LPA problems with repeated requests for trees to be trimmed. Here, the development appears to be mainly of sufficient distance away from any retained trees. Furthermore, woodland management operations will be required regularly and during these operations, problematic trees may be selected for removal to address any minor issues.

BRITISH STANDARD

BS 5837:2012

Allowance needs to be made for the swaying of stem and branches during storm conditions. Branches which are liable to strike the structure need to be removed or pruned back to a suitable branching point as appropriate (see BS 3998:2010).

Table A.1 Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm ^{A)}	Stem dia. 300 mm to 600 mm ^{A)}	Stem dia. >600 mm ^{A)}
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

^{A)} Diameter of stem at 1.5 m above ground level at maturity

A.1.3 Allowance for future growth

Where the installation of paths or light structures such as walls is unavoidable near to trees, the design and construction specification needs to take account of future growth.

If it is necessary to build a wall or similar structure over a root greater than 50 mm diameter, provision for future diameter growth needs to be made by surrounding the root with uncompacted sharp sand, void-formers, or other flexible fill materials, and by laying an adequately reinforced lintel or raft over the surface.

THE EFFECTS THAT DEVELOPMENT PROPOSALS MAY HAVE ON THE AMENITY VALUE OF THE TREES

Relates to both trees on and near the site.

The proposed development impacts upon those trees to be lost in close proximity to the footbridge and platform extension. There are no obvious impacts upon the wider trees that are to be retained, other than some on-going maintenance in the form of access facilitation pruning on Group 2, Hedge 1 & Tree 2 along the access path.

THE END USE OF THE SPACE

The station improvements will perhaps increase footfall marginally, but will not significantly place pressure upon the retained trees other than slightly increasing their target occupancy. However as the trees already occur within a publicly accessible area, along a railway line and residential road, the relevant, responsible landowners should be undertaking tree condition management on a cyclical basis into perpetuity, in order to manage their liabilities.

PREPARATORY WORKS FOR NEW LANDSCAPING

I am not provided with any landscape details as yet, and it is my understanding that a Landscape & Visual Impact Assessment Report, will be produced.

It is surmised that some form of mitigation work will occur, and as such the following principles should be considered when specifying, and undertaking landscaping work near trees.

Arboricultural Method Statement for Seeding within a Root Protection Area.

Where turfing or grass seeding is proposed within an RPA, the following method must be followed-

1. Any works within the RPA must be supervised by the Project Arborist.
2. Levels must not be altered.
3. Any set back or adjustment within the tree protective barrier fencing exposing the RPA to allow the works or access for the works must be agreed with the PA and protected using ground plates.
4. Fencing must be installed immediately upon completion of the works.
5. Any existing ground vegetation should be killed using an appropriate herbicide.
6. Dead vegetation may be raked or skimmed off using hand tools.
7. A layer of compost not exceeding 1cm in depth may be used.
8. Seed may be sown directly onto this.
9. Care must be taken to avoid compaction to the soil so ideally done during dryish conditions avoiding working on wet and saturated soils.
10. The use of fertilisers must be avoided.
11. Ground must be protected within all RPAs where wheelbarrows or mechanical barrows or small plant is used, working off load spreaders that are suitable to support and distribute the load.

The RPAs of retained trees should be excluded from any landscaping or reinstatement work where possible. Top soiling over and above the root-plate of tree' s is detrimental to their health even just 100-mm or so and where turf is added. Planting into the RPA is also damaging to roots as is any ground levelling activities.

The general treatment of areas around newly planted and existing trees should allow for adequate infiltration of water and free gas exchange, reduction of water evaporation and the retention of an open soil structure to encourage root growth. Care should be taken to ensure that grass or weed growth does not compete with young root growth by intercepting available water supply. Care should-also be taken to avoid the risk of damage to the stems of young trees from future strimming or mowing operations. An area with a radius of at least 500-mm from the stem of newly planted trees should therefore be kept free from competing vegetation by chemical weed control or by the more environmentally friendly option of mulching.

NOTE. Soft landscape finishes, including mulch and cultivated beds, will generally provide more favourable conditions for young tree establishment than most hard surfaces or grass. The use of ground-cover shrubs with an appropriate organic mulch is particularly beneficial: this treatment suppresses weeds, reduces maintenance, discourages intrusion and maintains a permeable open soil structure.

Soil Compaction and Remediation Measures.

Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss and other vegetation on development sites. Compacted soil will adversely affect drainage, gas exchange, nutrient uptake, and organic content, and will seriously impede or restrict root growth. The risk of

soil compaction is greatest in soils with significant clay content and in wet conditions. It can result from temporary or short-term loadings, such as the passage of a single vehicle, or from longer-term construction activities, including materials storage.

Soil compaction should be avoided in RPAs and areas where new planting or seeding is proposed which contain suitable ground conditions (fertile soil). Where soil compaction has occurred in RPAs or proposed planting areas, arboricultural advice should be taken before carrying out any remedial works. Remedial works may include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure.

Use of Mulch

Open soil and shrub planting areas around newly planted trees should be mulched to inhibit weed growth, reduce groundwater evaporation, resist and mitigate soil compaction and reduce maintenance requirements, whilst allowing gas exchange and water penetration to roots. The mulch material should be weed-free, easy to apply, containable within the area of application and readily available. The choice of material will be informed by local availability of materials, site characteristics and aesthetic requirements. The mulch should be periodically replenished as it decomposes so that it does not become depleted, and ideally when the soil is warm and moist.

The materials that may be used for mulching include coarsely divided plant matter, such as well-composted wood chip, pulverized bark, leaf mould or green waste conforming to PAS 100, and these may be combined with well-rotted animal manure. If the sole intention is to conserve moisture, a layer of gravel or well-secured sheets of material such as permeable geotextile fabric may be used, and may be covered for cosmetic purposes. Any such sheets should be maintained to avoid damage to the tree (e.g. by clogging, weed growth, restriction of air movement or constriction of the stem).

The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of organic mulch should not be so much as to inhibit aeration of the root system (normally no more than 100 mm). The area around the tree should be well-watered prior to the application of mulching material and the mulch should be periodically replenished as it decomposes, so that it does not become depleted. Mulches should be kept away from direct contact with the bark of the stem, or of major roots, since this might encourage infection by pathogens by maintaining wet conditions.

NOTES.

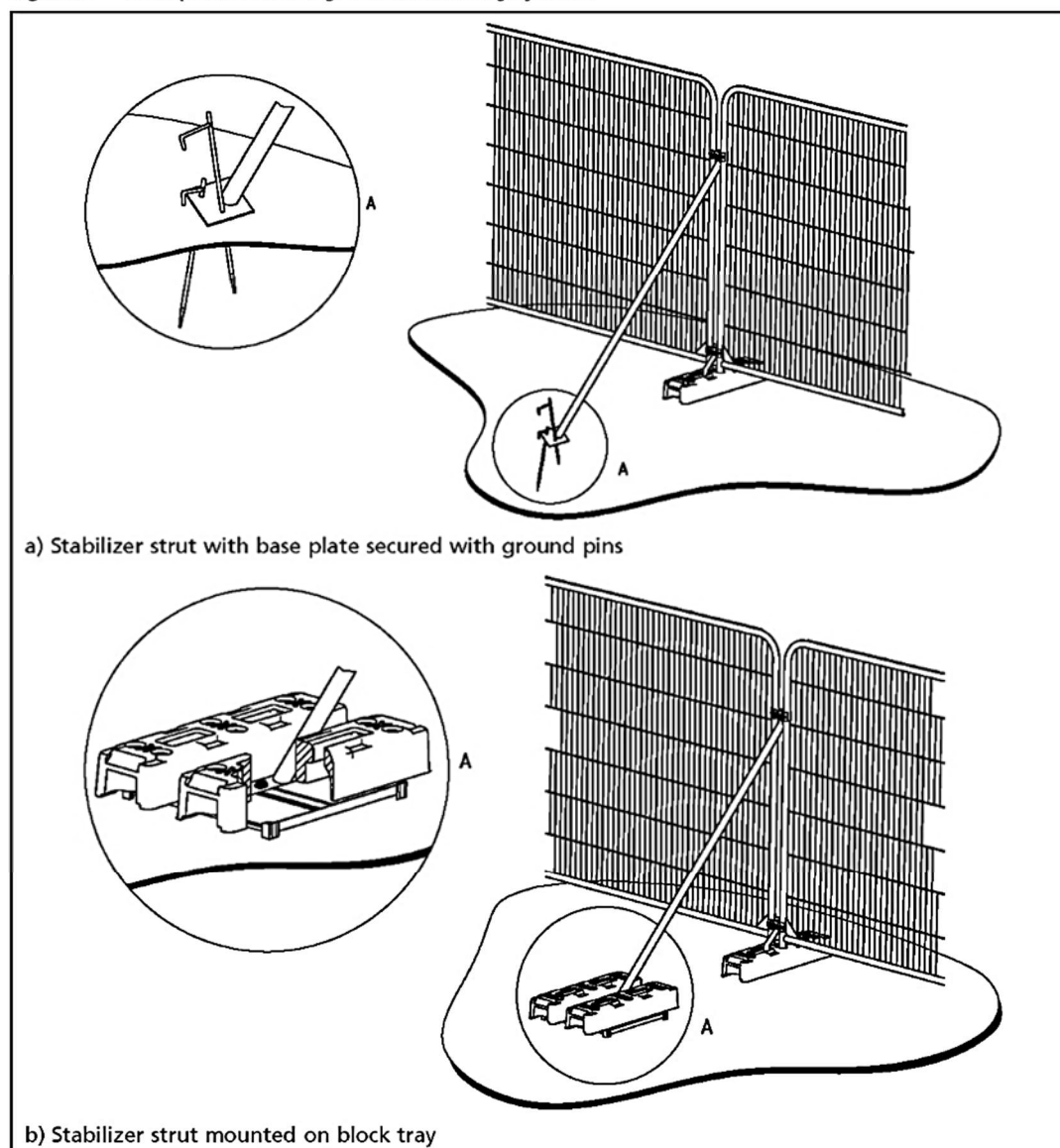
1. Mulches that retain water encourage the development of roots near the soil surface and within the mulch itself. This can become a disadvantage owing to desiccation if the mulch is removed or not replenished.
2. Although, by improving the soil texture and acting as a buffer for rainfall, mulches generally help to prevent extremes of soil wetness and dryness, they can prolong waterlogging on sites where drainage is seriously impeded. This in turn can harm tree roots and make them more susceptible to certain pathogens such as *Phytophthora* spp.
3. Further guidance on mulching is given in BS 3998:2010.

GENERAL COMMENTS AND OBSERVATIONS

Any construction work can have a negative effect on tree health and stability, if their underground parts, which are frequently ignored, are damaged or severed. Above ground parts may become injured or broken through impact/collision damage. Retained trees will require physical protection from such injury during the development phase from the onset. Barrier fencing must be installed to create an exclusion zone around the trees and enclose the necessary Root Protection Area or crown spread, whichever the greater. Its location and design must follow an approved ² Tree Loss, Retention & Protection Plan. The type of barrier fencing recommended for this proposal is produced below in Figure 3, and is taken from the British Standard. The positioning and suitability of the protective fencing must be assessed and signed off by the Project Arborist prior to all works commencing (enabling tree works may be excluded). Fencing must exclude and protect the Root Protection Area and crown spread whichever the greater. Such areas are regarded as a Construction Exclusion Zone.

The tree protection fencing should erected as soon as possible, given that construction works are underway.

Figure 3 Examples of above-ground stabilizing systems



² Approved by the Local Planning Authority

Providing the needs of the retained trees are catered for and that care is taken during construction to protect their roots and stems, it is reasonable to predict that no long-lasting disruption to the trees physiology is perceived, so long as the following is fully implemented:-

FURTHER ARBORICUTURAL INPUT

During the planning and development process, further information will be required. (1) **An Arboricultural Method Statement (AMS)** will be necessary to help guide tree friendly construction methods, which **must** be followed rigorously during construction. It is strongly recommended that (2) a **'Project Arborist'** is engaged for the duration of the construction period to oversee tree protection matters, be on hand to provide any arboricultural advice and maintain a level of communications between the client and Local Planning Authority's Tree Officer through submission of monthly progress reports.

RECOMMENDATIONS

- Commission an **Arboricultural Method Statement** to advise on precautions to safeguard the health and stability of any retained trees during the construction phase.
- Appoint a **Project Arborist** to undertake weekly **Arboricultural Watching Brief visits** for the duration of the development, to monitor and advise on tree protection measures, and liaise with the Local Planning Authority where required. The Project Arborist would also be on hand to offer advice on tree protection measures should ancillary operations or operational working space, bring activities into close proximity of the retained trees.
- Enter the trees into a cyclical tree condition inspection every 18 months, once the scheme is complete.
- Consider mitigation planting with native tree and shrub species , and maintain until established.

REPORT LIMITATIONS

It must be stressed that this arboricultural impact assessment is not a risk assessment or a detailed report on the health and condition of the trees. It has been produced as a desktop review.

Every attempt has been made to provide a realistic and accurate assessment of the impact of the development on the trees. . no liability can be accepted for any tree related issue or tree and building interactions in the absence of information or where information is unclear or misleading.

This report is based on the tree circumstances and condition at the time of the original tree survey. It must be recognised that the circumstances may be altered radically over the course of time and any development process and that such changes cannot be accurately predicted. The report does not provide any specific long-term tree management recommendations.

The effect this new development may have on localised wind turbulence has not been assessed during this inspection. As trees grow, they respond and mechanically adapt to their surroundings and exposure limits. With the erection of dwellings in close proximity to existing trees, new turbulence is created. The author accepts no liabilities to any failure subsequent upon such new imposed, artificial conditions.

This report does not consider **indirect** damage resulting from the extraction of moisture from shrinkable clay soils by tree roots causing **subsidence** or by **heave** occurring through soil rewetting following removal of trees on this site. Such problems are almost entirely restricted to areas of shrinkable clay soils and as I have **not** considered a soil analysis as part of my present brief, this aspect is **not** addressed at this time.

LEGAL CONSTRAINTS

The legal constraints of any site should be considered in early planning and well before any work commences on site. Such legal constraints should be fully considered from the outset to avoid time delays. The legal constraints referred to here are general constraints relating to arboriculture only and not any other legal matter that may arise.

Tree Preservation Orders and Conservation Area Status in Wales

In Wales, the law on TPOs is in Part V111 of the Town and Country Planning Act 1990 Town and Country Planning (Trees) Regulations 1999. When any tree/s are 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 the Local Planning Authority (LPA), there are exceptions. An LPA may grant permission, if considered reasonable following the submission of an application for consent to undertake the works, or where in accordance with an Approved Planning Application or under the exemptions within the Town and Country Planning Act 1990 of dead, dying, or dangerous. It is advisable to consult the LPA and an Arborist prior to conducting any tree works under these exemptions.

Felling License

A Felling Licence may be required in certain felling operations, and these are administered by the Forestry Commission where more than five cubic metres of wood are felled in one calendar quarter and when selling more than two cubic metres. There are exceptions, and these are in the Forestry Act 1967 and Regulations made under this Act. Contravention of the felling licence controls can incur substantial penalties. Tree felling forming part of a Local Authority Planning Approval is exempt.

Tree work operations have the potential to impact on protected species, most notably birds and bats. **The Wildlife and Countryside Act 1981** is the primary legislation which protect birds in the UK, and it is an offence, with certain exceptions, to intentionally kill, injure or take any wild bird, or intentionally take, damage or destroy the nest of any wild bird while it is in use or being built or take or destroy an egg of any wild bird. Certain species of bird are afforded additional protection, whereby it is an offence to intentionally or recklessly disturb any wild bird included on Schedule 1 of the Act, while it is nest building or at a nest containing eggs or young, or disturb the dependent young of such a bird.

It is not an offence to fell trees during the bird nesting period (which is generally considered to be between mid-February and September inclusive) providing it is done so without breaching the legislation detailed above.

Caution must be aired if tree works are programmed during the nesting season as there is the potential for delay if nesting birds are found to be on site. Should nesting birds be present then all but essential works must be postponed. If in undertaking essential works a nest or nests are found to be present, then further advice must be sought from the statutory nature conservation authority, which in Wales is Natural Resources Wales and in England is Natural England, or from an appropriately qualified ecologist. The penalty for disturbing or destroying one bird or nest can be an unlimited fine and up to six months in prison, or both.

Bats...Summary of Current Relevant Legislation

Bats are also generally associated with trees and can be impacted by tree work operations. There are some 17 species of bat which are known to breed in 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. All species of bats are afforded **full** protection under the **Conservation of Habitats and Species Regulations 2017 (as amended)** and **partial** protection under the **Wildlife and Countryside Act 1981 (as amended)**. It is an offence (with limited exceptions) to deliberately take, injure, or kill a bat, intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats, deliberately damage or destroy a place used by bats for breeding or resting (roosts) (even if bats are not occupying the roost at the time) or intentionally or recklessly obstruct access to a bat roost.

Therefore, bats are to be fully considered before any tree work commences and particularly if trees contain veteran features (which can occur in young trees as well as older trees). This can include all work on trees whether it is surgery, felling, the covering, or filling of cavities or the installation of rod braces and flexible cable braces. If a bat roost is known to be in any tree that is to be removed or worked on, or if any work is to take place adjacent to a known bat roost that may result in disturbance to that bat/s, then a license must be obtained from Natural Resources Wales or Natural England before work can take place.

Where there is the risk of a bat roosts being present, it is incumbent upon the owner or manager to commission a specialist bat survey to identify bat roosts before instructing tree surgery to commence. Failure to do so and in the event of breaching the legislation detailed above 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., £5000 in April 2001) per roost or bat disturbed or killed, or to both.

NOTE - This is a simplified summary of the legal position relating to bats and birds and is intended for guidance purposes only. If further assistance is required, the primary legislation should be referred to. It may also be necessary to see legal advice or the advice of an appropriately qualified ecologist.

In the event of disturbing a roost site or injuring any bats 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., £5000 in April 2001) per roost or bat disturbed or killed, or to both.

Statute and Common Law – for Tree Inspections.

A landowner or land manager 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 should be carried out within the time constraints 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. Arboricultural Association, the Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire, GL10 3DL. Telephone 01242 522152. www.trees.org.uk are able to provide advice on suitably qualified persons or indeed suitable qualifications a person should hold to undertake qualified inspections.

GLOSSARY OF TERMS

Adventitious; Latent or dormant bud on stem or root often invisible until stimulated into growth which occurs from an unusual place i.e. not a twig, leaf or bud.

Arboriculture: the culture and management of trees as groups and individuals, primarily for amenity and other non-forestry purposes.

Arboriculturalist: person who has, through relevant education, training and experience, gained recognised qualifications and expertise in the field of trees in relation to construction.

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 arboriculturalist, to identify, evaluate and possibly mitigate 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 loss of 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 (THIS INVOLVES A VISUAL INSPECTION FOR DEFECTS AND CONTRIBUTORY SITE FACTORS, AND SOMETIMES ALSO A DETAILED INVESTIGATION OF SUSPECTED DEFECTS)

Bole; (trunk) the main stem of a tree below its first major branch

Branch: a limb extending from the main stem or parent branch of a tree

Buttress zone: the region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper sides of the junctions

Canopy: the topmost layer of twigs and foliage in a woodland, tree or group of trees

Construction Exclusion Zone; this is an area established where construction is not permitted and usually correlates to the Root Protection Area.

Crown: in arboriculture the main foliage-bearing portion of a tree

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.

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

Dysfunction: in woody tissues, the loss of physiological function, especially water conduction.

Energy: the capacity to do work (THROUGH PHOTOSYNTHESIS, GREEN PLANTS ABSORB ENERGY FROM SUNLIGHT AND STORE IT IN THE FORM OF CHEMICAL COMPOUNDS WHICH ARE USED IN ENERGY-DEPENDANT PROCESSES SUCH AS GROWTH)

Failure: in connection with tree hazards, a partial or total fracture within woody tissues or loss of cohesion between roots and soil. (IN TOTAL FAILURE THE AFFECTED PART SNAPS OR TEARS AWAY COMPLETELY. IN PARTIAL FAILURE, THERE IS A CRACK OR DEFORMATION WHICH RESULTS IN AN ALTERED DISTRIBUTION OF MECHANICAL STRESS)

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 or wood pasture).

Heave: in relation to a shrinkable clay soil, expansion due to re-wetting, sometimes after the 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 tree stability, the lifting of one side of a wind-rocked root plate.

Leader: in a tree, a topmost shoot that has apical dominance.

Preventive 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.

Root Protection Area; this is a protection area established around the base of each tree to prevent physical, chemical or compaction damage occurring. Protection to the RPA is achieved through the erection of fencing or another suitable barrier.

Soil heave: see heave.

Special Precaution Area; this is an area, usually within the root protection area, where construction or other activity may be permitted but only under the direction of a 'Arboricultural Method Statement' and the supervision of an Arborist.

Species The species is the given name of the tree which is usually provided in both the common and scientific names.

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.

Subsidence: in relation to branches of trees, a term that can be used to describe a progressive downward bending due to increasing weight.

Targets: in a tree hazard assessment (and with somewhat incorrect terminology), persons or property or other things of value, which might be harmed by mechanical failure of the tree or by objects falling from it.

Tree: a woody plant, which typically has a single main stem and, in maturity, attains a height of at least four metres and a stem diameter at breast height of at least 75-mm.

Tree Constraint Plan (TCP): plan prepared by an Arboriculturalist for the purpose of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on 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 Retention, Protection & Removal 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.

Trunk: the single main stem of a tree.

Vigour: in tree assessment, an overall measure of the rate of shoot production, shoot extension or diameter growth (cf. vitality)

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 stem by wind.

Windthrow: the blowing over of a tree at its roots.

REFERENCES

1. BS 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations
2. Ambler SJ – Tree Survey, Categorisation & Constraints Report at Quakers Yard. June 2022.

APPENDICES

FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

TREE PRESERVATION ORDER PLAN

TREE CONSTRAINTS PLAN

TREE LOSS, RETENTION & PROTECTION PLAN

FLOW DIAGRAM – PLANNING FOR TREES IN DEVELOPMENT.

BS 5837:2012

BRITISH STANDARD

**Annex B
(informative)**

Trees and the planning system

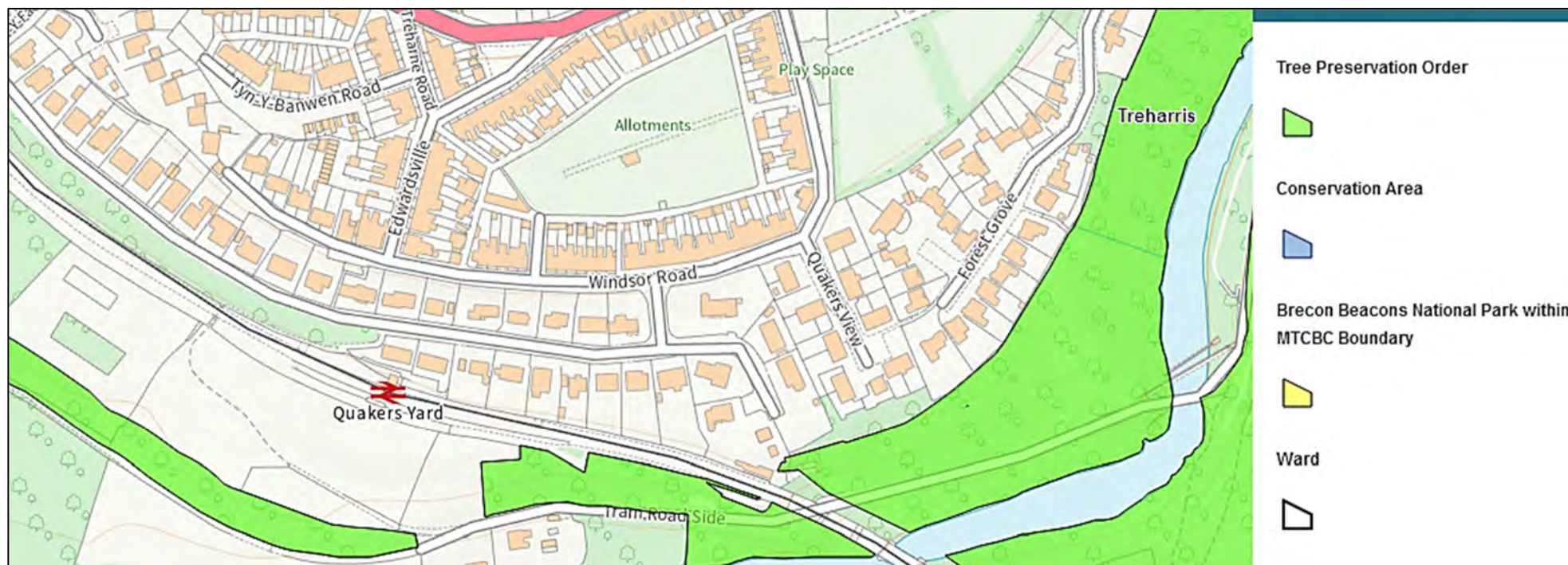
Under the UK planning system, local authorities have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a tree preservation order or by their inclusion within a conservation area) or not, is a material consideration that is taken into account in dealing with planning applications. Where trees are statutorily protected, it is important to contact the local planning authority and follow the appropriate procedures before undertaking any works that might affect the protected trees.

The nature and level of detail of information required to enable a local planning authority to properly consider the implications and effects of development proposals varies between stages and in relation to what is proposed. Table B.1 provides advice to both developers and local authorities on an appropriate amount of information. The term "minimum detail" is intended to reflect information that local authorities are expected to seek, whilst the term "additional information" identifies further details that might reasonably be sought, especially where any construction is proposed within the RPA.

Table B.1 Delivery of tree-related information into the planning system

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions) Tree retention/removal plan (finalized) Retained trees and RPAs shown on proposed layout Strategic hard and soft landscape design, including species and location of new tree planting Arboricultural impact assessment	Existing and proposed finished levels Tree protection plan Arboricultural method statement – heads of terms Details for all special engineering within the RPA and other relevant construction details
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method Dimensioned tree protection plan Arboricultural method statement – detailed Schedule of works to retained trees, e.g. access facilitation pruning Detailed hard and soft landscape design	Arboricultural site monitoring schedule Tree and landscape management plan Post-construction remedial works Landscape maintenance schedule

TREE PRESERVATION ORDER PLAN

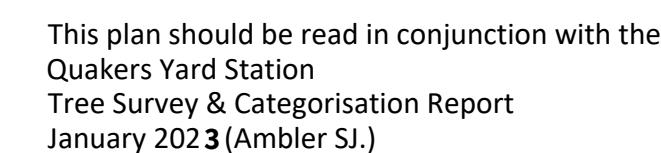
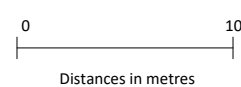


Source: MTCBC Maps Website

TREE CONSTRAINTS PLAN

&

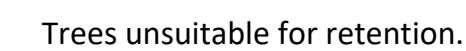
TREE LOSS, RETENTION & PROTECTION PLAN



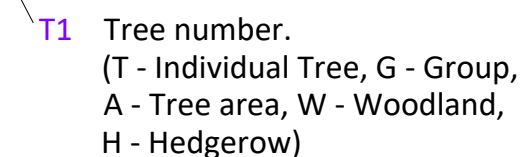
The original of this drawing was produced in colour.
A monochrome copy should not be relied upon.

(Please check all RPA's on site.)

Trees to be considered for retention.



Crown Spread.
Measured in North, South,
East and West side of tree.



Root Protection Area (RPA)
A layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.



Steve Ambler & Sons Tree Specialists Ltd
Tec.Arbor.A., Dip.Arb.(RFS), F.ARBOR.A.
Tel/ Fax: 01495 310826
Mob: 07813 310826
email: steve@steveamblertrees.com

Client	Amev Infrastructure Wales
Surveyed by	SJA
Date surveyed	January 2023
Drawn by	BC
Scale	1:350 when printed at A1
OS Grid Ref	ST 08577 96573

INDICATIVE ONLY.
PLEASE REFER TO ROOT PROTECTION TABLE.
DO NOT SCALE FROM THIS DRAWING
CHECK ALL DIMENSIONS ON SITE

REF. DRAWINGS	
TRAN01-KAW-ZZ- CVL-DDR-C-CV-000112	Quakers Yard Station Planning Drawing Amey Infrastructure Wales

TITLE	Tree Constraints Plan Quakers Yard Station
-------	---

DRAWING No: **22-003**

