

Arboricultural Assessment

Site of Tree Hazard & Risk Assessment: Leckwith Quay
Leckwith
Cardiff
Vale of Glamorgan
CF11 8AU

Client: Phil Worthing
C/O Gareth Davies
Gareth Davies Project Services
The Walled Garden
Wenvoe Castle
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CF5 6BE

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Little Oak
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Date of Assessment: Tuesday 4th June 2019

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1.

1.1 Assignment.

Arborwood Tree Care has been instructed by Phil Worthing. To carry out an arboriculture assessment for proposed large residential development, at Leckwith Quay. The site has been assessed in accordance with "BS5837:2005 Trees in relation to construction" – Recommendations. Client has requested that Arborwood Tree Care assess the area concerned with regards to the arboricultural impact of proposed building works.

1.2 Methodology.

The scope of this survey is concerned with the arboriculture aspects of the site only. Arborwood Tree Care has surveyed and classified the site in accordance with the BS 5837-2012. The survey was undertaken with the methodology to conduct a preliminary assessment of the trees and surrounding area. Trees are living organisms and are subject to change in a rapid manner. My recommendations within this report have been provided so that works may be adhered to in a timely manner. It is important to note, that any change to the surrounding environment, may have an impact on the trees structure which could invalidate my report. The assessment took place on a clear day and was undertaken by the Arborwood team. A good visual was had of all trees in the report.

1.3 Limitations.

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1.4 Disclaimer.

We have no connection with any of the parties involved in this situation that could influence the opinions expressed in this report

2.

2.1 Site visit

The visit was carried out on Tuesday 4th June 2019. The assessment took place on a clear day and was undertaken by the Arborwood team. A good visual was had of all trees in the report.

2.2 Description of site

The site is an old quay site and has a number of industrial units within the site. There is an open field, waste land where the Ely river runs along its boundary. There is a woodland area on a steep bank with the Leckwith road running through and then along the site.

2.3 Site location.

The Site is located 51.469694,-3.212421 (CF118AU) Leckwith Quarry .

3. Site details

- 3.1 G1 – A group of mature Cypressus x leylandii – planted primarily as hedge or screening trees in moderate condition.
- 3.2 G2 – Mature woodland primarily made up of Ash, Hawthorn, Elm, Yew & English Oak with sign of Ash dieback & Dutch Elm Disease in poor to Moderate.
- 3.3 T1 – Dead Elms due to Dutch Elm Disease x3 – remove due to condition.
- 3.4 T2 – Over mature multi stemmed Ash in poor condition – remove due to condition.
- 3.5 T3 – Dead Single stemmed Ash – remove due to condition.
- 3.6 T4 – Over mature multi stemmed Ash in poor condition – remove due to condition.
- 3.7 T5 – Dead Elm due to Dutch Elm Disease x 10 – remove due to condition.
- 3.8 G3 – A group of mature Cypressus x leylandii in moderate – planted primarily as hedge or screening trees.
- 3.9 T6 – Over Mature Multi stemmed Field Maple in moderate to good condition.
- 3.10 T7 – Over mature single stemmed Ash in poor condition with sign of Ash dieback.
- 3.11 T8 – Over mature single stemmed Ash in poor condition with sign of Ash dieback.
- 3.12 G4 – A group of Hazel, Cherry & Apple in moderate condition planted by pond.
- 3.13 G5 – A group of Self-seeded young shrub trees Goat Willow, Ash, Buddleia, Birch and Elm in poor condition sign of Ash dieback & Dutch Elm Disease.
- 3.14 G6 – A group of Mature Cypressus x leylandii in moderate condition – planted primarily as hedge or screening trees.
- 3.15 G7 – A group of young growing along riverbank - Ash, Elm, Field Maple, Buddleia, Sycamore, Cypress in poor condition.
- 3.16 G8 – A group of Mature Cypressus x leylandii in poor – planted primarily as hedge or screening trees
- 3.17 G9 – A group of young to semi mature Goat Willow, Buddleia, Ash, Sycamore and Elm in poor condition with sign of Ash dieback & Dutch Elm Disease.
- 3.18 T10 – Over mature single stemmed Ash in moderate condition.
- 3.19 T11 – Mature Field Maple in good condition.
- 3.20 T12 – Over mature single stemmed Ash in poor condition with sign of Ash dieback – remove due to condition.
- 3.21 T13 – Dead Single stemmed Ash – remove due to condition.
- 3.22 G10 – A group of young to mature Hazel, Hawthorn, Buddleia, Ash, Sycamore and Elm in poor to moderate condition with sign of Ash dieback & Dutch Elm Disease.
- 3.23 G11 – A group of young to mature Willow, Elm, Sycamore, Goat willow, Hawthorn, Buddleia, Ash in poor to moderate condition with sign with sign of Ash dieback & Dutch Elm Disease.
- 3.24 T14 – Over mature single stemmed Ash in moderate condition.
- 3.25 G12 – A group of Semi mature Ash in moderate condition.
- 3.26 G13 – A group young to over mature Sycamore, Ash, Hazel, Buddleia, Hawthorn and Alder with sign of Ash dieback in poor to moderate condition.
- 3.27 T15 – Mature single stemmed Sycamore in moderate condition.
- 3.28 T16 – Over mature single stemmed Ash with sign of Ash dieback in poor condition - remove due to condition.
- 3.29 T17 – Mature multi stemmed Ash in moderate condition.
- 3.30 T18 – Mature single stemmed Ash in moderate condition.
- 3.31 T19 & T20 – Semi mature single stemmed Ash with sign of Ash dieback in poor condition - remove due to condition.
- 3.32 T21 & T22 – Dead Single stemmed Willow – remove due to condition.

4. Roots protection area / construction exclusion zones.

4.1 A root protection area is mandatory for any works around areas of retained trees See appendix 2 (RPA Area Chart) for clarification.

5. Tree protection during building works Specification.

Contractors to undertake works in strict accordance with BS 5837: 2012:

5.1. Where building works are proposed on a site where trees are to be retained, access facilitation pruning should be undertaken as necessary to prevent injurious contact between demolition plant and the tree(s). In some cases, working space may be provided by temporarily tying back tree branches. Pruning or tying should be undertaken in accordance with a specification prepared by an arboriculturist.

5.2. When building works a structure (including underground structures) within what would otherwise be the RPA, barriers should be erected, and ground protection installed (see 6.2.3 of BS 5837:2012), to protect the underlying soil to the edge of the existing structure.

5.3. All plant and vehicles engaged in building works should either operate outside the RPA or run on the ground protection (see 6.2.3 of BS 837:2012). Where such ground protection is required, it should be installed prior to commencement of operations.

5.4. The advice of an arboriculturist should be sought where underground structures present within the RPA are, or will become, redundant. In general, it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.

5.5. Where an existing hard surface is scheduled for removal, care should be taken not to disturb tree roots that might be present beneath it. Hand-held tools or appropriate machinery should be used (under arboricultural supervision) to remove the existing surface, working backwards over the area, so that the machine is not moving over the exposed ground (see 7.2.2 of BS 5837:2012 for protection of exposed roots). If a new hard surface is to be laid, it might be

Barriers and ground protection

General

5.6. All trees that are being retained on site should be protected by barriers and/or ground protection (see 5.5 of BS 5837:2012) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed (see 6.2.3 of BS 5837:2012).

5.7. Areas of retained structural planting, or designated for new structural planting, should be similarly protected, based on the extent of the soft landscaping shown on the approved drawings.

5.8. The protected area should be regarded as sacrosanct, and, once installed, barriers and ground protection should not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the local planning authority.

5.9. Where required, pre-development tree work may be undertaken before the installation of tree protection measures, with the agreement of the project arboriculturist or local planning authority if appropriate (see also 8.8.1 of BS 5837:2012).

5.10. It should be confirmed by the project arboriculturist that the barriers and ground protection have been correctly set out on site, prior to the commencement of any other operations.

Barriers

5.11. Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

5.12. The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

5.13. Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins. Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray. Please see 6.2 Appendix 2 – Protective Barriers

Ground Protection

5.14 The ground protection on construction sites to protect the ground from erosion and damage by construction vehicles in root protection areas. Ground protection are usually installed as a roadway consisting of a parallel track of 2.4m x 1.2m panels with a 1.2m space in between. Where a temporary roadway must pass near to trees, the following extra precautions must be taken in order to provide cushioning for the ground under the tree canopy:

1. Edge rails of 200 x 50mm sawn timber should be installed where the trackway will pass under the tree canopy. These should be staked on either side of the trackway using 50 x 50x 500mm timber stakes at 1.5m spacing.
2. A layer of geotextile membrane should be laid to cover at least the area under the tree canopy, and preferably under the whole of the trackway.
3. A pad of ground guards, three boards wide should be laid on top of the geotextile membrane, between the timber rails.
4. A 150mm deep layer of wood chippings should be laid.
5. The twin trackway can then be laid so that it rises over the wood chippings as it passes under the tree canopy. Extra ground guard boards should be installed in the gap between the twin trackway at this point to retain the wood chips in place.

Please see 6.3 Appendix 3 – Ground Protective Barriers Guards

Avoiding physical damage to the roots during construction

5.15. Air pressured root pruning to take place minimize and avoid physical damage to tree roots, existing ground levels should be retained within the RPA. Intrusion into soil within the RPA is generally not acceptable, and topsoil within it should be retained in situ. However, limited manual excavation within the RPA might be acceptable, subject to justification. Such excavation should be undertaken carefully, using hand-held tools and preferably by compressed air soil displacement.

5.16. Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

5.17. Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps. Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist, as such roots might be essential to the tree's health and stability.

5.18. Prior to backfilling, retained roots should be surrounded with topsoil or uncompact sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.

Disease

Ash Die Back

5.19. Ash Die Back - Ash dieback affects ash trees (*Fraxinus excelsior*) and is caused by the fungus *Hymenoscyphus fraxineus*. It blocks the water transport systems in trees causing leaf loss, lesions in the wood and on the bark and ultimately the dieback of the crown of the tree. Young trees are particularly vulnerable and die quickly once they succumb. Older trees can be slowly killed by a yearly cycle of infection. The spread of the disease in the UK is most likely to be as a result of the planting of infected nursery stock and wood but windborne distribution of the fungal spores also occurs. The disease is spread by spores from the fruiting bodies of the fungus produced on fallen ash leaves. These airborne spores can disperse naturally via wind over tens of kilometers. Evidence suggests young trees are killed quickly while many mature ash trees can resist infection for some time until eventually dying or becoming weakened and succumbing to attack from another pest or pathogen.

Ways to reduce Ash Die Back.

- Monitoring of the Ash trees to safeguard the resistance trees (2-3% resistance trees protected in the UK)
- Clean and disinfect tools, equipment, work boots and vehicle tyres before visiting another site. Make sure that ash wood is free of soil and leaf material before being transported. Where practical collect up and burn or compost fallen ash leaves on site. This will help to disrupt the life cycle of the pathogen. (Between June and October, the black toughened rachises (leaf stalks) can be found in amongst the leaf litter. You may also see the tiny white trumpet shaped fruiting bodies that have emerged from the stalk)
- Replanting of woodland with a mix of 45 native broadleaf trees including some following species: Oak, Hornbeam, Silver birch, wild cherry, Beech, Field Maple.

Elm disease

5.20 Symptoms first appear in early summer, clusters of leaves turn yellow and wilt, leaves then turn brown and fall. Affected shoots die back from the tip twigs sometimes turn down to form 'shepherd's crooks' twigs have dark streaks in the outer wood beneath the bark, or spots or rings in cross section. The beetles that spread Dutch elm disease have distinct feeding preferences for certain species of elm, so even susceptible elms can sometimes escape the disease if they are not attractive to the beetles.

Ways to reduce Elm disease.

- Replanting of woodland with a mix of 45 native broadleaf trees including some following species: Oak, Hornbeam, Silver birch, wild cherry, Beech, Field Maple.
- Clean and disinfect tools, equipment, work boots and vehicle tyres before visiting another site. Make sure that ash wood is free of soil and leaf material before being transported. Where practical collect up and burn or compost fallen ash leaves on site. This will help to disrupt the life cycle of the pathogen.

6.1 Appendix 1 – Tree Survey

ID/ Group	Species	Height Approx. in meter	Stem Diam. (D B H)	PC	Branch & Canopy Clearance	Life Stage	General Observation and Comments	RPA m ²	IVY covered %	Cat. Grade
G01	Cypress	12	675	Mod	0.25m	M	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure. Heavy Ivy covered.</p> <p>Stems / trunks: A group of Multi stemmed Cypress tree with no apparent signs of decaying, fractures or fungal faults which will fail the trees structure. Stem has grown next to a wall and pond.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	206	2%	C
G02	Hawthorn Elm Ash Yew English Oak	4-20	10-300cm	Poor - Mod	0.25 - 8m	Y-OM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure on most of the woodland tree. Within copse has a number of trees with heave. Heavy Ivy covered.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure on most of the woodland trees. Within group there is signs of Dutch Elms disease and Ash Die back.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Crown suppressed by others.</p>	707	50-80%	C
T1	Elm x3	12	25-100	Dead	6m	Dead	<p>Roots: Signs of soil disturbance and heave. Heavy Ivy covered.</p> <p>Stems / trunks: A Multi stemmed dead standing tree and has numerous signs of decaying</p> <p>Crowns: Dead – likely cause is Dutch Elm disease.</p>	452	50%	U
T2	Ash	20	250cm	Poor	10m	OM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure. Heavy Ivy covered.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure on most of the woodland trees.</p> <p>Crowns: Shows large amount of dieback and deadwood, decay and branches crossing with wounds.</p>	707	40%	C
T3	Ash	16	100cm	Dead	16m	Dead	<p>Roots: Signs of soil disturbance and heave. Heavy Ivy covered.</p> <p>Stems / trunks: A single stemmed dead standing tree and has numerous signs of decaying with hung up branches</p> <p>Crowns: Dead – likely cause is Ash dieback.</p>	452	45%	Dead
T4	Ash	25	125cm	Poor	2.2m	OM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure.</p> <p>Stems / trunk: Multi stemmed with large cavity in 2 x stems at height of 1m width 1m. Tree is weighted with a 25%lean.</p> <p>Crowns: Shows large amount of deadwood, decay and branches crossing with wounds. Signs of Ash dieback within the crown.</p>	573	50%	C

T5	Elm x10	15	35 – 75cm	Dead	14m	Dead	<p>Roots: Signs of soil disturbance and heave. Heavy Ivy covered.</p> <p>Stems / trunks: A Multi stemmed dead standing tree and has numerous signs of decaying</p> <p>Crowns: Dead – likely cause is Dutch Elm disease.</p>	3	90%	Dead
G3	Cypress x 4	25-30	175cm	Mod	2m	M	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Crown has been raised. Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	707	2%	C
T6	Field Maple	25	2250cm	Mod – Good	1.5m	OM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure. Ivy covered roots.</p> <p>Stems / trunk: Multi stemmed, with fence / gate growing through main stem. No apparent signs of fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Crown is suppressed by other trees. Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. With birds nesting in crown.</p>	707	35%	B
T7 & T8	Ash	25	1250cm	Poor	2m	OM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure. Ivy covered.</p> <p>Stems / trunk: Both single stemmed, with large signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows larger than average amount of deadwood, decay and branches crossing with wounds. Signs of Ash dieback</p>	707	40%	U
G4	Hazel, Cherry & Apple	10	20 – 30cm	Mod	0.5m	M	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	48	40%	C
G5	Goat Willow, Ash, Buddleia, Birch Elm	2-6	5-15cm	Poor	0.5 – 2m	Y	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure but poorly formed and majority self-seeded scrub trees with no significant value. Dotted around industrial estate majority covered in bramble.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Some signs of Dutch Elm and Ash dieback</p>	10	20%	U

G6	Cypress x3	20-25	100cm	Mod	1m	M	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure. River bank grown trees.</p> <p>Stems / trunk: Multi stemmed, No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Nesting birds in upper crown and crown raised off unit. Note: Jappanese knotweed present.</p>	452	10%	C
G7	Ash, Elm, Field Maple, Buddleia, Sycamore, Cypress	2-10	5-45cm	Poor	0-4m	U-SM	<p>Roots: No apparent signs of soil disturbance, heave or subsidence and no apparent signs of decaying or fungal faults in root structure. Heavily Ivy & bramble covered.</p> <p>Stems / trunk: No apparent signs of decaying, fractures or fungal faults which will fail the trees structure. River bank grown with stems tapering out, most are multi stemmed.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Dutch Elm disease and Ash dieback</p>	92	40-60%	U
G8	Cypress	15-20	100cm	Poor	15m -2m 2 sided	M	<p>Roots: Banked soil around stems & signs of vehicle damage to roots.</p> <p>Stems / trunk: Vehicle damage to stems</p> <p>Crowns: Crown has been bare faced up back to stem up to 15m leaving crown unbalanced. Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Min powerlines through the group of trees</p>	452	5%	C
G9	Goat Willow, Buddleia, Ash, Sycamore and Elm	2-10	5-45cm	Poor	0-3m	Y-SM	<p>Roots: Heavily covered ivy and bramble roots.</p> <p>Stems / trunk: Heavily covered ivy and bramble stems.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Ash dieback and Dutch Elm Disease. Note: Japanese Knotweed present</p>	92	60%	U
T9	Elm	14	73cm	Dead	4m	Dead	<p>Roots: Heavy Ivy covered.</p> <p>Stems / trunks: A single stemmed dead standing tree and has numerous signs of decaying & heavily Ivy covered</p> <p>Crowns: Dead – likely cause is Dutch Elm disease.</p>	238	0%	Dead
T10	Ash	25	120cm	Mod	10m	OM	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure.</p> <p>Stems / trunk: Single stemmed, No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Crown has nesting birds.</p>	652	6%	C
T11	Field Maple	13	90cm	Good	2m	M	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure.</p> <p>Stems / trunk: Multi stemmed, No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	366	30%	B

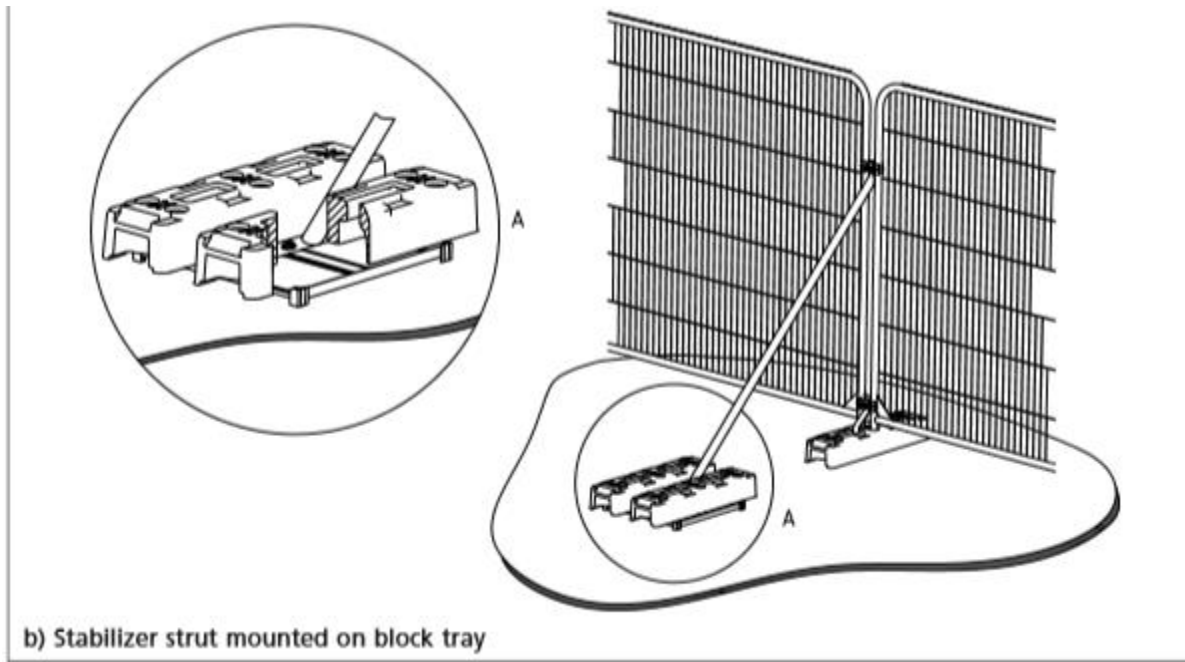
T12	Ash	15	76cm	Poor	10	OM	Roots: Heavily covered ivy and bramble roots. Stems / trunk: Heavily covered ivy and bramble stems. Crowns: Larger than average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Ash dieback	272	95%	C
T13	Ash	12	120cm	Dead	6	Dead	Roots: Signs of soil disturbance and heave. Heavy Ivy covered. Stems / trunks: Twinned stemmed dead standing tree and has numerous signs of decaying with hung up branches Crowns: Dead – No approx. cause	652	2%	Dead
G10	Sycamore, Hazel, Buddleia, Hawthorn, Elm, Ash	6-20	5-120cm	Poor – Mod	0-6	Y-M	Roots: Heavily covered ivy and bramble roots. Stems / trunk: Heavily covered ivy and bramble stems. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Ash dieback and Dutch Elm Disease.	652	50%	C
G11	Willow, Elm, Sycamore, Goat willow, Hawthorn, Buddleia, Ash	6-20	5-120cm	Poor – Mod	0-6	Y-OM	Roots: Heavily covered ivy and bramble roots. Stems / trunk: Heavily covered ivy and bramble stems. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Ash dieback and Dutch Elm Disease. Note: Powerlines running through	652	50%	C
T14	Ash	25	150cm	Mod	4	OM	Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure. Stems / trunk: Twinned stemmed, No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Crown has nesting birds. Some signs of dieback	707	40%	C
G12	Ash	10-20	100-250cm	Mod	2	SM	Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure. Stems / trunk: No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.	707	40%	C
G13	Sycamore, Ash, Hazel, Buddleia, Hawthorn, Alder	6-20	10-250cm	Mod-Poor	0.5 – 6	Y-OM	Roots: Heavily covered ivy and bramble roots. Stems / trunk: Heavily covered ivy and bramble stems. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size. Signs of Ash dieback. Some trees are growing close to a wall tapering over a road and close to streetlights Note: Powerlines running through	707	4%	C
T15	Sycamore	25	250cm	Mod	5	M	Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure. Stems / trunk: No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure. Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.	707	95%	C

T16	Ash	20	Unable	Poor	2	OM	<p>Roots: Heavily covered ivy and bramble roots.</p> <p>Stems / trunk: Heavily covered in climber and bramble stems.</p> <p>Crowns: Shows several snapped out limbs, decay and branches crossing with wounds. Signs of Ash dieback</p>	707	95& Climber	U
T17	Ash	20	250cm	Mod	4	M	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure.</p> <p>Stems / trunk: Multi stemmed, No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure apart from a vehicle strike on stem closest to road.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	707	50%	C
T18	Ash	17	250cm	Mod	5	M	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure.</p> <p>Stems / trunk: No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows average amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size.</p>	707	50%	C
T19 &20	Ash	20	250cm	Poor	3	SM	<p>Roots: Roots are ivy covered and unable to identify any decaying or fungal faults in root structure.</p> <p>Stems / trunk: No Apparent signs of decaying, fractures or fungal faults which will fail the trees structure.</p> <p>Crowns: Shows large amount of deadwood, decay and branches crossing with wounds. All is average for a tree of its age and size has signs of ash dieback. Covered in climber</p>	707	50 – 70%	C
T21 – 22	Willow	10 – 15	200cm	Dead	3	Dead	<p>Roots: Signs of soil disturbance and heave. Heavy Ivy covered.</p> <p>Stems / trunks: Single stemmed dead standing tree and has numerous signs of decaying with hung up branches</p> <p>Crowns: Dead – No approx. cause</p>	707	95%	Dead

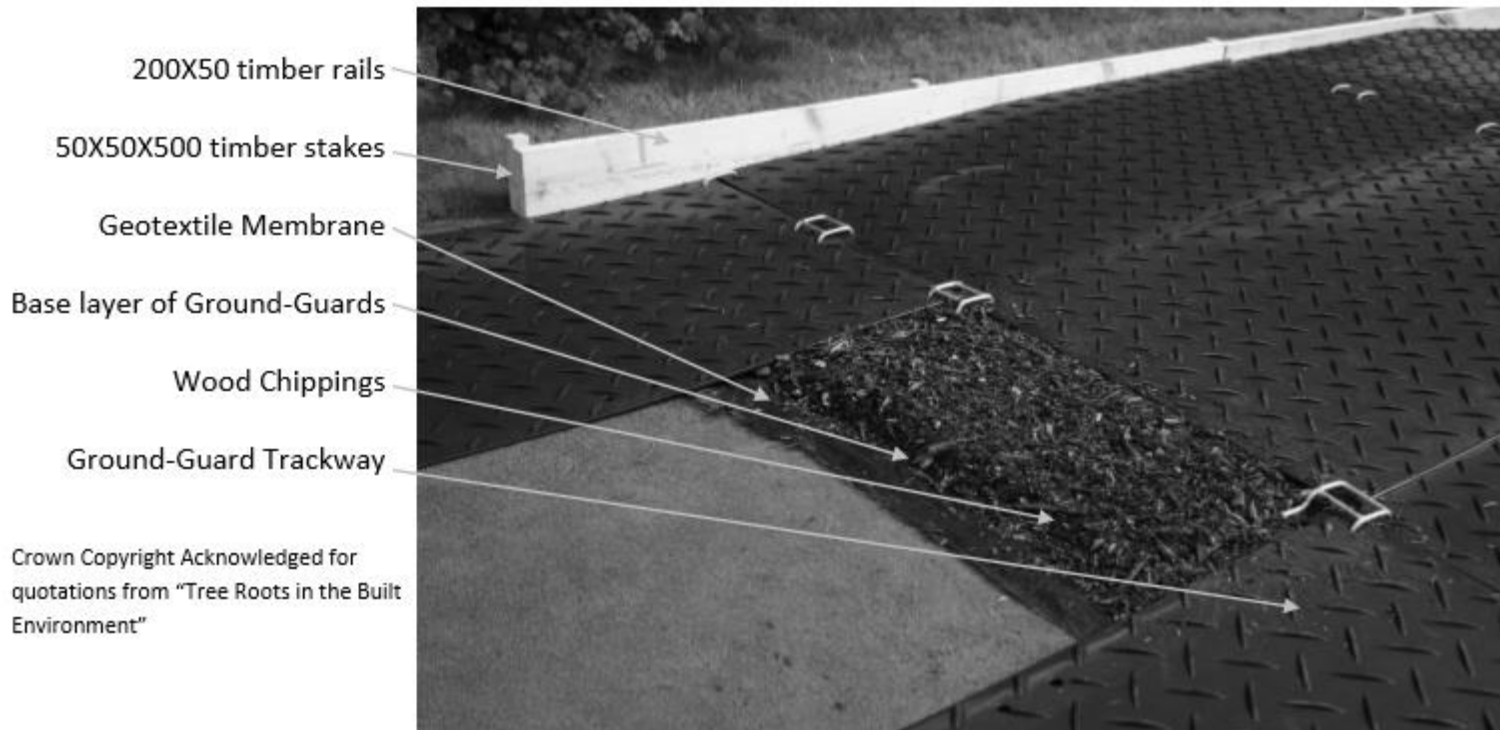
Key - Headings and Abbreviations: No.

COMMON NAME HEIGHT: IN METERS, TO NEAREST HALF METER – WHERE POSSIBLE APPROXIMATELY 80% ARE MEASURED USING AN ELECTRONIC CLINOMETER AND THE REMAINDER ESTIMATED AGAINST THE MEASURED TREES. IN THE CASE OF GROUPS AND WOODLANDS THE MEASUREMENT LISTED IS THAT OF THE HIGHEST TREE STEM DIAM.: STEM DIAMETER IN MILLIMETERS, TO NEAREST 10MM - MEASURED AND CALCULATED AS PER ANNEX C OF BS5837:2012. MS = MULTI-STEMMED, TS = TWIN-STEMMED BRANCH SPREAD: CROWN RADIUS MEASURED (OR ESTIMATED WHERE CONSIDERED APPROPRIATE) FROM THE FOUR CARDINAL POINTS (NORTH, EAST, SOUTH AND WEST) TO GIVE AN ACCURATE VISUAL REPRESENTATION OF THE CROWN BRANCH & CANOPY CLEARANCES: EXISTING HEIGHT ABOVE GROUND LEVEL, IN METERS, OF FIRST SIGNIFICANT BRANCH AND DIRECTION OF GROWTH (E.G. 2.5-N) AND OF CANOPY AT LOWEST POINT – TO INFORM ON CROWN TO HEIGHT RATIO, POTENTIAL FOR SHADING, ETC. LIFE STAGE: ESTIMATED AGE CLASS - Y = YOUNG, SM = SEMI-MATURE, EM = EARLY-MATURE, M = MATURE, PM = POST-MATURE PC: PHYSIOLOGICAL CONDITION - A MEASURE OF THE TREE'(S)' OVERALL VITALITY, I.E. D = DEAD, MD = MORIBUND, P = POOR, M = MODERATE, G = GOOD GENERAL OBSERVATIONS AND COMMENTS: COMMENTS RELATING TO THE TREE'(S)' OVERALL CONDITION AND ANY OTHER PERTINENT FACTORS INCLUDING STRUCTURAL DEFECTS, CURRENT AND POTENTIAL DIRECT STRUCTURAL DAMAGE, PHYSIOLOGICAL DECLINE, POOR FORM, ETC. MANAGEMENT RECOMMENDATIONS: EITHER PRELIMINARY OR IN CONSIDERATION OF THE PROPOSAL - IN THE CASE OF ARBORICULTURAL CONSTRAINTS SURVEYS THE RECOMMENDED MANAGEMENT WORKS ONLY TAKE EXISTING SITE AND TREE CIRCUMSTANCES AND CONDITIONS INTO ACCOUNT AND NOT PROPOSED DEVELOPMENTS. ARBORICULTURAL IMPACT ASSESSMENT AND METHOD STATEMENT RELATED SURVEYS TAKE THE PROPOSED DEVELOPMENT INTO CONSIDERATION WITH RECOMMENDATIONS MADE ACCORDINGLY. MORE THAN ONE OPTION MAY BE GIVEN IF CONSIDERED APPROPRIATE ERC: ESTIMATED REMAINING CONTRIBUTION - IN YEARS AS PER BS5837:2012 (I.E. <10, 10+, 20+, 40+) CAT. GRADE: CATEGORY GRADING - TREE RETENTION VALUE LISTED AS U, A, B OR C - IN ACCORDANCE WITH BS5837:2012 TABLE 1 RPA M²: ROOT PROTECTION AREA IN M² - CALCULATED AREA AROUND THE TREE THAT MUST BE APPROPRIATELY PROTECTED THROUGHOUT THE DEVELOPMENT PROCESS IN ORDER AVOID ROOT DAMAGE RPA RADIUS (M): ROOT PROTECTION AREA RADIUS - IN METERS MEASURED FROM THE CENTER OF THE STEM TO THE LINE OF TREE PROTECTION # (ESTIMATED DIMENSIONS): WHERE TREES ARE LOCATED OFF-SITE, OR ARE INACCESSIBLE FOR ANY OTHER REASON, AND ACCURATE MEASUREMENTS OR OTHER INFORMATION CANNOT BE TAKEN THEN THE INFORMATION PROVIDED IS ESTIMATED AND IS DULY SUFFIXED WITH A “#” SYMBOL

6.2 Appendix 2 – Protective Barriers



6.3 Appendix 3 – Ground Protective Barriers Guards



6.4 Appendix 4 – BS 5837:2012 Root Protection area table

BS 5837:2012

BRITISH STANDARD

Annex D (normative) **Root protection area**

The RPAs given in Table D.1 should be used for single stem trees and the equivalent resultant combined stem diameter for multi-stemmed trees.

Table D.1 **Root protection areas**

Single stem diameter mm	Radius of nominal circle m	RPA m ²	Single stem diameter mm	Radius of nominal circle m	RPA m ²
75	0.90	3	675	8.10	206
100	1.20	5	700	8.40	222
125	1.50	7	725	8.70	238
150	1.80	10	750	9.00	255
175	2.10	14	775	9.30	272
200	2.40	18	800	9.60	290
225	2.70	23	825	9.90	308
250	3.00	28	850	10.20	327
275	3.30	34	875	10.50	346
300	3.60	41	900	10.80	366
325	3.90	48	925	11.10	387
350	4.20	55	950	11.40	408
375	4.50	64	975	11.70	430
400	4.80	72	1 000	12.00	452
425	5.10	81	1 025	12.30	475
450	5.40	92	1 050	12.60	499
475	5.70	102	1 075	12.90	519
500	6.00	113	1 100	13.20	547
525	6.30	124	1 125	13.50	573
550	6.60	137	1 150	13.80	598
575	6.90	150	1 175	14.10	625
600	7.20	163	1 200	14.40	652
625	7.50	177	1 225	14.70	679
650	7.80	191	1 250+	15.00	707

NOTE These figures are derived from the calculations described in 4.6.

6.5 Appendix 5 – Site Plan

