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Our Ref:19.08.CH.02

Ref:

Date: 13th. February 2020

Project Title: AIRTON ROAD SHD Stage 3

Report Title: Arboricultural Impact Assessment and Tree Root Protection Plan

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13th. February 2020

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1. Introduction

1.1 TREE MANAGEMENT SERVICES have been commissioned by McGill Planning Limited, Chartered Town Planners, 45 Herbert Street, Dublin 2 to prepare this Arboricultural Impact Assessment and Tree Root Protection Plan for a proposed Residential Development at Airton Road, Tallaght, Dublin 24. This report details the arboricultural implications of the proposed development on the existing tree population on the site.

1.2 The proposed development is the development as described in the planning report.

1.3 A Tree Survey was carried out on 30th. May 2019 as a visual ground assessment by a qualified and certified arborist. The survey was carried out to the ISA's *Best Management Practices –Level 2 Assessment* and the *BS 5837:2012 Trees in relation to Design, Demolition and Construction – Recommendations.* The Tree Survey recorded information about the trees on the site, and trees were assessed objectively and without reference to site layout proposals.

1.4 Trees were plotted on a topographical survey drawing and a Tree Survey drawing Ref: 19.05.14.01A was prepared.

1.5 This Arboricultural Impact Assessment Report should be read in conjunction with the Tree Survey Report Ref 19.05.14.01A and the attached Tree Root Protection Plan Ref: 27.01.15.01A.

2 The Site and surrounding environment.

2.1 The site is located at the junction of Airton Road and Greenhills Road, Tallaght, Dublin 24.

2.2 The site is enclosed by perimeter fencing along the northern, western and southern boundaries, and by a variation of fencing, walls and hedgerow along the eastern boundary. The site, with industrial buildings, access roads and car parking is currently disused and derelict.

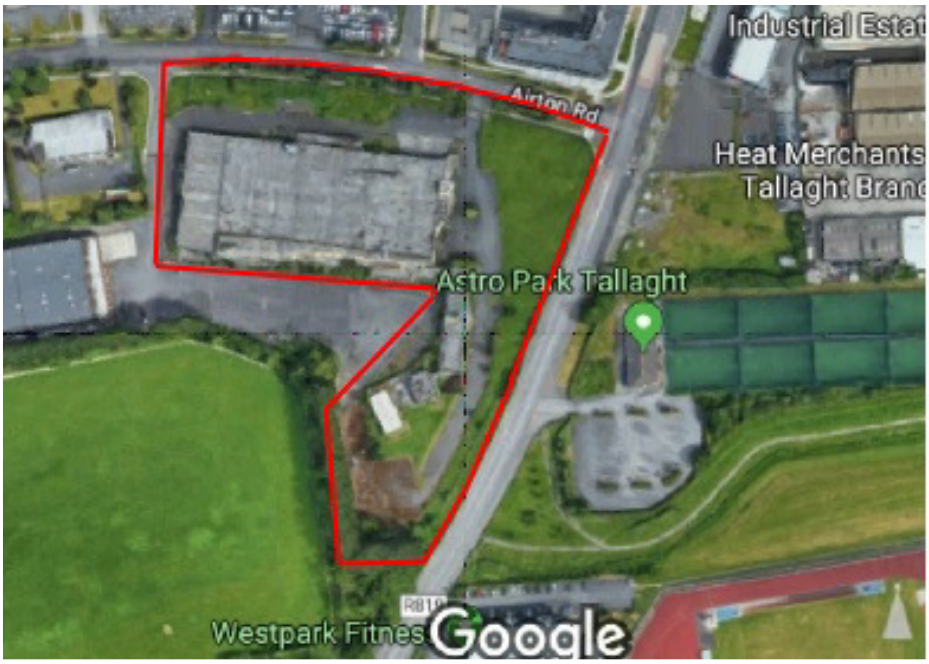


Photo 1: The Site at Airton Road, Tallaght, Dublin 24 © Google Maps.

3. Statutory Legislation.

3.1 The Forestry Act 2014 and accompanying Forestry Regulations 2017 sets out the legislation governing the felling of trees, the licenses required and offences and penalties for breaches of the legislation. It is important to note that certain tree felling activities are exempted from the need to obtain a felling license. Trees on this site may be defined as:-

3.1.2 Under clause 2.3 of the document entitled Felling and Reforestation Policy dated May 2017, these are trees defined as:-

'A tree in an urban area. (An urban area is an area that comprised a city, town or borough specified in Part 2 of Schedule 5 of the Local Government Act 2001, before the enactment of the Local Government Reform Act 2014.

3.2 There are also scenarios where a felling license is not required including:'*A tree outside a forest, the removal of which is specified in a grant of planning permission'*

3.3 In relation to the felling of trees, refer to the Felling and Reforestation Policy document dated May 2017 issued by the Department of Agriculture, Food and The Marine dated May 2017.

4. Details of existing Tree Population:

4.1 A total of 72nr. trees, including a row of 45nr. poplar trees (tag nos. 861-888) and 1nr. Hedgerow (H1) were surveyed within the boundaries of the site. In addition, a further 19nr. trees (Ref. letters A-S) were surveyed on Dublin City Council lands within influencing distance of the development outside the northern boundary of the site adjoining Airton Road. Refer to Appendix 1 - Arboricultural Data Sheets from the Tree Survey Report dated 30th. May 2019.

4.2 The trees surveyed are either indigenous (native) or non-native species and vary in age from young (15 years) to mature (>50 years).

4.3 The trees growing within the site boundaries are part of the original landscape scheme of the site or have occurred naturally through self-seeding or from root sucker propagation.

4.4 The trees are generally in fair condition and the majority of the trees fall into the low or C retention category and defined in BS5837: 2012 as '*Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm'.* Some trees, particularly the row of dominant Poplar trees along the southern boundary are displaying symptoms of poor formation and development as a result of overcrowding and close plant spacing. Poplar roots have encroached into the site. This has caused suckering to occur, where roots have come into contact with the surface of the ground, causing new shoots to emerge. This is a natural method of propagation commonly associated with the species.

4.5 The row of Poplar trees growing along the southern boundary are generally in fair condition. The trees have grown without management intervention and no tree treatment works has been carried out in the past. The trees were planted at close spacing (1-2m.) along the edge of a small watercourse. As a result, crowns are suppressed or malformed as trees struggle and compete for better growing conditions. Limbs from the trees overhang the site to the north (up to 4m.). Pruning back of overhanging limbs will be required before any demolition or construction works commence.

4.6 Poplar trees require abundant moisture and strong invading roots will travel long distance in search of favourable conditions. Height growth can often outstrip anchoring capacity causing mechanical structural weaknesses to occur. Trees can be prone to stem breakage or uprooting particularly during times of high winds. Twig abscission can be heavy and could become problematic in built up urban areas. Roots are known to cause direct damage to buildings, structures, roads, underground tanks, pavement and underground services.

4.7 Poplar roots will require management and control in consideration of the development proposals for the site. Prevention of root encroachment will be necessary and existing roots will need to be pruned back without destabilizing the trees. A root barrier membrane to curtail roots will be required where direct or indirect damage is a potential problem to buildings, roads, tanks, underground services and other structures. Root barriers, once installed will deflect roots and prevent encroachment and possible damage. To be effective, a root barrier should extend below the likely rooting depth and protrude above ground level, to prevent roots from growing over the top.

4.8 The Poplar tree suckers growing within the site are the least desirable to retain and removal is recommended.

4.9 The row of mature Poplar trees are for short-term retention only, and will be removed once new planting is established.

4.10 The whitebeam, cherry, ash and birch trees are young to middle-aged and generally in fair to good condition. The whitebeam and cherry trees are planted in shrub beds as part of the original landscape scheme of the site. These trees are growing in restricted ground conditions and great care should be taken during demolition works to avoid damage to root structures, when removing hard surfaces. There are signs of overcrowding and suppression in the *Prunus spp.* (Plum) and *Sorbus spp*. (Whitebeam) where trees have been planted in mixtures in enclosed old shrub beds. Ivy growth has restricted good development of the Myrobalan Plum species.

4.11 The mature weeping willow (tree no. 872) close to the southern boundary, is an important 'A' category tree, and could be incorporated into the new public space within the proposed development. Protection of the tree is important during demolition and construction works and damage to roots should be avoided.

4.12 Trees for retention shall be reassessed during and upon completion of the demolition and construction phases and may require remedial works to improve form and reduce risk. Trees found to be a hazard because of reduced structural stability, malformed root structures, or increased exposure after site clearing, should be removed. Finished ground levels will have a major bearing on the retention of trees.

4.13 The row of trees(19nr.) growing on Dublin City Council property outside the northern boundary comprising of Maple, Whitebeam and Sycamore are generally in good condition. The majority of trees are categorized as Category 'A' trees, defined as '*Trees of high quality with an estimated remaining life expectancy of at least 40 years*'. A number of trees (8nr) are proposed for removal to facilitate a layby, a road and pedestrian entrance, provision for a Fire Tender and to improve sightlines.

4.14 BS 5837: 2012 determines that trees should be categorized using the criteria shown in Table 1.

Retention Category	Description	Number of trees	Number of Hedgerows
Category A	Trees of high quality with an estimated remaining life expectancy of at least 40 years.	6	
Category B	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	12	1
Category C	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	48	
Category U	Those in such condition that they cannot be realistically be retained as living trees in the context of the current land use for longer than 10 years.	6	

Table 1: *BS 5837: 2012 Tree and Hedgerow Categorization*

5. Impact of the Proposed Development:

Table 2 lists the trees x category that are impacted due to the proposed development and those trees that may be retained. Trees in poor condition and require removal for reasons of sound arboricultural management are also listed.

	TREE CATEGORISATION				
Trees within site boundaries	**A**	**B**	**C**	**U**	Totals
Trees proposed for retention.	Tree nos. 861,862,863,872	Tree nos. 864,886	Row of 45nr. poplar trees (tag no. 888).	0	51
Trees proposed for removal to facilitate the development	Tree nos. 865,884	Tree nos. 866,869,870, 871,876,877, 878,882,885, 887 and hedgerow H1	Tree Nos. 867, 873,875	0	15 + H1
Trees to be removed for reasons of sound arboricultural management	0	0	0	Tree nos. 868,874, 879,880, 881,883	6
Trees on Dublin City Council Lands	**A**	**B**	**C**	**U**	**Totals**
Trees proposed for retention.	Tree ref. E,G,H,Q,S	Tree ref. C,O,P,R	Tree ref. F,M	0	11
Trees proposed for removal to facilitate the development	Tree ref. A,B,D,I,L	Tree ref. J,N	Tree ref. K	0	8
Trees to be removed for reasons of sound arboricultural management	0	0	0	0	0

Table 2: Summary of Impact of the Proposed Development on the Tree Population.

5.1 Within the site boundaries, there are 15 no. trees, 1 and one section of hedgerow (H1) proposed for removal to facilitate the proposed development. There are 8nr. trees growing on Dublin City Council lands proposed for removal to facilitate the development.

5.2 It is proposed to retain 51 nr. trees including a row of 45nr. poplar trees along the southern boundary. It is also proposed to retain 11nr. trees growing on Dublin City Council lands immediately outside the northern boundary.

5.3 A total of 6 nr. Poplar trees nos. 868,874,879, 880, 881,883 derived from root suckering shall be removed for reasons of sound arboricultural management.

5.4 The Hedgerow (H1,) along the eastern boundary adjacent to Greenhills Road is proposed for removal.

5.5 The row of 45nr. Poplar trees growing along the southern boundary are in fair condition only and are to be retained in the short-term only until new planting is established. The trees are not directly impacted by the proposed development. These trees shall be removed in time when new tree planting is established.

5.6 Fencing to protect the retained trees shall be erected prior to the commencement of any works. Refer to The Tree Protection Plan drawing Ref. *27.01.15.01A.*

6. Tree Protection measures during the proposed development:

6.1 All trees proposed for retention shall be protected during the demolition and construction phase of the proposed development so as to minimize damage to roots, stems or overhanging limbs. Refer to the attached Tree Root Protection Plan *Ref: 27.01.15.01A*. The guidelines as outlined in BS5837: 2012 shall be implemented in order to minimize or prevent damage to the trees during construction. These guidelines are copyrighted and cannot be reproduced for inclusion in this report. Refer to paragraph 4.6 – Root Protection Area (RPA). Refer also to Table 3: Tree Root Protection Zones - Appendix 2.

6.2 For single stemmed trees, the RPA is calculated as an area equivalent to a circle with a radius 12 times the stem diameter. In general the ability of the trees to tolerate disturbance within the RPA depends on prevailing site conditions and on individual circumstances. It is generally recommended that where demolition and construction occurs within the RPA then precautions should be taken to: -

- Prevent physical damage to roots during demolition and construction
- Make provision for oxygen and water to reach the roots
- Allow for the future growth of the root system
- Preserve the soil structure at a suitable bulk density for root growth and function.

6.3 Retained trees shall be protected by protective barriers during the course of site development works. Protective fencing alignment is shown on the Tree Protection Plan drawing ref: *27.01.15.01A*. Refer also to BS 5837:2012 paragraph 6.2 - Barriers and Ground Protection. Great care shall be exercised during the demolition and construction phases to protect all trees designated for retention. Damage to root or stem structures should be avoided. Vertical barriers will be erected and ground protection installed before any materials or machinery is brought onto the site and before any demolition, development or stripping of soil or hard surfaces commences.

6.4 Tree barriers to protect the trees shall consist of a scaffold framework. The default specification should consist of a scaffold framework, well braced to resist impacts - See Appendix 3. Refer also to BS 5837:2012 – Figure 2 and Figure 3 and clauses 6.2.2.2 and 6.2.2.3. To ensure the protected barriers are recognized and respected, clear signage shall be affixed to the barriers in unrestricted easily viewed locations with words such as 'CONSTRUCTION EXCLUSION ZONE - NO ACCESS'.

6.5 The trees growing on Dublin City Council lands outside the northern boundary shall also be protected during the construction phase. The type and location of fencing to be used shall be supplied and erected in full agreement with Dublin City Council - Roads and Parks Departments.

6.6 All protective barriers shall remain in place until completion of all construction works. Any breech of the barrier shall be reported to the consulting arborist.

6.7 Where movements are to occur within the RPA, then the installation of ground protection measures shall be carried out. New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

6.8 Topsoil or other materials should not be stacked on or close to the main tree trunks.

6.9 Soil compaction shall be avoided. Compaction is a common cause of post-construction tree loss on development sites. The passage of vehicles or the storage of top-soil within root protection zones shall be avoided.

6.10 Storage areas for any containers, toilets, fuels, liquids, gas tanks, shall be located to the outer edge of the Root Protection Areas due to the risk of ground compaction or soil contamination.

6.11 There is a wide overhang from Poplar trees extending into the site along the southern boundary. Damage to overhanging limbs by heavy machinery shall be avoided. A professional Tree Surgery Company shall be engaged where necessary to prune back any overhanging limbs where required and to the required height clearance.

6.11 Refer to other relevant sections of BS 5837:2012 most notably the following:-

- Paragraph 7.3 - Tree Protection during demolition.
- Paragraph 7.4 - Permanent hard surfacing within the RPA.
- Paragraph 7.5 - Special engineering for foundations within the RPA.
- Paragraph 7.7 - Underground and above ground utility apparatus.

7. Proposed Tree Works:

7.1 Any proposed tree work should be carried out to BS 3998:2010 Tree Work - Recommendations.

7.2 Tree works shall only be carried out by a competent, professional and fully insured, trained and certified Tree Surgery firm. During any felling works, care shall be taken to protect surrounding healthy trees, buildings and other structures. Strict safety precautions shall be put in place to safeguard site occupants, visitors and members of the general public. If possible, felling work should not be carried out during the bird-nesting season. While tree felling and removal works are being carried out, appropriate measures should be put in place to prevent access from unauthorized persons to the work sites.

8. Summary:

8.1 A total of 72 nr. trees, and one section of hedgerow were identified and surveyed within the site boundaries.

8.2 A total of 19nr. trees within influencing distance of the site, were identified and surveyed growing on Dublin City Council lands outside the northern boundary of the site.

8.3 There are fifty-one trees proposed for retention within the site. The most significant trees to be retained include the row of 45nr. Poplar trees along the southern boundary. The mechanical characteristics of the species indicate the wood is of low density, and trees can reach great height at maturity. Trees when exposed to strong winds, have a tendency to suffer from limb or main trunk failure. Topping of the species is not recommended as excessive pruning can lead to excessively long and weak regrowth. These dominant trees planted at close spacing are suitable for short-term retention only until new planting is established. Invading roots from the Poplar trees will require management and control to prevent encroachment into the proposed development

8.4 Tree No. 872 - a mature Weeping willow is the most significant tree growing within the site boundaries. It is proposed to retain this tree and incorporate within the public open space within the proposed development. Great care should be taken during the demolition and construction phases to avoid damage to the root structures.

8.5 There are six trees proposed for retention that are growing within the site boundaries. These comprise of *Sorbus spp*. (Whitebeam), *Prunus spp.* (Plum), *Acer spp.* (Maple) and two young self-seeded *Fraxinus spp.* (Ash) trees. Given the extent of demolition and construction works required for the proposed new development, changes to ground levels and other site factors, it may be difficult to retain these trees in their present location. The trees are not suitable for transplanting. The trees shall be monitored and assessed during any ongoing demolition and construction phases, to determine their suitability for permanent retention within the proposed new development.

8.6 A total of fifteen trees are proposed for removal to facilitate the development. These include *Prunus spp.* (Plum and Cherry), *Betula spp.* (Birch), *Fraxinus spp.* (Ash) *Populus spp.* (Poplar) and suckers and clumps of *Populus spp*. (Poplar) The hedgerow (H1) along the eastern boundary shall also be removed.

8.7 There are eleven trees growing on Dublin City Council lands outside the northern boundary of the site proposed for retention and eight trees proposed for removal to facilitate a layby, a road and pedestrian entrance, provision for a Fire Tender and to improve sightlines.

Appendix 1:

ARBORICULTURAL TREE SURVEY DATA SHEETS

Tree No.	Species Common Name	Ht. Ms. m.	Stem Diameter cms	Branch Spread m.	Age Y - Young M - Middle-aged MA - Mature OM - Over-mature V - Veteran	Physiological Condition	General Observations	Preliminary Management Recommendations	Estimated remaining contribution in years	Retention Category A- High B- Moderate C- Low U- Fell
861	Whitebeam	7.0	26	2N 1S 2E 0W	MA	Good.	Growing in island shrub bed. Forked at 1.5m. Minor scaring along stems - south side.	NAR	>40	A
862	Whitebeam	7.0	23	2N 1S 0E 2W	MA	Good.	Forked at 1m. Metal object attached in crown.	Remove metal object in crown.	>40	A
863	Whitebeam	9.0	24	2N 0S 1E 2W	MA	Good.	Growing in shrub bed close to building. Suppressed on southern side. Forked at 1.5m.	Lightly prune back limbs on north side to improve balance and shape.	>40	A
864	Norway Maple	8.0	14	1N 0S 1E 1W	M	Fair.	Growing in shrub bed close to building. Suppressed on southern side. Crooked stem.	Lightly prune back limbs on north side to improve balance and shape. Remove dead stems.	>40	B
865	Whitebeam	9.0	27	2N 0S 2E 0W	MA	Good.	Growing in shrub bed close to building. Suppressed on southern side. Forked at 1.5m. Unbalanced crown.	Lightly prune back limbs on north side to improve balance and shape. Sever light ivy growth at base.	>40	A
866	Cherry	7.0	14-Avg.	1N 1S 2E 1W	MA	Fair.	Early signs of decline. Forked from .5m. Lacks vigour.	Remove all minor dead stems.	>40	B
867	Cherry	5.0	30	2N 2S 1E 3W	MA	Poor.	Straight stem to 1.5m. Low leaf area. Epicormic shoot growth on east side.	Remove epicormic shoot growth. Prune to invigorate new growth.	>40	C
868	Poplar X 4 stems	9.0	15,13 7,6	1N 1S 1E 1W	M	Fair.	Derived from sucker growth. Close to kerb. Not for long-term retention.	Fell and treat resultants stumps.	>40	U

869	Myrobalan Plum	9.0	15,10 9	2N 0S 2E 0W	MA	Fair.	Heavy ivy growth attached. Multiple stems. Early signs of decline.	Sever ivy growth and prune to invigorate new growth. Remove any dead stems.	20-40	B
870	Myrobalan Plum	10.0	38	2N 2S 1E 2W	MA	Fair.	Heavy ivy growth attached. Forked from 1m. Multiple stems. Early signs of decline.	Sever ivy growth and prune to invigorate new growth. Remove any dead stems.	20-40	B
871	Weeping birch	3.0	19	0N 1S 4E 0W	MA	Fair.	Slightly suppressed. Unbalanced crown.	Requires pruning to reshape crown. Retain pendulous habit.	20-40	B
872	Weeping willow	10.0	55	4N 1S 0E 4W	MA	Good.	Leaning to west. Dead stems in crown. Heavy ivy growth to tip.	Remove all dead stems. Sever ivy growth at base. Remove broken stems west side.	>40	A
873	Poplar	10.0	22	.5N .5S .5E .5W	M	Good.	Derived from sucker growth. Close to fence. Not for long-term retention. Vigourous growth habit.	Consider removing tree.	>40	C
874	Poplar - Group of stem suckers	7.0-Avg.	12-Avg	-N -S -E -W	Y	Fair.	Group of poplar suckers. Multiple stems. Vigourous growth habit. Potential to cause structural damage to pavement.	Fell and treat resultants stumps.	---	U
875	Birch	11.0	11	1N 0S 1E 1W	M	Good.	Close to building. Not for long-term retention.	NAR. Consider removing tree. Remove minor stem on east side at 1.5m.	>40	C
876	Birch	7.0	8	1N .5S .5E .5W	Y	Good.	Self-seeded tree. Growing close to fence. Straight stem.	NAR	>40	B
877	Birch	5.0	6	.5N .5S .5E 0W	Y	Good.	Self-seeded tree. Growing close to fence.	NAR	>40	B
878	Ash	4.0	7	.5N .5S 1E .5W	Y	Good.	Self-seeded tree. Crooked stem. Growing close to fence.	NAR	>40	B

879	Poplar	7.0	15	1N 1S 1E 1W	M	Good.	Derived from sucker growth and surface roots. Roots causing pavement lift.	Fell and treat resultant stump.	20-40	U
880	Poplar	6.0	13	.5N 1S .5E 1W	M	Good.	Derived from sucker growth and surface roots. Roots causing pavement lift. Vigourous growth habit. Close to fence.	Fell and treat resultant stump.	20-40	U
881	Poplar X 5 stems	7.0	3,4 8,8 11	N S E W	Y	Fair.	Derived from sucker growth and surface roots. Roots causing pavement lift. Close to building.	Fell and treat resultant stump.	20-40	U
882	Magnolia	5.0	12-Avg.	2N 2S 3E 2W	MA	Fair.	Multi-stemmed from base. Dead stems present. Wide-spreading. Minor deadwood in crown.	Clean the crown and prune to encourage new growth.	20-40	B
883	Poplar	8.0	9	0N 0S 0E .5W	Y	Good.	Derived from sucker growth and surface roots. Vigourous growth habit. Close to kerb.	Fell and treat resultant stump. Remove scrub willow.	>40	U
884	Ash	5.0	11	1N 1S 1E 1W	Y	Good.	Close to fence. Self-seeded tree. Could become problematic in time to come.	NAR	>40	A
885	Ash	5.0	9,7	1N 1S 2E 1W	Y	Good.	Close to fence. Self-seeded tree. Cold become problematic in time to come.	Pruning required to improve shape and form.	>40	B
886	Ash	3.0	7	.5N .5S .5E .5W	Y	Good.	Close to fence. Self-seeded tree. Could become problematic in time to come.	Pruning required to improve shape and form.	>40	B
887	Ash	4.0	10	1N 1S 1E 1W	Y	Good.	Close to fence. Self-seeded tree. Could become problematic in time to come.	Pruning required to improve shape and form.	>40	B

888	Poplar - Row of 45 nr.	23.0 - Avg .	50 - Avg.	2-4m. N and W	MA	Fair.	Growing at close planting spacing around south-eastern corner of side. Close to watercourse. Heavy ivy growth attached that limited our assessments. Heavy overhang into site from trees along southern boundary. Deformed crowns as trees compete for light and growing space.	*Determine ownership of trees.* *Refer to paragraph 4.3 above.*	20-40	C
H1	Hedgerow - Hawthorn - Ash - Sycamore - Rosa - Hazel - Blackthorn	1.0	---	1.0 width	MA	Good.	Growing along eastern boundary close to Greenhills Road. Wall on east side. Well stocked. Ash suckers vigourous within hedgerow.	Requires regular trimming to curtail height and lateral spread. Retain at height not greater than 2m.	>40	B
LOCAL AUTHORITY TREES ALONG AIRTON ROAD.										
A	Norway maple	9.0	33	2N 1S 2E 1W	MA	Good.	Growing on grass margin between footpath and road. Straight stem to 2m. Well-balanced crown. Limbs close to street light fixture	Prune limbs away from light fixture.	>40	A
B	Norway maple	10.0	33	2N 1S 1E 2W	MA	Good.	Growing on grass margin between footpath and road. Limbs overhangs bus stop. Forked at 2m.	Clean the crown. Lightly prune back limbs over road.	>40	A
C	Norway maple Crimson king	6.0	13,14	.5N 1S .5E .5W	M	Fair.	Growing on grass margin between footpath and road. Forked at .75m. Crooked stems. Lacks vigour. Scaring at base east side.	NAR	>40	B
D	Norway maple	11.0	20	1N 1S 1E 2W	M	Good.	Growing on grass margin between footpath and road. Forked at 2m.	Clean the crown.	>40	A
E	Norway maple	12.0	32	2N 2S 1E 2W	M	Good.	Growing on grass margin between footpath and road. Straight stem to 2m. Well-balanced crown.	NAR	>40	A

F	Norway maple	11.0	40	2N 0S 2E 2W	MA	Poor.	Growing on grass margin between footpath and road. Heavy scaring along stems to 6. south side.	Remove all dead and weak stems. Reassess regularly. Prune back limbs over road. Consider removing tree.	20-40	C
G	Whitebeam	9.0	41	2N 4S 3E 2W	MA	Good.	Growing on grass margin between footpath and road.	Clean the crown. Lightly prune back limbs over road.	>40	A
H	Norway maple	10.0	40	2N 2S 2E 1W	MA	Good.	Growing on grass margin between footpath and road. Forked at 2m. Crown raised in past.	Clean the crown.	>40	A
I	Norway maple	11.0	41	3N 2S 2E 2W	MA	Good.	Growing on grass margin between footpath and road. Scaring at base. North side. Straight stem to 3m.	Clean the crown.	>40	A
J	Sycamore	12.0	49	2N 3S 2E 3W	M	Fair.	Growing on grass margin between footpath and road. Forked at 2m. Recent excavation on west side. Possible root damage. Open wounds not occluded. Lacks vigour.	Clean the crown.	>40	B
K	Norway maple Crimson king.	6.0	15	1N .5S .5E 1W	M	Poor.	Dead central stem.	Clean the crown. Remove dead central stem.	>40	C
L	Norway maple	12.0	46	4N 3S 3E 3W	MA	Good.	Growing on grass margin between footpath and road. Light ivy growth to 2m. Limbs overhang road.	Clean the crown. Lightly prune back limbs over road.	>40	A
M	Norway maple Crimson king	7.0	18	0N 1S 0E 0W	M	Poor.	Growing on grass margin between footpath and road. Almost dead.	Remove dead central stem. Consider removing tree.	>40	C
N	Sycamore	9.0	39	3N 2S 2E 2W	MA	Fair.	Growing on grass margin between footpath and road. Open wound at 1.5m. west side. Heavy ivy growth to 2m. Forked at 2m. Lacks vigour.	Clean the crown. Sever ivy growth at base.	>40	B

O	Sycamore	9.0	38	3N 3S 3E 2W	MA	Fair.	Growing on grass margin between footpath and road. On right-hand side of entrance to site. Manhole at base south side. Crown raised in past. Close to kerb. Wide-spreading crown. Fused stems.	Clean the crown. Lightly prune back limbs on east side.	>40	B
P	Norway maple	9.0	39	3N 1S 2E 2W	MA	Good.	Growing on grass margin between footpath and road. On left-hand side of entrance to site. Straight stem. Limb overhang road. Open wound at 2m. south side.	Clean the crown. Lightly prune back limbs over road.	>40	B
Q	Norway maple	10.0	28	2N 1S 1E 2W	MA	Good.	Growing on grass margin between footpath and road. Straight stem to 2m. Crown-raised in past. Small wound at 2m.	NAR	>40	A
R	Sycamore	8.0	39	2N 2S 2E 1W	MA	Fair.	Growing on grass margin between footpath and road. Forked at 1m. Wide-spreading crown. Crown raised in past. Lacks vigour.	Clean the crown.	>40	B
S	Norway maple	9.0	43	2N 2S 2E 2W	MA	Good.	Growing on grass margin between footpath and road. Forked at 1m. Wide-spreading. Close to junction and parked cars at traffic lights.	Clean the crown. Lightly prune back limbs over road.	>40	A

Appendix 2

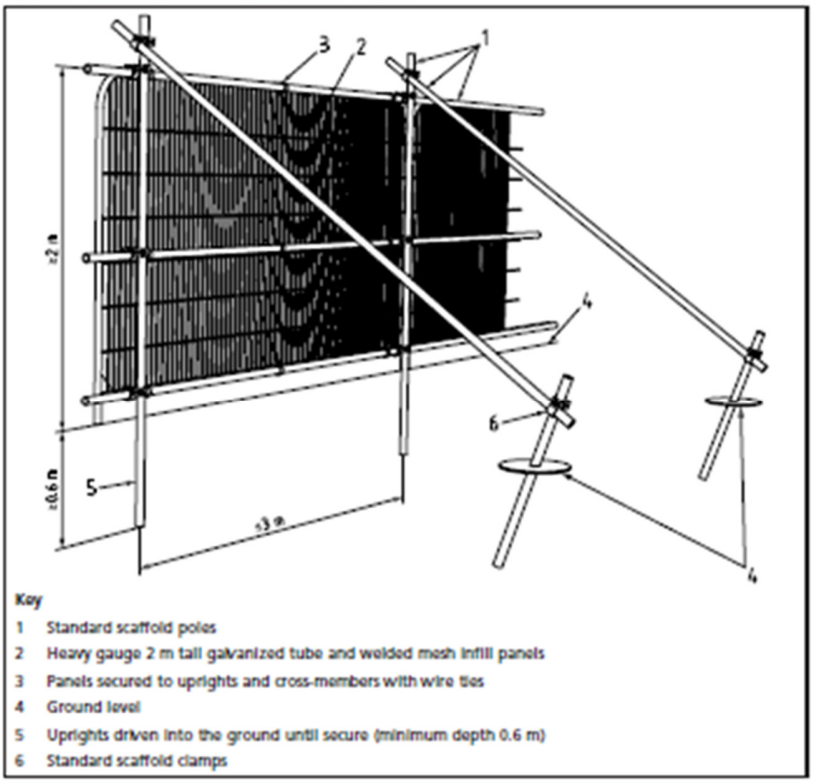
Tree Root Protection Areas (RPA)

Tree No	DBH	RPA(m2)	RPA equiv. to circle with rad.of
861	26	31	3.12
862	23	17	2.30
863	24	26	2.88
864	14	9	1.68
865	27	33	3.24
866	14	9	1.68
867	30	41	3.60
868	34.78505	55	4.17
869	20.14944	13	2.01
870	38	65	4.56
871	19	11	1.90
872	55	137	6.60
873	22	22	2.64
874	12	7	1.44
875	11	5	1.32
876	8	3	0.96
877	6	2	0.72
878	7	2	0.84
879	15	10	1.80
880	13	8	1.56
881	16.55295	12	1.99
882	29.39388	39	3.53
883	9	4	1.08
884	11	4	1.10
885	11.40175	4	1.14
886	7	2	0.84
887	10	5	1.20
888	50	113	6.00
A	33	49	3.96
B	33	49	3.96
C	19.10497	17	2.29
D	20	18	2.40
E	32	46	3.84
F	40	72	4.80
G	41	76	4.92
H	40	72	4.80
I	41	76	4.92
J	49	109	5.88
K	15	10	1.80
L	46	96	5.52
M	18	15	2.16
N	39	69	4.68
O	38	65	4.56
P	39	69	4.68
Q	28	35	3.36
R	39	69	4.68
S	43	84	5.16

Table 3: *Tree Root Protection Zones*

Appendix 3: - *Default specification for protective barrier - Figure 2.*
- *Examples of above-ground stabilizing systems - Figure 3.*

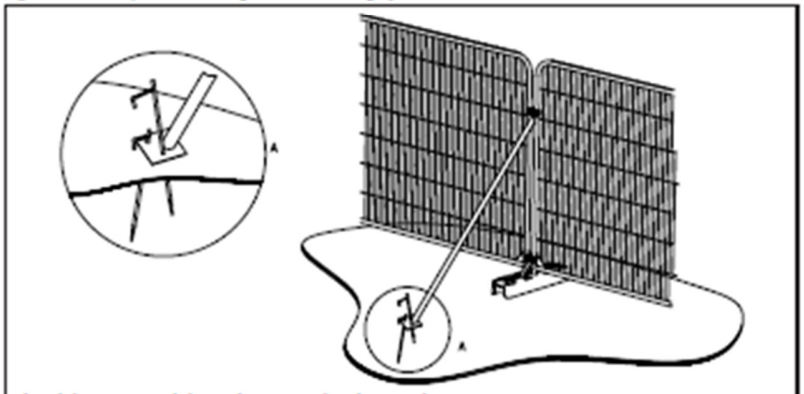
Figure 2 **Default specification for protective barrier**



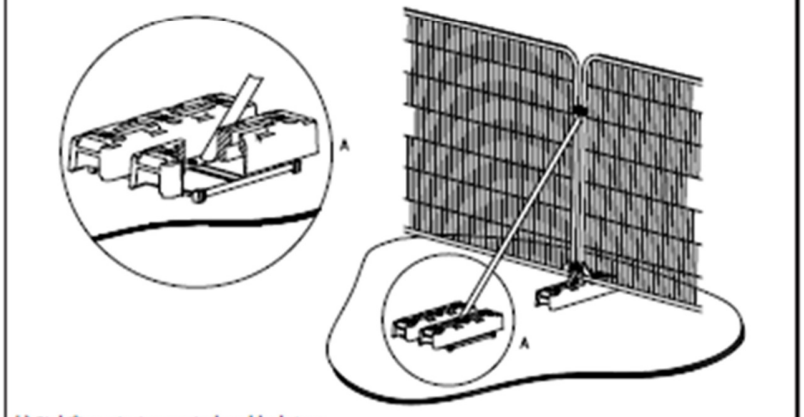
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 3 **Examples of above-ground stabilizing systems**



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Appendix 4: *Tree Root Protection Plan:*