ARBORICULTURAL IMPACT ASSESSMENT
AT CARDIFF PARK AND RIDE EAST, EASTERN AVENUE, PENTWYN

Prepared for Curtis Hall Ltd

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Executive Summary

This assessment outlines the tree constraints that affect the construction of a new data centre and associated ancillary buildings. The project will include a new road bridge over the river and two dormouse bridges. The document demonstrates how the retained trees can be protected throughout the development process.

Approximately 485 trees will need to be removed for development purposes. However, the combination of the proposed new tree planting and the implementation of a 25-year Woodland Management Plan will, over time, provide a clear net gain in terms of tree cover and a significant increase in species diversity.

All the retained trees will be provided with proper protection as set out in BS5837:2012 during the construction phase. Protection measures will include erecting temporary protective fencing, temporary ground protection, and the use of specialist foundations as appropriate.

This assessment forms an important stage in the process of managing and protecting the trees on site in relation to the proposed development. However, it will only ensure the protection of the trees on site if the tree protection measures in the Arboricultural Method Statement are implemented in full and the prescribed system of arboricultural supervision is followed. Tree protection works must be fully integrated into the construction process.

From an Arboricultural standpoint the proposed development will involve the loss of around 8% of the trees on site. However, the combination of the proposed new tree planting and implementation of the 25-year Woodland Management Plan will represent a significant increase in tree cover species diversity in the local area. In total 8508 new trees will be replanted (6000 in the WMP and 2508 off site) a replacement ratio of 17 new trees for each one lost. The considerable funding provided by the project will ensure the sustainable management of the site and prevent its slow degradation for the benefit of local wildlife and local residents alike.

A.T. Coombes
AT Coombes Associates Ltd.
04 December 2025

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1. Terms of Reference

1.1 The assessment addresses the likely impact of the development which will includes the construction of a new data centre and associated ancillary buildings and a new road bridge over the river Rhymney providing access to the site from the south. Work will include the provision of two new dormouse bridges over the river to link the site with newly planted and existing woodland.

1.2 Previous permission has been obtained for a development of commercial units and parking on the site (granted 11th January 2024 (Application Number 22/02673/FUL), and the proposed data centre will occupy a very similar footprint. Condition 6 of the planning permission was to submit an Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) for approval by Cardiff City Council.

1.3 The Arboricultural Impact Assessment (AIA) for the approved development prepared by Delta Simons has been used as a basis for this assessment. The document addresses the impact of development on surrounding trees and provides recommendations for the protection of retained trees during construction work based on BS 5837:2012 "Trees in relation to design, demolition and construction-Recommendations" hereinafter referred to as the British Standard.

1.4 The Tree Constraints Plan (TCP) contained in the preliminary assessment has been used as a basis for this document.

1.5 Delta Simons completed a desk search of the Cardiff City Council Website on 26/01/2021 that indicates the Woodland Group 7 is covered by a Tree Preservation Order (TPO). A search on the Natural Resource Wales (NRW) website also indicated that this area is designated as Ancient Semi-Natural Woodland (ASNW) covering 0.75 ha. Woodland Groups 2, 3, 14 and 15, located adjacent to the river were also covered by a TPO.

2. Site Description

2.1 The site extends to 22.8 ha and includes the existing park and ride surrounded by woodland and open ground. It is situated between Eastern Avenue (A48) to the north and the river Rhymney to the south. A total of 12 individual trees, 22 tree groups and 15 woodland groups were included in the AIA survey. Groups contain trees forming continuous features or clusters with similar characteristics were present. Figure 1 shows the current park and ride area.

Figure 1: The existing Park and Ride facility and surrounding trees to the north

Figure 2: Part of the ancient woodland at the northern section of the site

2.2 The site includes an area of ASNW close to the A48 as shown in Figure 2. There are two further blocks of ASNW woodland edging the river Rhymney which are shown in Figures 3 and 4, these will also be protected and restored.

Figure 3: Riparian woodland edging the river.

Figure 4: Woodland the south of the river

2.4 All woodland and open ground around the site is included in a 25-year Woodland Management Plan prepared by A. T. Coombes Associates Ltd which will be submitted as a separate document but should also be read in conjunction with this AIA.

3. Tree Survey Details

3.1 Appendix 1, the Tree Survey Schedule gives the survey findings in tabular form. The schedule contains all the information specified in section 4.4.2.5 of the British Standard. Appendix 2 gives a full explanation of the survey headings.

3.2 The trees were surveyed by Delta Simons on 26 July 2021; they were not climbed but surveyed from ground level. Subsequent site visits have established there has been no change in the woody vegetation across the site in the interim. However, some of the ash have deteriorated due to ash dieback. Given that most of the trees are in groups or woodland areas and the survey dimensions are

for average trees it was decided that that a complete re-survey would have produced little significant change in the Root Protection Areas (RPA) of retained trees.

3.3 The details recorded during the tree survey were collected independently of any development proposals, and the categorisation of the quality and amenity value of the trees was made purely on arboricultural grounds.

3.4 The British Standard states that a soil assessment should be carried out by a competent person to establish the structure, clay content and potential for volume change of the soil and separate soil survey report has been prepared as part of the application.

4. Assessment of Tree Constraints

4.1 To facilitate the proper assessment of tree constraints a Tree Constraints Plan (TCP) (prepared by Delta Simons) forms Appendix 3. The Tree Protection Plan (TPP) which forms Appendix 4 has been produced to both show the tree losses required and demonstrate how retained trees will be protected during construction.

4.2 Appendix 3 shows the position of trees and groups marked by a coloured line matching the retention category status and a reference number (as listed in Appendix 1). Heights (Ht) are marked in metres for each tree, together with the predicted ultimate heights (U/Hgt).

4.3 The plan deals with constraints that the trees may place on the development in two areas as follows:

Below ground Constraints

4.4 The boundaries Root Protection Areas (RPA) for the individual trees or groups are shown to match the retention category colour. The RPA's will be protected during any development work with temporary barriers as prescribed by the British Standard

Above Ground Constraints

4.5 The branch spreads were not shown on the preliminary AIA. However, the trees on site are largely semi mature and early mature and generally have radial crown spreads generally less than 5 m.

4.6 Shade patterns for the trees have not been shown as they are not considered relevant in the context of this commercial development.

5. Arboricultural Impact Assessment

5.1 A total of twelve individual trees, twenty-two tree groups and fifteen woodland groups were identified and assessed as part of the Tree Survey. Groups contain trees forming continuous features or clusters with similar characteristics.

5.2 Appendix 4 shows the areas of group losses, shaded in red and individual trees with a red tree icon. These are summarised as follows:

5.3 A Category Trees

5.4 One woodland tree group (WG7), which is ASNW, and two individual mature oak trees (T28 and T29) have been graded as A category and will be retained and protected throughout the development process.

5.5 B Category Trees

5.6 Eight tree groups with a total area of 8,444.38 m^2 (WG1, TG3, TG4, WG4, WG6, WG9, WG13 and TG20) and one individual B category tree (T6) will require removal.

5.7 C Category Trees

5.8 Six groups with a total area of 2,911.35m^2 (TG11, TG20, TG22, TG23, TG12, WG12, thirty-two trees within the C category tree groups (TG15, TG17, and TG19) and one individual tree (T16) will require removal.

5.9 The combined area of tree losses is 11,355.73 m^2 or **1.14 ha.** The estimated number of tree losses is given in tabular form below. The numbers are arrived at based on an estimated stocking of 400 trees per ha and must be regarded as approximate.

BS 5837 (20120 Category	Constituents of groups (Est)	Individual Trees	Total Removals
A Category	0	0	0
B Category	339	1	340
C Category	113	32	149
Combined Total	**452**	**33**	**485**

5.10 Any trees that are retained will be provided with their proper protection according to BS5837:2012 regardless of which category they have been placed in.

5.11 The tree constraints for each element of the development are discussed separately in the following table:

Element	Detail
Demolition of Existing Structures and Removal of Hard Surfacing	The only existing building is well away from any trees on site, and as such, there will be no tree constraints associated with this aspect of the development should it require demolition or alteration. Where surfaces are to be removed within the RPA of retained trees, this work must be carried out very carefully and under arboricultural supervision. Handheld tools, or appropriate machinery (such as an excavator fitted with a non-toothed ditching bucket) will be used, with due care and attention paid to any roots that may be underneath the surface.

Demolition Continued	If roots are found, they must be covered with good quality topsoil to a depth no greater than 150mm within 24 hours. Temporary protective barriers, as shown on the TPP, will be removed to allow access for this work to take place. Once carried out the protective barriers will be re-erected to prevent access to the now unsurfaced RPA.
Admin and Storage	TG12 (Part), TG19 (Part) and WG12 are within the footprint of the proposed buildings and will need to be removed for development purposes.
Plot 4	Part of TG14 (Part) and WG11, TG15, TG17 (Part), TG7, TG11 and WG9 are within the footprint of the proposed unit for the plot and will need to be removed for development purpose.
Plots 5/6	TG3, TG4 and WG4 are within the footprint of the proposed unit for the plot and will need to be removed for development purposes.
Plot 8	TG20, TG22 (Part), TG23 (Part) and WG13 are within the footprint of the proposed unit for the plot and will need to be removed for development purposes
New River Bridge and access road	Two small tree groups, not covered in the AIA, amounting to 248 m2 in total area will need to be removed for development purposes.
New Access Roads	Six tree groups (TG3 (Part), TG4 (Part), WG4 (Part), TG12 (Part), TG19 (Part), TG22 (Part), WG12 and TG12 (Part)) and two trees (T6 and T16) are within the footprint of the proposed road and will need to be removed for development purposes.
Surface drainage and swales	The main surface water drainage is shown on Appendix 4. This is largely clear of retained trees except for the area between plots 4 and 5, here existing ditches will be cleaned out operating as far as possible outside the RPA of retained trees. Where it is necessary for a machine to operate within the RPA of retained trees, this will be done working off temporary ground protection as specified in Appendix 5. This work will require arboricultural supervision.
Two Dormouse Bridges	The default position is that bridges should be positioned outside the RPA of retained trees. Where this is not possible, specialist techniques must be utilised to minimise the impact on the surrounding trees, using a combination of careful excavation using hand tools or and air spade and/or the use of special foundations such as mini piles. Trees around the bridges must be protected by a combination of temporary barriers and temporary ground protection. Arboricultural supervision will be essential at all stages of the work.
Areas for Landscape Planting	There are areas for landscaping within the development which are largely outside the RPA of retained trees. However, areas scheduled for landscape planting associated with the new development, must be protected from

	compaction and contamination throughout the course of the construction works with temporary fencing.
Services and Soakaways	Adjust slightly as it says above that surface drainage and swales are shown No details of any new service runs to the units have been provided. They should be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including micro tunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging. It will be necessary to prepare detailed plans for any services that run thorough the RPA of retained trees. This should be produced in conjunction with an arboriculturist and include allowance for the space needed for access for the installations, and the levels across the proposed area. Any above-ground apparatus including CCTV cameras and lighting should also be positioned to avoid the need for any regular or detrimental pruning to the trees. Minor facilitative pruning is acceptable. However, positions that require repetitive and significant tree work must be avoided.

6. Tree Management and Replanting Proposals

6.1 Remedial tree work has been specified in column 12 of Appendix 1 for arboricultural and health and safety reasons. The work is not considered urgent, and mainly consists of controlling ivy, but it is recommended that it is carried out within 12 months of the date of this report, or prior to the commencement of works, whichever is soonest.

6.2 This schedule does not refer to, and is superseded by, any requirements for tree felling for development purposes that may be required.

6.3 Please note that the inspection of trees on site was of a preliminary nature, gathering, as set out in the British Standard, only information needed to assess tree constraints. While any obvious tree defects that may constitute a risk have been recorded in the survey and appropriate remedial work specified this assessment does not constitute a full tree health and safety survey. In particular inaccessible trees, trees with heavy Ivy cover and trees within groups have not been inspected fully and dimensions estimated. However, any comments on the trees relating to health and safety remain valid for 12 months from the date of this report after which the trees will require re-inspection.

6.4 Approximately 489 trees (340 Category B and 149 category C) will need to be removed for development purposes. As the trees were assessed in groups it is difficult to estimate the exact number of ash that are included in these totals. However, ash could make up around 10% of the

removals. Ash dieback is present on site, and it is likely that most of the ash on site will succumb to the disease.

6.5 In order to mitigate the loss of the above trees a minimum of 2.28 ha of new native woodland will be funded in the local area planting a minimum 2,508 trees (1100 per ha). Funding will include five years maintenance. Work will include keeping a circular area with a 0.5m radius centred on the stem of the trees free from weed growth using either herbicide or mulch, checking supports and guards and replacing any failures during the period with trees of the same species and quality.

6.6 The reason for the offsite planting is to allow the retention of the varied ecotones and wildlife habitats across the site including grassland and woodland edge flora.

6.7 The Woodland Management Plan sets out a comprehensive 25-year plan to restore and maintain ASNW, other woodland, open ground, and riparian woodland edging the river Rhymney. It includes enrichment planting of around 6128 trees during the 25-year plan period.

6.8 The combined planting plans represent a 17 to 1 replacement ratio. The new planting, when coupled with the funding of the ongoing management and improvement of the woodlands and associated open ground, offers a sustainable future for the area.

6.9 The Woodland Management Plan provides crucial on-going maintenance of the site, dealing with problems such as eradicating non-native invasive species particularly Japanese knot weed and Himalayan Balsam, controlling the health and safety risk from trees, dealing with the impact of ash dieback and clearing and controlling fly tipping.

7. Further Arboricultural Input into the Design Process, Construction and Aftercare

7.1 A Tree Protection Plan (TPP), Arboricultural Method Statement (AMS) and Timetable for implementation of Tree Protection Works form Appendices 4, 5 and 6 respectively.

7.2 The AMS contains a timetable for implementation of the tree protection works. No work will commence until the protective fencing is in place.

7.3 If the proposed layout of the development changes beyond the latest revision V11 it will be necessary to revise this report.

8. Permissions and Constraints

8.1 Some of the trees on site are subject to a Tree Preservation Order. Therefore, written permission must be obtained from the Local Authority prior to commencing any work that may affect the condition of the protected trees, including any ground works adjacent to them. The Woodland Management Plan, provided as a separate document, details work required for 25 years and it is recommended that this submitted to the Local Authority with a view to agreeing the work programme detailed to avoid the need for frequent work applications.

8.2 To assist the planning process the LPA should be provided with a copy of this report and invited to comment on the proposals.

8.3 When dealing with developments close to trees, special attention should be paid to related legislation ensuring that the Wildlife and Countryside Act (1994), Conservation of Habitats and Species Regulations (2010) and the Countryside Rights of Way Act (2000) are adhered to. It must be ensured that nesting birds and protected species such as dormice, bats and reptiles are considered and protected.

8.4 Any tree removals, not directly necessary to implement an approved planning permission will require a felling licence from Natural Resources Wales.

9. Conclusions

9.1 Trees lost for development purposes include 340 B category trees including 1 individual tree, 5 woodland groups and 3 tree groups plus a further 149 C category trees including 33 individual trees, 1 woodland group and 5 tree groups these will be replaced with both off site planting and on-site enrichment tree and woody shrub planting over the period of a 25-year improvement plan. This will be planting will provide 17 new trees for each tree removed.

9.2 The proposed dormouse bridges will be constructed carefully by using specialist foundations where necessary.

9.3 A section of new native hedging will also be planted to provide additional protection for the ASNW and a habitat and food sources for the dormice, which are present on the site.

9.4 All other trees on or adjacent to the site will be retained and protected according to BS5837: 2012 throughout the works.

9.5 The combination of the proposed new tree planting and the implementation of the 25-year Woodland Management Plan will restore tree cover in the area. The considerable funding provided by the project will ensure the sustainable management of the site and prevent its slow degradation for the benefit of local wildlife and local residents.

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04 December 2025

4.4 Tree Schedule

Table 1 – BS 5837:2012 Tree Schedule

	Tree Species		Measurements				Crown (m)					Tree Condition							Management
Tree Number	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Average Height	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works
TG1	Pedunculate oak	*Quercus robur*	Y / SM	Av 12	S / MS	Av 300	0	6	6	6	6	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set group. Phototropic growth	F	>40	B 2	3.6	
T2	Sycamore	*Acer pseudoplatanus*	M	20	MS	4 x 600	2	12	12	12	12	No visual defects	Multi-stemmed from base, Vertical	Rounded canopy	Ivy clad stem	F	>40	B 2	14.4	Server and remove ivy
TG3	Hazel Common alder	*Corylus avellana* *Alnus glutinosa*	SM	Av 12	S / MS	Av 200	0	4	4	4	4	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one	Previously coppiced	F	20 - 40	B 2	2.4	
TG4	Common alder Silver birch Hazel	*Alnus glutinosa* *Betula pendula* *Corylus avellana*	SM	Av 6	MS	Est 200	0	4	4	4	4	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one	Group surrounding a pond	F	20 - 40	B 2	2.4	
TG5	Ash	*Fraxinus excelsior*	M	Av 20	S / MS	Av 500	8	9	9	9	9	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one. Scattered deadwood	Self-set group. Phototropic growth	F	20 - 40	B 2	6.0	
T6	Sycamore	*Acer pseudoplatanus*	SM	17	MS	Est 750	2	6	6	6	6	No visual defects	Single stem. Vertical. TD at 2 m	Balanced rounded canopy.	Standing on bank top	F	20 - 40	B 2	9.0	
TG7	Pedunculate oak Hazel	*Quercus robur* *Corylus avellana*	SM	14	S / MS	Av 400	0	6	6	6	6	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set group. Phototropic growth	F	>40	B 2	4.8	
T8	Sycamore	*Acer pseudoplatanus*	SM	18	3	3 x 600	1	10	10	10	10	No visual defects	Single stem. Vertical. TD at 1.5 m	Rounded spreading canopy Scattered deadwood.		F	>40	B 2	12.3	
TG9	Sycamore	*Acer pseudoplatanus*	M	Av 18	S / MS	Av 3 x 600	2	3	10	10	10	No visual defects	Single and multiple stems. Stubs at base. Vertical	Open, spreading canopy. Scattered deadwood.		F	>40	B 2	12.3	
TG10	Silver birch Hazel Cherry	*Betula pendula* *Corylus avellana* *Prunus* sp.	Y	Av 6	S / MS	Av 100	0	3	3	3	3	No visual defects	Single and multi-stems, vertical	Rounded canopies Scattered deadwood.	Tree guards present	F	20 - 40	B 2	1.2	
TG11	Common alder	*Alnus glutinosa*	Y	6	S / MS	Av 150	1	2	2	2	2	No visual defects	Single and multiple stems, vertical.	Canopies read as one.	Self-set group	F	20 - 40	C 2	1.8	

TG12	Silver birch Apple Hawthorn Common alder Pedunculate oak	*Betula pendula* *Malus* sp. *Crataegus monogyna* *Alnus glutinosa* *Corylus avellana* *Quercus robur*	Y	6	1	Av 125	0	2	2	2	2	No visual defects	Single stems, vertical.	Rounded canopies	Tree guards present	F	20 - 40	B 2	1.5	
T13	Pedunculate oak	*Quercus robur*	S M	14	1	700	1	8	8	8	8	No visual defects	Single stem, vertical. TD at 2 m.	Spreading canopy.		F	>40	B 2	8.4	
TG14	Cherry Ash	*Prunus* sp. *Fraxinus excelsior*	S M	Av 12	1	Est 200	1	4	4	4	4	No visual defects	Single stems, vertical.	Canopies read as one.	Ivy clad stems	F	20 - 40	B 2	2.4	Sever and remove ivy
TG15	Common alder	*Alnus glutinosa*	Y	Av 6	1	Av 175	2	2	2	2	2	No visual defects	Single stems. Vertical	Rounded canopies	Formal linear group. Formative pruning evident	F	20 - 40	C 2	2.1	
T16	London plane	*Platanus x hispanica*	Y	6	1	125	2	3	3	3	3	No visual defects	Single stem, vertical.	Rounded canopies		F	>40	B 2	1.5	
TG17	Ash	*Fraxinus excelsior*	Y	Av 8	1	Av 200	2	3	3	3	3	No visual defects	Single stems, vertical	Rounded canopies	Formal linear group. Formative pruning evident	F	>40	C 2	2.8	
TG18	Silver birch	*Betula pendula*	Y	Av 8	1	150	1	2	2	2	2	No visual defects	Single stems, vertical	Rounded canopies	Present on embankment	F	20 - 40	C 2	1.8	
TG19	London plane	*Platanus x hispanica*	Y	Av 7	1	Av 200	2	3	3	3	3	No visual defects	Single stems, vertical.	Rounded canopies	Formal linear group. Formative pruning evident	F	20-40	C 2	2.4	
TG20	Ash	*Fraxinus excelsior*	Y	Av 6	1	Av 125	0	3	3	3	3	No visual defects	Single stems, vertical.	Rounded canopies that read as one		F	20 - 40	B 2	1.5	
T21	Sycamore	*Acer pseudoplatanus*	S M	12	1	Est 575	0	8	8	8	8	No visual defects	Single stem, vertical.	Rounded canopy, minor deadwood.		F	>40	B 2	6.9	
TG22	Silver birch Hazel Blackthorn		Y	Av 8	S / M S	Est 150	0	3	3	3	3	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one	Scattered small groups of self-sets	F	20 - 40	C 2	1.8	
TG23	Ash Cherry Silver birch Hazel		Y	Av 8	S / M S	Av 15	0	3	3	3	3	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one	Parallel plantation woodland separated by footpath	F	20 - 40	C 2	1.8	
TG24	Cherry Hazel Silver birch Common alder		S M	Av 12	S / M S	Av 200	0	5	5	5	5	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one		F	20 – 40	B 2	2.4	
T25	Field maple		S M	10	M S	3 x 200	0	5	5	5	5	No visual defects	Multiple stems from base	Rounded canopy		F	20 – 40	B 2	4.2	
T26	Pedunculate oak		M	14	1	Est 900	4	7	7	7	7	No visual defects	Single stem, vertical. Bifurcated at 4 m.	Open canopy. Scattered deadwood.		F	>40	B 2	10.8	

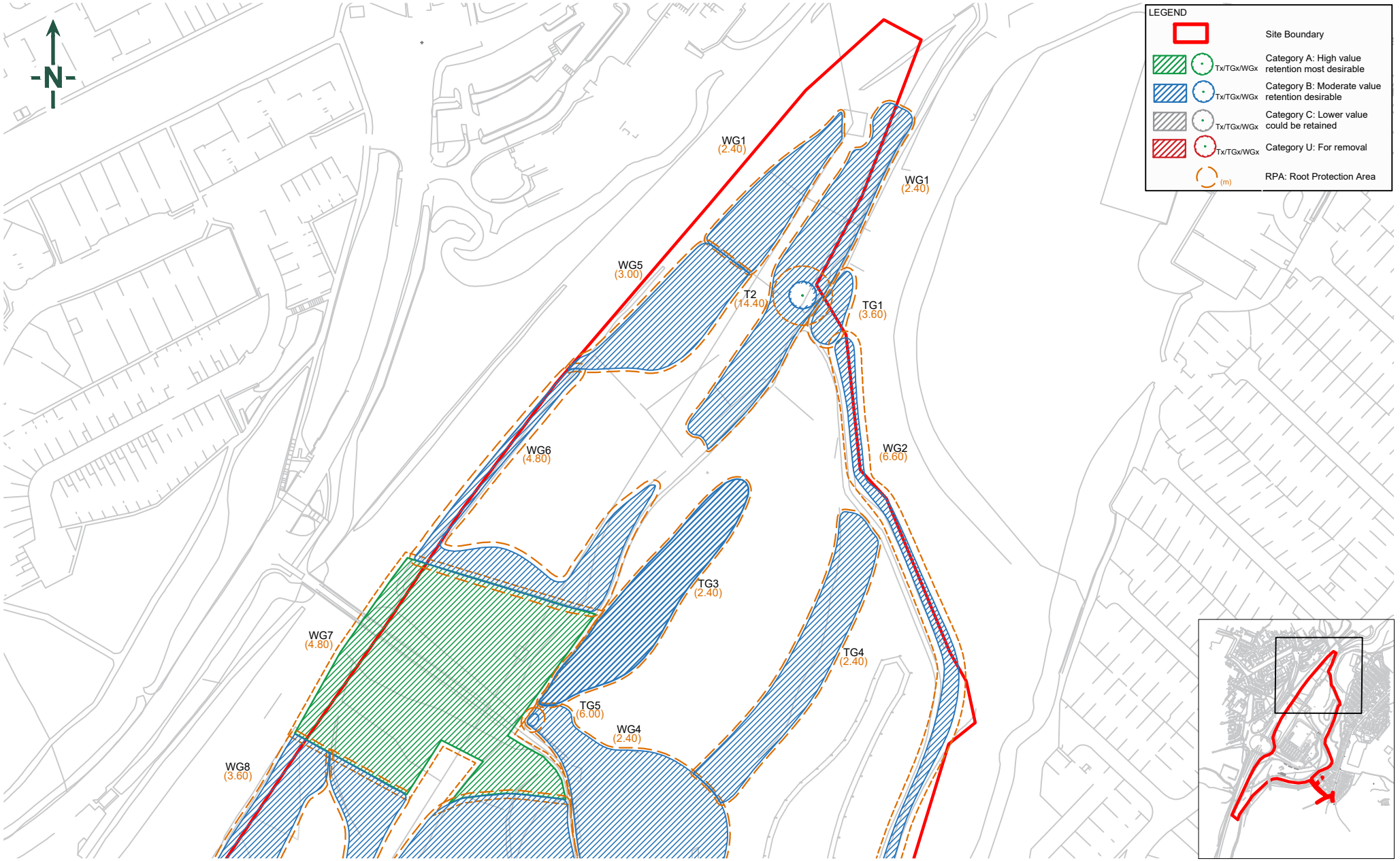
TG27	Common alder		Y	Av 10	1	Av 150	0	3	3	3	3	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one	Scattered small groups of self-sets	F	20 - 40	C 2	1.8	
T28	Pedunculate oak		M	19	1	Est 1100	2	12	12	12	12	No visual defects	Single stem, vertical. Extensive bark damage and rot	Open canopy with retrenchment		F	>40	A 2	13.2	
T29	Pedunculate oak		M	19	1	Est 1000	2	12	12	12	12	No visual defects	Single stem, vertical.	Open rounded spreading canopy. Scattered deadwood.		F	>40	A 2	12.0	
T30	Pedunculate oak		S M	15	1	Est 700	2	8	8	8	8	No visual defects	Single stem, vertical.	Open rounded spreading canopy.		F	>40	B 2	8.4	
TG31	Sycamore Common alder		S M	Av 12	S / M S	Av 175	4	8	6	4	6	No visual defects	Single and multiple stems, vertical.	Unbalanced canopies that read as one	Linear group on top of riverbank	F	20 - 40	B 2	2.1	
TG32	Hybrid black poplar Common alder		S M / M	Av 22	S / M S	Av 300	1	9	9	9	9	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one	Poplar DBH 800 mm	F	20 - 40	B 2	3.6	
T33	Cherry		M	15	1	625	2	8	8	8	8	No visual defects	Single stem, vertical.	Open rounded spreading canopy.		F	20 - 40	B 2	7.5	
TG34	Sycamore Common alder		S M	Av 18	S / M S	Av 450	0	8	6	6	6	No visual defects	Single and multiple stems, vertical.	Unbalanced canopies that read as one	Linear group with canopies extending over river	F	>40	B 2	5.4	
WG1	Common alder Silver birch	*Alnus glutinosa* *Betula pendula*	Y / S M	Av 16	S / S M	Av 200	6	4	4	4	4	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one.	Self-set trees displaying phototropic growth.	F	>40	B 2	2.4	
WG2	Crack willow Common alder Pedunculate oak	*Salix fragilis* *Alnus glutinosa* *Quercus robur*	S M	Av 18	S / M S	Av 550	3	8	8	8	8	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one.	Linear group along bank of river	F	20-40	B 2	6.6	
WG3	Crack willow Common alder Pedunculate oak	*Salix fragilis* *Alnus glutinosa* *Quercus robur*	S M	Av 18	S / M S	Av 550	3	8	8	8	8	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one.	Linear group along bank of river	F	20-40	B 2	6.6	
WG4	Hazel Ash Field maple Crack willow	*Corylus avellana* *Fraxinus excelsior* *Acer campestre* *Salix fragilis*	Y	Av 14	S / M S	Av 200	0	3	3	3	3	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one.	Standing water within low lying areas	F	>40	B 2	2.4	
WG5	Ash Hazel Common alder	*Fraxinus excelsior* *Corylus avellana* *Alnus glutinosa*	S M	Av 16	S / M S	Av 300	0	5	5	5	5	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.		F	>40	B 2	3.6	
WG6	Common alder Pedunculate oak Goat willow Ash	*Alnus glutinosa* *Quercus robur* *Salix caprea* *Fraxinus excelsior*	S M	Av 18	S / M S	Av 400	4	6	6	6	6	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Previously coppiced	F	20 - 40	B 2	4.8	

WG7	Common alder Pedunculate oak Hazel Sycamore	*Alnus glutinosa* *Quercus robur* *Corylus avellana* *Acer pseudoplatanus*	SM	Av 16	S/MS	Av 400	0	6	6	6	6	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Ancient woodland with hazel understorey	F	>40	A2	4.8	
WG8	Silver birch Pedunculate oak Hazel Ash	*Betula pendula* *Quercus robur* *Corylus avellana* *Fraxinus excelsior*	SM	Av 16	S/MS	Av 300	0	5	5	5	5	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set trees displaying phototropic growth	F	20 - 40	B2	3.6	
WG9	Silver birch Pedunculate oak Hazel Sycamore	*Betula pendula* *Quercus robur* *Corylus avellana* *Acer pseudoplatanus*	SM	Av 12	S/MS	Av 300	0	6	6	6	6	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set trees displaying phototropic growth	F	20 - 40	B2	3.6	
WG10	Silver birch Pedunculate oak Hazel Ash	*Betula pendula* *Quercus robur* *Corylus avellana* *Fraxinus excelsior*	SM	Av 16	S/MS	Av 300	0	5	5	5	5	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set trees displaying phototropic growth	F	>40	B2	3.6	
WG11	Pedunculate oak Cherry Sycamore	*Quercus robur* *Prunus* sp. *Acer pseudoplatanus*	Y	Av 18	S/MS	Av 300	6	5	5	5	5	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set trees displaying phototropic growth	F	>40	B2	3.6	
WG12	Ash Goat willow		SM	Av 18	S/MS	Est 600	3	7	7	7	7	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Self-set trees displaying phototropic growth	F	>40	B2	7.2	
WG13	Hazel Silver birch		SM	Av 16	S/MS	S/MS	Av200	0	5	5	5	No visual defects	Single and multiple stems. Vertical	Rounded canopies that read as one.	Hazel understorey	F	20 - 40	B2	2.4	
WG14	Pedunculate oak Ash Silver birch Goat willow Sycamore		SM/M	AV 18	S/MS	Av 450	0	5	5	5	5	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one. Occasional larger tree within group	Self-set trees displaying phototropic growth.	F	>40	B2	5.4	
WG15	Common alder Pedunculate oak Cherry Weeping willow		SM/M	AV 18	S/MS	Av 450	0	5	5	5	5	No visual defects	Single and multiple stems, vertical.	Rounded canopies that read as one.	Linear group along bank of river	F	20-40	B2	5.4	

Table 2 – Key to Tree Schedule

Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
MS – Multi-stemmed	Y - Young	G – Good	A – High	**<** = less than
Ht - Height in metres	SM – Semi-Mature	F – Fair	B – Moderate	**~** = approximately
Stem – Stem Diameter at 1.5m in mm	EM – Early-mature	P – Poor	C – Low	**>** = greater than
Crown – Crown spread in metres	M – Mature	D – Dead	R – Trees for Removal	
TD - Trunk division (height in metres)	V - Veteran **Est Yrs –** estimate of years remaining (>40 years; 20 –40 years; <20 years)		**Sub-categories:** **1** = mainly arboricultural values **2** = mainly landscape values **3** = mainly cultural values.	
RPA = Root Protection Area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).				

Appendix 3a



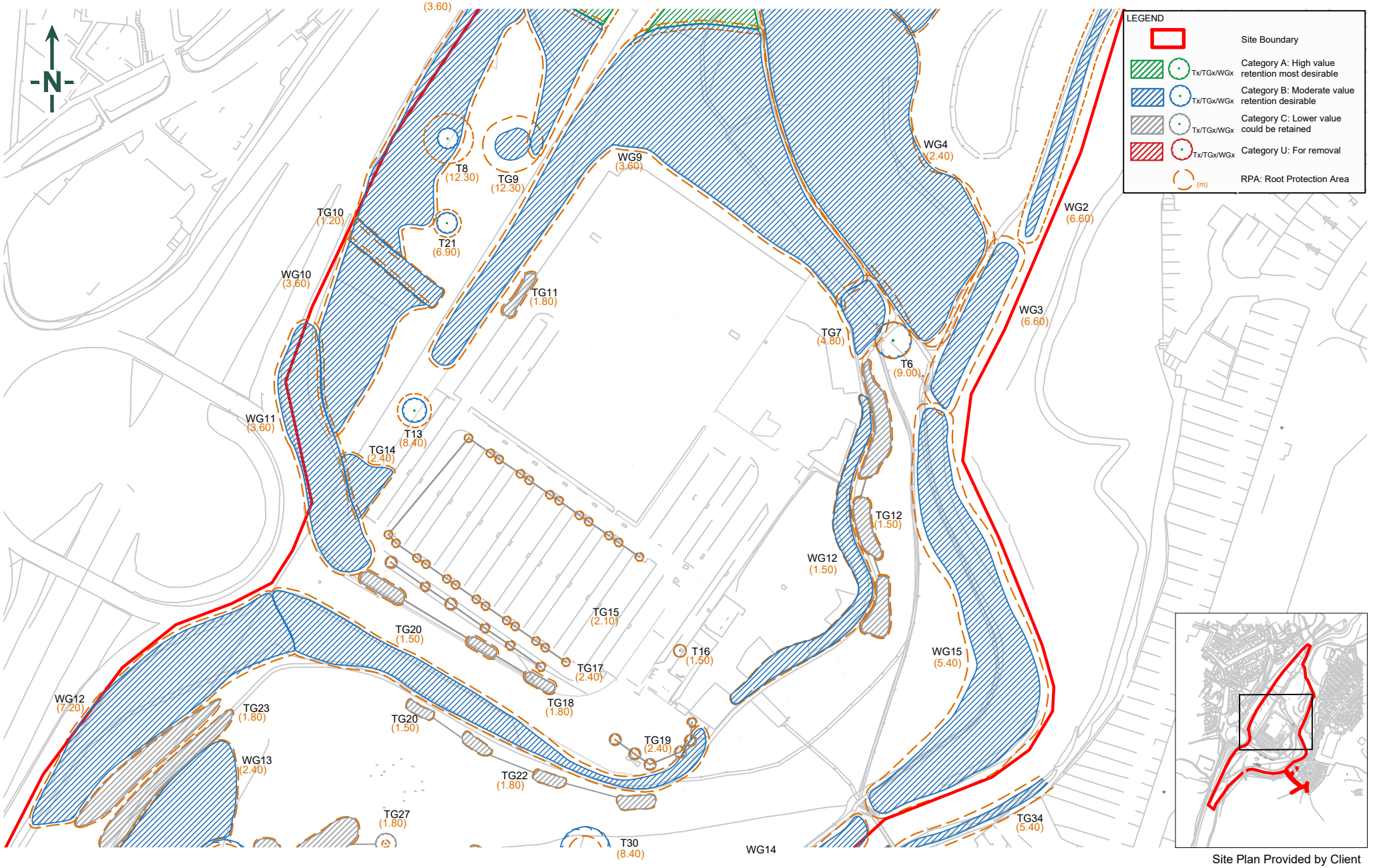
Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Cardiff Park and Ride

DRAWN BY: YA	SCALE: Not to Scale	PROJECT NO: 20-0981.08
CHECKED BY: PM	REVISION: 1	FIGURE NO: 3a
DATE: 11 August 2021		

Appendix 3b



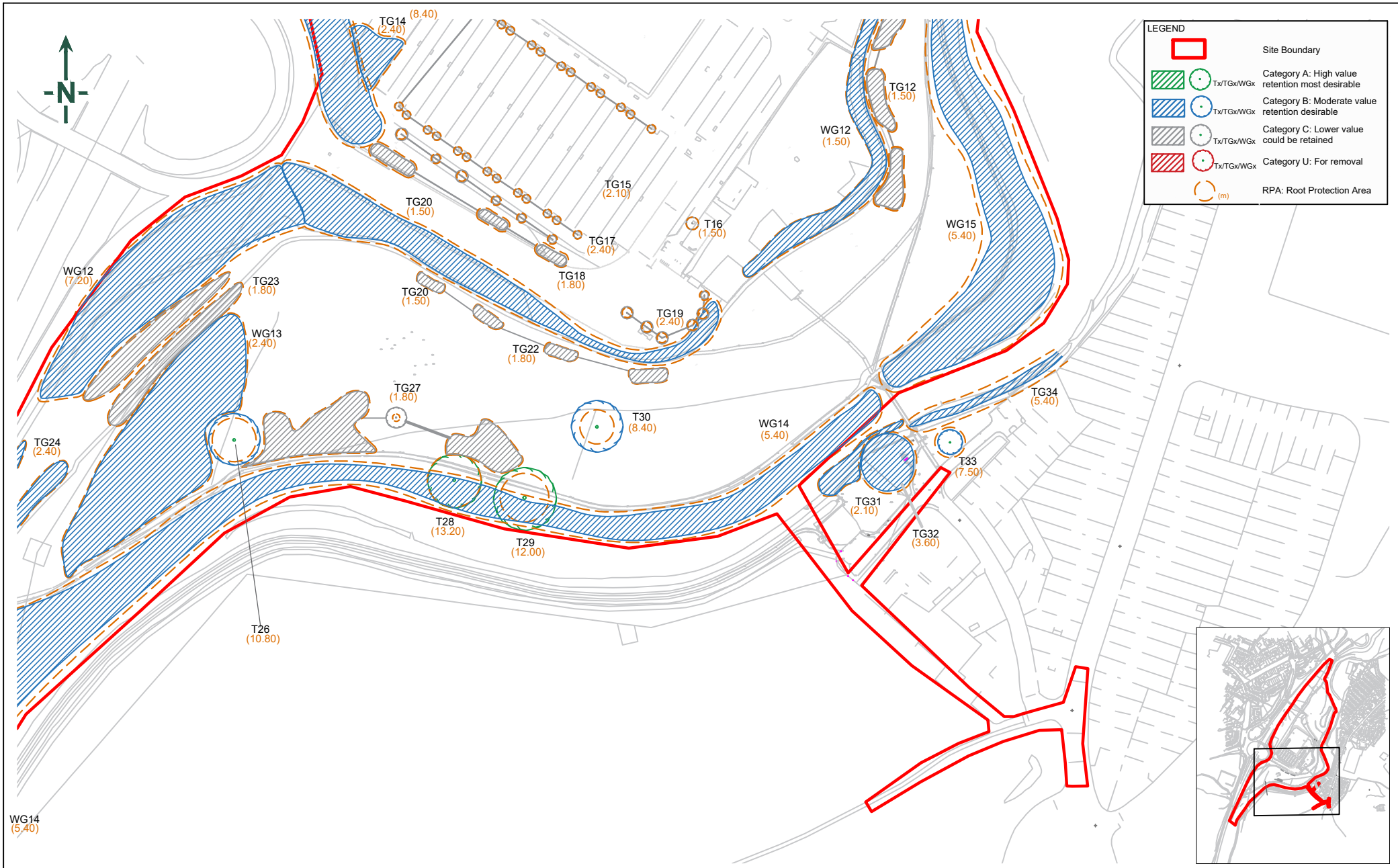
Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Cardiff Park and Ride

DRAWN BY: YA	SCALE: Not to Scale	PROJECT NO: 20-0981.08	
CHECKED BY: PM	REVISION: 1	FIGURE NO: 3b	
DATE: 11 August 2021			

Appendix 3c



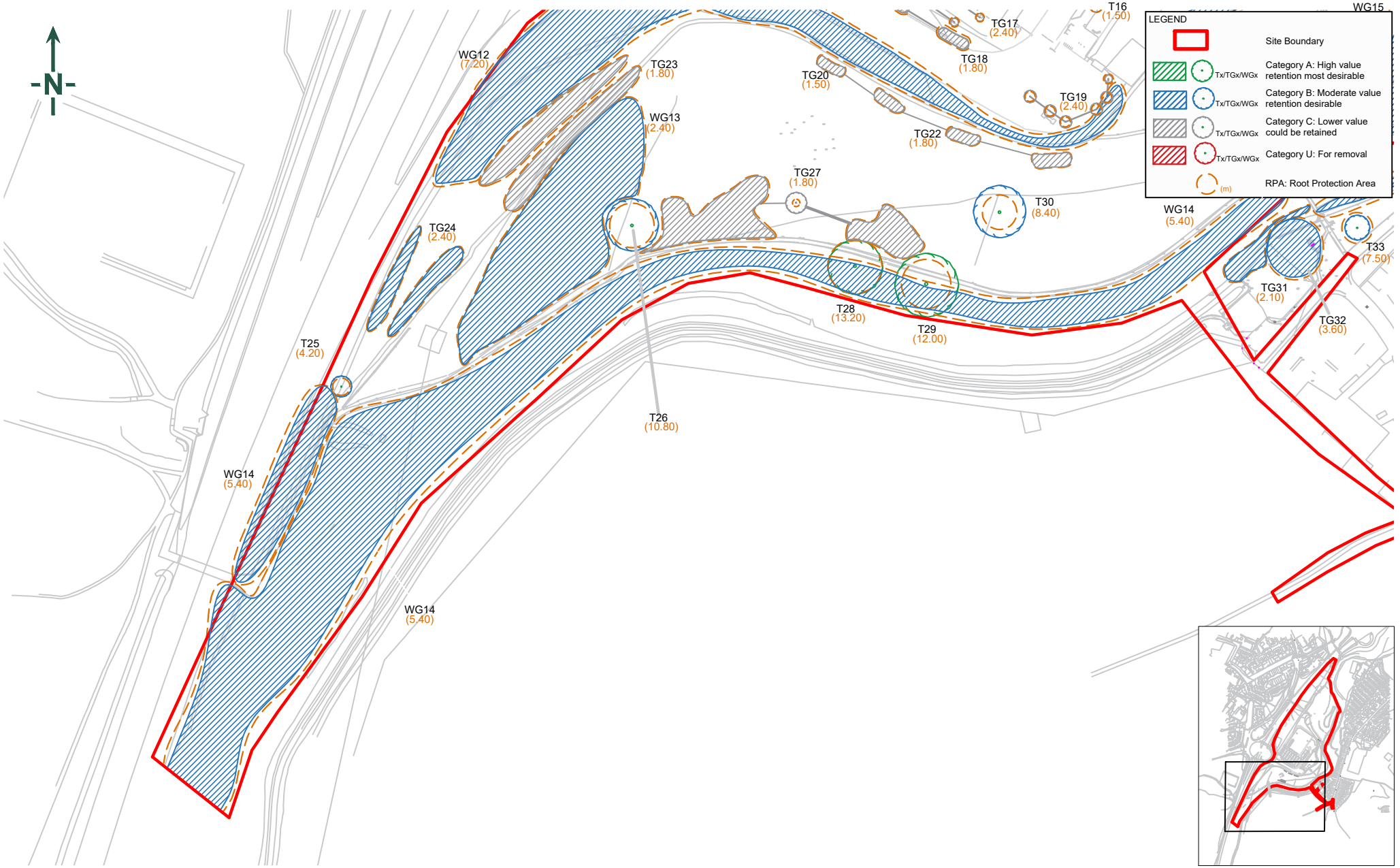
Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Cardiff Park and Ride

DRAWN BY: YA	SCALE: Not to Scale	PROJECT NO: 20-0981.08
CHECKED BY: PM	REVISION: 1	FIGURE NO: 3c
DATE: 11 August 2021		

Appendix 3d



Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Cardiff Park and Ride

DRAWN BY: YA	SCALE: Not to Scale	PROJECT NO: 20-0981.08
CHECKED BY: PM	REVISION: 1	FIGURE NO: 3d
DATE: 11 August 2021		

APPENDIX 5 - ARBORICULTURAL METHOD STATEMENT AT CARDIFF PARK AND RIDE EAST, EASTERN AVENUE, OLD ST MELLONS, CARDIFF CF23 8HH

1. Scope of the Works

1.1 This document provides a methodology for protection of trees, woodland, and open ground habitats during the demolition of the existing park and ride and the construction of a new data centre and the associated ancillary buildings, a new bridge over the river Rhymney and the associated access roads at the above site and should be read in conjunction with the Tree Protection Plan Appendix 4 and Timetable for Protection Works Appendix 6.

1.2 A qualified Arboriculturist, with arboricultural qualifications to a minimum of level 6, will be appointed to supervise the implementation of this AMS throughout the contract and beyond. The person appointed will be responsible for carrying out regular site visits and reporting the findings and any recommendations for remedial work to the client's, main contractor, and Cardiff City Council planning department.

1.3 The Arboriculturist will also be responsible for supervising the implementation of tree related work when the submitted Woodland Management Plan has been merged with ecological proposals in the form of a CEMP.

1.4 An ecological clerk of works will also be appointed, and it will be important to for the arboriculturist to liaise with the ecologist on a regular basis.

1.5 An Initial meeting between the site manager/main contractors and the appointed arboriculturist must take place prior to construction work commencing so that the protection measures set out in this document can be discussed and agreed. At this point a list of contact details for all relevant parties will be produced and circulated to all parties including the Tree Officer of Cardiff Council and Natural Resources Wales.

2. Phasing of the Works

2.1 There is a range of pre-construction work that needs to take place including removal of trees and shrubs, (this will be phased to protect the population of dormice on site) and eradication of invasive species particularly Japanese knot weed and Himalayan balsam. The bulk of the dormouse mitigation planting will be off site.

2.2 Work cannot commence until certain planning conditions have been met and the current programme may be subject to change. However, the timetable provided (Appendix 6) gives the order that the works need to be implemented to ensure the trees are fully protected and states when specific arboricultural input will be required.

3. Tree Removals

3.1 All required tree work and tree felling will be carried out prior to the commencement of any demolition and construction works on site. This work will be timed to minimise the impact on the dormice population and comply with the any conditions or restrictions imposed by Natural Resources Wales

3.2 All works will be carried out by suitably qualified and insured arborists, and will conform, where possible, to BS3998:2010 "Tree works Recommendations" and other relevant industry standards.

3.3 The combined area of tree losses is 11,355.73 m^2 or 1.14 ha**.** The estimated number of tree losses is given in tabular form below. The numbers are arrived at based on an estimated stocking of 400 trees per ha and must be regarded as approximate.

3.4

BS:5837 (2012) Category	Constituents of groups (Est)	Individual Trees	Total Removals
A Category	0	0	0
B Category	339	1	340
C Category	117	32	149
Combined Total	**456**	**33**	**489**

4. Tree Protection Barriers

4.1 Protective measures must be in place prior to any ground or construction works take place.

4.2 The retained trees will be protected by forming Construction Exclusion Zones (CEZ) as shown on Appendix 4 Tree Protection Plan (TPP).

4.3 Temporary barriers will be erected as shown by the thick green lines on the TPP to form the Construction Exclusion Zone (CEZ). The barriers will consist of 2m tall, welded mesh panels (Heras) supported on rubber or concrete feet. The fence panels should be joined together using a minimum of two anti-tamper couplers installed so they can be removed from the inside of the fence. The distance between couplers should be at least 1m and be uniform throughout the length of the fence.

4.4 Panels should be supported on the inner side by stabilizer struts which should normally be attached to a base plate and secured with ground pins. Where the fence will be erected on hard surfacing, or it is otherwise unfeasible to use ground pins the struts should be mounted on a block tray.

4.5 Figure 1 is an extract from the British Standard showing the method of supporting the panels with ground pins and a block mounted tray for use on hard surfaces. Stabiliser struts should be fitted at each panel junction.

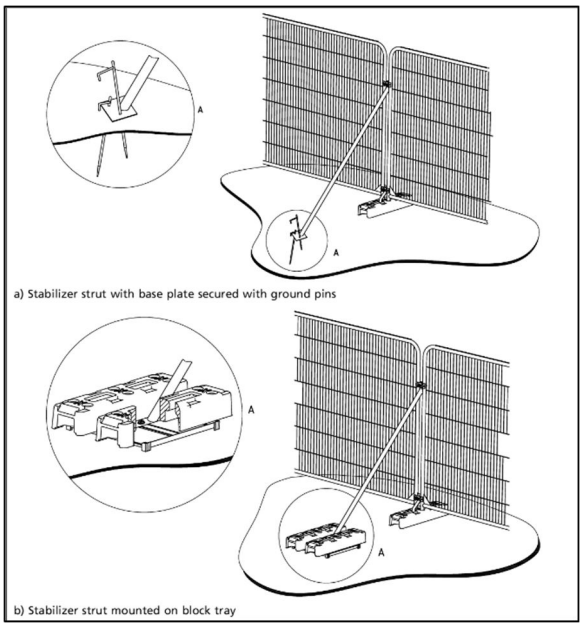


Fig 1: Temporary protective fencing as recommended by the British Standards.

4.6 Temporary protective barriers around the ancient woodland have been shown with a thick light blue (cyan) line on the TPP, to complete the Construction Exclusion Zone (CEZ). These sections of fencing will be erected as per the default design in the British Standard, using weldmesh panels supported on a scaffold pole framework, as shown in Figure 2.

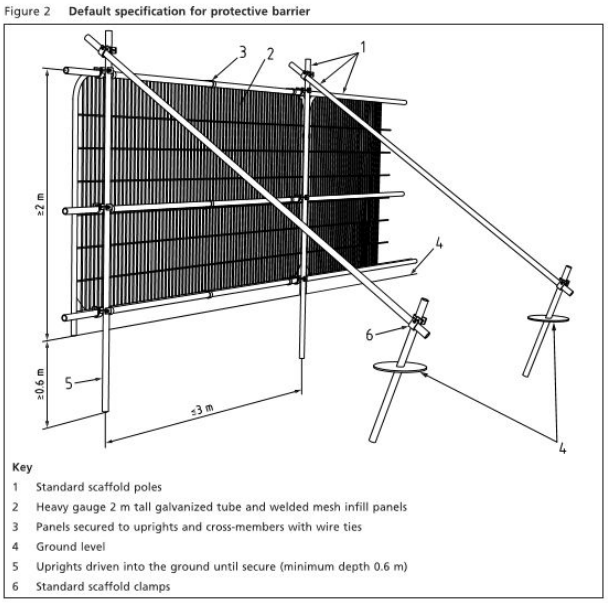


Fig 2: Default design using weldmesh panels supported by a scaffold pole framework as recommended by the British Standard

4.7 At least 40 all-weather notices should be erected on the barriers forming each CEZ stating “Construction Exclusion Zone – No Access “. These should face outwards towards the work area. Signs must be maintained in good condition and remain in place until completion of the works.

4.8 Barriers will be maintained throughout the duration of the works, ensuring that access is denied to the CEZ throughout the process.

5. Ground Works, and Eradication of Invasive Species

5.1 Before any groundwork or excavation of any kind commences temporary fencing must be in place to protect the RPAs of retained trees. In particular there must be no change of levels or deposition of soil within the RPAs.

5.2 The two invasive species involved are Japanese knot weed and Himalayan balsam. The eradication works will be completed by a specialised contractor, and a detailed invasive species plan has been submitted as part of the application. Where this involves excavation, the work must respect the RPAs of retained trees. If invasive species are growing within the CEZ alternative methods of eradication must be used.

6. Demolition of Existing Buildings and Removal of Hard Surfacing

6.1 Elements of the existing Park and Ride will be removed prior to the development. Protective fencing, as set out in the TPP, will be put in place prior to the commencement of works to protect retained trees.

6.2 Where buildings to be demolished are within the RPA of retained trees, all machinery will remain outside the RPA, and operate in a “top down, pull back” method.

6.3 Where surfaces are to be removed within the RPA, this work must be carried out very carefully and under arboricultural supervision. Handheld tools, or appropriate machinery (Such as an excavator fitted with a non-toothed ditching bucket) will be used, with due care and attention paid to any roots that may be underneath the surface. If roots are found, they must be covered with good quality topsoil to a depth no greater than 150mm within 24 hours.

7. Careful Hand Excavation

7.1 The proposed dormouse bridges may be within the RPA of retained trees. To ensure that the trees are not damaged when installing the dormouse bridges all adjoining trees must be protected by either temporary barriers or temporary ground protection before work commences. Any post holes will be excavated using an air spade or hand tools. If roots over 25 mm diameter are found, the position of the hole will be adjusted to avoid them. If roots under this diameter are found, they will be pruned to the edge of the hole using a sharp handsaw or secateurs.

7.2 The holes will then be lined with a root barrier material to prevent the leaching of any phytotoxic material from the wet concrete.

8. Installation of Specialist Foundations

8.1 The proposed dormouse bridges may be positioned within the RPA of retained trees. The British Standard states that structures can be built within the RPA of trees provided special foundations are used. It is important that specialist engineers are consulted who are experienced in designing foundations that have a minimal impact on the tree roots.

8.2 Any design for the foundations of this building must be assessed and approved by the consulting arborist for the project and by the Local Authority Tree Officer to ensure that they are suitable. Exact design details will be specified by the engineers. It is likely that mini piles will provide a satisfactory solution. However, the overriding principle will be that the need to excavate is minimised and the floor supported at or above ground level.

8.3 If mini piles are used these principals must be adhered to:

- Minimal excavation will take place within the RPA of the tree.
- Trial holes will be excavated using a hand auger or air spade when placing the piles to ensure that large roots are not damaged. If roots over 25mm diameter are found the final pile position will be adjusted to accommodate them.
- The piles will support a suspended floor or floor beams that will not be sunk into the ground.
- Tree roots will be protected during the piling process by preventing any leachates from wet concrete coming into contact with them by using prefabricated piles, or a sheath around the pile.

8.4 Piling rigs must be small, tracked machines with low ground pressure and work off proprietary temporary ground protection mats to minimise compaction.

8.5 Arboricultural supervision will be required throughout the work.

9. Site Huts and Temporary Buildings

9.1 All site huts and temporary buildings will be sited outside the CEZ.

10. Additional Precautions

10.1 The movement of plant in proximity to retained trees should be conducted under the supervision of a banksman to ensure adequate clearance from the branches of the trees. Hydraulic cranes, forklifts, excavators or piling rigs (other than small rigs used for mini piling) must be avoided in the immediate vicinity the crown of the trees.

10.2 Cement, oil, bitumen or any other products which spillage would be likely to be detrimental to tree growth should be stored well away from the outer edge of the RPA of retained trees. Precautions should include ensuring all toxic liquids are stored in fully bunded containers. Equipment such as barriers or sandbags must be available on site to deal with any accidental spillages that may occur.

10.3 Lighting of fires on site should be avoided. Where they are unavoidable, they must be at such a distance from retained trees that there is no risk of the heat causing fire damage to the trunk or branches. Full account must be taken of wind direction. Fires must be attended at all times until they are completely extinguished.

11. Service Trenches

11.1 Service runs must be routed to avoid the RPAs of trees. If this is not possible, special techniques must be employed to place the services within the RPA of the trees. The British Standard suggests a range of trenchless methods suitable for various applications including micro tunnelling, surface launched directional drilling, Pipe ramming and Impact Moleing/thrust boring. It is important common ducts should be used where it is not possible to avoid the RPA. Further guidance on installing underground services adjacent to trees can be found in the NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Volume 4 Issue 2). This document outlines a number of techniques that may be used for trenching near trees, including trenchless techniques, discontinuous trenching and hand digging.

11.2 It will be necessary to prepare detailed plans for these services that should be produced in conjunction with an arboriculturist and include allowance for the space needed for access for the installations, and the levels across the proposed area.

11.3 Any overground services including CCTV must also be positioned to avoid the need for any regular or detrimental pruning to the trees.

12. Arboricultural Supervision and Aftercare

12.1 Arboricultural/site monitoring will be carried out throughout all phases of the work by the appointed arboriculturist who will be responsible for consultation with Cardiff Council's Tree Officer.

12.2 The nominated arboriculturist will complete regular programme of site visits to check that the tree protection measures are being carried out and that all retained trees are in good condition. The frequency of the visits will be dictated by the level of activity. Provisionally a minimum of monthly visits will be required. However, this will be subject to variation depending on progress and the extent to which tree protection measures are respected.

12.3 A meeting will be held prior to commencement, to review the contents of the AMS, and deal with any queries the main contractor may have. At this point a series of fixed points will be marked out and photographs taken of trees to be retained.

12.4 A note of the date of each visit and a summary of the findings will be forwarded to both the Cardiff City Council Tree Officer, Curtis Hall Ltd and the Main Contractor to provide an audit trail enabling the proper implementation of the tree protection measures to be checked and verified. Appendix 7 is a copy of the Audit form to be used to notify all parties.

12.5 On completion of the works the trees will be inspected by the arboriculturist to check the condition of the trees and advise if any remedial work is necessary. This will involve two visits the first on completion and the second 12 months after the completion date. On the second visit a series of photographs will be taken at the previously selected fixed points to check the condition of retained trees.

A. T. Coombes NDF, MSc (Arb & Urban For), PDArb (RFS) FICFor MArborA
A.T. Coombes Associates Ltd
04 December 2025

Appendix 6: Timetable for Tree Protection Works at Cardiff Park and Ride East, Cardiff

Item	Operation *	Before Commencing Construction Works	During Construction Works	On Completion
1.	Carry out a pre-commencement site meeting to discuss any tree protection matters arising.	X		
2.	Carry out tree work as detailed in Appendix 1, and any tree felling as set out in the AIA. A check for habitat suitable for supporting dormice by the named ecologist and / or accredited agent must be carried ahead of any tree work commencing, in accordance with the dormouse EPSL and associated Habitat Management Plan (HMP)	X		
3.	Erect temporary protective fencing (thick green and magenta line) on edge of the CEZ as specified in the AMS and TPP and put temporary ground protection in place (Orange Hatching).	X		
4.	Erect warning signs on fencing around each CEZ stating “Construction Exclusion Zone - Keep Out.”	X		
5.	Construction and Installation of special foundations for Dormouse Bridges		X	
6.	Maintain Protective fences and signs in good condition.		X	
7.	Arboricultural supervision and advice including site visits during the course of the works to check the CEZ and liaison with the Local Authority.	X	X	X
8.	Remove protective fencing.			X
9.	Check condition of the protected trees and consider if remedial works are necessary.			X
10.	Plant replacement trees and implement separate woodland management plan.			X
	** All work to comply with the attached Arboricultural Method Statement and BS5837: 2012 Trees in relation to design, demolition, and construction - Recommendations"*			

APPENDIX 7 - ARBORICULTURAL SITE SUPERVISION FORM

(Audit of Tree Protection Measures)

Site:
Date of visit:
Name of Consulting Arboriculturist:

Circulation List
Main Contractor: Address Contact details
Relevant Sub contactors
Client:
Cardiff City Council Tree Officer
Cardiff City Council Planning Officer
Natural Resources Wales:
Ecological Clerk of Works:

Findings	**Satisfactory Yes/No**	**Remedial Work Needed Yes/No**	**Missing Yes/No**
Temporary Fencing			
In place			
Supports			
Couplings			
Blocks			
Scaffold Pole Framework			
Notices			
Temporary Ground Protection			
In Place			
Compressive layer			
Boards			
Scaffold Framework			
Appropriate for loading			
Condition of retained trees			
Physical damage			
Foliage			
Branch structure			
Vitality			
Roots and root plate			

Details of Remedial Work Needed	For Action by

Prescribed time for completion of Remedial Work:

Date of next Inspection:

Photographs before and after remedial work