



BS5837

**Arboricultural Survey, Implication Assessment and
Tree Protection**

**Land between Villiers Road and Penrhyn Road, Knowsley Business
Park, Knowsley, L34 9HY**

Pembury Developments Limited

09 February 2022

Revision 01

Surveyor	Author	Checked
B Knipe	B Knipe	A Whitworth

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1. Summary

- 1.1 Lowther Forestry Group Ltd has been commissioned by Pembury Developments Ltd to produce an Arboricultural Survey and Arboricultural Implication Assessment (AIA) following guidance of BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. The report is to aid the planning application for the construction of an industrial / warehouse building with associated infrastructure.
- 1.2 The report aims to give a balanced judgement of the trees, their protection prior to the development phase and future management.
- 1.3 The survey area is currently a vacant plot of land measuring approximately 2.3ha located in an industrial estate between Penrhyn Road and Villiers Road in Knowsley.
- 1.4 This is for development comprising the erection of a new building for Class E (industrial), B2 general industrial and B8 storage/distribution including ancillary offices, landscaping, yards, access points off Villiers Road, car & cycle parking & associated engineering works.
- 1.5 construct a distribution centre occupying the centre of the site, with parking on the west side of the building and a larger service area for goods vehicles on the east side of the building. Areas of trees and landscaping are proposed around the perimeter of the site.
- 1.6 The survey identified and recorded seven groups prior to the design or development of the site. The trees have been divided into the following four quality categories:
 - Category A = 0 trees
 - Category B = 2 groups
 - Category C = 2 groups
 - Category U = 3 groups
- 1.7 Irrespective of development, two Category-U groups require felling for safety.
- 1.8 To facilitate development, three additional lower-quality tree groups require removal. The two Category-B groups with higher amenity value are to be retained and require works to facilitate construction and improve their long-term quality.
- 1.9 An Arboricultural Method Statement is included in this report (Appendix 7) to protect the Category-B retained trees from damage during the construction phase.
- 1.10 Any tree works undertaken should conform to BS 3998: 2010 *Recommendations for Tree Works*.
- 1.11 Root Protection Areas can be seen in Drawing D01: Tree Constraints Plan (F476-01-D01). The proposed development can be seen in Drawing D02: Arboricultural Implication Assessment (F476-01-D02).
- 1.12 Details relating to individual trees can be seen in Appendix 1, Tree Survey Data Table.

2. Introduction

- 2.1 Lowther Forestry Group Ltd has been commissioned by Pembury Developments Ltd to produce an Arboricultural Survey and Arboricultural Implication Assessment (AIA) following guidance of BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. The report is to aid the planning application for the construction of an industrial / warehouse building with associated infrastructure.

3. The Brief and Requirements

- 3.1 A plan to a scale and level of accuracy appropriate to the proposal that shows the position, crown spread and root protection area (RPA) of every retained tree on site.
- 3.2 A schedule of tree works for all the retained trees in 3.1 above, specifying pruning and other remedial or preventative work; whether for physiological, hazard abatement, aesthetic, or operational reasons. All works shall be carried out in accordance with BS 3998: 2010 *Recommendations for Tree Work*.
- 3.3 Identify tree works that would be required for the proposed development to take place.

4. The Report

- 4.1 The report aims to give a balanced judgement of the trees, their protection prior to the development phase and future management.
- 4.2 The report will clearly identify the tree locations, their crown spread, and the extent of the root protection area (RPA) required at all stages of development.

5. Scope and Report Limitations

- 5.1 This is not a tree safety survey and therefore does not evaluate trees with regards to their likelihood to cause death or bodily injury to any person or damage to property. Any clear and identifiable hazards are highlighted with recommendations. There may, however, be hidden defects or defects which are not identified due to weather conditions or foliage for which Lowther Forestry Group Ltd cannot be held responsible. The survey produces a picture of those trees surveyed as on the date when the survey was undertaken. It is quite possible for hazards to have developed since that time.
- 5.2 This report confines itself to the silvicultural and arboricultural aspects of the trees and does not address any ecological or engineering aspects or anything in relation to soils for which other specialists' advice may be sought.

6. Documents Provided

- 6.1 The topographical plan (42584_T REV 0) and proposed development drawing (6982 - 005 Preliminary Site Layout Plan) were provided prior to the tree survey. An updated topographical plan with individual trees plotted (42584_T_REV_1) was later provided.

7. The Site

- 7.1 The site is land between Villiers Road and Penrhyn Road in Knowsley Business Park, Knowsley, L34 9HY. The site is currently a vacant plot of land measuring approximately 2.3ha located in an industrial estate between Penrhyn Road and Villiers Road.
- 7.2 Established trees are present around the western perimeter of the site and were planted at regular spacings in four rows parallel to the boundary fence. Individual trees within these groups have since died giving variation in the current spacing. Young tree regeneration is present throughout the remaining parts of the open site and includes a section of coppice near the western end.
- 7.3 Land-use surrounding the survey area includes a commercial industrial estate with associated infrastructure such as large buildings, car parks and access roads.

8. Legal Restrictions

- 8.1 Trees in any location may be protected by legislation. Where development is proposed, additional legal protection may be appropriate and can be enforced by the local authority. Attention is drawn to legal controls and liabilities under common law for consideration at the earliest stages of potential site development.
- 8.2 A check on the Knowsley Council interactive map (accessed 31.01.22) suggested that the site is not within a Conservation Area and does not contain trees with Tree Preservation Orders.
- 8.3 Substantial penalties and/or prison sentences can be incurred for contravention of legislation relating to protected species. Lowther Forestry Group Ltd has not been requested to make any checks for protected species on this site. Further legal considerations can be found in Appendix 4.

9. Proposed Development

- 9.1 It is proposed that the development will comprise of the erection of a new building for Class E (industrial), B2 general industrial and B8 storage/distribution including ancillary offices, landscaping, yards, access points off Villiers Road, car parking, cycle parking and associated engineering works.
- 9.2 The existing gateway into the site on the southern boundary will be replaced by a vehicle entrance to the car park near the southwestern corner and a larger entrance for goods vehicles on the eastern boundary.

10. Survey

- 10.1 The survey was carried out in accordance with BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. A glossary of arboricultural terms used in this report can be found in Appendix 2.
- 10.2 The surveyor was Ben Knipe, Contracts Supervisor, Lowther Forestry Group Ltd. Surveyor qualifications can be found in Appendix 3.
- 10.3 The trees have been categorised in accordance with the cascade chart in Table 1 of BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*, page 9. The survey methodology can be seen in Appendix 5, Survey Methodology.
- 10.4 The survey identified and recorded seven groups prior to the design or development of the site. The trees have been divided into the following four categories and are as follows:
- Category A = 0 trees
 - Category B = 2 groups
 - Category C = 2 groups
 - Category U = 3 groups
- 10.5 Table 1, Tree Quality Assessment Table shows the trees on site categorised following guidance from BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*.

Table 1. Tree Quality Assessment Table

Category	1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values including conservation
A			
B		G2, G4	
C		G1, G3	
U	G1b, G5, G5b		

A, B, C and U indicate the contribution in years the tree will potentially live for. 40+ years = **A**, 20 to 40 years = **B**, 10 to 20 years = **C**, less than 10 years = **U**

- 10.6 Category-A trees are those of high quality and value, with an estimated remaining life expectancy of at least 40 years. No Category-A trees are within the survey area.
- 10.7 The Category-B trees those are of moderate quality and value with an estimated remaining life expectancy of at least 20 years. The two groups in this category are composed of semi-

mature Scot's pine. The trees in these groups have a generally higher collective rating than as individual specimens due to competition and suppression, however some open grown trees are present which still qualify as Category-B.

- 10.8 The Category-C trees are those trees of low quality and value with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm. Two groups have been recorded as Category-C due to poor form of the dominant trees and small diameter of the understorey trees. These groups are located on the southern and western boundary of the site. As individuals, the mature white poplar in these groups are likely to be classed as Category-U due to signs of past instability and weak branch junctions, however the understorey layer of wild cherry, hawthorn, alder and birch help to qualify these groups as Category-C.
- 10.9 The Category-U trees are trees which are unsuitable for retention and cannot realistically be retained as living trees for longer than 10 years. One group and two sub-groups are Category-U due to recent storm damage, unstable root plates and past signs of instability. White poplar are dominant in these groups and have outgrown their positions. These trees have a short safe useful life expectancy and irrespective of development are recommended to be removed.



Figure 1. Looking northeast through Group 4.

11. Arboricultural Implication Assessment

11.1 Any arboricultural recommendations for the trees aim to promote health, growth, and retention of suitable specimens within the development. Recommendations may also aim to reduce the potential risk of harm to users of the site, by identifying significant defects within the trees.

11.2 Table 2 (below) Arboricultural Implication Assessment Table identifies trees to be retained and managed within the proposed development.

Table 2. Arboricultural Implication Assessment

Arboricultural Implication Assessment Table					
		Category A	Category B	Category C	Category U
Recommendations Irrespective of Development:	Fell for safety				G1b, G5b
Recommendations to Facilitate Development:	Fell			G1, G3	G5
	Retain and thin		G2, G4		

11.3 Irrespective of development it is recommended to fell Group 1b and Group 5b on the grounds of safety. The dominant white poplar in these sub-groups have outgrown their positions and become susceptible to wind throw. Recent storm damage has taken place to seven trees identified as Group 5b, which have been uprooted or destabilised. The shallow soil and elevated water table seen in Group 5b confirms that these trees have a short safe useful life expectancy. A cluster of three trees recorded as Group 1b have signs of past root heave and are at risk of further movement.

11.4 To facilitate development, three additional groups require removal. Group 1, Group 3 and Group 5 are proposed to be removed to allow sufficient space to make the development viable. The white poplar as individuals in these groups have a short safe useful life expectancy and will become more liable to storm damage as they age.

11.5 Two groups are proposed to be retained along with arboricultural works to improve their condition. Group 2 and Group 4 contain approximately 20 and 35 Scot's pine trees respectively with a small amount of understorey growth where sufficient light is available. The close spacing has resulted in suppressed trees in both groups with slender stems and narrow crowns. However, trees near to open spaces have better developed crowns. To improve the long-term quality of these groups it is recommended that they are thinned in numbers by 25% and 50% respectively which equals the removal of approximately 23 of the weaker, suppressed trees in total. However, the amount of canopy cover will not change

significantly from the thinning operation alone and will improve the long-term health and stability of the retained trees.

- 11.6 To facilitate development, an additional four trees require removal from Group 2 and an additional ten trees from Group 4. This will allow the construction of a landscaped embankment around the car park which is required due to changes in levels. The depth of the fill and the risk of damage during construction meant that retention of these trees within the embankment is impractical. Following development, twelve Scots pine will remain in Group 2 and thirteen in Group 4.
- 11.7 The lower levels of the embankment will encroach the RPA of three retained trees in Group 2 by a very small percentage, and the RPA of four trees in Group 4 by no more than an estimated 20%. The 1:3 rising of the slope out of the RPAs and away from the retained trees, results in the soil depth not becoming critical until the edge of the RPA is reached. Therefore, provided that care is taken when constructing the embankment, the changes in levels should not have a detrimental effect on the long-term health of the retained trees.
- 11.8 The pruning of low, subordinate branches may be required for edge trees facing the development in Group 2 and Group 4, to allow safe access for operatives along the base of the embankment during its formation. A height clearance of approximately 2.5m is recommended and pruning works are to follow BS 3998: 2010 *Recommendations for Tree Work*.
- 11.9 Should the plans or methods change, then revised works will need to be approved by Knowsley Council and the supervising arboriculturalist consulted. Details of tree works can be seen in Appendix 1, Tree Survey Data Table.



Figure 2 (above left). An example of wind-throw in Group 5a because of shallow roots and an elevated water table.

Figure 3 (above right). Looking northwest at Group 5, with the wind-throw visible beyond the cabin.

12. Tree Protection Arboricultural Recommendations

- 12.1 A pre-commencement meeting attended by the supervising arboriculturist, and site manager is recommended before any works are undertaken. A copy of the Arboricultural Method Statements and drawings should be retained on site.
- 12.2 The RPA of each tree and group and the location of the proposed development can be seen on Drawing 02, Proposed Development Plan (F476-01-D02). The RPA radius is the minimum distance the Construction Exclusion Zone (CEZ) and any protective barriers would ideally be from the centre of the individual tree where ground compaction is possible.
- 12.3 In the case of this development, CEZ fencing is recommended around Group 2 and Group 4 once thinning and tree felling operations are complete, and prior to development activities. It is recommended that the design of the CEZ fences will ensure that the crowns and RPA of retained trees are protected from damage and ground compaction during the construction phase, but can be adjusted when required to access ground for the formation of the car park embankment.
- 12.4 The CEZ fences are to be placed initially around the outside of the retained group RPAs and canopies (approximately 4m away from the tree stems), then realigned only when required to provide access to the footprint of the embankment. This will partially expose the RPA of edge trees but will allow the formation of the embankment to begin. Careful working procedures are required for this phase of the development, therefore an Arboricultural Method Statement (AMS) has been written and can be found in Appendix 7.
- 12.5 The laying of services is not proposed to take place within the RPA of the retained trees and no excavations are required in or adjacent to the RPAs.
- 12.6 An existing security fence surrounds the site and is proposed to be removed. To protect the retained trees during this operation, it is recommended that works take place where practical from hard surfaces and that machinery is placed on ground protection if sited within the RPA. Dismantled materials are not to be stored within the RPA of the two retained groups.

13. Biodiversity Opportunities

- 13.1 There is scope for small scale retention and enhancement of tree-associated habitats within this development.
- 13.2 Small diameter dead trees are within the Scots pine groups. Where possible these can be retained where their eventual collapse will not pose a hazard to the public. Timber produced from tree felling can be placed in neat stacks under the canopy of the groups and under the canopy dripline for habitat variety. However, the possibility of unwanted removal of timber by third parties should be considered. Alternatively, proposed tree felling within the groups can leave high stumps to provide succession of deadwood habitat.
- 13.3 Enhancement of ground flora under the Scots pine will also provide a biodiversity niche. At present there is limited floristic diversity however following thinning works, the seeding of shade-tolerant wildflowers will add wildlife value to the site.

Appendix 1 Tree Data Table

Tree Data Table - Arboricultural Survey BS 5837: 2012 - F476-01																	 LOWTHER			
Client: Pembury Developments Limited					Location: Knowsley					Surveyor: Ben Knipe										
Site: Penrhyn Road					Survey Date: 13.01.22					Weather: Dry and bright										
					Crown Spreads				Condition											
Tree No.	Botanical Name	Common Name	Ht (M)	N	E	S	W	Mean Diameter @ 1.5m (mm)	No of stems	Age class	Physiological	Structural	SULE	BS5837 Categorization	Hazards	Comments and Defects	Preliminary Arboricultural Recommendations	Recommendations to Facilitate Development	Root Protection Area m²	Root Protection Radius
G1	<i>Populus alba</i> , <i>Prunus avium</i> , <i>Crataegus monogyna</i> , <i>Betula pendula</i>	White Poplar, Wild Cherry, Hawthorn, Silver birch	16	5	5	5	5	260	~150	SM	F	F	10	C 2	N	White poplar are the dominant species with approximately 50 trees in the group which are outgrowing their position. Past root heave is present leading to trees leaning into and out of the site. Poor branch junctions can also be seen. Wild cherry and hawthorn are present as an understorey with few larger silver birch.	Fell all of the mature white poplar due to short SULE.	Fell group. Replace with landscaping appropriate for the site and space available.	30.59	3.12
G1b	<i>Populus alba</i>	White poplar	18	6	6	6	6	220	3	SM	F	P	5	U	Y	A sub-group of three trees within Group 1 which have suffered significant root heave in the recent past. The trees are leaning over the boundary fence and are weighted towards the highway.	Fell group on safety grounds.	Fell group	21.90	2.64
G2	<i>Pinus sylvestris</i> , <i>Crataegus monogyna</i> , <i>Alnus glutinosa</i>	Scots Pine, Hawthorn, Alder	16	4	4	4	4	280	21	SM	G	F	20	B 2	N	A small group on the south east corner of the site. The trees are healthy with mixed spacing leading to five suppressed trees. Hawthorn and alder are present in small numbers as an understorey.	Thin by 25% - fell 6-7 suppressed trees	Fell 4 Trees to facilitate development & Thin by 25% to remove 6-7 suppressed trees.	35.47	3.36
G3	<i>Populus alba</i> , <i>Prunus avium</i> .	White Poplar, Wild Cherry.	18	5	5	5	5	230	~40	SM	F	F	10	C 2	N	This group is on the western side of the site. An open canopy layer present with white poplar being dominant. These are outgrowing their position with signs of past root heave. An understorey of cherry and hawthorn is present.	Remove all white poplar (approximately 25 trees).	Fell group. Replace with plants appropriate for the site and space available.	23.93	2.76
G4	<i>Pinus sylvestris</i>	Scots Pine	16	2	2	2	2	260	35	SM	G	F	20	B 2	N	This is a dense stand of healthy trees on the north west corner of the site. Understorey growth is mostly absent. The trees have a mixed density leading to approximately half of the trees being suppressed with narrow crowns. No signs of storm damage can be seen.	Thin by approximately 50% (12-15 trees) to remove the suppressed trees.	Fell 10 trees to facilitate development & Thin by approximately 50% to remove 12-15 suppressed trees.	30.59	3.12
G5	<i>Populus alba</i> , <i>Prunus avium</i> , <i>Alnus glutinosa</i> .	White Poplar, Wild Cherry, Common Alder.	18	3	3	3	3	200	~30	SM	F	F	5	U	N	A poor quality group located on the northern boundary. Waterlogged ground is present leading to past and recent root heave and wind throw. White poplar are the dominant species in this group and have outgrown their position. An understorey of alder and wild cherry is present.	Fell all of the white poplar due to short SULE.	Fell group	18.10	2.40
G5b	<i>Populus alba</i>	White poplar	16	5	5	5	5	200	7	SM	F	P	5	U	Y	A sub-group of seven trees within Group 5 with storm damage leading to wind throw and tilted root plates. The root systems are poorly developed due to shallow soil and a high water table. The surrounding trees are now exposed to the wind.	Fell group on safety grounds.	Fell group	18.10	2.40

Key			
Tree No:-	Number given to the individual tree or group.		
Crown Spreads:-	Distance in meters from the stem of the tree to the edge of the canopy in the four cardinal directions.		
1st Branch:-	First significant branch height and direction of growth i.e., North, South, East or West.		
Crown Clearance:	Height above ground level to the canopy		
Diameter:-	Diameter of the trunk at 1.5 m above adjacent ground level. (mm)		
No of Stems:-	No of stems per tree below 1.5 m above adjacent ground levels.		
Hazards:-	Y = Hazards are present, N = No hazards present.		
Physiological / Structural Condition:-	G = Good, F = Fair, P = Poor, D = Dead		
SULE = Safe Useful Life Expectancy (years).	40+ = A, 20 to 40 = B, 10 - 20 = C, less than 10 years = U		
BS5837 categorization:-	1 = Arboricultural values	2 = Landscape values	3 = Conservation and cultural values
	1, 2 or 3 plus the SULE = BS5837 category		
Age Class:-	Y = Young, recently planted with no viable seed production. EM = Early Mature, apical dominance with growth to normal crown dimensions for species and height. M = Mature, normal life expectancy with normal crown size for species and type and maximum seed production. OM = Over-Mature, past normal life expectancy and in natural decline. V = Veteran and A = Ancient, both (A and V) are as defined by Natural England.		
Tree number followed by #	Tree, Group or Woodland with no access therefore dimensions are approximate.		

Appendix 2 Glossary of Arboricultural Terms

<i>Term</i>	<i>Description</i>
Tree Number	Reference number, or tag number
Botanical Name	Scientific name
Common Name	Common Name
Height	Height in metres from ground level
Crown Clearance	Height in metres of crown clearance above adjacent ground level (to inform on ground clearance, crown stem ratio and shading.
Crown Spread	Distance from the stem to the crown edge. Usually specified as a single average distance or as four separate measurements for north, south, east, and west.
Stem Diameter (DBH)	(Diameter at breast height) Stem diameter in millimetres at 1.5m above adjacent ground level (on sloping ground to be taken on the upslope side of the tree base) or immediately above the root flare for multi-stemmed trees.
Physiological Condition	e.g., good, fair, poor, dead
Structural Condition	e.g., collapsing, the presence of any decay and physical defect.
SULE	Safe Useful Life Expectancy, stated in years.
BS5837 grading	A to C or U quality category grading
Hazards	Defects present on a tree considered to elevate the risk of harm
Bat Potential	The potential for the tree to be used by bats
Recommendations	Preliminary management recommendations, including further investigation of suspected defects that require more detailed assessment and potential for wildlife habitat.
RPA	Root Protection Area
CEZ	Construction Exclusion Zone

Appendix 3 Surveyor Qualifications

LOWTHER FORESTRY GROUP LTD
PROFESSIONAL CURRICULUM VITAE

Name	Ben Knipe
Position in Company	Contracts Supervisor
Professional Qualifications	BA (Hons) Environmental Management degree Professional Tree Safety Inspection qualification QTRA, Quantified Tree Risk Assessment IOSH Managing Safely
Professional Experience	
2015-Present	Lowther Forestry Group Ltd
2012-2015	National Trust, Woodland Ranger, Central & East Lakes
2007-2012	Area Ranger, National Trust, Windermere & Troutbeck
2011-2012	Head Warden, National Trust, Lyme Park
2003-2007	Warden, South Peak Estate
2000-2003	National Trust Warden (Staffs) & Patrol Ranger (Macclesfield Forest) Peak District National Park
Other Qualifications & Training Courses	Applied Tree Biology – Arboricultural Association (AA)
	AA Surveying and Categorising Trees for BS:5837
	AA Introduction to Soils
	Pesticides- PA1, PA6
	C.A.T. Locator & Genny
	Brushcutters & Trimmers
	Off-road Driving (NPTC)
	Manual Handling Level 2 for Managers
	CSCS for Managers and SSSTS
	Peak District National Park Ranger Training

Appendix 4 Legal Restrictions

Trees in any location may be protected by legislation. Where development is proposed, additional legal protection may be appropriate and can be enforced by the local authority. Attention is drawn to legal controls and liabilities under common law for consideration at the earliest stages of potential site development.

The Town and Country Planning Act 1990 requires that, except in certain circumstances, “no work shall be carried out which will affect trees over a certain size which are situated in Conservation Areas”. Six weeks’ notice of intent must be given to the local authority before the work is carried out. This provides an opportunity for the local authority to make a Tree Preservation Order (TPO) under this Act to protect the trees.

Tree Preservation Orders allow for trees to be protected either as individuals, groups, areas, or woodlands. The orders have the effect of preventing the cutting down, topping, lopping, uprooting, wilful damage, or wilful destruction of trees, except in certain circumstances, other than with consent of the local authority.

Even when no specific legal protection exists, it may be necessary to obtain a felling licence. These apply if the volume of timber exceeds specified amounts; site clearance, even of small areas, before detailed planning permission has been granted could exceed the felling licence quota. The Forestry Commission, under the Forestry Act 1967, administers felling licences.

Before carrying out any arboricultural or forestry operations, consideration should be given to the following legislation for protected species of flora and fauna: The Wildlife and Countryside Act 1981 (as amended), the Conservation (Natural Habitats & c.) Regulations 1994 (as amended), and the Countryside Rights of Way Act 2000 protected species of flora and fauna. This will prevent any harm or damage to protected species.

Substantial penalties and or prison sentences can be incurred for contravention of legislation relating to protected species.

Lowther Forestry Group Ltd has not been requested to make any checks for protected species on this site.

Appendix 5 Survey Methodology

The survey was carried out in accordance with BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. A glossary of arboricultural terms used in this report can be found in Appendix 2.

All recommendations of tree works should be carried out to BS 3998: 2010 *Recommendations for Tree Work*.

Tree categorisation is the method by which a value is placed on an individual tree using the method described in BS 5837: 2012. The method considers the Safe Useful Life Expectancy (SULE) which is measured in numbers of years. Trees of greater than 40 years = A, The Category A trees are of high quality with an estimated remaining life expectancy of 40 years. A minimum of 20 years = B, The category B trees are of moderate quality and value with an estimated remaining life expectancy of at least 20 years. A minimum of 10 years = C, The category C trees are 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.

Once this is established a trees contextual attributes are determined and come under the following three headings.

- Mainly Arboricultural values.
- Mainly Landscape values.
- Mainly cultural values, including conservation.

Category U trees are those in such a condition that any existing value would be lost within 10 years, and which should, in the current context, be removed for reasons of sound arboricultural management.

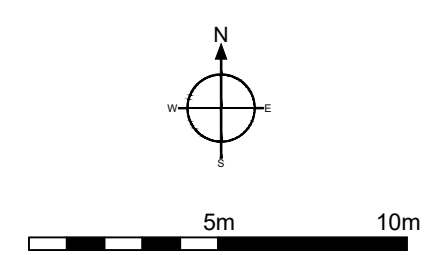
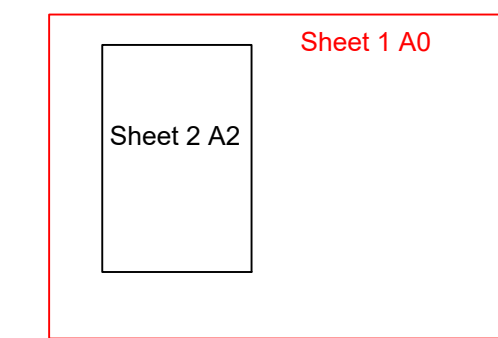
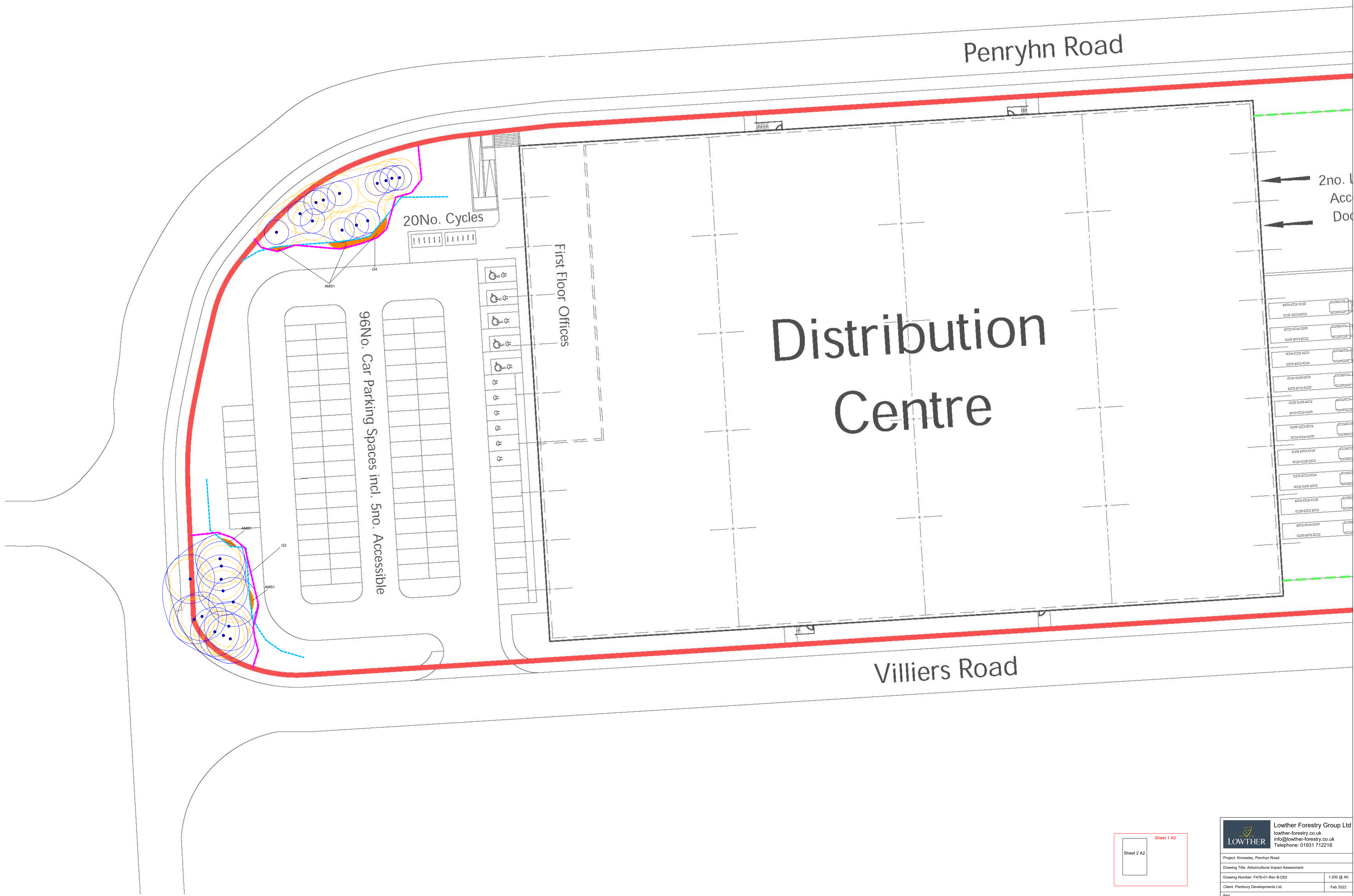
A single tree can come under one or more of these headings and can therefore be found twice in the quality assessment table. This does not give the tree a higher value than one with a single value in the same table.

The trees have been categorised in accordance with the cascade chart in Table 1 of BS 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*, page 9.

Where access to the tree trunk is restricted, the diameter is approximate. This is highlighted in by a hash mark (#) in the tree data table.

All measuring equipment is regularly checked, replaced and calibrated where required to ensure accuracy.

Appendix 6 Survey Area and Drawings

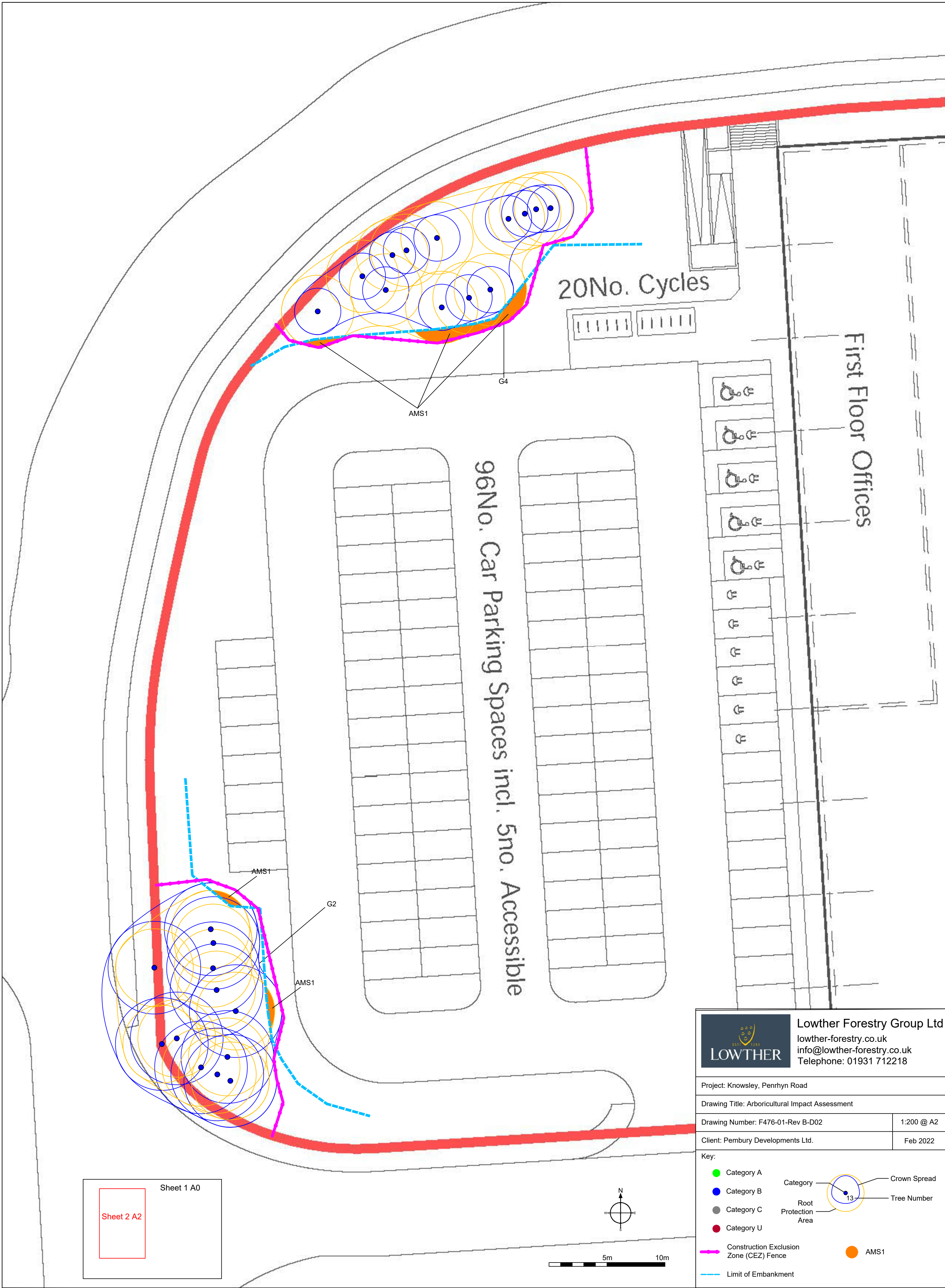


Lowther Forestry Group Ltd
 lowther-forestry.co.uk
 info@lowther-forestry.co.uk
 Telephone: 01931 712218

Project: Knowsley, Penryn Road
 Drawing Title: Arboricultural Impact Assessment
 Drawing Number: F476-01-Rev B-D02
 Client: Pembury Developments Ltd.
 1:200 @ A0
 Feb 2022

Key:

- Category A
- Category B
- Category C
- Category U
- Contribution Exclusion Zone (CEZ) Fence
- Limit of Embankment
- Category
- Crown Spread
- Tree Number
- AMS1



Sheet 1 A0

Sheet 2 A2



Lowther Forestry Group Ltd
lowther-forestry.co.uk
info@lowther-forestry.co.uk
Telephone: 01931 712218

Project: Knowsley, Penrhyn Road	
Drawing Title: Arboricultural Impact Assessment	
Drawing Number: F476-01-Rev B-D02	1:200 @ A2
Client: Pembury Developments Ltd.	Feb 2022

Key:

● Category A

● Category B

● Category C

● Category U

— Construction Exclusion Zone (CEZ) Fence

— Limit of Embankment

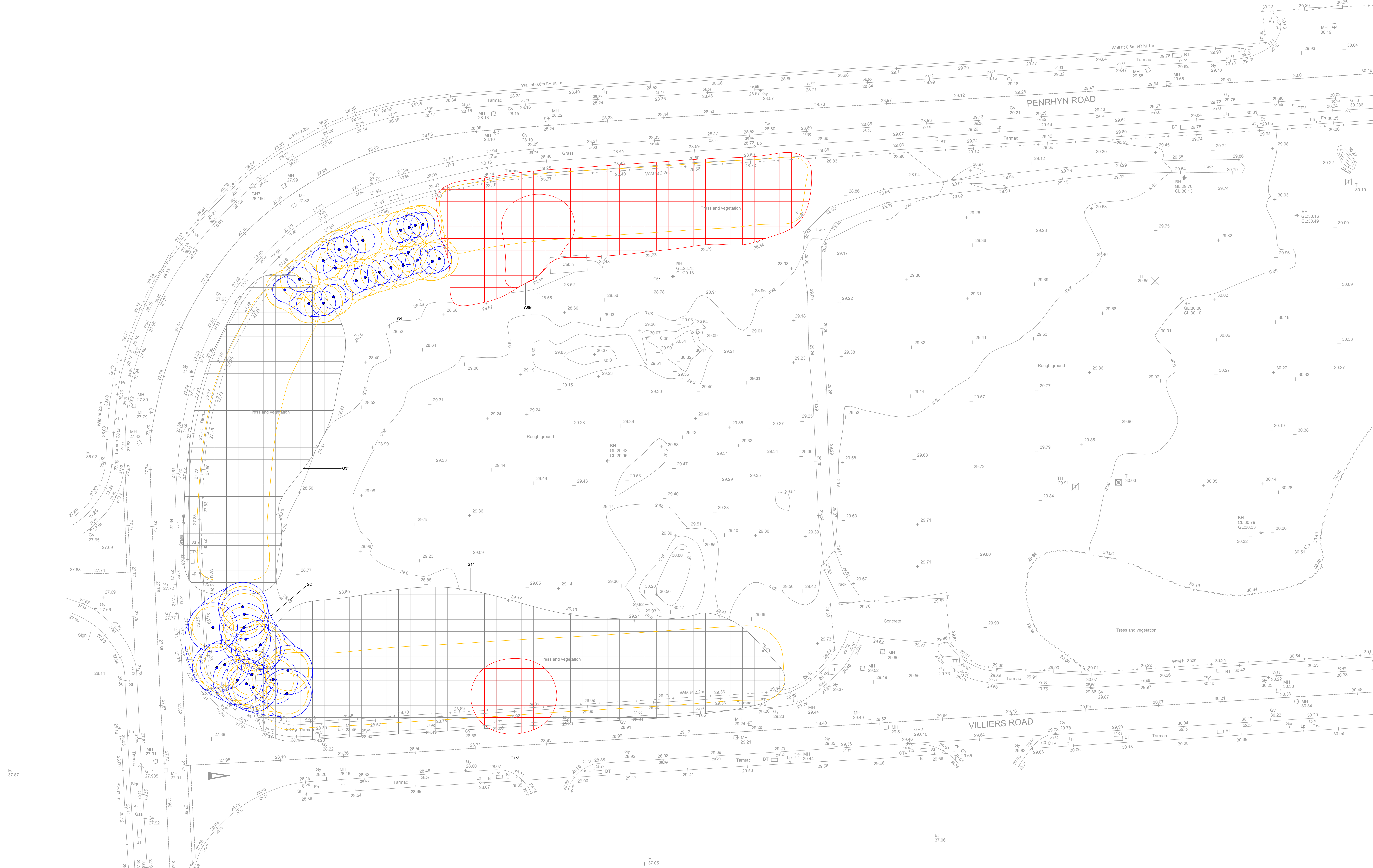
Category

Root Protection Area

13

Tree Number

● AMS1





Lowther Forestry Group Ltd
lowther-forestry.co.uk
info@lowther-forestry.co.uk
Telephone: 01931 712218

Project: Knowsley, Penrhyn Road

Drawing Title: Tree Constraints Plan

Drawing Number: F476-01-Rev A-001

Client: Pembury Developments Ltd.

1:200 @ A0

Feb 2022

Key:

● Category A

● Category B

● Category C

● Category U

Category

●

Crown Spread

●

Tree Number

●

Root Protection Area

NOTE: Tree/group numbers marked with an * have approximate locations.

Appendix 7 Arboricultural Method Statement 1 (AMS1) – Development works within the RPA of trees in Group 2 and Group 4

The purpose of this Arboricultural Method Statement is to protect the roots of edge trees in Group 2 and Group 4 during the formation of a graded embankment around the car park due to changes in ground levels required for the development.

The embankment formation will be located within the outer RPA edge of three trees in Group 2, and in approximately 20% of the RPA for four trees in Group 4, as shown by AMS1 area on drawing D02. In Group 4, the toe of the embankment will start approximately 1m from the stems of edge trees. The embankment will rise at a rate of 1:3 away from the stems and out of the RPA.

Without precautions, shallow roots in the AMS1 are at risk of compaction and contamination. With suitable planning and careful working procedures physical damage to retained trees can be avoided, therefore the following recommendations are to be followed:

- Carry out tree removal prior to development using lightweight machinery around the retained trees.
- Install CEZ fences following tree removal and prior to development.
- Adjust CEZ fences to allow the formation of the embankment only when required next to the retained trees.
- Once the edges of the RPA are exposed from the CEZ, do not stock-pile materials or site plant and machinery inside the RPA.
- Move embankment fill materials into the RPA by using extendable booms.
- Light compaction of imported fill can take place without the use of vibrating machinery within the RPA.
- Avoid pedestrian movement over the graded embankment until it has become vegetated.
- It is recommended to communicate this information and the importance of tree protection during site inductions.