Carlton Road, Barnsley

Arboricultural Impact Assessment and Arboricultural Method Statement

Keepmoat Homes Ltd

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Executive Summary

On behalf of Keepmoat Homes Ltd (the Client), Ecus Ltd. has carried out an Arboricultural Impact Assessment and Method Statement to BS 5837 (2012) "*Trees In Relation To Design, Demolition And Construction- Recommendations",* following a Tree Survey Report carried out by Ecus Ltd in July 2017 for the site at Carlton Road, Barnsley. This survey has formed the basis of an assessment of the impact development proposals may have on existing trees and any methodologies to be adopted to protect any retained trees.

The survey records all trees within the site and all those which may be affected by any development proposals within the site boundary, recording a number of parameters including species, crown spread and Root Protection Area (RPA).

Throughout this report 'RPA' is used to refer to 'Root Protection Area'. The RPA of any given tree is the area of ground around that tree which should not be disturbed by excavation, compaction, changes in level or other construction/demolition operations. The extent of the RPA is calculated in accordance with BS5837 (2012), and is an important part of the methodologies described in this report.

The Client proposes construction of 93 housing units, with associated hard and soft landscaping. This will require the removal of 13 trees, two tree groups and part of one group. There may also be an impact on above and below ground parts of retained trees, unless adequate protection of these trees is provided.

This report details the arboricultural impact and offers a range of protection measures that should be put in place prior to works starting on site as well as construction methodologies which should be adopted. These measures as described in detail in Chapter 5 will prevent accidental damage and other adverse affects on the health of retained trees and cover:

- Access facilitation pruning.
- Protective fencing.
- Installation of utilities and services within RPA.
- Construction within RPA
  Fencing, street furniture, level changes, surfacing.
- Level changes within RPA.
- Soft landscaping and planting within RPA.

This report also makes further recommendations for any measures to mitigate or compensate the loss of trees within the site and the likely impact on the site and the local landscape. These include:

- Replacement tree planting to compensate the loss of trees.
- The preparation of a Landscape Management Plan to ensure the continued monitoring of retained trees and the establishment of newly planted trees and shrubs.

For ready reference, the Figure 1 (Appendix 3) is a simplified version of the 'Design and Construction Process and Tree Care' table outlined in BS5837:2012. The table clearly identifies processes and obligations expected at the various stages of the construction project. BS:5837 is considered an iterative process and as such the project Arboriculturalist's advice should be ongoing.

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1. Introduction

1.1 Context of this document in the Planning System

1.1.1 Ecus Ltd was commissioned by Keepmoat Homes Ltd to assess the arboricultural impact and produce an arboricultural method statement, to accompany development proposals at the site at Carlton Road, Barnsley. The site location is shown on Figure 2.1 (Appendix 2).

1.1.2 This report is based upon data obtained by Ecus in July 2017, collected as part of a Tree Survey in accordance with BS 5837 (2012) "*Trees In Relation To Design, Demolition And Construction- Recommendations*". This report analyses the potential impact of the development on trees and provides recommendations for tree protection during the construction process. It is recommended that Ecus report ref 10112 Carlton Road, Barnsley, *BS 5837 (2012) Tree Survey* is to be read in conjunction with this report.

1.2 Tree Designations

1.2.1 The survey included identification of any existing designations affecting trees on site such as Tree Preservation Orders and Conservation Area status by checking the map information available on Barnsley Metropolitan Borough Council website www.barnsley.gov.uk/services/parks-and-open-spaces/tree-preservation-orders.

1.2.2 This check confirmed that there are no Tree Preservation Orders (TPO) on any of the trees surveyed. The site is not within a Conservation Area.

2. Arboricultural Impact Assessment (AIA)

2.1 Development Proposals

2.1.1 An Arboricultural Impact Assessment of the proposed site plan has been undertaken to assess the likely impact of the development on existing trees and tree groups. This assessment is based on the development plan provided by Keepmoat Homes Ltd (ref. Sten Architecture, drawing number 1931.01). The results can be found in the Tree Schedule (Table 2.1, Appendix 1).

2.1.2 The client proposes construction of 93 housing units with associated garages, roadways and hard and soft landscaping.

2.1.3 Construction will be of standard materials and methods and completed in one phase.

2.2 Arboricultural Impact Assessment

Direct Impact from Development

2.2.1 The development plan indicates that 13 trees, two groups and part of one group within the red line site boundary will need to be removed to accommodate the new development, including new buildings, new roads and drives as well as new hard landscape.

2.2.2 All removals are C Category. The grouping of trees T23 – T36 are poor quality trees which have suffered vandalism, in addition to damage from grazing animals, therefore, their loss is of little consequence.

2.2.3 A small section of group G056 must be removed to create the link between the north and south parts of the site. A small amenity woodland group planted densely and never thinned, this group has been given a C Category. The partial loss of this group is of limited consequence and the remaining portion should be thinned to encourage better tree development.

2.2.4 The southernmost groups G067 and G069 are low quality. G067 is a group of sycamore which have suffered vandalism and are not suitable for retention in an urban garden. G069 is a suckering blackthorn mass which is of little merit.

2.2.5 The sales area for the development will require a temporary car park constructing within the RPA of T2 and T3. This will be created using no dig methods, with a porous block paving wearing course. Once the development is complete the temporary car parking will be removed and the ground reinstated. If the methodology contained in the method statement is followed, then an impact on the trees should be short term and insignificant.

Removal of Trees for Amenity and Safety Reasons (T27, T28, T29, T63)

2.2.6 A number of trees on site have been assessed as being “unsuitable for retention”. Unless otherwise agreed with the developer/owner, these trees should be removed to ensure the safety of the site during construction and operation of the development/ improve the amenity spaces within the site.

Summary

2.2.7 A total of 13 C category trees , two C category groups and part of one category c group require removal to facilitate the development, in addition to four trees (T27, T28, T29, T63) recommended for removal due to their poor quality.

2.3 Recommendations

2.3.1 As the development proposals assume the removal of 13 trees, two groups and part of one group growing within the site, no protection measures will be required for those trees.

2.3.2 Chapter 3 Arboricultural Method Statement describes measures to protect the retained trees during the development, and operations within the RPA of retained trees including:

- Access Facilitation Pruning Works.
- Protective fencing.
- Construction/ /change of level within the RPA.
- Installation of power supply services.
- Permanent surfacing in the RPA.
- Excavation for soft landscaping.

2.3.3 It is recommended that replacement tree planting is carried out in the locations indicated in the Ecus landscape plan. The trees should be planted at minimum 12-14 cm heavy standard size. Proposed tree species should be suitable for the spatial constraints posed by their location. Recommended tree species include those listed in the planting schedule of the Ecus landscape plan.

2.3.4 It is recommended that tree planting follows 5-10-20-30 formula (i.e. No more than 5% of any one cultivar, no more than 10% of any one species, no more than 20% of any one genus, and no more than 30% of any one family.) This gives any new tree population maximum resilience against pests and diseases.

2.4 Chalara dieback of ash (Hymenoscyphus fraxineus)

2.4.1 A large number of trees on site are common ash, in various stages of their life cycle.

2.4.2 Chalara dieback of ash, also known as Chalara or ash dieback, is a disease of ash trees caused by a fungus called *Hymenoscyphus fraxineus*. Chalara causes leaf loss, crown dieback and bark lesions in effected trees. Once a tree is infected, the disease is usually fatal, either directly or indirectly, by weakening the tree to the point where it succumbs more readily to attacks by other pests or pathogens, especially *Armillaria* fungi or honey fungus.

2.4.3 It has caused widespread damage to ash populations in continental Europe, where experience indicates that it can kill young ash trees quite quickly, while older trees can resist it for some time, until prolonged exposure or another pest or pathogen attacking them in their weakened state, eventually causes them to succumb.

2.4.4 Chalara is now widespread in Yorkshire. Once established on a site locality it is to be assumed that the majority of the ash trees present on site will be lost, or severely disfigured by the disease.

2.4.5 It is becoming increasingly difficult to assign ash trees a retention category using the BS5837:2012 standards. The general advice from public bodies is to retain ash trees and see how the disease develops within the local population. However, if clear signs of chalara are found on sites, it is highly likely that all the ash trees on that site will succumb in a relatively short period. It would be unreasonable to consider an ash tree a significant constraint to a site, if it is to die within a short period of time.

3. Arboricultural Method Statement (AMS)

3.1 Important Founding Principle of BS5837:2012

3.1.1 The most important and effective process, in terms of preventing damage to trees on a construction site, is the timely erection of tree protection fencing. **This must be erected as the first operation on site**, for example, before access track construction, before Contractors site cabins, and before trenching for service runs.

3.1.2 The founding principle of BS5837:2012 Trees In Relation To Construction is that the protective fencing is erected before any other operation. However, it is noted that the fencing provides a unnecessary and potentially dangerous restriction to essential tree works and therefore tree works can be carried out before fencing is erected.

3.1.3 The following paragraphs are laid out in sequence of chronological order of operations on site.

3.2 General

3.2.1 The Arboricultural Method Statement should be read in conjunction with Figure 4 Tree Protection Plan in Appendix 3. The Arboricultural Method Statement paragraphs below are written in the chronological sequence they are to be carried out:

3.3 Pre-Commencement

3.3.1 It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery on site. The meeting will firstly highlight the potential for damage occurring to tree crowns, but thereafter ensure that extra care is applied when manoeuvring any machinery within close proximity of retained trees to prevent any contact with the tree and consequent damage to crown, stem or roots.

3.3.2 For clarity, prior to any construction or development work proceeding, the alignment of the protective fencing (Section 3.5) and the RPA's of any individual trees to be retained which are not able to be protected by fencing should be marked out using the distances provided in the table within the tree survey report. Marking out should be completed or approved by a person with arboricultural expertise as individual trees will have root zones that may be affected by local conditions and allowances will need to be made to accommodate this. This may be done prior to, or during, the Pre-Commencement Site Meeting.

3.4 Access Facilitation Pruning (G54, G66)

3.4.1 As it is expected necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works and/or traffic on the construction access road, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within, or without, the RPA fencing, it is best advised that appropriate, but limited tree surgery, be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012).

3.4.2 The trees identified in Table 3.1 require pruning to facilitate the development, including the use of outdoor spaces:

Table 3.1: Access facilitation pruning

Tree number	Tree work required	Reason
G54	Select and retain suitable individuals for retention, eastern half of group.	To create working and construction space for new development
G66	Prune back overhanging branches along access road from St Helens Boulevard. Prune back overhang and scrub from the rear of housing plots	To create working space and light for landscape planting. To create space for rear gardens of plot

3.4.3 All tree works should be carried out in accordance with BS 3998 (2010) "*Tree Works-Recommendations*".

3.4.4 The Facilitation Pruning should be carried out on site by a suitably qualified and experienced tree surgeon before construction or demolition operations commence on site. The Facilitation Pruning can run concurrent with operations to erect tree protection fencing as long as this can be co-ordinated such that neither presents a hazard to the other.

3.4.5 Trees on site which are not to be retained can be removed as part of the Facilitation Pruning (or earlier if the appropriate planning consent is confirmed). To avoid mistakes, the individual trees to be removed should be identified and marked by a person with arboricultural expertise.

3.4.6 It is recommended that any trees that require removal or significant canopy works, should be checked in advance of works by an ecologist to ensure there is no possibility of any disturbance to nesting birds or roosting bats.

3.5 Protective Barrier/Tree Protection Fencing

3.5.1 The development design prepared for the site indicates that a large number of trees within the site are being retained. In addition there are several trees off site but within 12m of the site boundary. All these trees need to be protected from all demolition/construction operations by a protective barrier (fencing to BS5837 (2012) which creates a sacrosanct Construction Exclusion Zone (CEZ).

3.5.2 The alignment of the protective barrier is based on the calculated extent of the RPA in accordance with BS5837 (2012). The detailed alignment is shown in Figure 4 Tree Protection Plan in Appendix 3.

3.5.3 In principle, protective fencing should be erected before any construction/demolition operations start on site and should be removed only on completion of all construction/demolition works on site.

3.5.4 The default specification for protective barrier is shown in Figure 3 (Appendix 3). Site hoarding is an acceptable alternative. It may be appropriate on some sites to use temporary site offices as components of the protection barriers, on the understanding that they will remain in situ for the duration of the construction/demolition works and their removal will be planned to ensure the Contractor's co-ordinated withdrawal from site away from the trees rather than towards them.

3.5.5 BS 5837 (2012) clause 6.2.2.3 specifies an alternative protective barrier where site circumstances and associated risk of damage incursion into the RPA do not necessitate the default level of protection. This can include 2m tall welded mesh panels (e.g. Heras

fencing) on rubber or concrete feet to protect from cars, vans, pedestrians and manually operated plant. The alternative specification for the protective barrier should only be used if and where agreed with the Local Planning Authority.

3.5.6 All weather notices should be placed on fencing to indicate that operations are not permitted within the fenced area, for example "CONSTRUCTION EXCLUSION ZONE – NO ACCESS" or similar.

3.5.7 Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor.

3.5.8 The presence of long grass and other vegetation in the 'Construction Exclusion Zone' is a welcome indicator that the protected area has been left undisturbed. However, on occasion, and certainly towards the end of the project, it is acceptable to cut the vegetation by hand held strimmer or scythe taking care not to work within 300 mm of the tree trunk (to avoid damaging the bark). Vegetation within 300 mm of the trunk can be cut with non-mechanised shears.

3.6 Installation Of Power Supply And Services

3.6.1 There are currently no proposals to route services or utilities through the RPA of any retained trees. If this changes at a later stage of the project, proposals should be submitted to the local planning authority Tree Officer for approval.

3.6.2 As guidance only, it is noted here that any underground power supply and services routed through the RPA should be installed in accordance with BS 5837:2012 clause 7.7.2 and NJUG *Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees*.

3.7 Construction within RPA

3.7.1 For no-dig permanent surfacing, see Section 3.8.

Fence Construction Within RPAs

3.7.2 Where fence posts need to be installed within RPAs, excavations should be minimal and carried out using hand held tools. Fence posts should be erected at least 1 m from trees, using metal post support spikes or semi-dry postcrete mixes if installed within the RPA.

3.7.3 The proposed fence alignment should allow for a minimum distance of 500 mm between the tree stems and the fence, providing sufficient room for the future increase of the stem diameter and minimising the risk of potential conflicts between the fence structure and the tree stem.

Changes of Level Within RPAs

3.7.4 Generally, the levels within the RPA or protected area should not be changed. Tree roots are considered to be, in the main, within the top 600 mm of the soil. Obviously, any excavation into this will remove part of the root system and potentially affect the vigour or stability of the tree. Conversely, any additional material built up above ground level will compact the soil beneath it, potentially compacting all the air pores in the 600 mm depth of soil that most roots are in, effectively suffocating the roots and thus affecting the vigour or stability of the tree.

3.7.5 On occasion, additional soil may be gently spread by hand within the RPA/protected area, for example, to marry levels in small areas between raised levels of no-dig

construction and the existing levels. The maximum depth of this would be to 150 mm, reducing to nil. However, it is not generally acceptable, in large areas of the RPA/protected area to raise the level as a blanket. Any areas which will need to be raised are to be agreed Local Planning Authority prior to construction. Specifically there will be no mechanical equipment within the RPA/protected area to spread, compact, or level out soil levels as this would compact the soil.

3.8 Sales Area Temporary Car Park (T2 and T3)

3.8.1 T2 and T3 require protecting with fencing as per section 3.5 until the construction of the sales area houses is complete. Once the plot fences are erected, and work is ready to commence on the temporary parking area, the protective fencing can be set back to the cyan line alignment shown on figure 4.

3.8.2 After scraping off the above soil vegetation layer, a non-woven semi-permeable geotextile such as Terram (or similar approved) will be laid out on top of the existing ground as a separation layer, and subsequently ProtectaWeb will be laid over this, and pegged out in position. ProtectaWeb, as supplied by Wrekin Products Limited (or similar approved) is a three-dimensional Cellular Confinement System (CCS) installed as Ecus Arboricultual Technical Advice Note 4 (See Appendix 3), and infilled as manufacturer's recommendations. Infill material shall be 4-20 mm clean angular stone free from fines and dust, granite or flint in composition, which will interlock and be free draining and allow gaseous exchange. When infilled, this structure will act as the sub-base. Over fill (for example by 25 mm) in accordance with manufacturer's recommendations and proposed use. A separation geotextile should be laid on top of this construction before any final wearing course is installed (unless machine laid bounded surface), or overfill by 40-60 mm to provide the wearing course.

3.8.3 At no point should machinery operate on the unprotected RPA of the trees.

3.8.4 The wearing course should be a permeable surface, allowing gaseous exchange and the infiltration of water into the root zone. In this situation block paving is considered a suitable wearing course.

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

3.8.6 Kerbs and edgings that require excavations should not be used. Where kerbing is required for light structures, above-ground peg and board edging might be acceptable.

3.8.7 Once the car park is constructed, a physical barrier such as a knee rail or a line of sleeps shall be created around the parking bays to prevent accidental trafficking un the unprotected RPA. Once this fencing is in place, the remaining tree protection fencing around T2 and T3 can be removed for aesthetical reasons.

3.8.8 Following completion of construction works, the ground protection should be removed and the ground reinstated without soil disturbance. This will necessitate systematic removal of the various construction layers of the temporary ground protection. Specifically, there should be no disturbance of the underlying ground with mechanical tools. The wearing course/top surface may be removed by mechanical scraping in such a way as to not disturb the cellular confinement system. Thereafter, the removal of the cellular confinement system should be done in systematic sections, within each section, firstly removing the inert granular infill material by hand tools and removing it from site; then unpegging the cellular confinement system and removing that from site.

3.8.9 This process should be planned to ensure that no machinery is required to pass over the unprotected ground/RPA of trees T2 and T3. When all the cellular confinement system has been removed from site, the final stage is to remove the geotextile initially laid on the existing ground.

3.9 Excavations for soft landscaping

3.9.1 Where soft landscaping is proposed within the RPA of retained trees, excavations should be kept to the minimum required to provide adequate conditions for the establishment of new shrubs and trees. Excavations should be carried out carefully and by hand, avoiding the severance of any roots larger than 25 mm diameter.

Soil Improvements and Mulching (T2, T3, T13, T14)

3.9.2 To compensate for root damage and stress caused by construction activities retained trees T13, T14 should be mulched. The materials that may be used for mulching include coarsely divided plant matter, such as wood chip, pulverized bark, or leaf mould, any of which may be combined with well-rotted animal manure. The mulched area should extend over as much of the root system as can be allowed by other site-usage requirements. The depth of an organic mulch should not be so much as to inhibit aeration of the root system or to cause overheating of uncomposted material (normally no more than 80 mm to 100 mm, and not against the tree trunk). The mulch should be periodically replenished as it decomposes, so that it does not become depleted.

4. Tree Management

4.1.1 The following section provides guidance as to how retained trees will best be protected during construction. More detailed guidelines for tree protection during construction are given in *BS5837: Trees In Relation to the Design, Demolition and Construction Recommendations (2012)*.

4.1.2 Any tree roots severed during site clearance works will be wrapped or covered with hessian sheets (wet in summer, dry in winter) as an immediate protection measure against desiccation and rapid temperature changes. This will be removed prior to backfilling which will be carried out as soon as possible. In addition the advice of an arboriculturalist, or the Tree Officer of the local planning authority, will be sought as soon as possible on the potential effect of the root damage on the tree's stability, vitality and legal implications.

4.1.3 All tree works will follow best practice procedures as set out in BS 3998 (2010). All trees will be maintained in good condition on site and be inspected annually (where overall condition requires) or every 2 years and after any major storm events, with safety a priority.

4.1.4 The best practice principles have been broadly summarised below:

- Once areas around trees have been protected by fencing, any works on the remaining site area may be commenced providing activities do not impinge on protected areas.

- Wide or tall loads etc. will not come into contact with retained trees. Banksman will supervise transit of vehicles, jibs, booms etc. where this is in close proximity to retained trees.

- Oil, bitumen, cement or other material that is potentially injurious to trees will not be stacked or discharged within 10 m of a tree bole. No concrete mixing will be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree.

- No fires will be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire.

- Notice boards, telephone cables or other services will not be attached to any part of a retained tree.

- In the event of having caused any branch or limb damage to retained trees, the advice of an arboriculturalist will be sought on what tree surgery should be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, and the best timescale for that tree surgery which will be determined by season, species, gravity of damage and legal status of the tree (Tree Preservation Order/ Conservation Area/nesting birds/roosting bats).

4.1.5 All of the above precautionary measures will be applied to minimise the effect of any damage to long-term tree health and safety.

4.1.6 It is recommended that any trees that require removal or significant canopy works, should be checked in advance of works by an ecologist to ensure there is no possibility of any disturbance to nesting birds or roosting bats.

5. References

Books and Papers

BS 3998:2010 *Tree Work – Recommendations*. ISBN 978 0 580 53777 6

BS 5837:2012 *Trees In Relation To Design, Demolition And Construction – Recommendations*. ISBN 978 0 580 69917 7

Volume 4 NJUG *Guidelines For The Planning, Installation and Maintenance of Utility Apparatus in Proximity To Trees*, Volume 4: Issue 2: 16/11/2007, www.njug.org.uk

Appendix 1 – Tables

Table 2.1 – BS5837 Tree Survey Schedule

Key:	Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
	MS – Multi-stemmed	YNG – Young Mature	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	U – Unsuitable for retention	
	TD - Trunk division (height in metres)	OM – Over mature **Est Yrs –** estimate of years remaining (40+ years; 20+ years; 10+ years, <10 years)		**Sub-categories:** **1** = mainly arboricultural values **2** = mainly landscape values **3** = mainly cultural values.	# = estimated because the tree was inaccessible
RPA = Root protection area (equivalent to a circle with a radius 12 x the stem diameter of single stem trees or 12 x the notional stem diameter of multi stemmed trees as per BS 5837:2012 clause 4.6). This will be capped to 707m² for trees with a stem diameter larger than 1.25m.					

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N-	E-	S-	W	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T1	Norway Maple (*Acer platanoides*)	9	35	2	6	5	5	1.8	EM	20+	Poor	Occluded union at 2m, weep coming from base of occlusion and at ground level on south.	***Removed in 2018 due to storm damage***	U	4.20	55.42
T2	Norway Maple (*Acer platanoides*)	10	44	6	6	6	6	1.5	EM	40+	Fair	Girdling root on north side	-	B2	5.28	87.58
T3	Swedish whitebeam (*Sorbus intermedia*)	9	34	5	4	4	5	1.8	EM	40+	Fair	Minor mower damage on east side	-	B2	4.08	52.30
T4	Cockspur thorn (*Crataegus crus-galli*)	6	23	3	3	3	3	2	M	40+	Fair	Ivy	-	B2	2.76	23.93
T5	Silver birch (*Betula pendula*)	10	26	4	6	4	0	1.8	EM	40+	Fair	Unbalanced due to removal of tree to the west	-	B2	3.12	30.58

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T6	Cockspur thorn (*Crataegus crus-galli*)	6	25	2	1	3	4	1.5	M	40+	Fair	Crownlift 2.5m over footpath	-	B2	3.00	28.27
T7	Cockspur thorn (*Crataegus crus-galli*)	6	26	1.5	3	3	1	1.5	M	40+	Fair	Remove competing willow branches from crown of T6. Crownlift 2.5/5.5m over footpath/roadway	-	B2	3.12	30.58
T8	Norway Maple (*Acer platanoides var.*)	4	6	1	1	1	1	2	YNG	<10	Poor	Strimmer damage, bark damage on east side	Remove and replace	U	0.72	1.63
T9	Norway Maple (*Acer platanoides var.*)	4	6	1	1	1	1	2	YNG	<10	Poor	Strimmer damage	Remove and replace	U	0.72	1.63
T10	Norway Maple (*Acer platanoides var.*)	4	7	1	1	1	1	2	YNG	10+	Fair	Strimmer damage	-	C2	0.84	2.22
T11	Norway Maple (*Acer platanoides var.*)	4	7	1	1	1	1	2	YNG	<10	Poor	Strimmer damage, moribund	Remove and replace	U	0.84	2.22
T12	Norway Maple (*Acer platanoides var.*)	4	7	1	1	1	1	2	YNG	<10	Poor	Dead	Remove and replace	U	0.84	2.22
T13	Rowan (*Sorbus aucuparia*)	7	32	4	4	4	3	1	M	40+	Fair	Girdling root on north side, lean to east, minor mower damage	-	B2	3.84	46.32
T14	Common lime (*Tilia x europaea*)	9	38	5	5	5	5	0	EM	40+	Good	-	-	B1	4.56	65.33
T15	Bird cherry (*Prunus padus*)	6	7.5	3	3	3	3	0	EM	40+	Fair	Coppicing/sucker mass of stems <7.5cm	-	C2	0.90	2.54

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T16	Wild Cherry (*Prunus avium*)	10	25	3	1	1	1	2	EM	40+	Fair	Part of woodland	-	C2	3.00	28.27
T17	Norway maple (*Acer platanoides*)	10	20,15,8	4	1	1	1	1	EM	40+	Fair	Part of woodland	-	C2	3.12	30.58
T18	Norway maple (*Acer platanoides*)	10	30,25,20	5	2	1	1	1	EM	40+	Fair	Part of woodland	-	C2	5.28	87.58
T19	Oak (*Quercus robur*)	10	22	1	1	1	4	2	EM	40+	Fair	Part of woodland	-	B2	2.64	21.90
T20	Oak (*Quercus robur*)	10	31	3	1	1	3	2	EM	40+	Fair	Part of woodland, co dominant at 2m	-	C2	3.72	43.47
T21	Goat willow (*Salix caprea*)	10	32,20,19	6	1	2	6	2	M	20+	Fair	-	-	C2	5.04	79.80
G22	Woodland of silver birch (*Betula pendula*), Norway maple (*Acer platanoides*), willow (*Salix sp*.), oak (*Quercus sp*.) and ash (*Fraxinus excelsior*)	10	Ave 20	As per plan				2	EM	40+	Good	Approx. 1m spacing, well structured woodland, with understory of woody shrubs	-	A2	2.40	18.10
T23	Silver birch (*Betula pendula*)	9	11,10,7.5	1.5	2	1.5	1.5	2	SM	20+	Fair	Smaller stem growing through fence and rubbing	***Remove for development***	C2	2.04	13.07
T24	Ash (*Fraxinus excelsior*)	9	22	3	4	3	2	1.5	EM	20+	Fair	Nails in stem	***Remove for development***	C2	2.64	21.90
T25	Flowering cherry (*Prunus sp*.)	9	25,10	3	3	3	3	2	M	20+	Fair	Large mature sucker on west side	***Remove for development***	C2	3.24	32.98

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T26	Sycamore (*Acer psuedoplatanus*)	9	#22	2	2	2	2	2	EM	40+	Fair	Off site	-	C2	2.64	21.90
T27	Goat willow (*Salix caprea*)	8	22,7	3	1	2	2	1	M	<10	Poor	Dieback poor tree	***Remove for development***	U	2.76	23.93
T28	Goat willow (*Salix caprea*)	7	23	1	2	1	1	1	M	<10	Poor	Dieback poor tree	***Remove for development***	U	2.76	23.93
T29	Goat willow (*Salix caprea*)	6	22,10	1	1	4	1	2	M	<10	Poor	Major bark damage, extensive decay in main stem	***Remove for development***	U	2.88	26.06
T30	Ash (*Fraxinus excelsior*)	8	13,16,15	3	3	1	2	2	EM	20+	Fair	Multi stemmed	***Remove for development***	C2	3.00	28.27
T31	Ash (*Fraxinus excelsior*)	11	26	4.5	6	0	0	1.5	EM	20+	Fair	Root damage by animals	***Remove for development***	C2	3.12	30.58
T32	Ash (*Fraxinus excelsior*)	11	25	1	6	0	0	1.5	EM	20+	Fair	Root damage by animals	***Remove for development***	C2	3.00	28.27
T33	Ash (*Fraxinus excelsior*)	11	16,7.5	0	4	0	0	2	EM	20+	Fair	Root damage by animals	***Remove for development***	C2	2.16	14.66
T34	Ash (*Fraxinus excelsior*)	11	26	0.5	0.5	2	4	2	EM	20+	Fair	Root damage by animals	***Remove for development***	C2	3.12	30.58
T35	Field maple (*Acer campestre*)	9	24	1.5	3	3	1	2	EM	20+	Fair	-	***Remove for development***	C2	2.88	26.06
T36	Ash (*Fraxinus excelsior*)	10	16,7.5,14	0.5	1	2	3	2	EM	20+	Fair	-	***Remove for development***	C2	2.76	23.93
T37	Ash (*Fraxinus excelsior*)	11	28	5	6	1	0	1.5	EM	20+	Fair	-	**-**	C2	3.36	35.47
T38	Alder (*Alnus glutinosa*)	11	23	1.5	1.5	1.5	1.5	3	EM	20+	Fair	Ivy	-	C2	2.76	23.93

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T39	Ash (*Fraxinus excelsior*)	10	24	1	6	2	1	2	EM	20+	Fair	Ivy	-	C2	2.88	26.06
T40	Ash (*Fraxinus excelsior*)	11	22	1	1	1	1	3	EM	20+	Fair	Ivy	-	C2	2.64	21.90
T41	Ash (*Fraxinus excelsior*)	11	23	0.5	2	2	2	3	EM	20+	Fair	Ivy	-	C2	2.76	23.93
T42	Ash (*Fraxinus excelsior*)	11	23,22	4.5	5	5	0	1	EM	20+	Fair	-	-	C2	3.84	46.32
T43	Ash (*Fraxinus excelsior*)	10	20,7.5	0	0	0	4	2	EM	20+	Fair	Ivy, heavy lean over boundary	-	C2	2.52	19.95
T44	Ash (*Fraxinus excelsior*)	10	20	0.5	0.5	0.5	2	2	EM	20+	Poor	Ivy, die back	-	C2	2.40	18.10
T45	Ash (*Fraxinus excelsior*)	10	24	1	0	0	5	2	EM	20+	Fair	lean over boundary	-	C2	2.88	26.06
T46	Ash (*Fraxinus excelsior*)	5	14	0.5	4	0	0	1	EM	20+	Fair	Ivy, poor form	-	C2	1.68	8.87
T47	Aspen (*Populus tremula)*	12	31	2.5	2.5	1	1	3	EM	20+	Fair	Ivy	-	C2	3.72	43.47
G48	Group of aspen (*Populus tremula*) and ash (*Fraxinus excelsior*)	15	between 7.5 - 35	As per plan					EM	20+	Fair	Group of approx. 100 stems, less than o.5m spacing's, 95% aspen suckering from T49.	-	C2	3.36	35.47
T49	Aspen (*Populus tremula*)	15	67	10	10	10	3	1.5	M	40+	Good	-	-	B3	8.04	203.08

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
G50	Group consisting of Ash (*Fraxinus excelsior*), Oak (*Quercus robur*), Rowan (*Sorbus aucuparia*)	11	Ave 22	As per plan				1.5	EM	40+	Fair	1m spacing's, 95% ash, 4% oak, rowan. Some stems very close to neighbouring property	-	B2	2.64	21.90
T51	Ash (*Fraxinus excelsior*)	11	21	2	4	1	1	1	EM	20+	Fair	Part of G50	-	C2	2.52	19.95
T52	Ash (*Fraxinus excelsior*)	11	20	1	5	1	1	1	EM	20+	Fair	Part of G50	-	C2	2.40	18.10
T53	Ash (*Fraxinus excelsior*)	12	22	4	4	2	2	1	EM	20+	Fair	Part of G54	-	C2	2.64	21.90
G54	Group consisting of Oak (*Quercus robur*), rowan (*Sorbus aucuparia*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*)	12	Ave 25	As per plan				1	EM	40+	Fair	80% oak, dbh between 25-30, 15% ash and 5% rowan. 1m spacing's.	-	B2	3.00	28.27
T55	Goat willow (*Salix caprea*)	10	24,24,15	4	4	0	1	1	EM	20+	Fair	Suspect unions at base, part of G56	***Remove for development***	C2	4.44	61.93

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
G56	Group consisting of Oak (*Quercus robur*), rowan (*Sorbus aucuparia*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*)	8 to 10	Ave 20	As per plan				1	EM	40+	Fair	Typical amenity woodland planting mix, 1m spacing's, some stakes still present	***Remove small central section of group for development as per plan. Thin remaining section and prune back from new building plot.***	C2	2.40	18.10
G57	Group consisting of Oak (*Quercus robur*), rowan (*Sorbus aucuparia*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*)	8 to 10	Ave 20	As per plan				1	EM	40+	Fair	Typical amenity woodland planting mix, 1m spacing's, some stakes still present	-	C2	2.40	18.10
T58	Hybrid black poplar (*Populus x canadensis*)	18	58	5.5	5.5	5.5	5.5	4	EM	40+	Fair	-	-	B3	6.96	152.18
G59	Group of 4 ash (*Fraxinus excelsior*) and 5 rowans (*Sorbus acupaparia*)	12	Ave 25	As per plan				2	EM	20+	Fair	-	-	C2	3.00	28.27
T60	Ash (*Fraxinus excelsior*)	11	24	0	2	3	1	1	EM	20+	Fair	-	-	C2	2.88	26.06
T61	Ash (*Fraxinus excelsior*)	11	20	0	1	3	1	1	EM	20+	Fair	-	-	C2	2.40	18.10

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W				Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
T62	Ash (*Fraxinus excelsior*)	11	21,18	0	1	3	1	1	EM	20+	Fair	-	-		3.36	35.47
T63	Ash (*Fraxinus excelsior*)	11	24	0	0	3	1	1	EM	20+	Poor	Lost major limb at 2.5m, remaining co dominant poorly attached	***Remove for development***	U	2.88	26.06
T64	Ash (*Fraxinus excelsior*)	11	25	0	1	3	3	1	EM	20+	Fair	-	-	C2	3.00	28.27
T65	Ash (*Fraxinus excelsior*)	12	25	2	2	2	2	2	EM	20+	Fair	-	-	C2	3.00	28.27
G66	Woodland of silver birch (*Betula pendula*), Norway maple (*Acer platanoides*), willow (*Salix sp*.), oak (*Quercus sp.*) and ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), hornbeam (*Carpinus betulus*)	10 to 15	Ave between 25-30	As per plan				2	M	40+	Good	Approx. 1m spacing, well structured woodland, with understory of woody shrubs, occasional vandalism	***Crown lift trees along St Helens Boulevard to 5m over parking areas.*** ***Prune back trees around new rear gardens to create working space and avoid damage to trees.***	A2	3.00	28.27
G67	Sycamore (*Acer psuedoplatanus*)	7	7.5	As per plan				0	EM	20+	Fair	Coppice regrowth and suckers from large stump, some vandalism	***Remove for development***	C2	0.90	2.54
G68	Group of silver birch (*Betula pendula)*	8	#3@8	As per plan				2	SM	20+	Fair	Off site	-	C2	0.96	2.90

Tree No	Species	Ht (m)	Stem Diam @ 1.5m (cm)	Canopy Spread (m) N- E- S- W	Height of Crown Clearance	Age Class	Est yrs	Overall Condition	Comments	Management Recommendations *For Arboricultural Method Statement*	BS 5837 Category	RPA Radius (m)	RPA (m²)
G69	Group of blackthorn (*Prunus spinosa*)	7	Ave 7.5	As per plan	0	SM	20+	Fair	Blackthorn thicket	***Remove for development***	C2	0.90	2.54

Appendix 2 – Site Photographs

Plate 1: **Lime tree T14, with rowan T13**

Plate 2: **T1-T3 middle left**

Plate 3: **Western site boundary, (l-r) G48 – T26**

Plate 4: **SW corner of former school site, (r-l) G50 –G56**

Plate 5: **NE corner of site G66**

Plate 6: **T49 centre, with G48 behind**

Appendix 3 – Figures

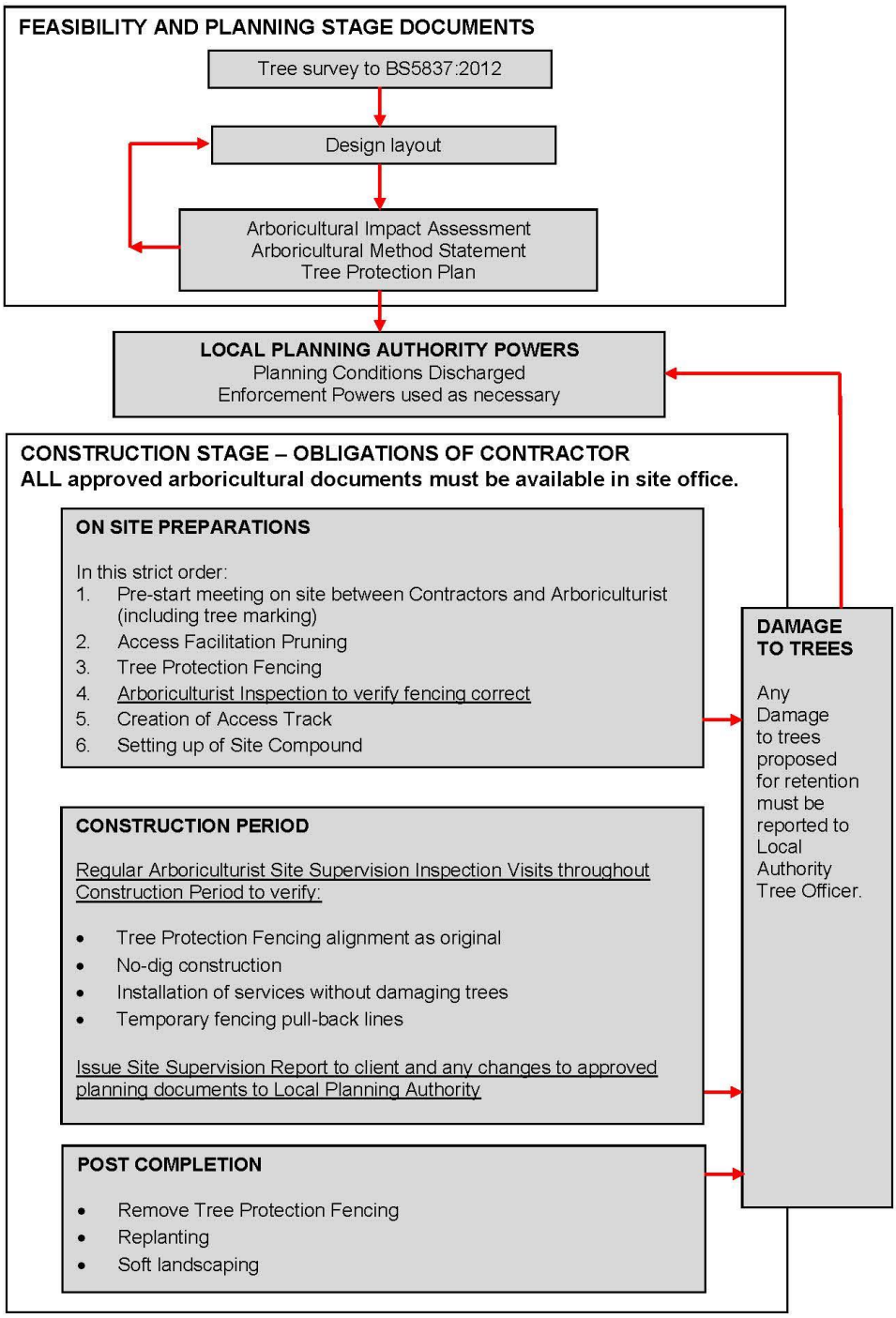


Figure 1 - The Design and Construction Process and Tree Care

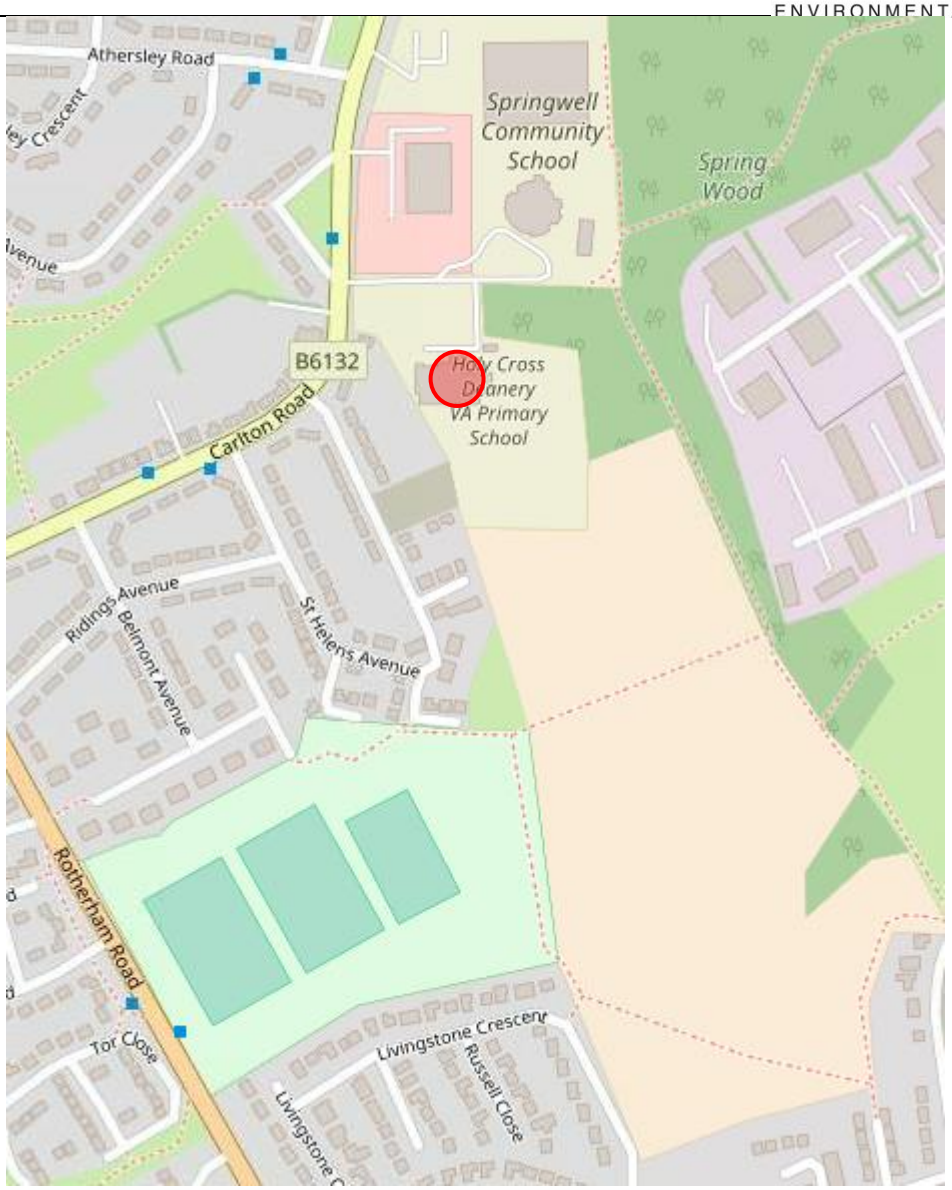
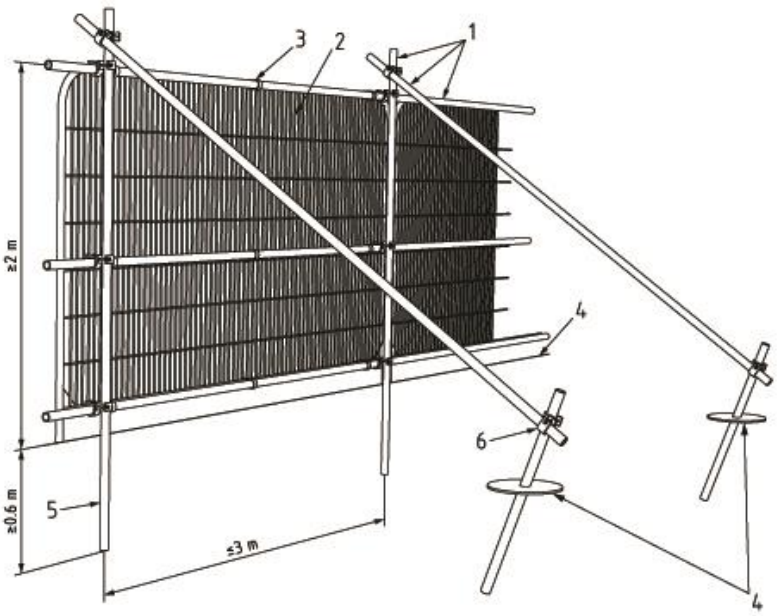


Figure 2 – Location Plan
© OpenStreetMap contributors



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: Default Specification for Protective Barrier to BS 5837 (2012)

NOTES

Protective Barrier/Fencing

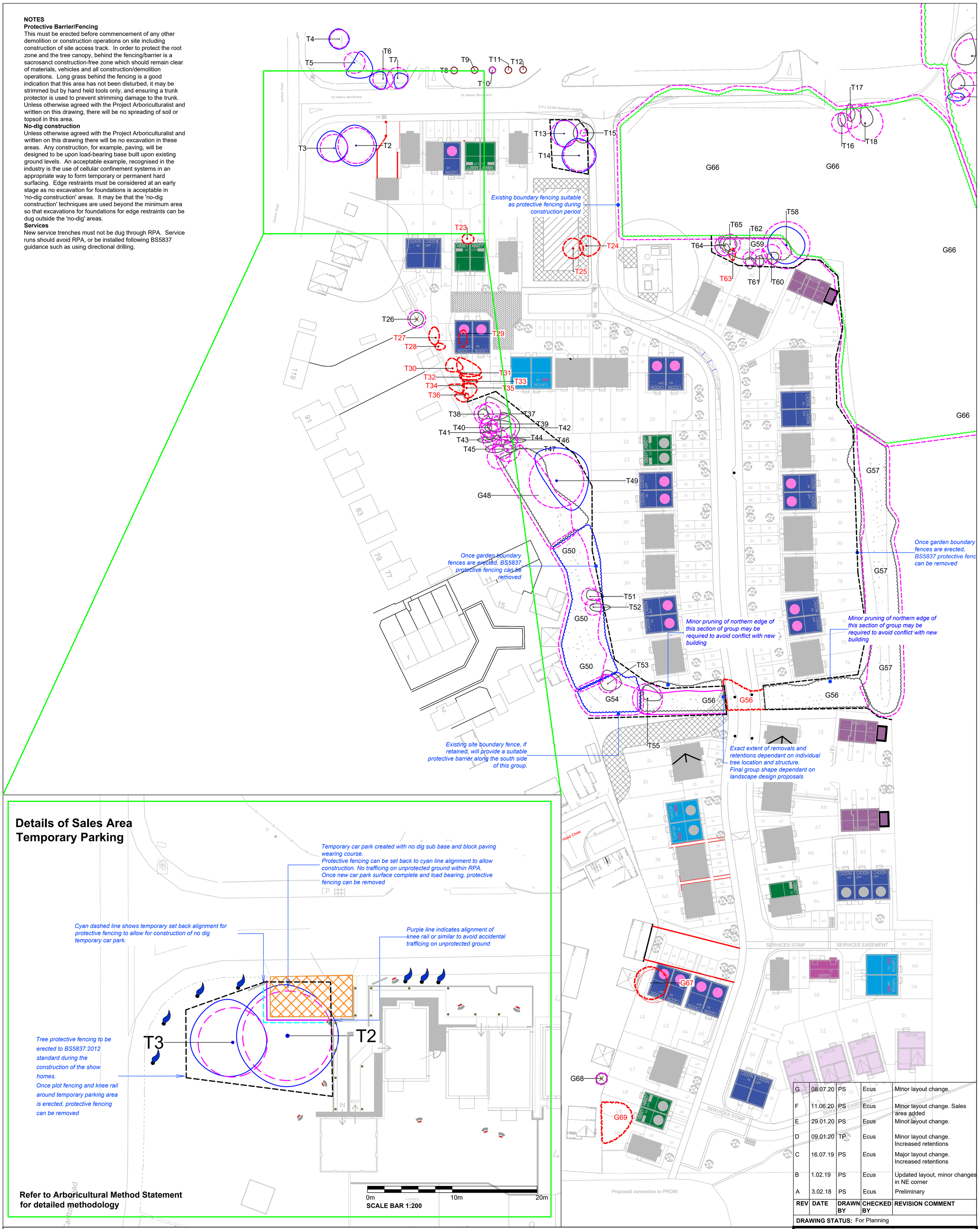
This must be erected before commencement of any other demolition or construction operations on site including construction of site access track. In order to protect the root zone and the tree canopy, behind the fencing/barrier is a sacrosanct construction-free zone which should remain clear of materials, vehicles and all construction/demolition operations. Long grass behind the fencing is a good indication that this area has not been disturbed, it may be strimmed but by hand held tools only, and ensuring a trunk protector is used to prevent strimming damage to the trunk. Unless otherwise agreed with the Project Arboriculturalist and written on this drawing, there will be no spreading of soil or topsoil in this area.

No-dig construction

Unless otherwise agreed with the Project Arboriculturalist and written on this drawing there will be no excavation in these areas. Any construction, for example, paving, will be designed to be upon load-bearing base built upon existing ground levels. An acceptable example, recognised in the industry is the use of cellular confinement systems in an appropriate way to form temporary or permanent hard surfacing. Edge restraints must be considered at an early stage as no excavation for foundations is acceptable in 'no-dig construction' areas. It may be that the 'no-dig construction' techniques are used beyond the minimum area so that excavations for foundations for edge restraints can be dug outside the 'no-dig' areas.

Services

New service trenches must not be dug through RPA. Service runs should avoid RPA, or be installed following BS5837 guidance such as using directional drilling.



REV	DATE	DRAWN BY	CHECKED BY	REVISION COMMENT
G	08.07.20	PS	Ecus	Minor layout change.
F	11.06.20	PS	Ecus	Minor layout change. Sales area added
E	29.01.20	PS	Ecus	Minor layout change.
D	09.01.20	TP	Ecus	Minor layout change. Increased retentions
C	16.07.19	PS	Ecus	Major layout change. Increased retentions
B	1.02.19	PS	Ecus	Updated layout, minor changes in NE corner
A	3.02.18	PS	Ecus	Preliminary

DRAWING STATUS: For Planning

GENERAL NOTES - TREE PROTECTION PLAN

- Drawing for Planning purposes only
- Refer to arboricultural report produced by ECUS Ltd titled 10112 Carlton Lane AIA AMS
- Based on topographic survey provided by Haycock and Todd dated May 2017.
- Building layout and masterplan provided by Sten Architecture on drawing ref. 1931.01
- Refer to Engineer's details for level and drainage information.
- Check all dimensions on site.
- Do not scale from this drawing.
- Report any discrepancies and omissions to Ecus Ltd.
- This drawing is Copyright.

3RD-PARTY INFORMATION

NB This drawing includes information provided by independent surveyors and / or consultants, to whom all queries shall be made. Ecus Ltd can accept no liability for its context or accuracy.

KEY

Trunk location from topographic survey

Trunk location approximated by ECUS

Tree categories (BS 5837:2012)

Category A Trees — Category B Trees — Category C Trees — Existing tree to be removed

Root Protection Area (RPA) of trees to be retained

Protective Barrier - BS5837 (2012), clause 6.2.2

No-dig construction - BS5837:2012, clause 7.4.2

N

0m 10m 20m 50m

SCALE BAR 1:500

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Job

10112 Carlton Road

Title

Figure 4
Tree Protection Plan

By	Date	Scale @ A1	Drg. no.
PS	Feb 2018	1:500	10112-ARB-02

PROTECTING RETAINED TREES FROM DAMAGE:

- **DO NOT BANG OR CHIP/CUT/SLIT BARK.** The living tissue (where water and nutrients are transported from roots to leaves and vice versa) of the trunk is just under the bark.
- **DO NOT KNOCK OR BREAK BRANCHES.** Broken branches do not heal. Breaks can be a source of infection/death to the tree, and require expensive tree surgery to prune back to appropriate branch joints.
- **DO NOT DIG THROUGH ROOTS.** Roots provide stability and vital nutrients to the tree.
- **DO NOT COMPACT UNMADE GROUND AROUND TREE.** Compaction destroys soil structure affecting roots' ability to respire/function/live.

BEWARE, DAMAGING TREES CAN BE A CRIMINAL OFFENCE.

RECOMMENDED CELLULAR CONFINEMENT SYSTEM:

Wrekin ProtectaWeb as supplied by www.wrekinproducts.com Tel: 01543 440440
General Guidance Depth* of ProtectaWeb per weight of proposed traffic as below:

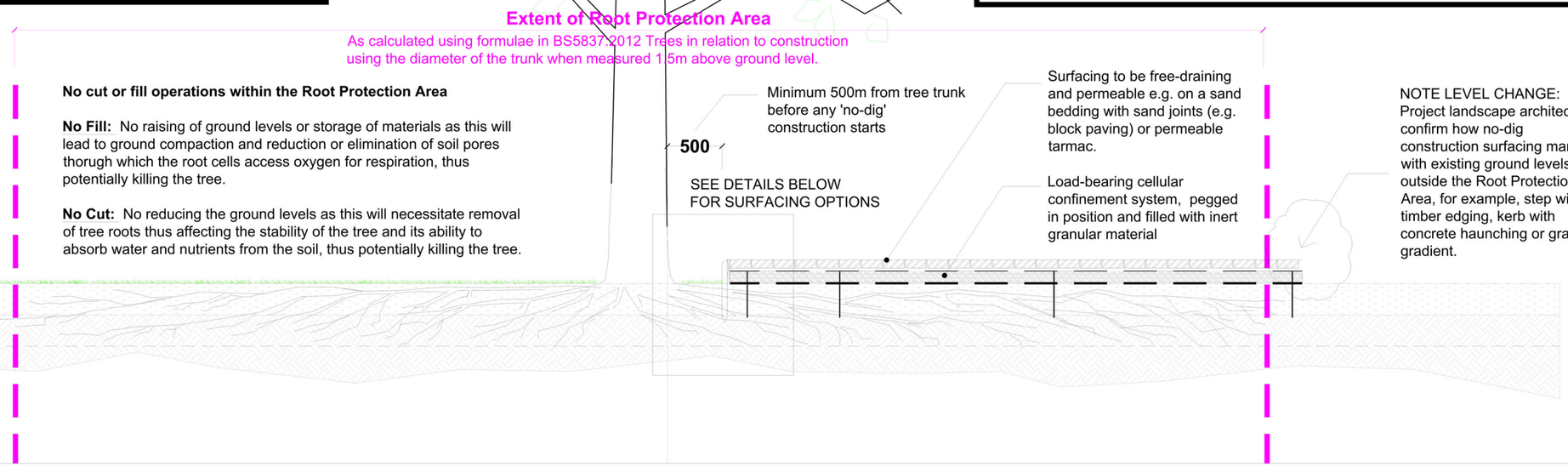
75mm depth for pedestrian and cycleways (< 1 tonne (1000 Kg))
100mm depth for domestic traffic (< 3 tonnes)
100-150mm depth for cars and small vans (< 6 tonnes)
100-150mm depth for delivery vans (< 9 tonnes)
150mm depth for mergency access and tractors (< 16 tonnes)
150-200mm depth for refuse lorry& construction traffic (< 30 tonnes)
200mm depth heavy construction traffic incl temporary access track (<50 tonnes)
200mm depth piling platforms (bespoke design) (< 60 tonnes)

* For poor/unstable ground conditions contact ProtectaWeb for site-specific design

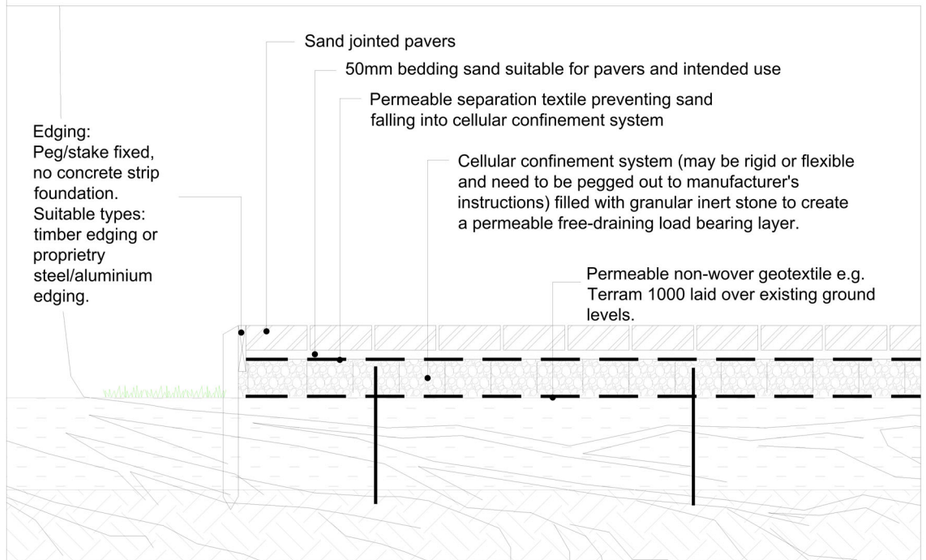
No-dig Construction

The principle of no-dig construction is to retain existing ground levels, and build a load-bearing permeable surface above the existing surface.

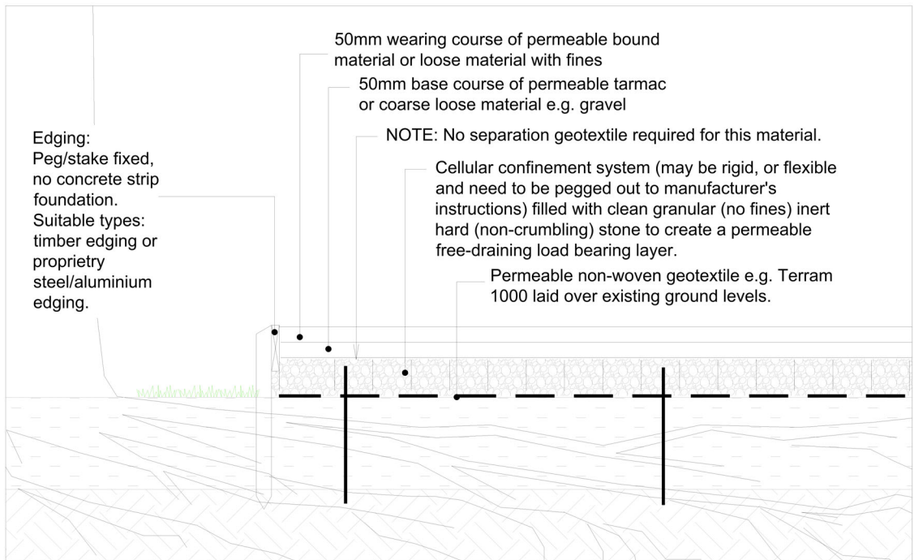
Using no-dig construction, hard surfacing, for light load use e.g. pedestrian traffic or occasional parking, is possible within the Root Protection Area (RPA) of an existing tree. Even heavier loads can be acommodated with specialist no-dig construction products.



1:50 No-dig construction - standard detail in relation to the tree, its root protection area (RPA) and its context



1:20 No-dig construction - sand-bedded & jointed paving



1:20 No-dig construction - gravel road/permeable tarmac construction

REV	DATE	DRAWN BY	CHECKED BY	REVISION COMMENT
B	15.08.18	ZW	Ecus	Wrekin CCS product
A	18.06.18	ZW	Ecus	Preliminary

DRAWING STATUS: For information

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ARBORICULTURAL TECHNICAL NOTE No. 4

Title
No-dig construction
Principles and standard detail

Drawn by	Date	Scale @ A3	Drg. no.
ZW	June 2018	1:50/1:20	ECUS-ARB-04