

BS5837 Tree Survey, Arboricultural Impact Assessment and Method Statement.

Conery Lane Farm, Conery Lane, Bronington, Whitchurch, Shropshire, SY13 3EZ.

January 2018

Prepared By:	Prepared For:
Matthew Owen FDS Arb	Simon Marshall
Arbserv Limited	Conery Lane Farm,
Pony House	Conery Lane,
Crew Green	Bronington,
Shrewsbury	Whitchurch,
SY5 9BQ	Shropshire, SY13 3EZ.

Table of contents

- 1) Introduction**
- 2) Method**
- 3) Key to survey & plans**
- 4) Location of survey**
- 5) Tree survey site parameters**
- 6) Results**
- 7) Constraints posed by existing trees**
- 8) Arboricultural Impact Assessment**
- 9) Arboricultural Method Statement**
- 10) Arboricultural site monitoring**

Appendix 1: Figure 1 overview Tree Location Plan

Appendix 2: Figure 2 RPA plan of all trees and proposed plot

Appendix 3: Example pile foundation method pictures

Appendix 4: Example pile foundation method pictures

Appendix 5: BS5837 Tree Survey Schedule

Appendix 6: British Standard chart

Appendix 7: Barriers

Appendix 8: References

Appendix 9: Tree photos

1 Introduction

1.1 Instruction

I am instructed by Simon Marshall to carry out a BS5837 Tree Survey, Arboricultural Impact Assessment and Method Statement for the proposed development of a stable block at Conery Lane Farm, Conery Lane, Bronington, Whitchurch, Shropshire, SY13 3EZ.

This Report has been prepared to take account of the constraints that the existing trees place on the site. I discussed the brief and specification of the survey during a site meeting with Simon on 13/01/18. The parameter of trees to be surveyed was established on site as well as using a PDF location plan provided.

1.2 The Author

My name is Matthew Owen. I am a Professional member of the Arboricultural Association. I have a degree in Arboriculture, Royal Forestry Society Certificate in Arboriculture, Lantra Awards in Professional Tree Inspection. I have worked in Arboriculture for 15 years as a climbing Arborist, surveyor and consulting Arboriculturalist. A list of my qualifications can be sent on request.

1.3 Survey constraints

This report was prepared for use by our client for planning purposes only. It is not a substitute for a tree condition, insurance, or mortgage service. Information provided by third parties used in the preparation of this report is assumed to be correct. The contents are copyright and may not be duplicated or used by third parties without written consent of Arbserve Ltd. The tree survey site parameters are highlighted on the location plan. This parameter has been established by reviewing the proposed building location and selecting all trees over a diameter of 75mm that could be affected by the proposed construction.

2 Method

2.1 All trees in this survey have been surveyed from ground level using Visual Tree Assessment (VTA) observations. This involves a systematic, non-invasive, ground based examination of each tree, looking for signs of ill-health vulnerability or damage and their causes. Protocol described by (Lonsdale 1999), and (Mattheck & Breloer 1998) Strouts & Winter 1998) No aerial inspections or invasive decay detection surveys or soil samples have been carried out.

2.2 Data was collected in accordance with the requirements of British Standard 5837:2012. Measurements were taken using diameter tape, digital clinometer or laser measure. Where this was not possible or reasonably practical, measurements have been estimated by eye.

2.3 Data collected

- Tree ID
- Species
- Maturity
- Height
- Height and direction of first significant branch
- Stem Diameter according to annex c of BS5837:2012
- Crown spread-in four cardinal directions
- Physical and structural condition
- Retention category according to table 1 BS5837:2012

2.4 All trees surveyed have been plotted on a tree protection plan of the site and their data recorded in the BS5837 Tree survey schedule. This includes all trees and shrubs with a diameter of 75mm or above measured at 1.5m above ground level. Measured according to annex c of BS5837:2012.

2.5 *(Note in the case of woodlands or substantial tree groups, only individual trees with stem diameters greater than 150mm usually need plotting)*

2.6 The tree constraints and Root Protection Areas (RPA) are then calculated for single stemmed trees; by calculating an area equivalent to a circle radius 12 times the stem diameter.

2.7 Root Protection area (RPA) Layout design tool indicating the minimum areas around a tree deemed to contain sufficient roots and rooting volume to maintain the trees viability, and where the protection of the roots and soil structure is treated as a priority. (BS5837:2012)

2.8 The (RPA) will be calculated for all trees surveyed using the BS5837 formula. The radius of the RPA will be given and highlighted on a tree protection plan/Map attached to this document.

2.9 The current value of the trees is assessed in the Arboricultural Impact Assessment using the quality categories A, B, C, U ranging from high quality (A) to low quality or DBH <150mm (C) based on arboricultural, landscape, and cultural values. Category U trees are considered to be unsafe for arboricultural reasons and should be normally removed. With the exception of retaining standing dead habitat poles.

The arboricultural impact assessment and method statement for each tree will be recorded within the BS5837 Tree survey schedule preliminary recommendations survey comment

The remaining contribution of each tree is noted <10 10-20, 20-40 or >40years. This can only be an informed opinion based on the surveyor's experience and the current conditions of the tree, and obviously cannot take account of catastrophic weather events.

3 Key to survey & Plans

3.1 **ERC:** Means 'estimated remaining contribution', recorded in a range of years. It is the amount of *time the tree can realistically be retained for*.

3.2 **Cat:** Means 'category grading', a full explanation of the categories is given in an excerpt from BS 5837:2012 in the Tree Survey Schedule section

3.3 **Ref:** The reference number assigned to that item with a code to help identify the type or structure such as:

3.4 Letters

T	Tree
S	Shrub
G	Group of Trees
SG	Group of Shrubs
O	Orchard
W	Woodland
H	Hedgerow

3.5 **Hgt (m):** Height of the tree in metres rounded up to the nearest half metre.

3.6 **DBH:** 'Diameter at Breast Height' – the stem diameter measured in millimetres at 1.5m above ground level. Where the ground around the base of the tree is not level, this is taken 1.5m above the upper side of slope.

3.7 **Crown Spread:** The crown spread is given to four cardinal points, rounded up to the nearest half metre.

3.8 **Clear (m):** The height of the crown clearance of the lowest branch above ground level, with the general direction it is growing to a cardinal point.

3.9 **Life stage:** Recorded with codes as follows, and relative to the species of the tree:

3.10 **RPA:** root protection area.

3.11 **CEZ:** Construction exclusion zone.

Y	Young
EM	Early-mature
SM	Semi-mature
M	Mature
OM	Over-mature
V	Veteran

3.12 The trees were surveyed and assessed impartially and irrespective of the proposed development. Management recommendations should be implemented regardless of any proposed development for reasons of sound arboricultural management or safety.

3.13 BS 5837:2012 requires retention of better quality (category A and B trees) where possible. Planning permission overrides a Tree Preservation Order and Conservation Area. Furthermore, trees are a material consideration in the UK planning system irrespective of their legal status. It is therefore not considered necessary to highlight or give additional merit to trees that have legal protection. Trees in land adjacent to the site are considered where they may be impacted by development, for example when roots or branches encroach onto the site.

3.14 Trees may be recorded as group or woodland where:

- The canopies touch
- The trees have more group value than individual merit.
- They are part of a formal landscape feature like an avenue.
- It is impractical to record them individually.
- Trees within groups or woodlands etc. are recorded individually where it is necessary to distinguish them from others.

4. Location of survey: Proposed stable block to East of Conery Lane Farm.



5. Tree survey site parameters are highlighted in red box above.

6 Results

- 6.1 The survey was carried out on 13/01/18 by Matthew Owen, the weather at the time was cold and clear with good visibility. A total of 7 trees have been surveyed. Figure 1 shows the general layout of the site and the locations of all trees. The full results are tabulated in BS5837 tree survey schedule table (appendix 5) and should be read in conjunction with the tree protection plans Figures 1-2.
- 6.2 The survey site was contained within the garden to the East of Conery Lane Farm. The site is a flat lawn area with sheds to the north. The proposed building is a stable block with concrete pad and timber frame.

7 Constraints posed by existing trees

- 7.1 The above ground constraints posed by the existing trees are shown in the current height and spread. The height and direction of the first significant branch and any notable physical and structural defects are also shown in the BS5837 survey schedule. Appendix 6.
- 7.2 The effects of trees on daylight and sunlight with regards to shading can be illustrated by plotting a segment, with radius from centre of the stem equal to the height of the tree. This is drawn from due north-west to due east, indicating the shadow pattern through the main part of the day. See figure 3, 5. Further details of the above ground constraints are found in the arboricultural impact assessment.
- 7.3 The below ground constraints are marked as Root Protection Areas (RPA'S) on the tree protection plans figures 2 and 5. The concise arboricultural impact assessments and method statements are displayed in the survey comment of the tree survey table for each tree. This is to provide uncomplicated use by operatives along with the tree protection plan on site. The arboricultural impact assessment and method statement in this report provide more detailed information.

8 Arboricultural Impact Assessment

- 8.1 Evaluates the direct and indirect effects of the proposed design on the trees and where necessary recommends mitigation methods. The concise arboricultural impact and method statement for each tree surveyed is included in the recommendations survey comment of the BS5837 tree survey schedule.
- 8.2 Trees 0111, 0115 are proposed for removal. The arboricultural impact of the proposed removal of 2 category c trees is low. Category C unremarkable trees of very limited merit.
- 8.3 The proposed building falls inside the RPA's of trees 0110, 0113 The arboricultural impact on these can be mitigated by following the Arboricultural Method statement in-side the RPA. The arboricultural constraints and impacts are discussed below:
- 8.4 The stable block proposed is based on a concrete pad and timber frame. The concrete pad is essential to the construction for cleaning the stable blocks. The construction footprint location is over the RPA of T110 and part of T0113. Conventional foundations for the concrete pad would have a direct impact on the tree roots.
- 8.5 It is possible to construct new buildings near trees, without adversely affecting their health. If care is taken in the design and installation. This is most commonly achieved by supporting the base of the building just above ground level with a framework of narrow diameter piles that require very little excavation into the soil. Further information of this method is explained in the method statement and pictures appendix 3.
- 8.6 The indirect impacts of low branches have been removed by previous pruning. The effects of shading do not represent minimal impact as this is not a residential building. The shading of tree 0113 to the south west could have a positive effect for shading in hot weather for animal welfare.
- 8.7 The proposed buildings, and driveway fall out-side the RPA,S of all other trees in the site parameter. (see figure 1) The arboricultural impact on these trees can be mitigated by following the Arboricultural Method statement out-side RPA.

9 Arboricultural Method Statement

- 9.1 This details best practice measures to be adopted to protect retained trees during the development process. Details included within this section should be included within the specifications and schedules of work issued to all relevant construction and landscaping contractors. The methodology should be discussed and agreed between the local authority tree officer, architect and relevant contractors. The methods are listed in order of implementation.
- 9.2 **Method out-side RPA** for all trees retained. The RPA shall be measured and clearly marked on site with the use of ground pins or marker spray. All relevant personnel should be briefed to ensure they are fully aware of the location and extent of the RPA'S Construction Exclusion Zone (CEZ). Install the section of Heras fence or similar barrier positioned as indicated on the tree protection plan to form a construction exclusion zone (CEZ).
- 9.3 Weatherproof notices shall be attached to the protective fencing displaying the words Construction Exclusion Zone. It shall be checked by an arboriculturalist before excavation works commence.
- 9.4 Ground levels should not be raised or lowered within the RPA and CEZ
- 9.5 Proposed removal of Trees 0111, 0115 should be carried out after the RPA protection for all other trees has been implemented. This work should be carried out by a suitably qualified Arborist.

9.6 Method in -side RPA for trees T0110, T0113

9.7 Mark out the CEZ with pegs or spray to make all aware of the exclusion zone. Mark positions of the foundation piles on ground. Move positions if obvious interaction with tree roots or other obstacles is evident.

9.8 The amount of piles required shall be designed by the site engineer to calculate loads and bridging gaps.

9.9 Hand digging of foundation holes or use of micro tracked piling machine. Ground protection mats or boards shall be used if a micro tracked pile machine issued.

- Place boards around work area to prevent compaction and contamination.
- Place boards along heavy trafficked and/or material transport routes.
- Site cement mixer and bagged materials away from RPA'S on boards or access tracks.
- Hand dig or pile to a depth of 500mm to check for roots. Careful use of an air spade is an acceptable alternative to the use of hand tools.
- During excavations, any roots less than 25mm should be cut cleanly to the sides with a pair of secateurs. All roots greater than 25mm diameter will be left in situ undamaged. If no roots are found, complete hole mechanically with micro digger (less than 1 tonne tracked excavator).
- If roots greater than 25mm are encountered carefully expose roots, wrap with hessian and sleeve with a split plastic pipe to protect.
- Hand dig either side of root to expose a pier area unaffected by roots.
- Engineer shall design a shuttered steel mesh reinforcement pad. This bridges the piles with a biodegradable void former layer underneath. See appendix 3 for pictures.
- Pour concrete avoiding spillage cement additives are highly alkaline and toxic to plant roots. Mixing and washing must be done outside of the RPA'S.

9.10 **Drainage and utilities:** follow recommendations in the NJUG Volume 4 Code of practice relating to work in proximity to tree roots within the RPA; specifically, the avoidance of trench excavations within the RPA. Any drainage or service related works to be carried out within the RPA must be subject to prior written approval of the LPA of a method statement detailing how such works are to be carried out and monitored, to avoid undue damage to the tree.

10.0 Arboricultural site monitoring

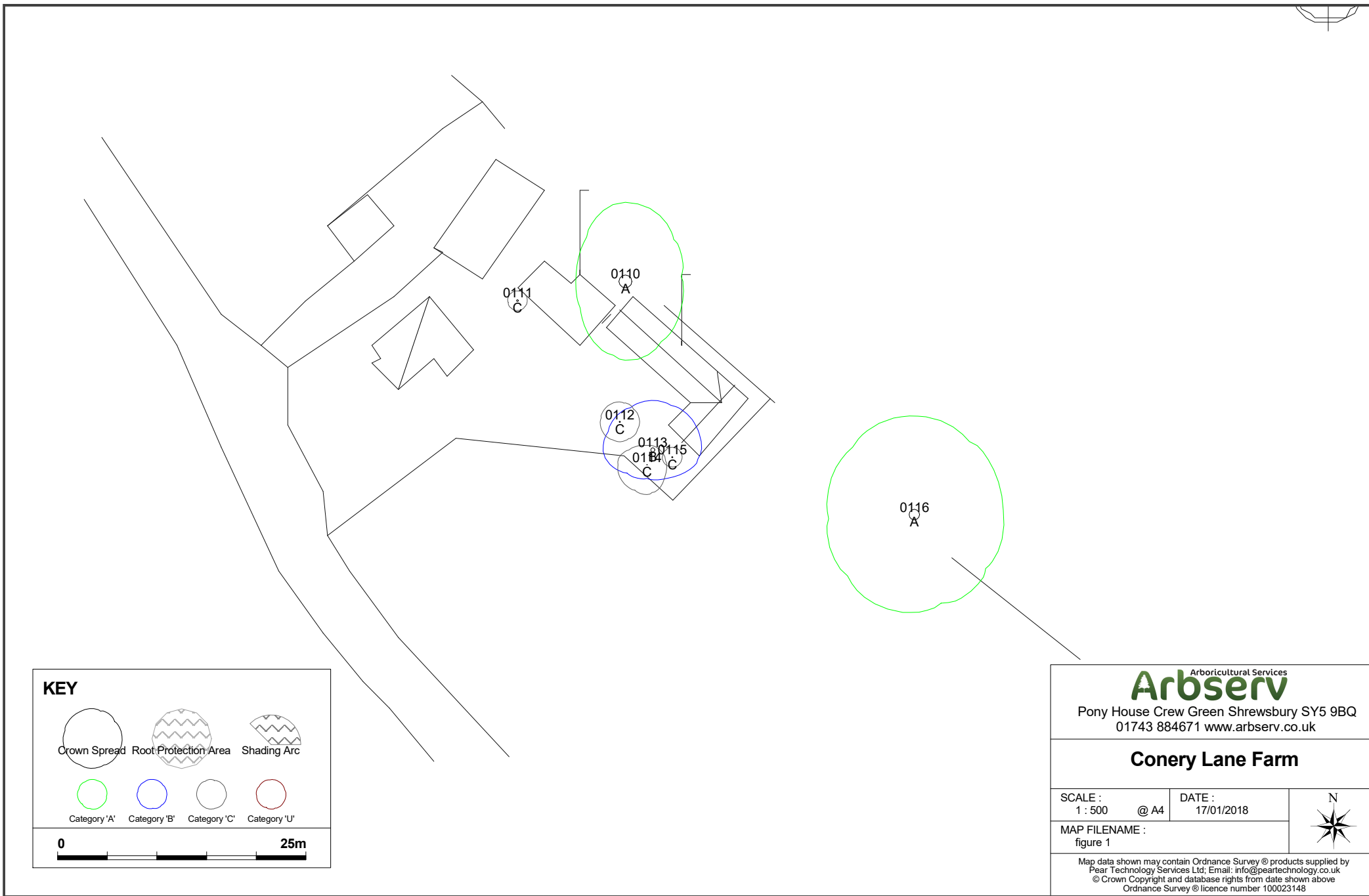
The arborist shall visit site at pre-scheduled intervals below to ensure the method statement is followed under field conditions and ensure compliance by contractors.

- The marking out and instalment of construction exclusion zones
- Inspection of piles and shuttering before concrete pour.

MB Owen

Matthew Owen 25/10/17

Appendix 1 figure 1



Arborserv

Arboricultural Services

Pony House Crew Green Shrewsbury SY5 9BQ
01743 884671 www.arbserv.co.uk

Conery Lane Farm

SCALE :
1 : 500 @ A4

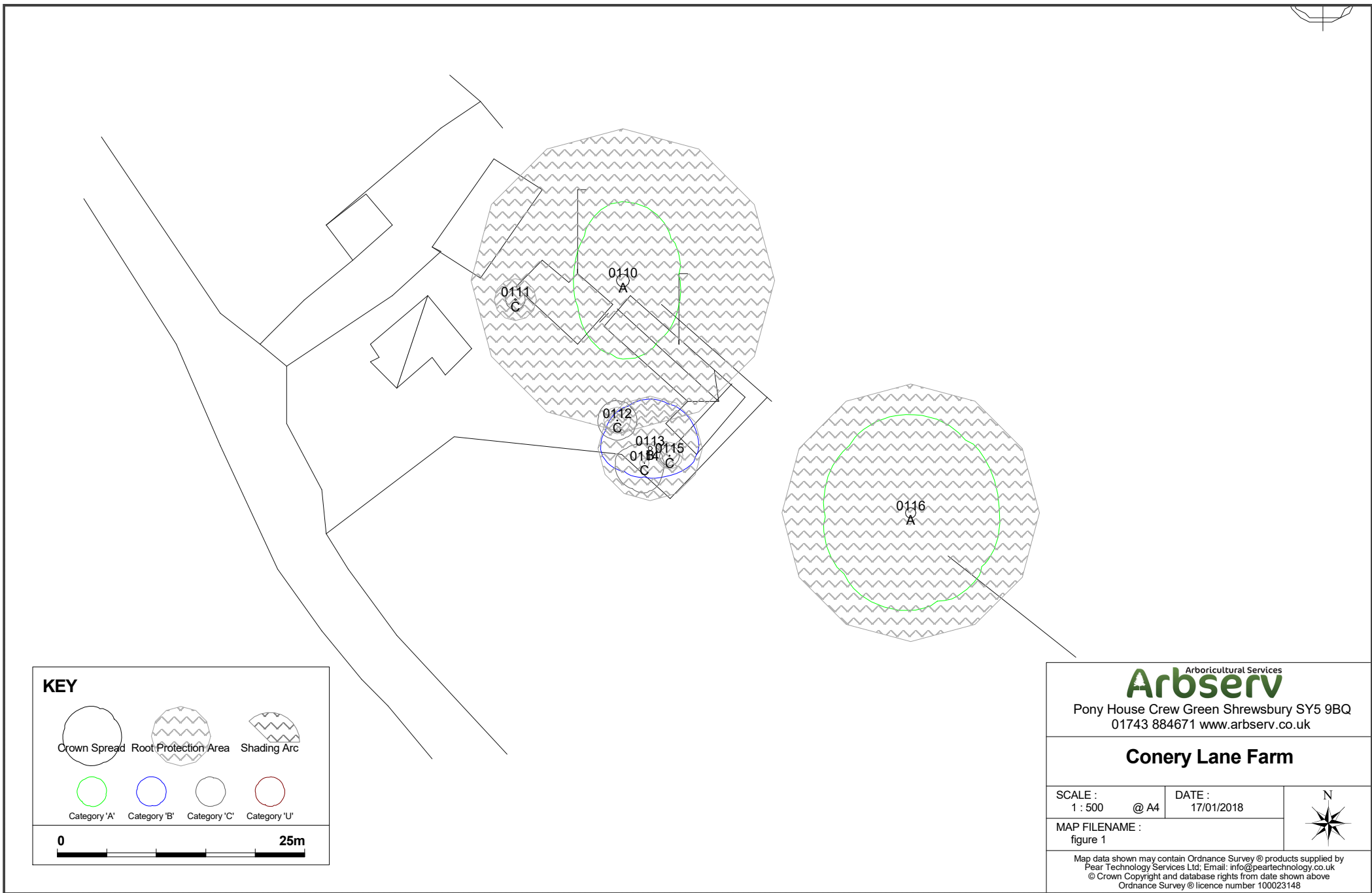
DATE :
17/01/2018

MAP FILENAME :
figure 1



Map data shown may contain Ordnance Survey © products supplied by
Pear Technology Services Ltd; Email: info@peartechnology.co.uk
© Crown Copyright and database rights from date shown above
Ordnance Survey © licence number 100023148

Appendix 2 figure 2



Appendix 3 figure 3

Example of shuttering in place and the biodegradable void-former acting as the temporary base. The reinforcing steel links the top of each pile to the main floor ready for pouring concrete



Close up of the proposed floor slab showing the biodegradable void-former layer resting on the soil surface, which supported the pored concrete of the floor until it had set.



Appendix 4 figure 4

Example of an oak in the foreground with a completed double garage using this proposed pile foundation 5 years after completion.



Appendix 5: BS5837 2012 Tree Survey

BS5837:2012 Tree Survey

Arbserve Ltd

Client: Simon Marshall
 Project: Conery Lane Farm
 Survey Date: 13/01/2018
 Surveyor: Matthew Owen



Crew Green
 Shrewsbury
 Shropshire
 SY5 9BQ
 Phone: 01743 884671
 Mobile: 07912599933

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations			Cat ERC
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment			
110	110											Estimated Measurements		
Common Oak <i>Quercus robur</i>	18	1	1310	N	8	M	A: 707 R: 15	Good	C: Fair S: Good B: Good	ARBORICULTURAL IMPACT ASSESSMENT: The proposed build fall in-side the RPA. METHOD STATEMENT: Hand digging of foundation holes. (see instructions and diagraph appendix 3-4) Hand digging of drainage trenches. Non dig construction of pathways and parking areas.			A.1 >40 yrs	
111	111											Estimated Measurements		
Lawson Cypress <i>Chamaecyparis lawsoniana</i>	3	3	173 (Eq)	N	1	SM	A: 13.6 R: 2.08	Fair	C: Fair S: Fair B: Fair	Fell :: Fell to ground level ARBORICULTURAL IMPACT ASSESSMENT: Proposed for removal.			C.1 <10 yrs	
112	112											Estimated Measurements		
Norway Spruce <i>Picea abies</i>	5	1	110	N	2	Y	A: 5.5 R: 1.32	Fair	C: Fair S: Fair B: Fair	ARBORICULTURAL IMPACT ASSESSMENT: The proposed build fall out-side the RPA. METHOD STATEMENT: Install the section of Haras fence barrier positioned as indicated on the tree protection plan to create the CEZ.			C.1 10 to 20 yrs	
113	113											Estimated Measurements		
Silver Birch <i>Betula pendula</i>	10	1	430	N	5	M	A: 83.7 R: 5.16	Good	C: Good S: Good B: Good	ARBORICULTURAL IMPACT ASSESSMENT: The proposed build fall in-side the RPA. METHOD STATEMENT: Hand digging of foundation holes. (see instructions and diagraph appendix 3-4) Hand digging of drainage trenches. Non dig construction of pathways and parking areas.			B.1 20 to 40 yrs	
Age Classifications:		N Y SM	Newly planted Young Semi-mature	EM M OM	Early Mature Mature Over Mature	Condition:		C S B	Crown Stem Basal area	Stems:		Ø (Eq)	Diameter Equivalent stem diameter using BS5837:2012 definition	

Tree and Tag No Species		Hght (m)	Stems		Crown		Age	RP A (m²) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC
			No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment		
114	114											Estimated Measurements	
Lawson Cypress	11	3	38 (Eq)	N	2	M	A: 0.7	Fair	C: Fair				C.1
Chamaecyparis lawsoniana				E	2		R: 0.47		S: Fair		ARBORICULTURAL IMPACT ASSESSMENT: The proposed build fall out-side the RPA. METHOD STATEMENT: Install the section of Haras fence barrier positioned as indicated on the tree protection plan to create the CEZ.		<10 yrs
				S	3				B: Fair				
				W	3								
115	115											Estimated Measurements	
Lawson Cypress	5	1	110	N	1	Y	A: 5.5	Fair	C: Fair		Fell :: Fell to ground level		C.1
Chamaecyparis lawsoniana				E	1		R: 1.32		S: Fair				<10 yrs
				S	1				B: Fair		ARBORICULTURAL IMPACT ASSESSMENT: Proposed for removal.		
				W	1								
116	116											Estimated Measurements	
Common Oak	16	1	1060	N	10	M	A: 508.4	Good	C: Good				A.1
Quercus robur				E	9		R: 12.72		S: Good				>40 yrs
				S	10				B: Good		ARBORICULTURAL IMPACT ASSESSMENT: The proposed build fall out-side the RPA. METHOD STATEMENT: Install the section of Haras fence barrier positioned as indicated on the tree protection plan to create the CEZ.		
				W	9								

Report selection criteria.

Projects.

Conery Lane Farm

Date Range.

Any Date

Work types.

----> Fell :: Fell to ground level
----> -No Selection made-

Latest Survey.

All surveys for the selected trees.
---> Last survey for each selected tree.

Work Completed.

---> Work Completed
---> Work Not Completed

Number of trees in selected Project(s) **7**

Number of trees in Report selection **7**

Age Classifications:	N	Newly planted	EM	Early Mature
	Y	Young	M	Mature
	SM	Semi-mature	OM	Over Mature

Condition:	C	Crown
	S	Stem
	B	Basal area

Stems:	Ø	Diameter
	(Eq)	Equivalent stem diameter using BS5837:2012 definition

Appendix 6 British standard cascade chart for tree quality

BRITISH STANDARD

BS 5837:2012

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
Trees unsuitable for retention (see Note)		
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>	See Table 2
Trees to be considered for retention		
1 Mainly arboricultural qualities		
2 Mainly landscape qualities		
3 Mainly cultural values, including conservation		
Trees to be considered for retention		
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees with material conservation or other cultural value
	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

Appendix 7 Barriers

Barriers

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

6.2.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.

6.2.2.3 Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 3a). Where the fencing is to be erected

Figure 3 Examples of above-ground stabilizing systems

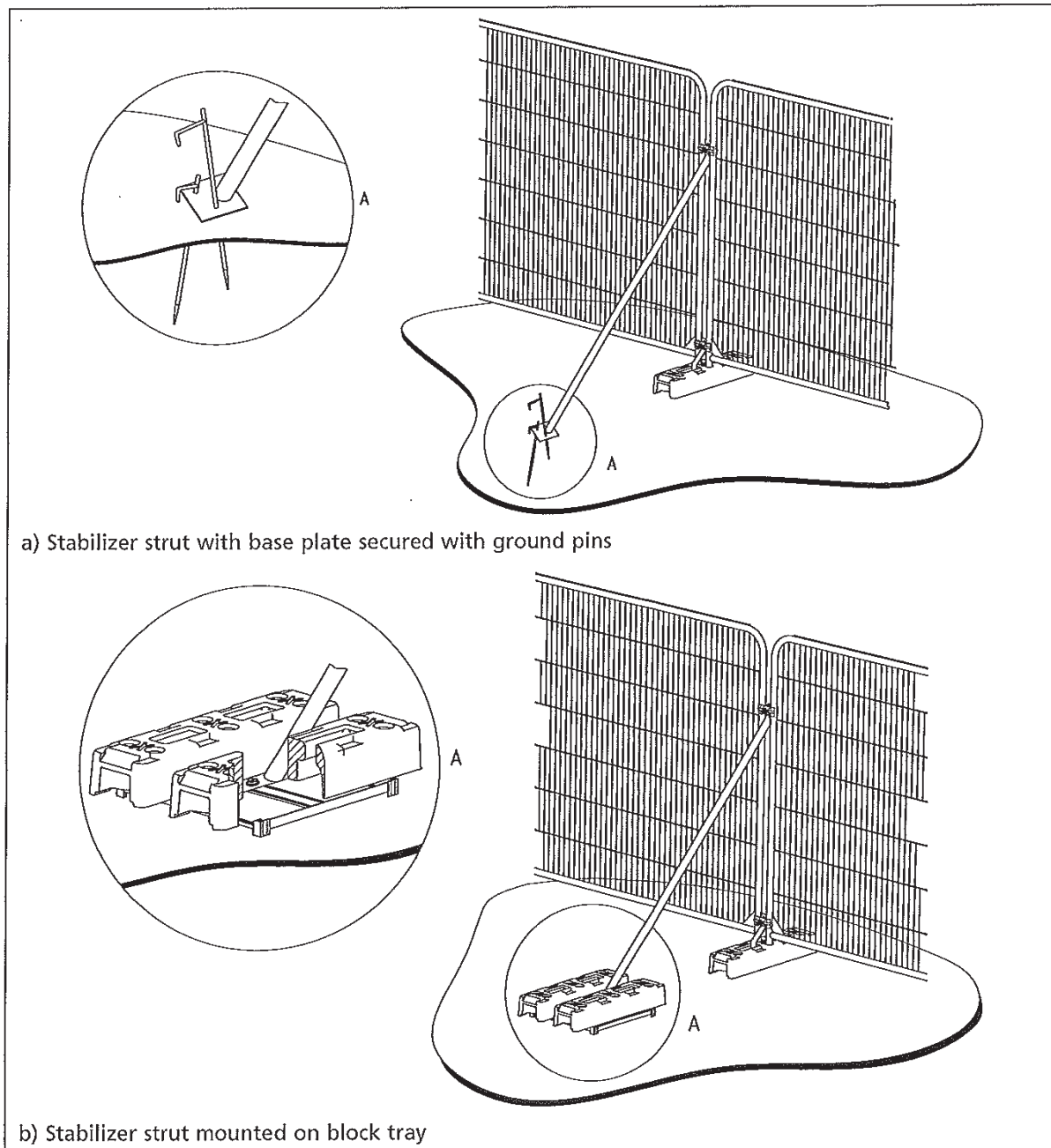
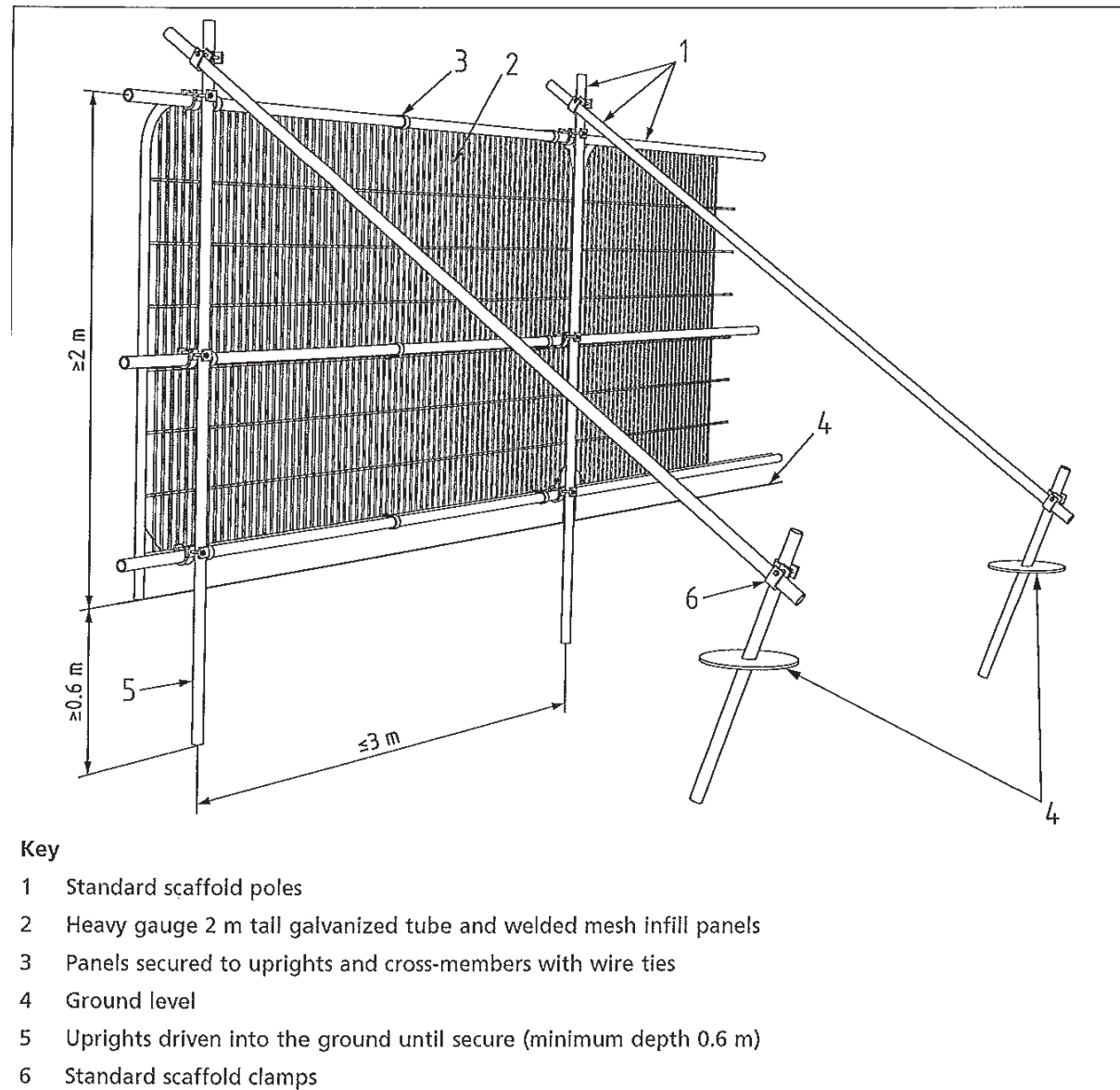


Figure 2 Default specification for protective barrier



Appendix 8 References

Arboricultural Practice Note No 12 'Through the Trees to Development' by Derek Patch and Ben Holding 2007.

BS5837: 2012 Trees in Relation to Design, Demolition and Construction Recommendations.

Diagnosis of ill-health in trees by R.G. Strouts and T.G Winter

Trees Pests and Diseases an arborists field Guide. Arboricultural Association.

Barrell Tree Consultancy: Buildings near trees.

Appendix 9 photo

