Treestyle
CONSULTANCY

February 2015

# BS5837
## *Trees in Relation to design, demolition & construction survey*

**A potential Driveway and barn**
**At**
**Pinfold Farm Barn**
**Preston Road**
**Ribchester**
**PR3 3YD**

Author;

Andrew McLoughlin

Treestyle Consultancy

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| **Client:** | **ALH Design Services** |
| **Site details:** | **Pinfold Farm Barn**<br>**Preston Road**<br>**Ribchester**<br>**PR3 3YD** |
| **Date of site inspection:** | **August 2015** |
| **Assessor & Report Author:** | **Andrew McLoughlin**<br>**NC/HND Arboriculture**<br>**Treestyle Consultancy** |
| **Proposal:** | **Potential road installation** |

## 1.0 Instruction and the purpose of the report

**1.1** I have been instructed to prepare an Arboricultural Implications Assessment (AIA), an Arboricultural Method Statement (AMS) and to produce a Tree Protection Plan (TPP) in accordance with BS 5837:2012 (Trees in relation to design, demolition and construction – Recommendations), by ALH Design Services for the above site. Maps supplied by ALH Design Services. The findings are listed in the Conclusion in section 9 page 11. The proposal is to install a driveway past a tree where a barn may be developed.

**1.2** This report seeks to read in conjunction with the Tree Protection Plan that accompanies it if any of the trees are to be retained.

**1.3** To assess the implications of the proposed extension of the property with regards to the close proximity to trees and to provide a method statement for the potential works that surround the residential area that may be affected by the site development. Then to provide tree protection measures for any retained trees during the construction phase.

**1.4** To provide a schedule of tree works to accompany a planning application.

## 2.0 The scope of the report - methodology & limitations

**2.1** The tree survey process consisted of a ground-based visual inspection only.

**2.2** The inspection consisted of an aboveground inspection only. Soil types were not assessed.

**2.3** This report is valid for one year from the date of site inspection. The condition of trees can change following severe weather conditions, the effects of diseases or pests and other abiotic factors.

**2.4** Any works to next to neighbouring trees may require the consent of the owner. These trees have not all been inspected because of this access couldn't always be gained. Access wasn't gained to the property that houses some of the trees. No defects were obvious at the time from any of the crowns of the trees where access couldn't be gained. Please note the trees were observed from a short distance.

**2.5** Only trees over 100mm in diameter at 1.5 meters have been included in the report. This is in accordance with British Standard for trees in relation to construction BS 5837:2012 (Trees in relation to design, demolition and construction – Recommendations). One tree in particular was very young, located at the front of the property, this has also been included even though its too small for BS5837. Another party produced the topographical mapping supplied to myself, the trees have been edited over this.

**2.6** No details relating to the location or the installation of services have been supplied. Therefore this report can only deal with this issue in a preliminary manner. The positioning of services should be approved by the appropriate organisation.

## 3.0 Site Description and Nature of Tree Stock

**3.1** Pinfold Farm Barn is located on the outskirts of Ribchester and is considered a rural area, the property is set immediately off the busy Lower Road (B6245). The Barn is surrounded by fields with Boyces Brook to the rear and a few trees and hedges that line the boundaries.

**3.2** Pinfold Farm Barn has some tree plantings within the grounds, these are mainly in the original Pinfold Farm.

**3.3** There is only one mature Lime *(Tilia cordata)* located in the boundary hedge that separates the B6245 from the grounds.

## 4.0 Description of the subject trees

**4.1** The table of results in section 12 and the submitted plan show the condition of the trees and their suitability for suitability for retention according to the British Standard for trees in relation to construction BS 5837:2012 (Trees in relation to design, demolition and construction – Recommendations). This guidance sets out four categories of trees; from trees that are highly desirable to retain (A), through (B) to trees that may or may not be suitable for retention C and trees to be removed (U). This system assesses the trees health and condition. In addition other factors such as their long-term impact on adjacent structures and good arboricultural management. A more detailed breakdown of this is included in Section 13 page 18.

**4.2** Trees marked 'U' have a condition that mean they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years. However, they may have existing or potential conservation value that might be desirable to preserve. Trees marked 'C1 – C3' are insignificant or immature specimens or those not of sufficient quality to be in the higher 'A' and 'B' categories. **'C' trees should be retained where possible or where it suits the development layout but there is a general presumption that they can be removed to facilitate development if necessary.** These trees are easily replaced with suitable landscaping.

**4.3** There is one tree listed under the B category, this equates to 100% of the tree population that may be affected by the development. This is of below average health so therefore down graded from A category, it still should be protected.

## 5.0 Arboricultural Implication Assessment

**5.1** Crown clean of T1, removal of dead, dying and any crossing and rubbing branches. A small crown lift will allow access beneath to aid construction.

**5.2** The arboricultural implications with this potential driveway are; The protection T1 Lime *(Tilia cordata)* the mature tree is set in the bordering hedge where the road will probably pass over the root plate. The road can still pass over the RPA (Root Protection Area) as long as a Geocell membrane is constructed where the two over lap. Also requires protection from contamination from building materials such as cement etc.

**5.3** Once the geocell has been installed, T1 and all other remaining trees will have to be fenced off and protected prior to any building materials, plant machinery or chemicals are allowed on site.

## 6.0 Tree Protection Plan

**6.1** The Tree Protection Plan (TPP) shows the ground to be designated as a Root Protection Area (RPA). The RPA also represents a Construction Exclusion Zone (CEZ).

**6.2** It should be noted that the full RPA cannot always be achieved on site due to ground constraints. The RPA can also be tailored to some extent given the structure and condition of individual trees. The CEZ shows the area that should be kept free of development work

**Root damage can be minimised by using;**

- Piles, with site investigations used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement; to a minimum depth of 600 mm.

- Beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.

**6.3 The following are precautions that must be taken within the RPA:**

- Fencing to be erected prior to any development commencing on site or any materials or machinery associated with development are brought onto the site.

- The fencing shall be maintained for the duration of the development unless otherwise agreed by the Local Planning Authority or in accordance with the approved plans and particulars.

- No materials, machinery, chemicals or fuel shall be stored within the RPA for the duration of the development.
- The ground levels within the RPA shall not be lowered or raised without the consent of the Local Planning Authority and/or in accordance with the approved

plans and particulars.

- Dwellings should be constructed with a ventilated air space between the underside of the slab and the existing soil surface (to enable gas exchange and venting through soil surface). This should be a three dimensional cellular confinements system. The design of the foundation should take account of any effect on the load bearing propertied of underlying soil from the redirected roof run off. Approval in principle for a foundation that relies on topsoil retention and roof run off under the slab should be sought from the building control authority prior to the approach being installed. Where piling is to be installed near to the trees, the smallest practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles.

- Following treatment with herbicide, existing vegetation shall be removed once dead by the use of hand tools e.g. spade or fork and shall not be removed by machinery.

**6.4 Protective measures outside the RPA**: The following are additional precautions outside the RPA. In addition to the ground protection within the RPA the following should be addressed or avoided

a) Care should be taken when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to trees and might make their safe retention impossible. Consequently, any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banks man to ensure that adequate clearance from trees is maintained at all times.
b) Material that will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10m of the tree stem.
c) It is essential that allowance be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards trees.
d) Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.
e) Notice boards, telephone cables or other services should not be attached to any part of the tree.

**6.5 Installation of new services**: No services should be installed within the root protection area (RPA). Should existing services within the RPA need upgrading this should be done in accordance with the advice of a suitably qualified Arborist and using a method approved by the Local Planning Authority.

**6.6 Site monitoring**: British Standard for trees in relation to BS 5837:2012 (Trees in relation to design, demolition and construction – Recommendations). requires that any RPAs are monitored during construction by a qualified and experienced Arborist. An appointed Arborist should be involved with the pre-commencement discussions and oversee the tree protection measures.

**6.7 Construction plans**: The RPA should be marked on all the construction plans to prevent any breach of the protection measures and planning conditions.

## 6.8 Tree root protection areas

| Tree / Hedge Number | Species | BS5837 Category | Root Protection (Radius m) | Root Protection (Area m2) |
|---|---|---|---|---|
| 1 | Lime | B1 | 7.2 (8.2) | 163 |
| 2 | Mixed hedge | B2 | 1.2 | n/a |

The figure in brackets (8.2) is the extended root protection distance as T1 has a none permeable surface on the Preston Road side, therefore there will be more rooting area on the permeable grassed area in the garden.

## 7.0 Arboricultural Method Statement (AMS)

**7.1** Any required tree pruning or tree removal should be carried out prior to commencement of the extension.

**7.3** Protective fencing is to be installed prior to any building being undertaken or any building materials being brought on site. This is still to be inspected by a qualified Arborist.

**7.4** For this section the following methodology is to be applied:

1) *Pre commencement site meeting with site manager, works crew and appointed* Arborist. *The appointed* Arborist *will fully explain how this AMS is to be executed and answer any questions.*
2) *Distances from the tree should be identified and the RPA marked out, of which T1 is breached. The area to be excavated and the overlapping RPA will determine the size of the area that the geocell should be installed.*
3) *The excavation of current surface with hand tools only, these are to be used for this AMS. No wheeled or tracked excavators to be used within the fenced off working area. Any existing tarmac surface is to be broken up in sections sequentially in a direction backwards away from the tree using either hand tools or hand-operated breakers.*
4) *Any roots below 25 mm in diameter can be severed.*
5) *A topsoil is to be applied to the exposed surface of the roots* ***immediately.***
6) *A gravel layer and then sandy surface can be applied on which a load platform geocell tree root protection flooring (See conclusion 9.2) can be laid with a 1 m overlap toward the tree and 1 metre toward the extension. This can now handle plant machinery.*
7) *Ensure that fencing is installed in accordance with the Tree Protection Plan See section 6 page 7. This fencing defines the working area. Distances can be seen on the page 9, the maps on page 20 and fencing criteria on page 22. Fencing should sit on the membrane and overlap by 0.5m allow 0.5 m work area.*
8) *Fencing can only be removed once permission from the LPA's tree officer is received.*
9) Once this has been completed a qualified Arborist must inspect the site, only then can machinery enter the site and construction begin.
10) A tree survey must be carried out approximately 24 months after the extension has been completed.

## 8.0 Legal constraints

**8.1 Trees subject to statutory controls:** The site may be subject to a Tree Preservation Order (TPO). If this is the case then any works to trees covered by the TPO will need the consent of the Local Planning Authority (LPA), unless exempt. The site may also be within a Conservation Area. If this is the case it is necessary to give six weeks prior written notice of intent to the LPA before any tree works other than certain exemptions can be carried out. Any works specified herein are necessary for the proposal to be implemented, and if approved, should be acceptable to the LPA. However, this should be confirmed in writing with the LPA prior to being implemented.

**8.2 Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provide statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist should be obtained before undertaking any works that might constitute an offence.

## 9.0 Conclusions

**9.1** T1 Lime *(Tilia cordata)* has been down graded to category B tree because of its poor crown canopy. The leaves are shrivelled and not complete and with a minor disease on its leaves. The RPA of T1 is greater on the garden side because of the none permeable surface of the road. This extends to 8.2m and there will be an area where the road overlaps the RPA. This is the Geocell surface will protect the roots from compaction. Driving over this root plate will crush and damage the root system that will then allow an entry point for fungi into the tree. The installation of the geocell membrane will prevent this from damaging the root system. The hedge H2 will alos require protective fencing.

**9.2** For the construction to take place within the RPA of T1, **only hand tools** maybe used in this area. The area that has been identified where the driveway and RPA of T1, see below;

http://www.terram.com/products/geocells/tree-root-protection-geocell.html

Once installed then the fencing can be installed on top of the 1 metre overlap, this will allow a .5m work area.

**9.3** The other issue with T1 Lime *(Tilia cordata)* are that the building materials like cement can leach into the soil and ultimately damage the trees root system. This is important that the wash off from tools and equipment is kept well away from this area.

**9.4** Re-inspection of all trees within 24 months of the construction of the garage. This is because it can take this long for the trees to show signs of stress because of the construction.

## 10.0 Methodology

The data recorded includes:

Height - Where access to the tree was not possible the Heights were estimated.
Diameter - measurements taken at 1.5 metres above ground level (complying with requirements for BS 5837:2012 (Trees in relation to design, demolition and construction – Recommendations).). Where multiple stems occurred below 1.5m the measurement was take as the point immediately above the root flare.
Girth data was gathered using a metric diameter tape, callipers or estimated when no access.
Tree crown spread – estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
Tree Crown Clearance – crown height above ground level
Tree condition - judged visually using the guidelines produced in the report. The condition is
indicated with the appropriate colour on the map found in the report
Age class - estimated from an examination of the tree in question.

### 10.1 Age Classification

The following classification is employed:
Y - Young: MA – Middle Aged:
M - Mature:
OM- Over mature:
V – Veteran:
Saplings and young trees under 10 years of age
Trees older than 10 years but less than one third of the life expectancy of their species, normally making substantial extension growth.
Trees between one third and two thirds of the life expectancy of their species. More or less full height and large girth, increasing only slowly.
Trees beyond two thirds of the life expectancy of their species. No significant extension growth. Crown starting to break up and decrease in size.
tree that shows features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

### 10.2 Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances, The following classification is employed:
Death or removal is likely within less than 10 years Death or removal is likely within 10-20 years. Death or removal is likely within 20-40 years.
Death or removal is likely beyond 40 years The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

### 10.3 Tree Condition

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.
The categories considered for Physiological Condition are good, fair, poor and dead. Structural Condition is also commented on and this will include such items of presence of decay and physical defects.
Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

## 11.0 References

**11.1** *British Standards: 5837 - Trees in relation to design, demolition and construction – Recommendations (2012). The British Standards Institution, controlled copy.*

**11.2** *DEFRA (2013).Wildlife and Countryside Act (WCA) 1981. Accessed 08.03.13 via http://jncc.defra.gov.uk/Default.aspx*

**11.3** *RG Strouts and TG Winter - Diagnosis of ill health in trees*

**11.4** *Principles of tree hazard assessment and management – David Lonsdale*

**11.5** *Claus Mattheck and Helge Breloer – Body Language of trees*

**11.6** *British Standards: 3998 -2010 - Tree work – Recommendations*

**11.7** *R.G.Srouts and T.G Winter - Diagnosis of ill health in trees*

**11.8** *NTSG - Common sense risk management of trees*

**11.9** Shigo (1986) - A new tree biology

**11.1.1** John Roberts, Nick Jackson and Mark Smith - *Tree roots in the built environment (2006)*

**11.1.2** Google maps

## 12.0 BS5837 Tree Survey Schedule

| Tree Number | Tree Species | Height meters | DBH mm | Bra N | nch S | spr E | ead W | Height of crown | Clearan ce | Age | Physiolo gical con | Structur al con | Preliminary management requirements | Est years | Catego ry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Lime (Tilia cordata) | 14 | 600 | 4 | 4 | 4 | 4 | 3 | 2 | M | G | G | Good to retain, below average crown canopy, requires a crown clean & lift | 40 | B1 |
| H3 | Mixed species hedge | 2 | 100 | 1 | 1 | 1 | 1 | 0 | 0 | m | G | G | Good screen hedge to be retained | 20 | B2 |

**Key;** **DBH Diameter at breast height - Age, Young, Young/Mature, Mature, Over Mature and Dead - Physiological condition, Good, Average, Poor, Dead Structural condition, Good, Average, Poor, Dead – H = Hedge – A = Area**

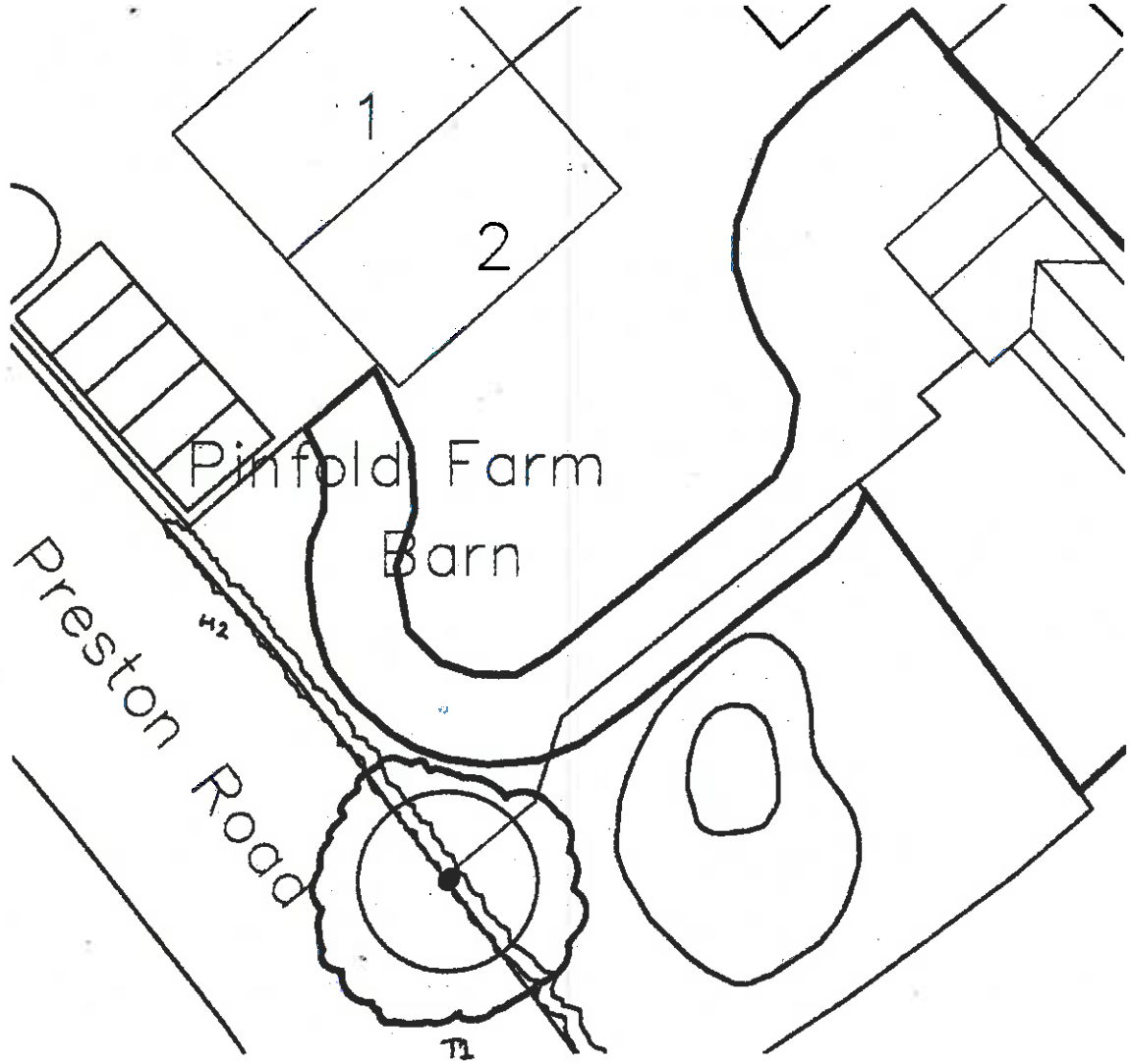
## 13.0 Cascade chart for tree quality assessment

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**<br>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)<br>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline<br>• 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<br>*NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.* | | | See Table 2 |
| | **1 Mainly arboricultural qualities** | **2 Mainly landscape qualities** | **3 Mainly cultural values, including conservation** | |
| **Trees to be considered for retention** | | | | |
| **Category A**<br>**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 | Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture) | See Table 2 |
| **Category B**<br>**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 | Trees with material conservation or other cultural value | See Table 2 |
| **Category C**<br>**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 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 | See Table 2 |

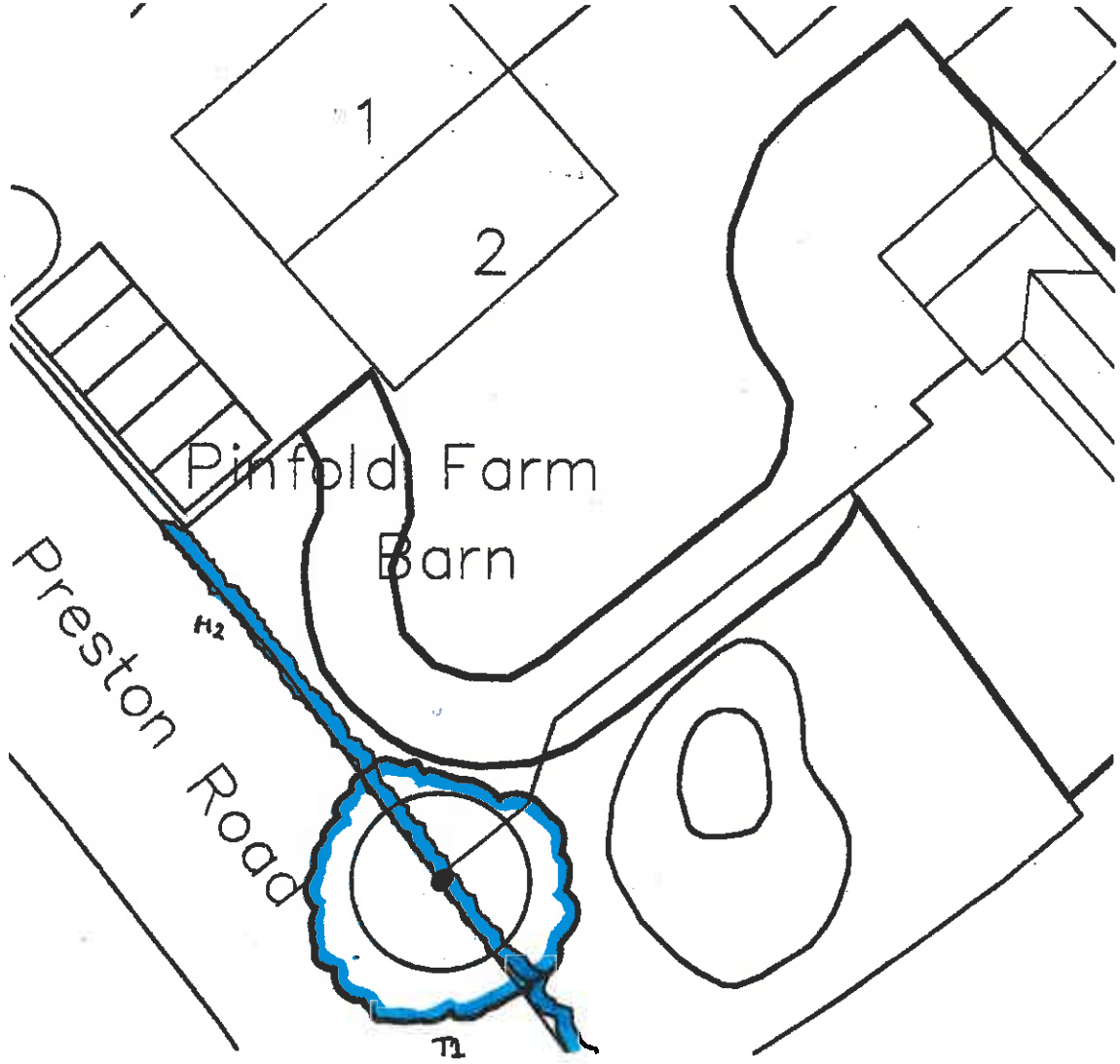
## 14.0 Mapping

## 14.1 Tree numbering



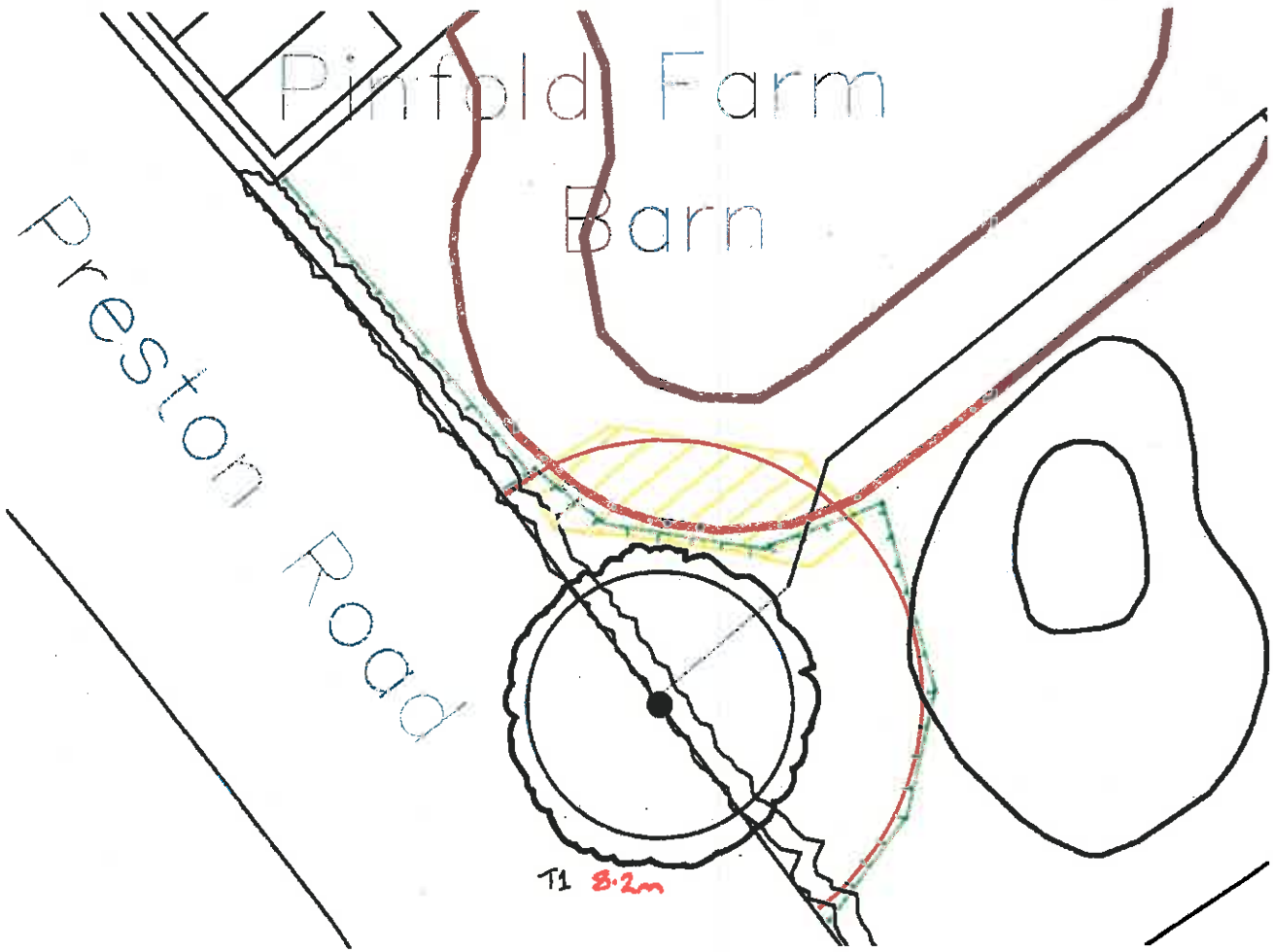
## 14.2 Mapping – Tree Categorisation

**Green – High quality,**
**Blue - Moderate quality,**
**Grey – Low quality,**
**Red cannot realistically be retained as living trees in the context of current land use**



## 14.3 Mapping – Root protection areas

**Orange indicates the RPA**
**Yellow is the Geocell membrane**
**Green is the protective fencing to be installed after the membrane has been fitted. Then the works can commence**



## 15.0 Photographs

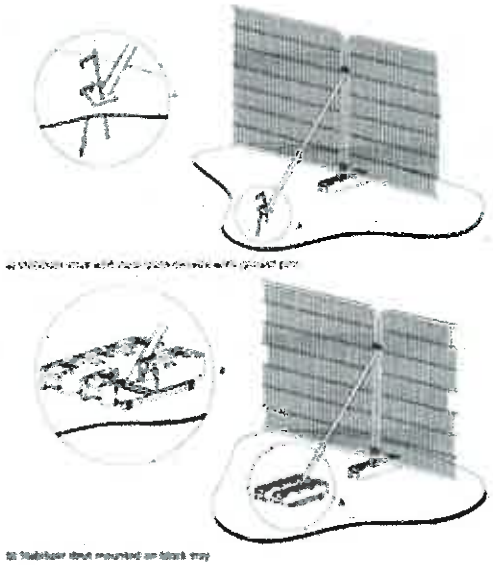
Left; Looking south, T1 overhanging the potential driveway.

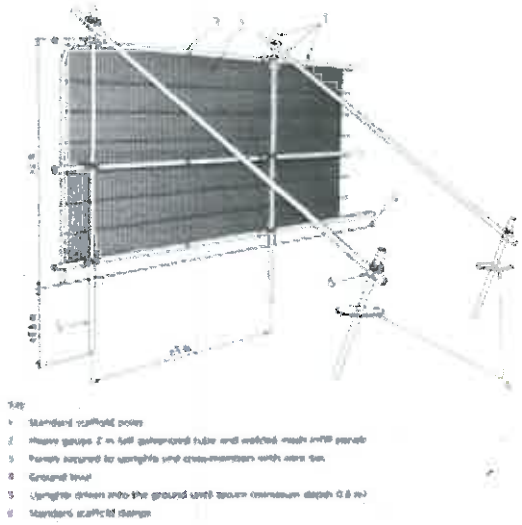
Above left; Looking west at T1 and the potential driveway.

Right; View from the road.

## 16.0 Root Protection Area Fencing Details

**Protective Fencing Specifications;** Since trees are living organisms which interact with their immediate environment any changes made to their surroundings may have a bearing on that trees future. Developing a site will undoubtedly place any trees within close proximity under some level of stress, which could predispose them to infection. The aim of this method statement is to limit the amount of stress induced by introducing protection measures.
The most effective way of offering protection is by erecting protective barriers set at a distance from the tree stem using the methods given within BS 5837: 2005 Trees in Relation to Construction. Barriers should be braced and constructed to resist impacts; see figures 1 & 2 below for barrier specifications.
Barriers should be erected before any works commence on site with the exception of recommended tree work. Areas of retained and future structure planting should be similarly protected.
All personnel should be made aware of the protected areas and instructed to keep them free of materials, waste and excess soil. Soil disturbance should be prohibited and travel of any kind, including foot traffic should also be excluded within the root protection area (RPA) unless previously agreed and adequate ground protection has been installed. Where foot traffic is agreed within the RPA, single thickness scaffold boards laid over a compressible material on a geotextile, or supported by scaffold should suffice. Where vehicular access through the RPA is agreed an engineer should be consulted to design adequate ground protection methods.





## 17.0 Curriculum Vitae

**Treestyle Consultancy**

This survey was carried out by Andrew McLoughlin. I have a National Certificate in Arboriculture (Distinction) and a Higher National Diploma in Arboriculture (Distinction and best student). I am also a qualified teacher and a LANTRA instructor. Full range of surveys include; Tree condition and recommendation survey, Trees in relation to design, demolition and construction, Mortgage report surveys for insurance purposes.

As part of my continual professional development I have attended a three day conference in London, two separate events at Myerscough College with the Arboricultural Association. These subjects covered Healthy trees, healthy people, tree health and trees in a hard landscape. All attended this year.

**Regards,**

**Andrew McLoughlin**
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