



Cedar Lodge • Wilcott Marsh • Shrewsbury • SY4 1AR
Tel: 01743 741 421 • 07811 113 250
Email: info@pearce-environment.co.uk
Web: www.pearce-environment.co.uk

Registered in England and Wales: 5175771

Arboricultural Assessment

(Incorporating Arboricultural Impact Assessment and
Tree Protection measures in accordance with BS5837:2012)

Project: Cleveland House, Clayton Road,
Pentre Broughton LL16BU

On behalf of: Castlemead Group Limited

Date: September 2015

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Wild Vision
Productions Ltd

TE Pearce Group of Companies

Author	D. Williams
2 nd Reader	W. Macken
Proof Reader	C. Pearce
Date	17/09/2015

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Executive Summary

An Arboricultural Assessment detailed within this report has been undertaken by Pearce Environment Ltd in accordance with BS5837:2012 '*Trees in Relation to Design, Demolition and Construction*' on behalf of Castlemead Group Limited. This report has been prepared to inform a planning application for construction of 4 residential units and associated access arrangements within the curtilage of the property referred to as 'Cleveland House'. The site is centred on approximate Ordnance Survey Grid Reference SJ 298 540.

The survey identified that the site supports a high density of broadleaved trees many of which exhibit tall etiolated growth forms due to group competition. Recent ground disturbance in close proximity to trees was identified within the eastern portion of the site adjacent to Clayton Road, consequential of the movement of machinery and spoil.

An Arboricultural Impact Assessment has been prepared with reference to the Site Layout (**Appendix 1**) to assess the potential impacts on trees. Appropriate tree protection measures required to provide successful tree retention are detailed in **Section 5 & 6**.

The assessment identifies that the removal of 9 trees and reduction of a hedgerow will be required to implement the proposal. Facultative pruning of a single tree (**T22**) is necessary to provide sufficient clearance from the proposed residential unit. Minor encroachment within the RPA of **T20** and **T22** has been identified, excavation within these areas will be restricted to hand dig methodologies. All remaining trees and hedgerows will be retained and protected throughout the duration of the construction period, in accordance with those measures detailed in **Section 4**.

It is acknowledged that a proactive management program during and post development will deliver arboricultural works which will be beneficial to the tree stock in the long term, given the sites lack of recent formal management.

Section 1

Introduction

- 1.1 Pearce Environment Ltd were commissioned by Castlemead Group Limited to undertake a *BS5837:2012 Trees in Relation to Design, Demolition and Construction* compliant survey at a parcel of land referred to as Cleveland House, Clayton Road, Pentre, Broughton (hereafter referred to as 'the site'). The site is centred on approximate Ordnance Survey Grid Reference (OSGR) SJ 298 540.
- 1.2 This report sets out the findings the Arboriculture Assessment undertaken on the 26th August 2015. An assessment of the potential impacts of the proposed development of the site on the current tree stock has been undertaken with recommendations and appropriate tree protection measures detailed, to ensure the successful retention of trees. The findings of this report have been used to inform a planning application for the construction of 4 residential units and associated access arrangements.
- 1.3 The aims of this report are to:
- Record and present the findings of the tree survey in accordance with BS5837:2012, identifying necessary tree works to maintain a safe and healthy tree population.
 - Present those arboriculture constraints pertinent to the development proposals.
 - Seek a satisfactory juxtaposition between the trees and new development by detailing tree protection measures, mitigation and compensation where necessary; and
 - Identify opportunities for the proposed development to provide enhancements to the tree stock within the site.
- 1.4 This report does not;
- Provide a detailed structural inspection of each tree surveyed. A lack of recommended work does not imply that a tree is safe, likewise it should not be implied that a tree will be made safe following completion of any recommended works;
 - Provide an assessment of the soils and the potential for those trees onsite to cause subsidence issues at present or in the future following development.

Section 2 Methodology

- 2.1 This section summarises the methodologies used during the tree survey which is based on the guidelines detailed in Section 4.4 'Tree Survey' of BS5837:2012 *Trees in Relation to Design, Demolition and Construction*,
- 2.2 The tree survey was undertaken on the 26th August 2015 by Douglas Williams, who holds an MSc in Biological Recording; the Arboricultural Association Professional Tree Inspection Certificate; the Royal Forestry Society Certificate in Arboriculture and is a Professional Member of the Arboricultural Association.
- 2.3 The tree survey includes all trees and other significant vegetation with a stem diameter of >75mm at 1.5m within the site, in addition to those located beyond the boundaries within a distance of 12 times their stem diameter. The position of each item is represented in **Plan 1**, derived from the topographical data included as **Appendix 2**. Those items not recorded on the topographical survey have been annotated by hand and marked using the symbol *.
- 2.4 All numbering of surveyed items is sequential with trees given the prefix 'T', hedgerows the prefix 'H' and groups of trees the prefix 'G'. **Schedule 1** contained at the rear of the report provides detailed of each items surveyed.
- 2.5 All trees have been visually inspected from ground level, with no climbing or further detailed investigative tests being undertaken. All measurements are metric and have been recorded in accordance with Section 4.4.2.5 of BS5837:2012. Where access to trees has been restricted, either as a result of vegetation, ground conditions or third party land ownership, dimensions have been estimated and highlighted using symbol # in **Schedule 1**.
- 2.6 All items have been categorised in accordance with the 'Table 1 Cascade Chart for Tree Quality Assessment' given in BS5837:2012. This framework provides a qualitative method in which trees can be categorised in terms of their health, amenity value and long-term contribution to the site summarised in **Table 2.1** below.

Table 2.1: Summary of Cascade Chart for tree quality assessment

Category and definition	Criteria
Category U	Those trees in such a condition that they that cannot be realistically retained as a living tree in the context of the current land use for longer than 10 years. If they cannot be safely retained as an ecological receptor following proposed remedial works, these trees should be removed for arboricultural reasons followed by appropriate replacement planting.
Category A (High quality of value)	Trees with an estimated life expectancy of at least 40 years. These trees may be of particular good example of their species or contribute an important visual landscape feature or provide significant historical/conservation value.

Category and definition	Criteria
Category B (Moderate quality and value)	Trees with an estimated life expectancy of at least 20 years. Trees which may be included within category A but are downgraded due to the presence of significant but remedial defect. May also include trees present in such numbers that they form a distinctive landscape feature i.e. woodland, or tree of a material conservation/cultural value.
Category C (low quality and value)	Trees with an estimated life expectancy of at least 10 years. Generally regarded as an unremarkable specimen of its species or of such an impaired condition that they do not qualify for higher categories providing little landscape/conservation or cultural value.

Tree Work Priority Codes

- 2.7 Priority codes from 1 to 3 have been given for those trees requiring tree works detailed in **Table 2.2 below**. The definition and level of urgency have been determined based on the perceived likelihood of failure and potential/actual targets.

Table 2.2: Tree works Priority Codes

Priority Code	Description
Priority Code 1	An identified hazard considered to pose an imminent or serious risk to person or property in the context of the current land use. Works should be undertaken at the earliest possible opportunity.
Priority Code 2	Works considered necessary to mitigate a perceived hazard from an observed and recorded defect. These tree works should be undertaken prior to any development works commencing on site.
Priority Code 3	Considered to be general maintenance works which should commence post development but prior to residential occupancy.

Limitations

- 2.8 Trees are dynamic structures and can never be considered 100% safe, even those in good condition can become compromised during extraordinary circumstances or rapid decline following the infection of pathogen/disease. Regular inspection of the tree stock should be undertaken to identify potential defects/hazards before they become acute.

Section 3

Results and Design Constraints

Site Description

- 3.1 The site is located upon the north eastern periphery of the village of Brymbo approximately 3.5km north west of Wrexham. Situated between Green and Clayton Road, the topography of the site runs east to west down towards Green Road and would form an area of residential infill. Bound to the north, south and west by residential development, the eastern boundary of the site meets pasture (Beyond Clayton Road) reflective of the land use surrounding Brymbo.

Figure 3.1: Site location plan “labelled C” provided by Castlemead Group Limited.



Tree Preservation Orders/Conservation Areas

- 3.2 At the time of the arboricultural assessment it was undetermined as to whether those trees surveyed are the subject of a Tree Preservation Order or fall within a Conservation Area. Written consent must be given by the Wrexham County Borough Council prior to any works upon a tree subjected to statutory protection.

Forestry Act 1987

- 3.3 A felling licence is required whereby an excess of 5 cubic metres of timber is felled per calendar quarter. Exception to the Forestry Act 1967 include felling trees which when measured at 1.3m above ground level;
- Have a stem diameter of 8cm or below
 - Thinning of trees with a stem diameter of 10cm or below
 - Coppicing of trees with a diameter of 15cm or below
- 3.4 Exceptions are also afforded to work carried out by statutory undertakers; removal of dangerous/dead trees, prevention of abatement of a nuisance and to prevent the spread of quarantined pest or disease in accordance with a notice served by a Forestry Commission Plant Health Officer.
- 3.5 Whereby full planning permission is authorised both statutory obligations above are no longer applicable, transcended by the Town and Countryside Planning act (1990) which permits tree removal for the purpose of development.

Protected Species

- 3.6 All species of British bat are listed as an European Protected Species (EPS) on Schedule 2 of the Conservation Regulations (Annex IV(a) to the Habitats Directive). This affords them strict protection under the Conservation of Habitats and Species (Amendment) Regulations 2010, making it an offence to:
- Deliberately capture, injure or kill a wild animal of an EPS;
 - Deliberately disturb wild animals of an EPS wherever they are occurring, in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or in the case of hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong;
 - Deliberately take or destroy the eggs of a wild animal of an EPS; or
 - Damage or destroy a breeding site or resting place of a wild animal of an EPS.
- 3.7 Additional protection for bats is also afforded under the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly disturb bats whilst they are occupying a structure or place which is used for shelter or protection, or to obstruct access to this structure or place.

- 3.8 All wild birds, their nests and eggs are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:
- i. Intentionally kill, injure or take any wild bird;
 - ii. Take, damage or destroy the nest of any wild bird while it is in use or being built;
 - iii. Take, damage or destroy the egg of any wild bird; or
 - iv. To have in one's possession, or control, any wild bird (dead or alive) or egg or any part of a wild bird or egg.
- 3.9 A separate ecological report has been produced for the site by Pearce Environment Ltd which includes details of the trees potential to support roosting bats and nesting birds.

Tree Stock Generally

- 3.10 The survey process recorded a total of 25 individual trees, a single tree group and 2 hedgerows totalling 29 items. A total of 11 species were recorded on site, semi mature to early mature standards of ash and sycamore comprise the majority of the tree stock forming a cohesive tree group which covers the majority of the site. **Schedule 1** contains the full attributes of each item surveyed and details the condition and any tree works perceived as necessary.
- 3.11 In order to provide an informed account of the quality of the tree stock as a whole to contribute to the local landscape in the long term, the tree survey data has been categorised into two specific categories below, age distribution and grade classification.

Age Distribution

- 3.12 Analysis of the age distribution of the tree stock presented in **Table 3.1** below assesses the tree stocks potential to provide long term contributions to the amenity of the local area. The ability for a tree to tolerate ground disturbance and changes in abiotic factors is largely dependent on its age, becoming less tolerant as it becomes more established. Other factors such as site conditions and species tolerance also play a role in a trees ability to endure ground disturbance.

Table 3.1: Tree works Priority Codes

Age Class	Number	Percentage
Young	0	0
Semi Mature	11	38
Early Mature	9	31
Mature	9	31
Over Mature	0	0

Age Class	Number	Percentage
Veteran	0	0
Total	29	100

- 3.13 Over half of the trees surveyed fall within the early mature to mature age class spread evenly throughout the site. Particular consideration should be given to those mature items with respect to encroachment/conflict with the RPA/canopy and the footprint of development.

Grading Classification

- 3.14 Whist age distribution is important to quantify the longevity of the tree population the health and condition of the tree stock is undoubtedly the overriding factor in the tree populations potential to provide long terms contributions in terms of amenity, cultural and ecological value. An assessment of the quality of the tree stock has been undertaken and is presented in **Table 3.2** below.

Table 3.2: Category Grading

Category Grading	Number	Percentage
Category A (High quality of value)	0	0
Category B (Moderate quality and value)	7	24
Category C (low quality and value)	22	76
Category U	0	0
Total	29	100

- 3.15 The majority of those trees on site fall within the low grade categories can be directly attributed to;
- Specimens which exhibiting tall etiolated forms due to group competition for ambient.
 - Significant ground disturbance/wounding during resent construction works.

Tree Work Recommendations

- 3.16 Any tree works detailed in **Table 3.3** overleaf should be undertaken in accordance with the requirements of BS3998:2010 *British Standard Recommendations for Tree Works* by fully trained, qualified and insured arboricultural contractor. Permissions/Notice of tree works will be undertaken prior to any works taking place as highlighted in paragraph 3.2 of this report.

Table 3.3: Tree Work Recommendations

Urgency	Tree number	Proposed works
Priority Grade 1 High Urgency	N/A	N/A
Priority Grade 2 Pre-construction	T1 Lombardy Poplar T11 Ash T16 Goat Willow	Fell to ground level Fell to ground level Fell to ground level
Priority Grade 3 Pre residential occupancy	N/A	N/A

Design Considerations

- 3.17 The design of the proposed development of the site should seek to retain all 'B' grade and where practical 'C' grade items. Consideration should be given to the future implications associated with the retention of trees in term of their potential influence on the development.

Section 4

Arboricultural Impact Assessment

- 4.1 Pearce Environment Ltd have provided inputs regarding the tree constraints on site informing the site layout included as **Appendix 1** to meet satisfactory juxtaposition between trees and the proposed development.
- 4.2 An Assessment of **Appendix 1** has been undertaken with reference to **Plan 1** to inform a desk based assessment of the foreseeable impacts that the development may have on the current tree stock. The Tree Protection Plan (**Plan 2**) depicts trees to be retained with solid crown spreads, numbered and coloured stems to reflect their respective category grading. **Plan 2** also depicts the extent of the Construction Exclusion Zone (CEZ), protective barrier fencing and additional tree protection measures where appropriate.
- 4.3 The arboricultural impact assessment recognises that construction activities have the potential to pose significant threats to the long-term health of trees during and post development. Tree protection measures have been recommended and where appropriate mitigation proposed with the view of providing a harmonious relationship between trees and the development.
- 4.4 Ultimately the removal of any tree is based on its proximity to the development footprint and associated landscaping. Consideration has been given to the future growth of retained trees to ensure future conflicts do not arise between trees and the built form in terms of regular pruning and shading.

Trees Falling under the Footprint of Development

- 4.5 Assessment of the site layout identified the removal of 2 B grade trees of moderate quality and value and 7 C grade trees of poor quality and value is required detailed in **Table 4.1** below.

Table 4.1: Trees falling under the footprint of development

Tree number	Species	Category Grading
T6	Wild Cherry	B1
T7	Wild Cherry	B1
T8	Goat Willow	C1
T9	Ash	C1
T10	Ash	C1
T11	Ash	C1
T14	Sycamore	C1
T15	Ash	C1
T29	Laurel	C1

- 4.6 It is acknowledged that this level of tree removal constitutes a significant proportion of the overall tree stock. Due to the congested nature of the tree stock and the restricted size of the site, substantial tree loss is unavoidable as part of the development of this site.

Tree Removal due to Arboricultural Reasoning

- 4.7 Tree removal **T1** a tall early mature poplar is recommended. This species is susceptible to windthrow and given its location (on top of a retaining wall), soil area and absence of companion shelter is predisposed to failure. It is recommended that this tree is felled to ground level.

Tree removal/hedge reduction to achieved visibility splays

- 4.8 The removal of **T13** a B grade Sycamore of moderate quality and value is required to achieve the necessary visibility splays upon Clayton Road. The reduction of **H12** will also be required to facilitate both access and visibility splays associated with the properties which meet Clayton Road.

Temporary RPA Set Back

- 4.9 In accordance with Section 5.5.4 of BS5837:2012 temporary RPA setback is permitted where access is required to implement works such as pruning operations to provide sufficient clearance from **T10** and the built form. In addition temporary access is required within the RPA of **T20** and **T22** during and construction of the residential units adjacent to Clayton Road. The period of RPA setback will be restricted to these activities.

Construction within the RPA of retained trees

- 4.10 Assessment of site layout identified that minor encroachment of the residential units adjacent to Clayton Road within the eastern corner of the RPA **T20** and northern extent of **T22**. Allowance for limited manual excavations are permitted for such activities in section 7.2. of BS5837:2012 using hand tools only.

Facilitative Pruning

- 4.11 Pruning of northern canopy of **T22** a B grade sycamore will be required to provide clearance from the proposed unit during and post development. Pruning works will be restricted to the reduction of secondary branches to ensure a 1.5 m clearance. Such tree works should be undertaken sympathetically, prior to construction works in accordance with the requirements of BS3998:2010 *British Standard Recommendations for Tree Works* by fully trained, qualified and insured arboricultural contractor.

Installation of Utilities

- 4.12 All services both above and below ground should be located outside the CEZ. Guidance should be sought from NJUG 4 issue 2 included in **Appendix 4**. Where this is not possible allowances are made within Section 7.1 and 7.7 of BS5837:2012 to perform trenchless insertion methods or in the case of shallow service runs, hand dig excavations are permitted where roots can be retained and desiccation avoided.

Site Compound and Storage of Materials

- 4.13 It is envisaged that materials will be brought onto site on an as need basis and stored on site adjacent to Clayton Road and Green Road. Clayton Road and Green Road will provide a source of parking for a small number of contractors vehicles.

Mitigation Planting

- 4.14 Tree removal is restricted largely to 'C' grade items of low quality and value (with the exception of two B grade Cherry's **T6** & **T7**). Development of the site will lead to proactive management of the tree stock and it is envisaged that new tree and hedgerow to replace those items lost.

Future Growth of Trees

- 4.15 Consideration has been given to the future growth of those trees retained. Care has been given to ensure trees have not been incorporated into the proposal on the basis that they can be regularly pruned in future years.

Section 5

Tree Protection Measures

- 5.1 This section details those tree protection measures which are required to ensure the adequate protection of any trees in proximity to development. These protection measures are detailed in **Plan 2** taking into account the crown spreads and RPAs calculated using the methodology set out in Section 4.6 and Annex C and D of BS5837:2012 of all trees proposed for retention on site.

Below Ground Constraints

- 5.2 The rooting system of the trees provides the resources required for growth, photosynthesis and other vital metabolic process. The majority of the trees roots are located in the top 50cm of the soil, compaction/disturbance of the upper surface can have a serious effect on the trees ability to function.
- 5.3 To ensure adequate protection is afforded to the root system of retained trees, the extent of the RPA will be enclosed using protective barrier fencing as illustrated in **Appendix 3** using the measurements provided in **Schedule 2**.
- 5.4 Section 4.6.2 of BS5837:2012 acknowledges that pre-existing site conditions may indicate that the rooting system is not asymmetric. In this case the shape of the RPA may be modified but area not reduced based on arboricultural reasoning.
- 5.5 Where temporary access routes transverse the RPA of retained trees, porous ground protection will be installed in accordance with Section 6.2.3 of BS5837:2012 to avoid compaction of soils.
- 5.6 Roots smaller than 25mm in diameter may be pruned back making a clean cut with a sharp tool. Where roots above 25mm are encountered works will halt and advice sort from an appropriately qualified arboriculturalist. Exposed roots will be covered with hessian to prevent desiccation which should be removed prior to backfilling as soon as possible.
- 5.7 All material/liquids will be stored on wooden pallets and kept on area of hard standing/site compounds due to the toxicity of some materials. No mixing or storage of materials will take place upslope where they may leak into a CEZ.
- 5.8 Lowering of the water table can significantly impair a trees ability to function. All hard standing areas should be drained into a soft landscape area or a known soak away.

Above Ground Parts

- 5.9 The stem and branches of the tree support the photosynthetic resource needed for the tree to provide itself with carbohydrates and to grow. Whilst more visible and easier to quantify than the root system, consideration is needed in respect to the ultimate height and canopy spread of the trees to prevent future conflict with the built form.

- 5.10 Protective barrier fencing erected to safeguard the RPA in most case will incorporate the crown spread of any given tree. In some cases the crown spread may exceed the RPA in which case the tree protective barrier should be extended and offset 1m from the extremities of the crown.

Recommendations for Future Actions

- 5.11 All services both above and below ground should be located outside the CEZ. Guidance should be sought from NJUG 4 issue 2 included in **Appendix 4**. Where this is not possible allowances are made within Section 7.1 and 7.7 of BS5837:2012 to perform trenchless insertion methods or in the case of shallow service runs, hand dig excavations are permitted where roots can be retained and desiccation avoided.
- 5.12 Following completion of development, an arboriculture survey of the tree stock should be undertaken on an bi-annual cycle to ensure long term longevity and safety is monitored and documented.

Section 6

Arboricultural Method Statement (AMS)

- 6.1 This Arboricultural Method Statement has been prepared to ensure successful retention of the tree stock during all stages of construction. This section details the protective measures to be applied, specialist construction methodologies to be adopted, the schedule of works to be undertaken and the responsibilities of the Contractors and Arboricultural Clerk of Works. This section should be read in conjunction with **Plan 2** the tree protection plan which shows the proposed protective measures, as identified in the Arboricultural Impact Assessment (**Section 4**).
- 6.2 **Table 6.1** below provides a schedule in which works will be undertaken and where supervision/inputs will be required by the Arboricultural Clerk of Works (Highlighted in green) to ensure tree protection measure are appropriate and enforced.

Table 6.1: Timings Set Out for Details of the Arboricultural Method Statement

Arboricultural Method statement Phase	Pre works	Construction Period	Post Construction period
Appointment of ACW & Contactors			
Pre commencement meetings			
Pre commencement tree works			
Installation of tree protection measures			
Ground works			
Construction of Residential units and garages			
Remedial landscaping			
Dismantle tree protection Measures			
Post construction Tree inspection			

Schedule of Works & Working Methodologies

- 6.3 The following method statement sets out a four staged approach to ensure impacts upon the tree stock are avoided during the construction of the development:

Appointment of Arboricultural Clerk of Works (ACW) & Pre commencement meetings

- The developer shall appoint an experienced ACW to ensure that those protection measures detailed in this report are enforced to safeguard all retained trees/hedgerows.

- The ACW will be appointed at the developers cost prior to the commencement of works and shall attend site on an 'as need basis'. It is proposed that a regular inspection regime will be agreed with the Local Planning Authority (LPA).
- A pre commencement meeting will be undertaken between the developer, appointed contractor, ACW and LPA tree officer to confirm the arrangement of the tree protection measures, timings of construction program/monitoring regime and reporting procedures.

Pre commencement Tree works & Insulation of Tree Protection Measures

- Where tree works are required they will be completed prior to the commencement of construction works in accordance with *BS3998 2010 British Standard for Tree Works*, by appropriately qualified and trained and insured arboricultural contractor.
- Prior to the commencement of tree works the ACW will meet the appointed arboricultural contractor to confirm the scope and extent of the tree works proposed.
- The installation of tree protection measures in accordance with Section 6.2 of BS5837:2012 as detailed in **Section 4** and illustrated in **Appendix 3** will be completed post tree works but prior to any construction activities.
- To assist with the setting out of protective barrier fencing the measurements of the RPAs have been included within **Schedule 2** and checked against **Plan 2**. The enclosed area referred to as the construction exclusion zone should be treated as sacrosanct and remain intact/undisturbed throughout the construction process. The ACW will undertake an inspection of all protective barriers to ensure the specifications comply with the measurements included in **Schedule 2**.
- Where temporary access is required within the RPA of retained trees ground protection will be installed in accordance with paragraph 6.2.3.3 of BS5837 and overseen by the ACW. Ground protection will be capable of supporting the relative loads without resulting in compaction of the underlying soils.

Monitoring and Maintenance of Tree Protection Measure

- The Appointed ACW will undertake regular site visits to ensure tree protection measures remain fit for purpose in accordance with the monitoring regime determined during the pre-commencement meeting
- It is the responsibility of the main contractor to contact the ACW in the event of any conflicts between the tree protection measures and construction operations.

- Where required ACW will make changes to those recommendations in this report in the best interest of the tree stock to be agreed with the LPA prior to implementation.
- Site access will be achieved via Clayton Road and Green Road.
- Contractors parking, plant and machinery will be located on site adjacent to Clayton Road and Green road following the tree removal identified in the Arboricultural Impacts Assessment. An area of hardstanding adjacent to Green Road where a garage has been demolished will be used for the safe storage of all hazardous material and liquids.
- No lighting of fires/mixing of material will take place within 2m of the construction exclusion zone. No mixing or storage of material will take place up slope where they may leak into a construction exclusion zone.
- Contingency plan: water will be readily available on site to flush spilt materials through the soil to avoid contamination to the tree roots. In the event a spillage occurs, the ACW will be contacted for advice.

Construction Within the RPA of retained trees

- In accordance with 6.2.3 of BS5837:2012 temporary RPA set back of **T20** and **T22** is required to facilitate construction of two residential units where there is minor encroachment into the RPA. Activities within this area will be restricted to hand dig methodology in accordance with Section 7.2.1 of BS5837:2012 as shown on **Plan 2**. The ACW will ensure that the works are in line with the provisions set out below.
- Works will be undertaken between May – October, all ground vegetation will be killed using a herbicide and removed by hand.
- All major protrusions/stumps will be removed/ground out where necessary and remaining holes will be filled with sharp sand.
- Roots smaller than 25mm in diameter may be pruned back making a clean cut with a sharp tool.
- Where roots above 25mm are encountered works will halt and advice sought from an appropriately qualified arboriculturalist.
- Exposed roots will be covered with hessian to prevent desiccation which should be removed prior to backfilling as soon as possible.
- Once construction activities in these areas are completed, the protective barriers will be repositioned.

Dismantle Tree Protection Measures/Post Construction Tree Inspections

- Once all construction/landscaping is completed all tree protection measures will be removed from site.
- A post construction tree survey will follow to assess the condition of the tree stock and identify any remedial works required.

Section 7

Conclusion

- 6.1 An Arboricultural Assessment was undertaken in accordance with the recommendations of the British Standard 5837:2012 *Trees in relation to Design, Demolition and Construction*. The survey process identified 25 individual trees 1 group of trees and 2 hedgerows.
- 6.2 The arboricultural Impact assessment identified that the removal of 9 trees and reduction of a single hedgerow is required to implement the proposed layout. The crown reduction of the northern extent of **T22** is proposed to achieve clearance from one of the proposed residential units. In addition temporary RPA set back and use of hand tools to facilitate construction of the foundation of residential units within the RPA of **T20** and **T22** is proposed. Three trees **T1**, **T11** and **T16** has been proposed for removal irrespective of development due to non-remedial defects which are predisposed to failure.
- 6.3 Protective measures have been detailed in **Section 5 & 6** of this report to ensure no significant impacts upon those remaining trees are considered likely to arise.
- 6.4 The arboricultural assessment of the tree stock is valid for up to two years from the date of this report. The findings of this report, plans and appendices is the property of Pearce Environment Ltd, and has been prepared for the sole use of the client. Permission from the author must be obtained prior to reproduction of material either wholly or in part.
- 6.5 Should the development proposals be altered significantly, such that changes to the working area and/or duration of the works arise, then a re-assessment of the likely impacts arising by a suitably experienced arboriculturalist will be required.

Schedules

Schedule 1 (Tree Survey Schedule)

Client:	Castlemead Group Limited										Site:	Cleveland House Clayton Road & Green Road					
Date of Survey:	26 August 2015										Consultant	Douglas Williams MSc, BSc, RFS cert Arb, AA PTI					
Tagged	No										Weather	Sunny					
Tree Reference No.	Species	Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch (m)	Canopy Clearance (m)	Life Stage	Physiological Condition	Structural Condition	Proposed Works	Estimated Remaining Contribution (Years)	Category Grade	Priority	
				N	E	S	W										
T1	Lombardy Polar	24	360, 240, 150	2	2	2	2	4S	4	Early Mature	Fair	Trifurcated at base. Tall specimen set on raised boundary wall. No companion shelter.	Fell to ground level due location, predisposed to failure.	10+	C1	2	
T2	Wild Cherry	6	200, 150, 120	1	2	4	3	1S	1	Semi Mature	Fair	Bifurcated at base western stem further bifurcates at 1m. Historically reduced to 5m in height. Poor Shape and form.	N/A	10+	C1	N/A	
T3	Wild Cherry	8	190, 200	2	3	4	2	2/S	2	Semi Mature	Fair	Bifurcates at ground level, eastern stem felled at 1m. Historic leader lost at 6.5m, elongated southern limb has taken apical dominance. Poor shape and form.	N/A	10+	C1	N/A	
H4	Lawson Cypress	2	80	1	1	1	1	0.25	0.25	Semi Mature	Fair	Defunct throughout, dense undergrowth brash adjacent to hedgerow.	N/A	10+	C1	N/A	
G5	Filed Maple & Wild Cherry	8	120	2	2	2	2	2/W	2	Semi Mature	Fair	Self set, tall etiolated growth form, situated on raised retaining wall.	N/A	10+	C1	N/A	
T6	Wild Cherry	14	360	5	2	4	5	2/nw	1	Mature	Good	Ivy on stem extending in crown. Rope swing on lowest primary limb. Crown is asymmetric due to group competition.	N/A	20+	B1	N/A	
T7	Wild Cherry	14	340	6	6	5	1	2/N	1	Mature	Good	Asymmetric crown development	N/A	20+	B1	N/A	
T8	Goat Willow	14	520	6	6	6	3	3/N	2	Mature	Fair	Spoil/brick dumped against eastern buttress. Multi stemmed at 1.8m.	N/A	10+	C1	N/A	

Client: Castlemead Group Limited										Site: Cleveland House Clayton Road & Green Road						
Date of Survey: 26 August 2015										Consultant: Douglas Williams MSc, BSc, RFS cert Arb, AA PTI						
Tagged: No										Weather: Sunny						
T9	Ash	14	340	4	4	3	5	2 N	2	Early Mature	Fair	Ground disturbance evident. Prolific ivy on main stem extending into crown, inhibits detailed inspection of stem.	N/A	10+	C1	N/A
T10	Ash	14	330	5	6	4	4	2 N	2	Early Mature	Fair	Grown disturbance evident. Prolific ivy on main stem extending into crown inhibits detailed inspection. Vertical decay coulomb extends from ground level to 2.5m on south east of main stem. Minor deadwood through the southern canopy symptomatic with reduced vascular function.	N/A	10+	C1	N/A
T11	Ash	11	220	3	3	3	3	2/W	2	Semi Mature	Poor	Signs of extensive excavation and severance of major roots north west and south of the tree to provide access.	Fell due to compromised condition	10+	C1	2
H12	Hawthorn	5	100, 100, 100, 100	1.5	1.5	1.5	1.5	0.25	0.25	Early Mature	Fair	Multi stemmed specimen of hawthorn forms a hedgerow feature, severed in part to facilitate access into the site.	N/A	10+	C1	N/A
T13	Sycamore	13	380	3	4	3	3.5	1/N	0.5	Early Mature	Good	Set in hedgerow, bifurcated at 1.5m, union included, no spacing within crown, stable at present.	N/A	20+	B1	N/A
T14	Sycamore	12	200	2	2	5	6	1/E	1	Semi Mature	Good	Prolific ivy on stem extending into crown. Tall etiolated growth form.	N/A	10+	C1	N/A
T15	Ash	14	210, 200, 160, 100, 150	2	2	2	2	5/w	5	Semi Mature	Fair	Lapsed coppice, multi stemmed at base forming tall etiolated poles.	N/A	10+	C1	N/A
T16	Goat Willow	11	260, 280, 210	7	5	2	5	0.5/N	0.5	Early Mature	Fair	Recent ground disturbance evident north and east. Trifurcated at base western union has partially failed. Minor deadwood in crown. First primary branch at 0.5m north torn but remains attached.	Remove due to compromised main union	10+	C1	2
T17	Hawthorn	9	100	2	2	2	2	0.25	0.25	Semi Mature	Fair	Self set, tall etiolated growth form. Prolific ivy on main stem extending into crown.	N/A	10+	C1	N/A

Client: Castlemead Group Limited Date of Survey: 26 August 2015 Tagged No										Site: Cleveland House Clayton Road & Green Road Consultant Douglas Williams MSc, BSc, RFS cert Arb, AA PTI Weather Sunny						
T18	Sycamore	12	250	3	3	3	2	6/N	5	Semi Mature	Good	Tall etiolated growth form due to group competition.	N/A	20+	B1	N/A
T19	Sycamore	12	260	3	2	3	3	2W	2	Semi Mature	Good	Tall etiolated growth form due to group competition.	N/A	20+	B1	N/A
T20	Sycamore	16	400, 300, 300, 320	5	5	5	5	4.5/W	5	Mature	Good	Multi stemmed at base, south union included, no spacing in crown. Minor deadwood in upper crown, bark abrasions at 10m and 11m east.	N/A	10+	C1	N/A
T21	Sycamore	13	340	3	4	4	4	4/N	3	Early Mature	Fair	Recent ground disturbance at all cardinal points, bifurcates at 1.5m. Wounding on stem between 0.5m and 2m south.	N/A	10+	C1	N/A
T22	Sycamore	13	310	4	4	2	4	3/E	3	Early Mature	Fair	Recent ground disturbance at all cardinal points.	N/A	10+	C1	N/A
T23	Sycamore	11	340	3	3	3	3	2/E	2.5	Early Mature	Fair	No visible defects. Prolific Ivy on stem.	N/A	20+	B1	N/A
T24	Hawthorn	7.5	510	3	2	3	2	2/S	1	Mature	Fair	Multi stemmed at 2m, canopy development suppressed by T20.	N/A	10+	C1	N/A
T25	Ash	13	320	5	3	4	4	3/SW	3	Mature	Fair	No visible defects.	N/A	20+	B1	N/A
H26	Hawthorn & Damson	10	100	N/A	N/A	N/A	N/A	2/S	2	Semi Mature	Fair	Unmanaged hedgerow.	N/A	10+	C1	N/A
T27	Goat Willow	11	420	5	3	2	3	5/N	5	Mature	Fair	Prolific ivy on main stem inhibits detailed inspection. Suppressed by T28.	N/A	10+	C1	N/A
T28	Goat Willow	12	420, 350, 360	6	5	7	5	2/S	2	Mature	Fair	Trifurcates at 1m, union tight and included, prolific ivy inhibits detailed inspection. Three tear out wounds of primary limbs evident at 8m east.	N/A	10+	C1	N/A
T29	Laurel	7	100, 100, 100, 100, 100	6	8	6	2	0.25/E	0.25	Mature	Fair	Forms a dense spreading mass west.	N/A	10+	C1	N/A

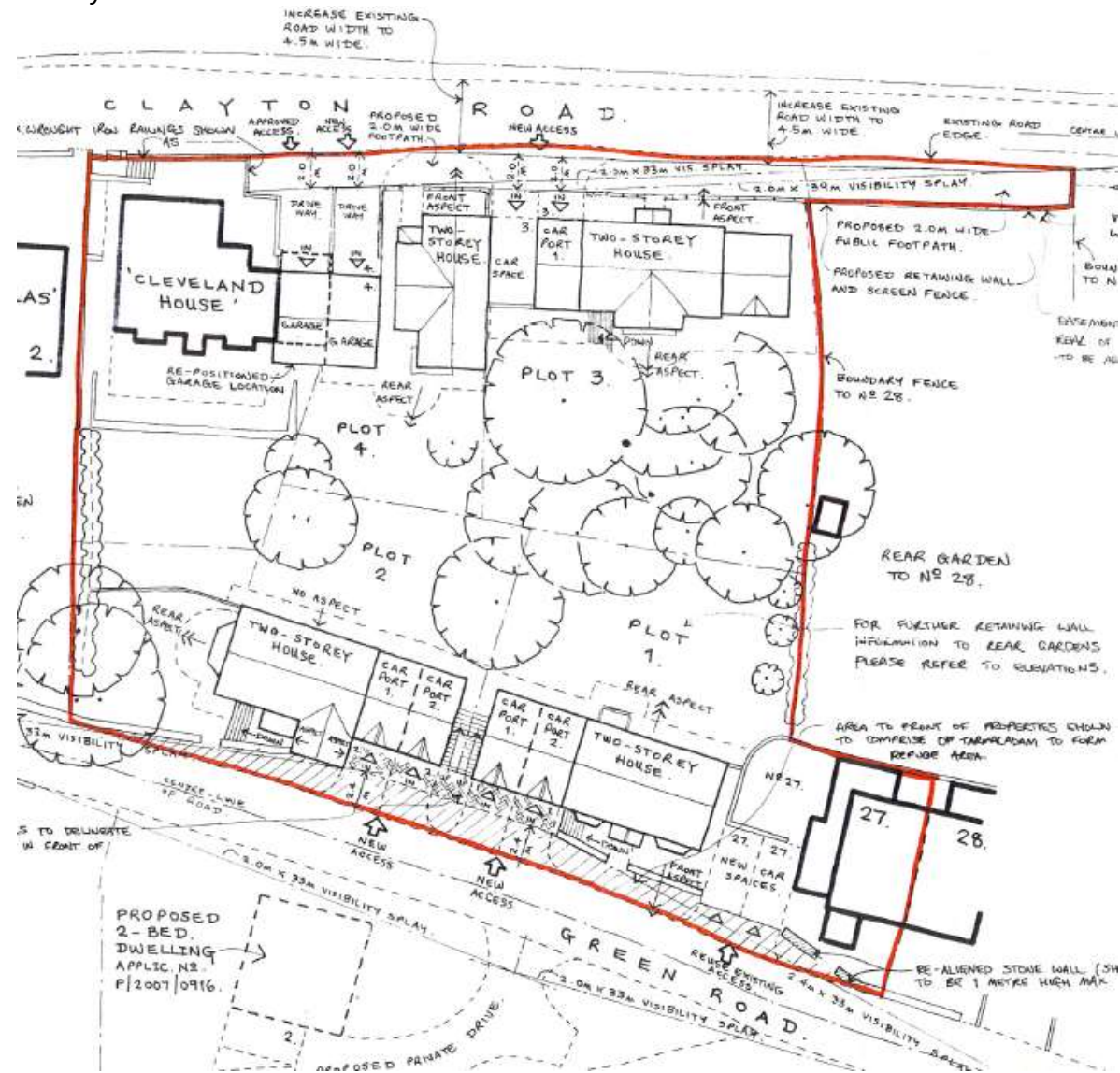
Schedule 2 (Tree Constraints Schedule)

Tree ID	DBH (mm)	Radius of RPA (m)	Area of RPA (m2)	Category Grading	Crown spread			
					N	E	S	W
T1	360, 240, 150	5.5	94.90	C1	2	2	2	2
T2	200, 150, 120	3.3	34.80	C1	1	2	4	3
T3	190, 200	3.3	34.40	C1	2	3	4	2
H4	80	0.96	2.90	C1	1	1	1	1
G5	120	1.44	6.52	C1	2	2	2	2
T6	360	4.32	58.64	B1	5	2	4	5
T7	340	4.08	52.30	B1	6	6	5	1
T8	520	6.24	122.34	C1	6	6	6	3
T9	340	4.08	52.30	C1	4	4	3	5
T15	330	3.96	49.27	C1	5	6	4	4
T11	220	2.64	21.90	C1	3	3	3	3
H12	100, 100 ,100, 100 ,100	2.7	22.60	C1	1.5	1.5	1.5	1.5
T13	380	4.56	65.33	B1	3	4	3	3.5
T14	200	2.4	18.10	C1	2	2	5	6
T15	210, 200, 160, 100, 150	4.5	64.30	C1	2	2	2	2
T16	260, 280, 210	5.2	86.00	C1	7	5	2	5
T17	100	1.2	4.52	C1	2	2	2	2
T18	250	3	28.28	B1	3	3	3	2
T19	260	3.12	30.59	B1	3	2	3	3
T20	400, 300, 300, 320	8	200.10	C1	5	5	5	5
T21	340	4.08	52.30	C1	3	4	4	4
T22	310	3.72	43.48	C1	4	4	2	4
T23	340	4.08	52.30	B1	3	3	3	3
T24	510	6.12	117.68	C1	3	2	3	2
T25	320	3.84	46.33	B1	5	3	4	4
H26	100	1.2	4.52	C1	N/A	N/A	N/A	N/A
T27	420	5.04	79.81	C1	5	3	2	3
T28	420, 350, 360	7.9	193.80	C1	6	5	7	5
T29	100, 100, 100 , 100 ,100	2.7	22.60	C1	6	8	6	2

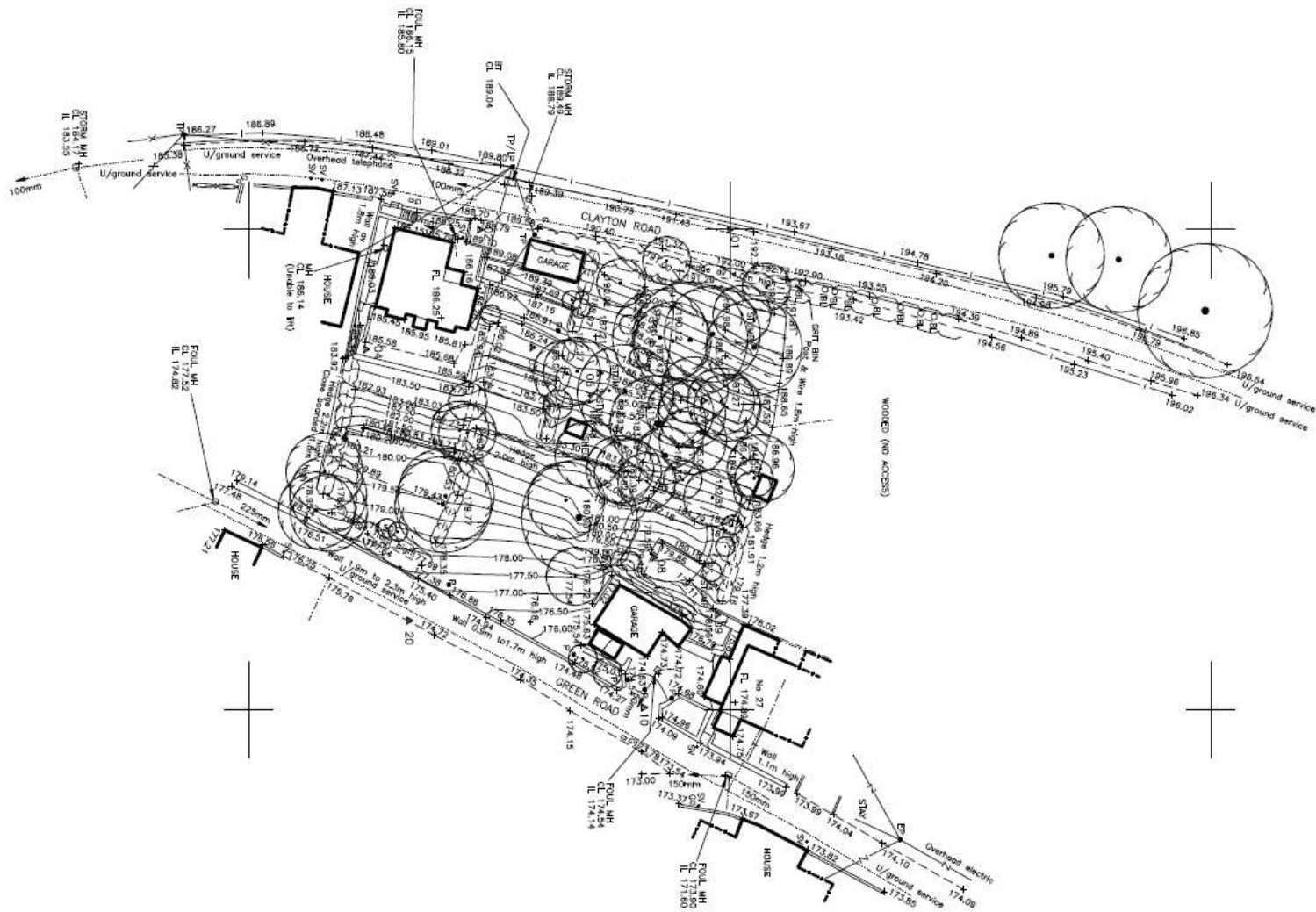
Appendices

Appendix 1

Illustrative Site Layout Plan



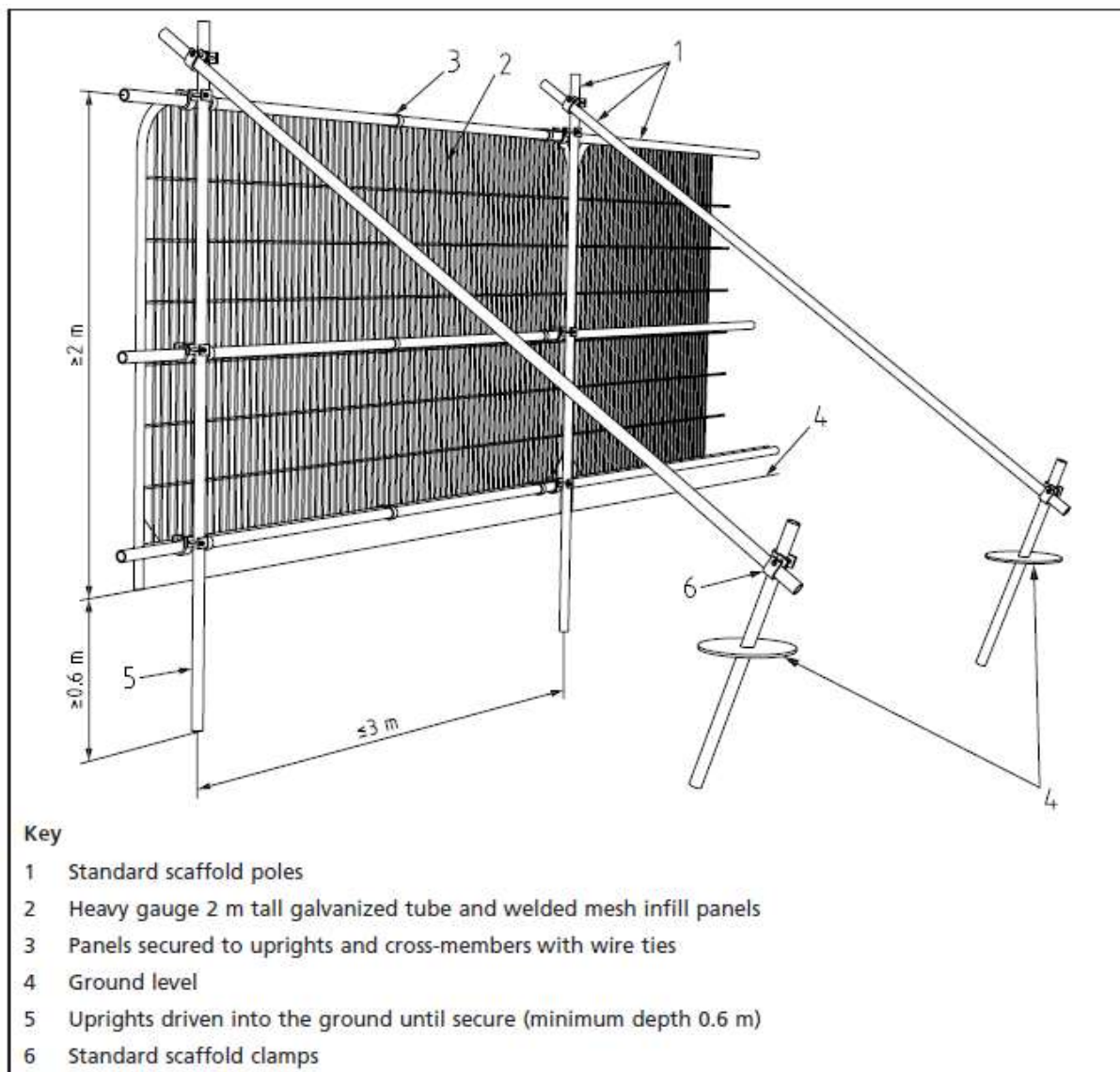
Topographical Survey



Appendix 3

Tree Protection Barrier on Scaffold 2.0m High

(Extract from BS 5837:2012, Figure 2 'Protective Barrier')

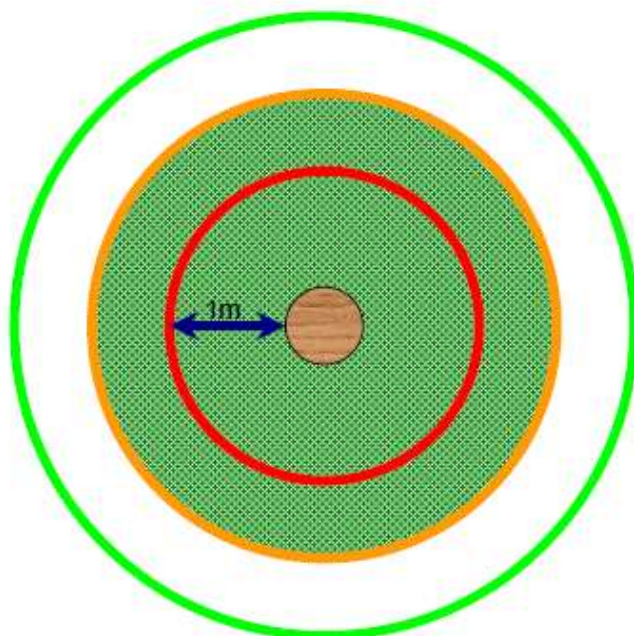


Appendix 4

NJUG Vol. 4 Guidelines for the Planning Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue2)



NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2



TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



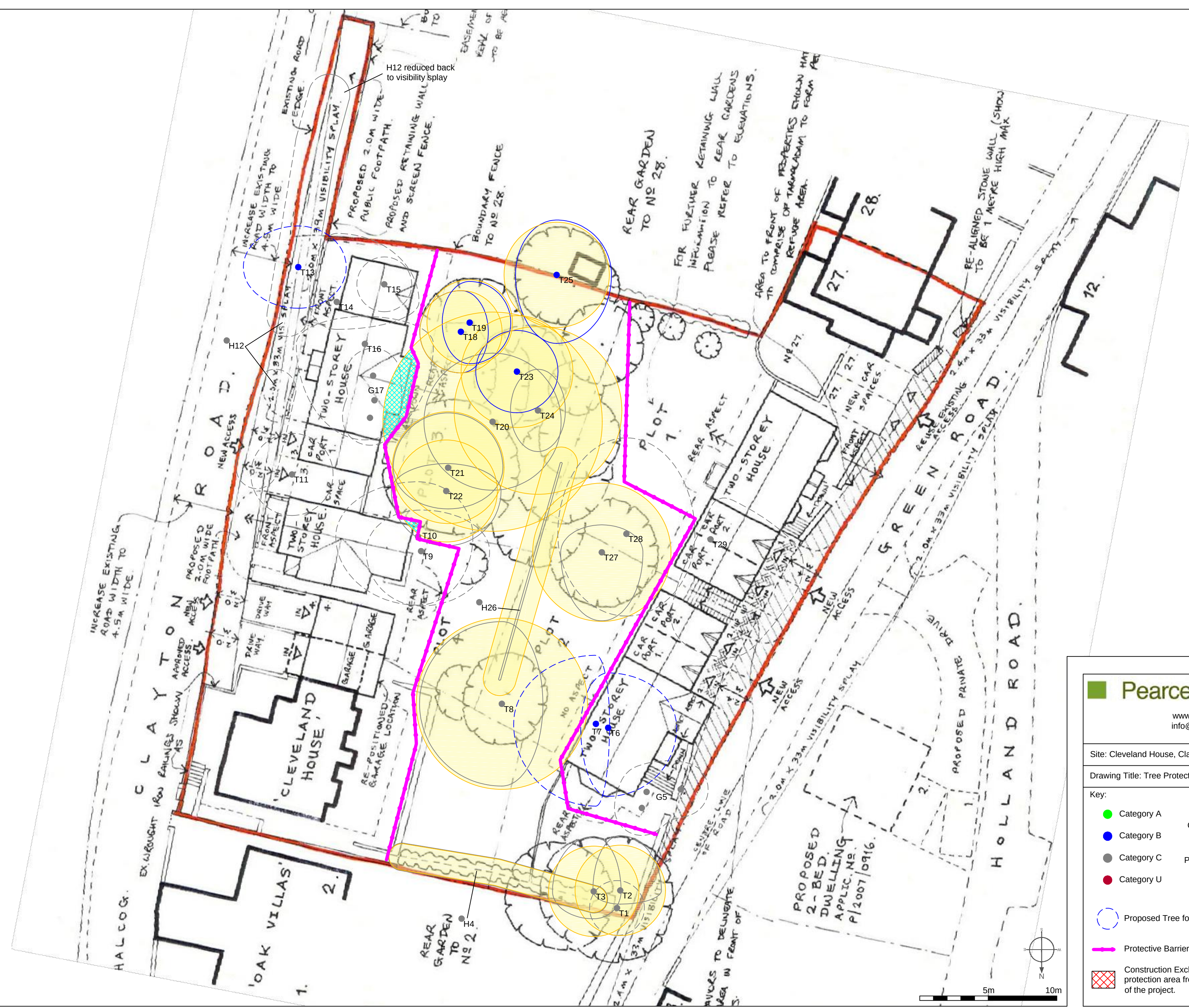
PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.





www.pearce-environment.co.uk
info@pearce-environment.co.uk
01743 741 421

Site: Cleveland House, Clayton Road & Green Road	1-200@A2
Drawing Title: Tree Protection Plan	September 2015

Key:

● Category A

● Category B

● Category C

● Category U

Category

Root Protection Area

Crown Spread

Tree Number

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

○ Proposed Tree for Removal

■ Protective Barrier Fencing

■ Construction Exclusion Zone (CEZ). Area based on the root protection area from which access is prohibited for the duration of the project.

■ Hand Dig Methodology