



Arboricultural Report

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Land off Tudor Drive
Penley
Wrexham

*For the purpose of dealing with all tree issues in accordance with
BS5837:2012 Trees in Relation to design, demolition and
construction: Recommendations for a development at the site*

Commissioned by:

James Bennett
Greenscape Architects Ltd

Surveyed by:

David Bailey
BSc (hons), M.Arbor.A, cert.Arb.(RFS)

Survey date:
27th February 2017

Report date:
3rd March 2017

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1 Qualifications and Experience

- 1.1 My name is David Bailey. I am the owner of Old Oak Tree Care, an arboricultural consultancy business based on the Staffordshire/Shropshire border. I have run my business as a contractor since 2004 and progressed to work as a consultant since 2008.
- 1.2 I attained the honours degree in arboriculture at Myerscough College, Lancashire at an upper second level in 2011 after completing the foundation degree in arboriculture at merit level from Myerscough College, in 2008. I attained the certificate of arboriculture from the Royal Forestry Society in 2006.
- 1.3 I am a professional member of the Arboricultural Association and hold professional indemnity insurance to £1million.
- 1.4 Old Oak Tree Care carries out work for government agencies, county councils, town/parish councils, the Forestry Commission and private individuals.
- 1.5 In my work as a consultant, I have carried out surveys of trees in relation to construction, large scale health and safety investigations, private consultancy work, LPA appeals and work as an expert witness.

2.0 Instructions

- 2.1 I am instructed by James Bennett of Greenspace Architects to carry out a tree survey at Land off Tudor Drive, Penley and produce a tree report to support a planning application at the site.
- 2.2 It is proposed to build five detached properties alongside two properties which have passed a separate planning application.
- 2.3 I am therefore to visit the site, survey all trees of importance, work with the developer to produce a viable design and then produce a tree report to support the planning application.
- 2.4 A tree report has already been prepared at this site for a significantly different design in May 2014. This new report is an update of the old report and add details of a tree shading analysis.
- 2.5 The survey is to be compliant with BS5837:2012 Trees in Relation to design, demolition and construction: *Recommendations*.

3.0 Summary

- 3.1 *The proposal is possible without causing any significant harm to amenity provided by trees to the area. Two category C trees require removal as they are semi-collapsed. A moderate crown reduction on three category C and one category B trees is prescribed as well as a crown clean and ivy removal on all remaining trees.*
- 3.2 *All retained trees can be effectively protected using standard tree protection measures.*
- 3.3 *The proposal is arboriculturally sound.*



Summary TPP
Land off Tudor Drive, Penley,
Wrexham.

Tree Constraints Plan with Proposed Development
Showing all trees, crown dimensions,
tree categories and Root Protection Areas (RPAs)

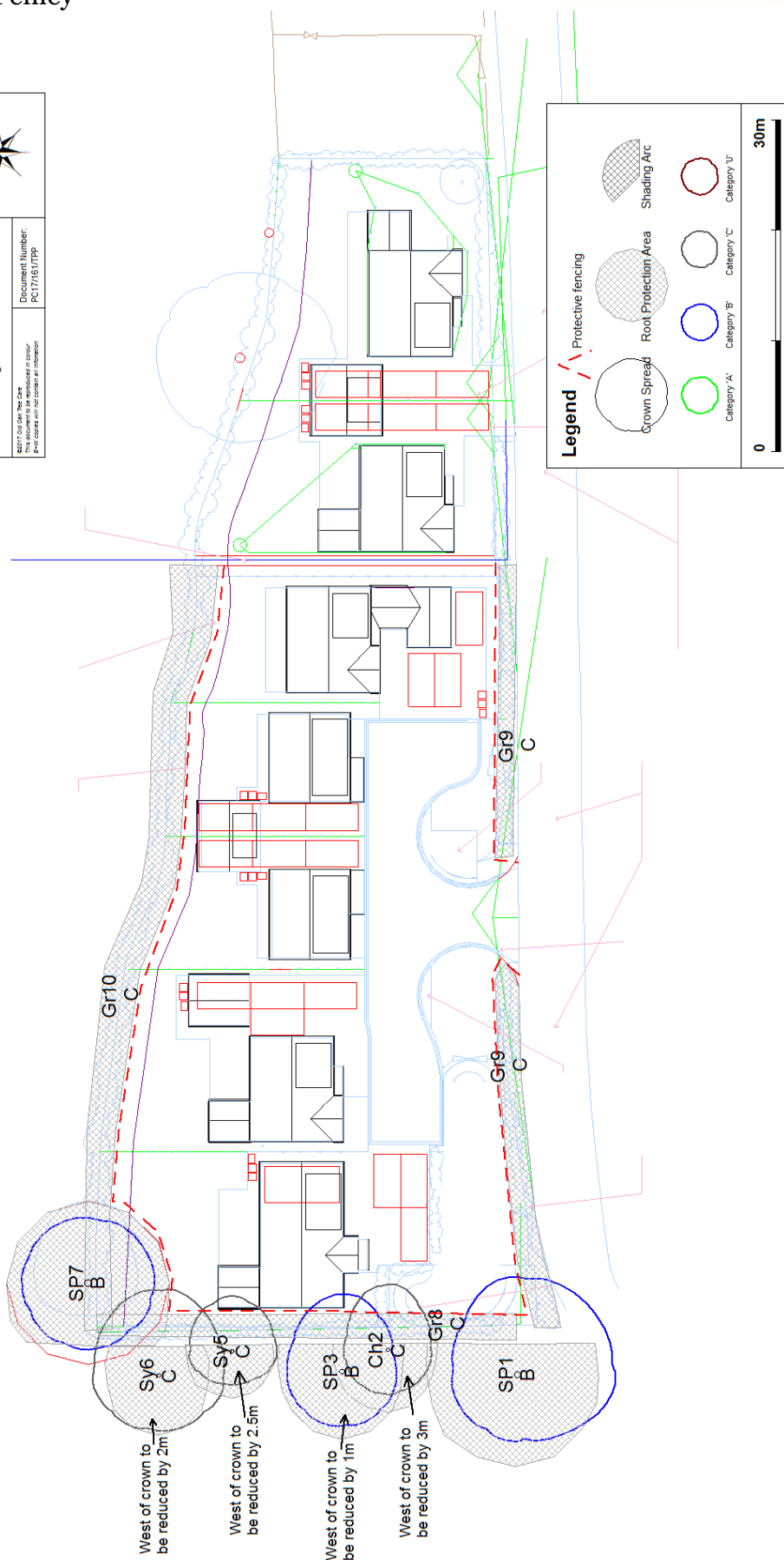
SCALE at A4 : 1 : 500 DATE : 03/03/2017

Drawn by: Old Oak Tree Care, Wrexham.
DTP: 10/11/16 Checked/signed off: 02/07/17 Old Oak Tree Care

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4.0 Extent of Survey

- 4.1 The survey was undertaken on 27th February 2017. Weather conditions were bright, still and cold.
- 4.2 The survey covers only arboricultural matters on, or adjacent to the site. The survey methodology is set out in Appendix C.
- 4.3 Statutory protection (either Tree Preservation Orders or Conservation Area Status), has not been officially investigated.
- 4.4 Information was gathered to comply with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations.
- 4.5 Trees were surveyed to assess their health, structural condition, estimated remaining longevity and amenity value to the area.
- 4.6 The survey deals with identifying the constraints retained trees will impose on development of the site, if trees will need to be removed to allow development and how remaining trees can be protected to prevent significant damage to them. The survey is to recommend necessary tree work if required.
- 4.7 Documents seen:
 - i) Site plans including proposed layout as supplied by Greenspace Architects.
 - ii) Previous tree report OOTC/PC14/4
- 4.8 Documents referred to:
 - BS5837:2012 Trees in Relation to design, demolition, and construction - *Recommendations*.
 - BS3998:1010: Tree Work – *Recommendations*.
 - The Body Language of Trees: Mattheck and Breloer. DofE Research for Amenity Trees no. 4, 1994.
 - Tree roots in the built environment. TSO Research for Amenity Trees no. 6, 2006.
 - BS8545:2014 Trees: from nursery to independence in the landscape.
 - National House Building Council Standards 2016. Chapter 4.2 Building Near Trees. <http://www.nhbc.co.uk>
- 4.9 Any tree work suggested or recommended in Section 8 is to comply with British Standard 3998:2010 Tree Work – Recommendations.

- 4.10 In some instances the National House Building Standards require foundation depths to be altered due to tree proximity and soil interactions. Soil types have not been laboratory analysed as part of this report so no definitive comment can be made. It is recommended that the instructions of Chapter 4.2 of the NHBC Standards is followed to ensure the correct foundation depth for all buildings is implemented.
- 4.11 Any engineering solutions referred to are done so on the understanding that specifications will be required from a suitably qualified professional. Reference is made to them purely to demonstrate an end-result is possible using the method prescribed.

5.0 The Site

- 5.1 The site is a paddock attached to a property to the east.
- 5.2 To the north are agricultural fields. To the east is the development of two buildings, currently being built. In a southerly direction is Tudor Drive with residential properties beyond. To the west is a woodland area consisting of mainly pioneer species.
- 5.3 The profile of the site is generally flat.
- 5.4 There are a number of trees around the edge of the paddock as well as extensive hedging. There are no trees within the paddock.
- 5.5 Viewing the Geology of Britain Viewer as supplied by the British Geological Survey (www.bgs.ac.uk), it appears that the bedrock is a Helsby Sandstone formation consisting of sandstone and pebbles. Soil on this kind of bedrock is generally free draining and provides a good medium for the growth of trees. Vegetation sourced soil shrinkage and heave is not associated with this soil.
- 5.6 As long as there are no buried obstructions, severe soil compaction or historical root damage, a typical root distribution could be expected for all of the trees on site.

6.0 Trees Surveyed

The schedule of trees surveyed is set out in the following section.

- Tree Number Tree identifier. Letter denotes species and number is sequential
- Species Using common names
- Height In metres
- Stem diameter Taken 1.5 m from the ground in accordance to Annex C of BS5837:2012



Land off Tudor Drive, Penley

- Age class Either young, mid aged, early mature, mature, over mature or veteran
- Est R Cont Estimated Remaining Contribution. Trees useful life in years
- Physiological Assessment of the physiological condition of the tree
- Structural Assessment of the structural condition of the tree
- Ret. Cat. Retention Category. See Appendix C for details
- RPA radius Radius of the Root Protection Area (RPA) from the centre of the tree
- Fence from... Distance from the tree bark a protective fence should be placed, measured at 1.5 metres height
- Prelim Man Rec Preliminary management recommendations
- Notes Notes of importance to the survey

Tree Number:	SP1	Species:	Scots Pine	Height:	15m
Stem diameter:	575mm	Age Cat.	mature	Est R cont.	20 to 40years
Physiological cond:	good	Structural:	good	Ret. Cat.	B
RPA radius if RPA is circular:	6.9m			RPA area:	150m2
Prelim Man. Rec.					
Notes:					

Tree Number:	Ch2	Species:	Cherry	Height:	14m
Stem diameter:	325mm	Age Cat.	mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	3.9m			RPA area:	48m2
Prelim Man. Rec.					
Notes:					

Tree Number:	SP3	Species:	Scots Pine	Height:	15m
Stem diameter:	425mm	Age Cat.	mature	Est R cont.	20 to 40years
Physiological cond:	good	Structural:	good	Ret. Cat.	B
RPA radius if RPA is circular:	5.1m			RPA area:	81m2
Prelim Man. Rec.					
Notes:					



Tree Number:	Gr4	Species:	2 Cherries	Height:	12m
Stem diameter:	250mm	Age Cat.	early-mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	fair	Ret. Cat.	C
RPA radius if RPA is circular:	3m			RPA area:	28m2
Prelim Man. Rec.					
Notes:					

Tree Number:	Sy5	Species:	Sycamore	Height:	13m
Stem diameter:	275mm	Age Cat.	early-mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	3.3m			RPA area:	34m2
Prelim Man. Rec.					
Notes:					

Tree Number:	Sy6	Species:	Sycamore	Height:	12m
Stem diameter:	375mm	Age Cat.	mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	4.5m			RPA area:	64m2
Prelim Man. Rec.					
Notes:					

Tree Number:	SP7	Species:	Scots Pine	Height:	15m
Stem diameter:	600mm	Age Cat.	mature	Est R cont.	20 to 40years
Physiological cond:	good	Structural:	good	Ret. Cat.	B
RPA radius if RPA is circular:	7.2m			RPA area:	163m2
Prelim Man. Rec.					
Notes:					

Tree Number:	Gr8	Species:	Hedge	Height:	3m
Stem diameter:	100mm	Age Cat.	mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	1.2m			RPA area:	5m2
Prelim Man. Rec.					
Notes:					



Tree Number:	Gr9	Species:	Hedge	Height:	3m
Stem diameter:	100mm	Age Cat.	mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	1.2m			RPA area:	5m2
Prelim Man. Rec.					
Notes:					

Tree Number:	Gr10	Species:	Hedge	Height:	2m
Stem diameter:	100mm	Age Cat.	mature	Est R cont.	10 to 20years
Physiological cond:	good	Structural:	good	Ret. Cat.	C
RPA radius if RPA is circular:	1.2m			RPA area:	5m2
Prelim Man. Rec.					
Notes:					

7.0 Shading Evaluation

- 7.1 Appendix A shows a basic tree shading arc as defined in paragraph 5.2.2 of BS5837:2012 Trees in relation to design, demolition and construction – Recommendations. Some caution should be applied to this method as no account is made of the crown shape of the trees as well as the additional shading of trees further into the woodland. It is proposed to remove the two cherries in Group 4 so shade arc from these trees are not shown. The shading diagram also does not take account of shading by proposed buildings.
- 7.2 The tree shading analysis shows shading from trees will affect the western plot. No shading from trees is shown during the morning. Once the afternoon is reached shade will increase within the garden with much of it shaded by the end of the afternoon. There are parts of the garden indicated as not being affected by shade from trees.
- 7.3 Long un-obstructed views under the crown of SP7 to the north of this plot will add a more open feel to this plot.
- 7.4 Work to trees as set out in section 8 will help to bring more light into the garden and better views into the woodland to the west.

8.0 Arboricultural work required

- 8.1 Gr4 is a group of two category C cherries who have suffered root slip and are overhanging the site considerably. These trees should be removed as they are likely to fall into the site at some stage.
- 8.2 Gr9 a category C hedge consisting of mainly hawthorn and hazel will need a 10 metre long gap cut in it to provide access to the site. The remaining hedge can be cut back to approximately 2 metres high to provide mature hedging and screening.
- 8.3 Gr8 is a category C poor hedgerow between the wood and the site. It should be cut back to one metre high and interplanted with similar species to build the hedge up to a useful height and density. Removal of tall branches will open up views into the woodland beyond, giving the plot a secluded character without the nearby trees becoming overly burdensome.
- 8.4 A number of trees overhang the site and should be cut back to prevent them encroaching too far over the site. Ch2 and Sy5 should be cut back to the fence line which demarks the property. This will not have an adverse effect on the look of the trees.
- 8.5 Sy6, although overhanging the garden somewhat, should be cut back, but not as much as the other two trees. A crown reduction of two metres on the eastern aspect of the tree is required.
- 8.6 SB3 is a category B Scots pine. It will be the tree in closest proximity to the house. The crown should be reduced on the eastern aspect by one metre and the tree should be checked for any signs of weak branches or attachments by the tree climber when they are in it. Any faults found should be acted upon.
- 8.7 Removal of ivy from all trees on site will also help to brighten the area with no harm to the amenable nature of them. In addition to this, all trees should be crown cleaned, removing deadwood and any significant weak stems.
- 8.8 In summary, two very poor category C trees within a group will be removed and two category C hedgerows will be cut back. One of the hedgerows will have a gap cut in it to allow access to the site. Four overhanging trees will have their crowns cut back to prevent overhanging branches and increase light penetration.

9.0 Tree Protection

- 9.1 Root Protection Areas (RPAs) do not show the total extent of a tree's roots but is an area around a tree that contains the minimum amount of roots and rooting medium to maintain the viability of the tree. This area is prioritised for the tree. The RPA should contain the area of growing medium as set out in section 7 even if the RPA shape needs to be adjusted to more accurately reflect the rooting architecture.
- 9.2 RPAs are usually drawn as a circle, its radius measuring 12 times the diameter of the tree trunk. Although tree roots are often found underneath roads, buildings and in inhospitable places, the tree would suffer if this area was 'set aside' for the roots, especially if there was better rooting mediums close by.
- 9.3 All retained trees can be effectively protected by a fence as shown in the tree protection plan TPP, Appendix B.
- 9.4 Where RPAs are not drawn as a circle, it has been estimated that the rooting architecture of the tree will not prosper in parts of its environment where rooting is difficult such as roads, buildings, underground obstructions or natural barriers such as rivers or embankments.
- 9.5 The Tree Protection Plan (TPP), Appendix B, shows all retained trees and how their RPAs are to be protected by a fence as set out in Appendix E.
- 9.6 RPAs are to be protected from infill, chemical incursion, fuel spillage, building material storage, solid waste disposal, liquid waste disposal or soil compaction of any kind, be it machinery, goods, foot traffic or vehicular.
- 9.7 Where specified, tree protection should be facilitated by a fence. Examples of such a fence are given in Appendix E. It is essential these fences cannot be moved without concerted effort.

10.0 Conclusion

- 10.1 The proposed scheme requires the removal of two very poor category C cherries as well as the cutting back of four other trees to provide amenable garden space and clearance for the house. All trees on site should be crown cleaned and have ivy removed.
- 10.2 The work to trees will cause very little change to the amenity provided by them in the area.
- 10.3 All retained trees can be protected using standard tree protection measures.
- 10.4 The proposal is arboriculturally sound and complies with British Standard 5837:2012 Trees in relation to design, demolition, and construction – Recommendations.

The data, views and opinions of this report relate to the survey undertaken on the date shown and do not take into account effects of weather conditions, vandalism or accidental damage. Neither can the effects of tree surgery work, poorly executed or which does not comply with BS3998:2010, be predicted. Old Oak Tree Care cannot accept any liability in connection with any of these factors. This report becomes out of date and in need of renewal two years from the survey date. Data relating to tree health and condition will become out of date and in need of renewal six months from the survey date.



Appendix A

Land off Tudor Drive, Penley,
Wrexham.

Tree Constraints Plan with Proposed Development
Showing all trees, crown dimensions,
tree categories and Root Protection Areas (RPAs)

SCALE at A4 :
1 : 500

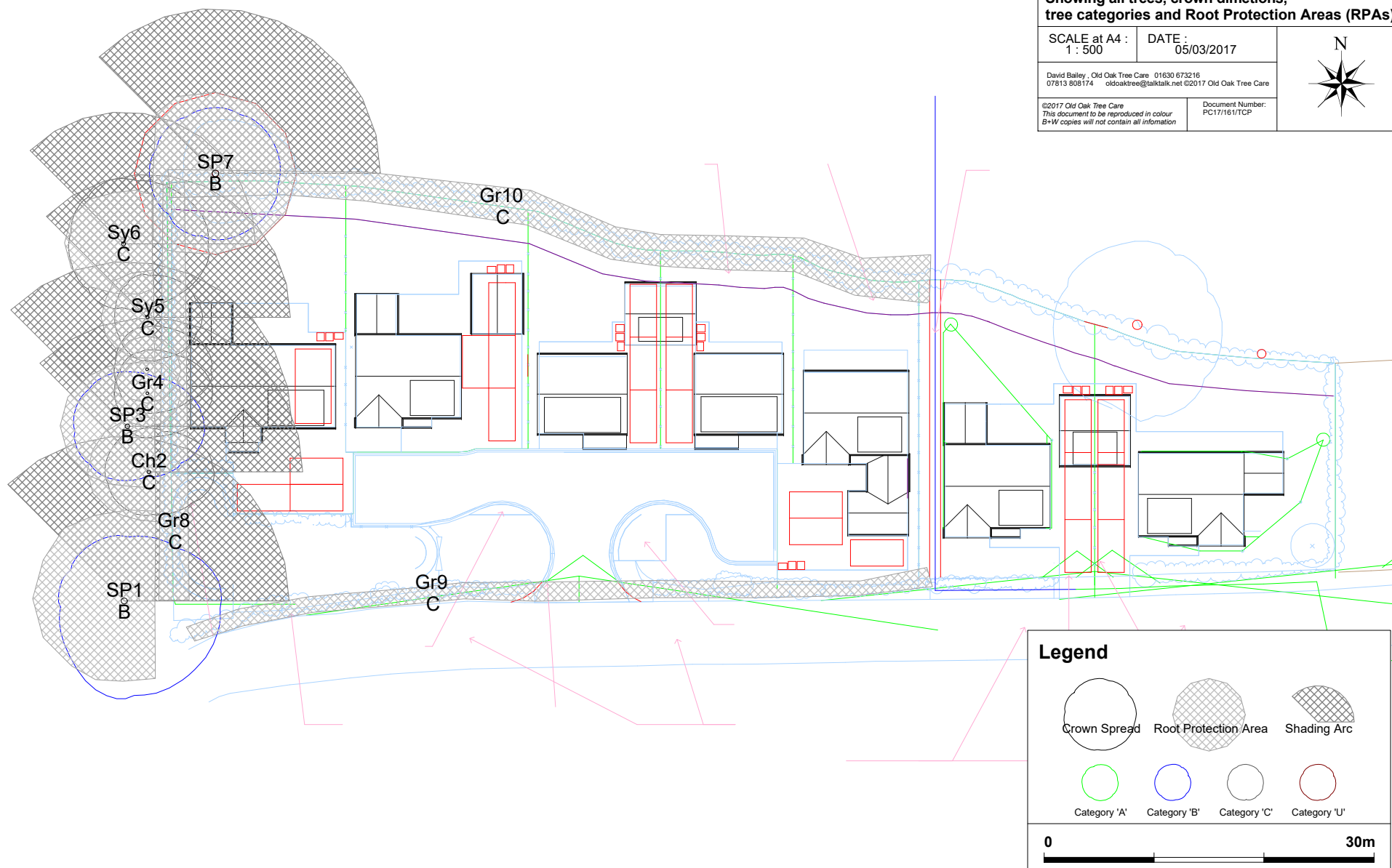
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Appendix B

Land off Tudor Drive, Penley,
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Tree Constraints Plan with Proposed Development
Showing all trees, crown dimensions,
tree categories and Root Protection Areas (RPAs)

SCALE at A4 :
1 : 500

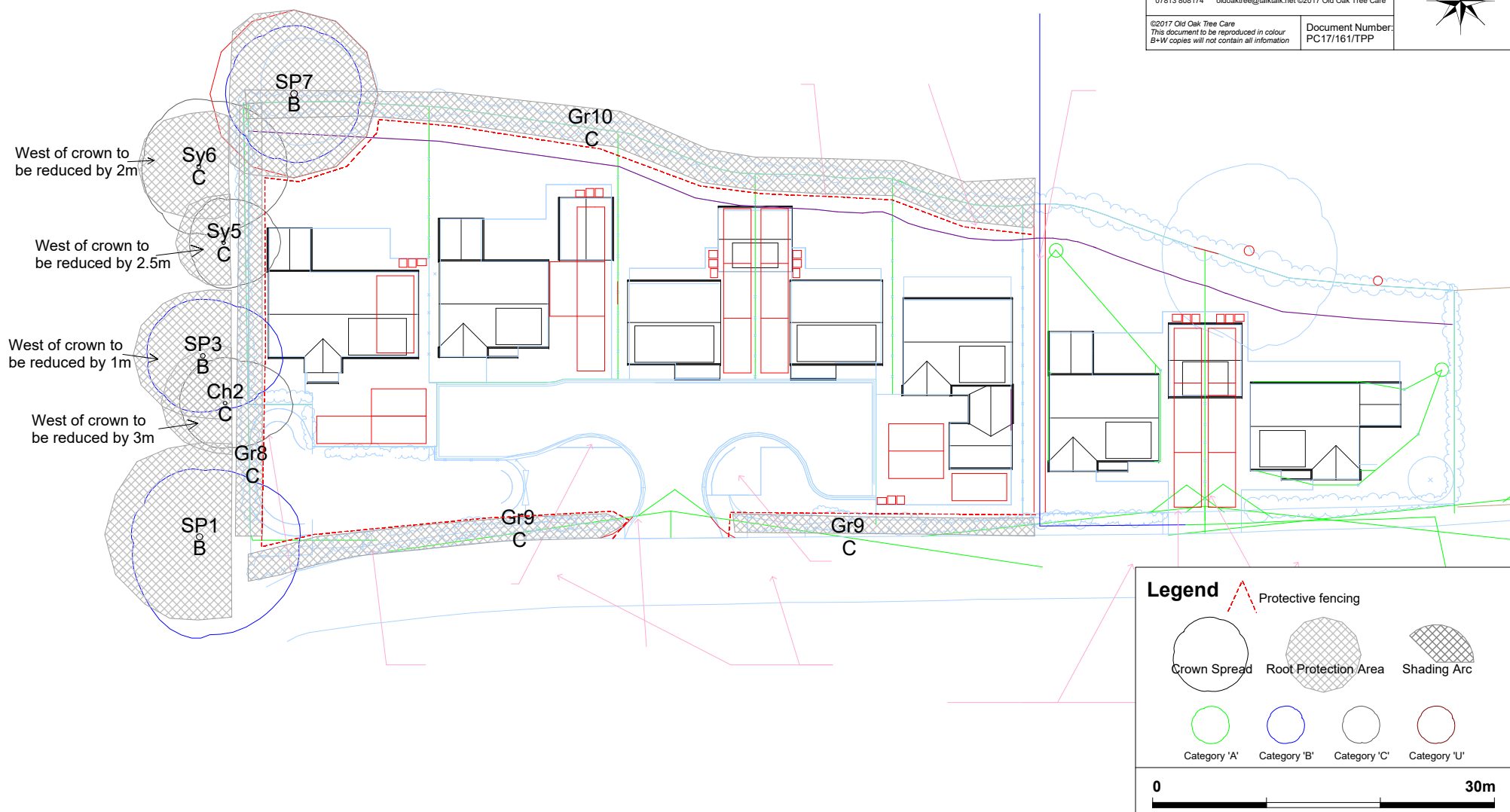
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Appendix F		Tree survey raw data																	
Tree number	Species	Height (m)	Diameter (mm)	N Crown spread (m)	E	S	W	N Crown Height (m)	E	S	W	Age bracket	Physiological Condition	Structural Condition	Years remaining	Quality assessment	RPA radius(m)	RPA Area (m2)	Notes
SP1	Scots Pine	15	575	6	9	9	6	4	4	4	4	mature	good	good	20 to 40	B	6.9	150	
Ch2	Cherry	14	325	4	6	4	4	4	4	4	4	mature	good	good	10 to 20	C	3.9	48	
SP3	Scots Pine	15	425	5	7	5	5	9	9	9	9	mature	good	good	20 to 40	B	5.1	81	
Gr4	2 Cherries	12	250	4	6	4	3	5	5	5	5	early-mature	good	fair	10 to 20	C	3	28	semi collapsed
Sy5	Sycamore	13	275	4	5	4	3	7	7	7	7	early-mature	good	good	10 to 20	C	3.3	34	
Sy6	Sycamore	12	375	6	8	6	5	6	6	6	6	mature	good	good	10 to 20	C	4.5	64	
SP7	Scots Pine	15	600	6	6	6	6	5	5	5	5	mature	good	good	20 to 40	B	7.2	163	
Gr8	Hedge	3	100	1	1	1	1	0	0	0	0	mature	good	good	10 to 20	C	1.2	5	Thin hedge of hawthorn and hazel
Gr9	Hedge	3	100	1	1	1	1	0	0	0	0	mature	good	good	10 to 20	C	1.2	5	Hedge hawthorn and hazel
Gr10	Hedge	2	100	1	1	1	1	0	0	0	0	mature	good	good	10 to 20	C	1.2	5	Hawthorn hedge

Appendix C

Survey Methodology, describing how tree survey was conducted

- 1.1 Where trees are not shown on a topographical survey their positions were plotted using triangulation from marked positions on the plan using a laser rangefinder.
- 1.2 Crown diameters and heights were estimated using a laser rangefinder.
- 1.3 I viewed each tree, or group, on the survey to assess structural integrity, health, presence of dysfunction and form. The basis of the survey was undertaken using VTA (visual tree assessment method) as expounded by Mattheck and Breloer in The body language of trees, A handbook for failure analysis, TSO 1994.
- 1.4 Stem diameters were measured in millimetres, taking the circumference at approximately 1.5 metres above the ground and dividing by π (Pi), in accordance with Annex C of BS5837:2012. Where ivy or any other material would give an incorrect measurement, a suitable correction was made before recording. Results were rounded up or down to the nearest 25mm. Where trees could not be reached, their diameters were estimated.
- 1.5 The trees were assessed for longevity using survey data, experience gained in working with similar trees and likely management decisions.
- 1.6 Trees were placed into categories using the criteria set out in BS5837:2012 (Appendix D).
- 1.7 All trees that will be affected by the entire development were surveyed, excluding those due to distance from the development, those of insignificant nature or unremarkable trees that fall within the RPAs of more significant trees.
- 1.8 No invasive testing was carried out.
- 1.9 No soil samples were taken.
- 1.10 Internal investigations and tissue samples were not taken.
- 1.11 All tree information is tabulated in Appendix F and plotted in Appendix A, overlaid on top of a survey plan of the area.

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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		
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 significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
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 no material conservation or other cultural value

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Figure 2 Default specification for protective barrier

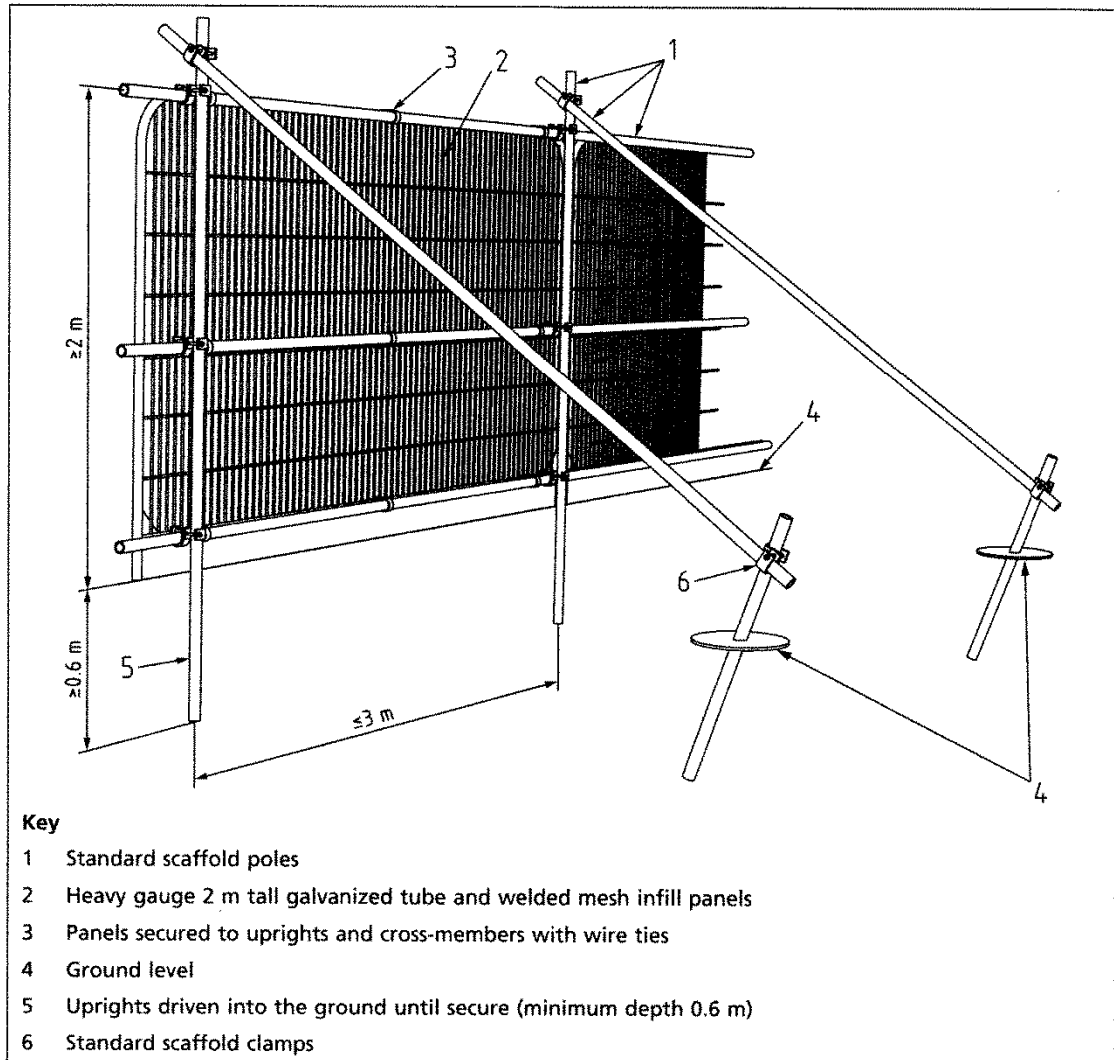


Figure 3 Examples of above-ground stabilizing systems

