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BS 5837:2012 Tree Survey and Tree Protection Plan for Sandrock Nursery, Gypsy Hill Lane, Exeter, Devon.

8th May 2012.

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Ref: 12.007.2.TPP.

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Client:	Strategic Land Partnerships, Greendale Court, Clyst St Mary, Exeter, EX5 1AW.
Ref no:	12.007.2.TPP.
Site details:	Sandrock Nursery, Gypsy Hill Lane, Exeter.
Date of site inspection:	10th April 2012 and 2nd May 2012.
Report Author:	Doug Pratt BSc (Hons.) For., F. Arbor A. Devon Tree Services Ltd.
Proposal:	Residential development.

1.0 Instruction and the purpose of the survey and report

1.1 This report follows from a Tree Constraints Plan (TCP) reference 12.007.1.TCP. The TCP is the result of a tree survey at Sandrock Nursery, Gypsy Hill Lane, Exeter.

1.2 Further to the TCP, I have now been instructed to make an Arboricultural Implications Assessment and Tree Protection Plan in accordance with BS5837:2012 (Trees in relation to design, demolition and construction – Recommendations), by Mr T. Baker of Strategic Land Partnerships. This report encompassing the above is based upon drawings supplied by Mr. Simon Spencer, Chartered Architectural Technologist, reference; 11.44 SP 04 'main detailed site plan'.

1.3 An Arboricultural Implications Assessment, or AIA, is an assessment of the likely and potential impacts to trees due to the proposed construction.

1.4 The Tree Protection Plan (TPP) is a scheme of temporary fencing positioned to prevent damage to trees and their rooting areas due to construction activities.

2.0 The scope of the report - methodology & limitations

2.1 The tree survey process consisted of a ground-based visual inspection only. Soil type was not assessed.

2.2 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 and pests, and other abiotic factors.

2.3 A topographical survey with the tree positions plotted was not available for use as base information for the benefit of the tree survey. As a result the

associated plan 12.007.2.TPP has the tree positions estimated and plotted by eye. Due to the uniformity of the tree stock in terms of species composition, size, age, and combined canopy cover, the surveyed trees have not been listed individually, but as ten groups of trees, identified as G1 to G10.

2.4 Limitations of use and copyright**:**

3.0 Site location and description

3.1 Sandrock Nursery is in the Monkerton area of Exeter approximately 4.2km due east from the city centre, located close to the west side of the M5 motorway at junction 29. It can be accessed from Gypsy Hill Lane via Pinn Lane off Grenadier Road.

3.2 The site covers approximately 2.3ha of gently sloping ground descending from south to north. It is currently used mainly as a commercial nursery site, comprising portable housing, sheds and polytunnels. The west boundary is marked by a very steep bank below which is Pinn Lane. Gypsy Hill Lane forms the south boundary, and Gypsy Lane, which is not suitable for traffic forms the east boundary. The north boundary is shared other non residential land beyond.

4.0 Nature of tree stock

4.1 The table of results in Appendix 1 provides details of the condition of the trees and their suitability for retention according to BS 5837:2012. Where there are trees of particular interest, merit, or require mention due to their condition, these will be discussed below.

4.2 BS5837 requires a survey of any tree population to identify four categories of trees; trees that are highly desirable to retain (A), good quality trees (B), and (C); trees which may or may not be suitable for retention. Trees marked ‘U’ (Unsuitable for retention) should be removed due to poor condition. The system assesses not only tree health and condition, but other factors such as their long-term impact on adjacent structures and good arboricultural management. Details of the categorisation system are provided on page 9.

4.3 Trees marked ‘C1 – C3’ are trees of low quality with an estimated remaining life expectancy of less than ten years, or are unremarkable specimens of limited merit or such an impaired condition to not qualify in the higher ‘A’ and ‘B’ categories.

4.4 The edges of the site are almost exclusively made up of Elm hedgerows, which contain dead and dying Elm stems, some in very poor condition. The Elm stems arise from common root stock which is infected with Dutch Elm Disease[1], which is endemic in the area. There are occasional multiple stemmed Oak and Ash which grow from the hedgerows, more particularly on the west boundary; however, full access could not be gained to inspect these individuals due to dense undergrowth and the steepness of the bank. Overall, the boundary hedgerows are categorised as 'U' trees on account of the poor condition of the Elms.

4.5 In the north west corner is Group 1 (G1), which comprises mainly Leylandii and Eucalyptus trees of up to 20m in height. Access through the group is limited by undergrowth and debris, and so a full inspection was not possible. The Eucalyptus trees are rather etoliated and spindly, and the Conifers appear to be of varied conditions. Interspersed among this tree grouping are also self set Oak and Ash, which have developed into multiple stemmed trees with acute primary stem unions, which will limit their long term retention due to structural instability as they continue to gain in height, weight and loading. Overall within G1 there are no specific individuals identified by this survey worth saving or capable of enhancing the potential development. As most trees within G1 are capable of further retention beyond the next 20 years G1, has been categorised as 'B2'.

4.6 In the north section is a row of young Ash trees (G2) adjacent to a row of young Norway Spruce (G3), presumably an abandoned Christmas tree crop, which are still within their seedling pots. Subject to selective removals some individuals within G2 may be retained to grow on, hence G2 is categorised as' B2'. The Spruce of G3 may be capable up further retention beyond 20 years, but they can be relatively easily replaced by new planting, hence their categorisation as' C2'. In addition there is a group of Leylandii (G4) of uniform size and age but divided by a gap. These trees are capable of retention for more than 20 years hence they are categorised as' B2'.

4.7 Towards the centre of the site is another row of young Ash (G5). G5 is orientated west east, and is up to 7m in height. Some trees display extensive basal damage due to rabbits stripping the lower bark, but as with G2, subject to selective removals some individuals within G2 may be retained to grow on. G8 comprises two Poplar trees and several small Cherry trees. Both G5 and G8 are generically categorised as 'B2'.

4.8 G6 is located in the south west corner and consists of Poplar, Cherry and Birch. The Cherry has been extensively damaged by rabbit grazing. The Poplar and Birch may be retained, but the Birch is a more sustainable species for long term retention within a layout. G6 is categorised as 'B2'.

4.9 G7 is a row of 12m high Leylandii which has arisen from a bed of cuttings. These trees are capable of retention as a block or group for more than 20 years, hence they are categorised as 'B2' trees.

[1] *Ophiostoma novo-ulmi*

4.10 G9 comprises two mid mature Oak stems, possibly arising from the same root stock. They are of reasonable condition and health, though are likely to require pruning such as crown lifting for access. They are categorised as 'B2'.

4.11 G10 is a group of sapling stage Field Maple and Lime, with one or two larger young trees growing from an area of scrub. G10 is categorised as 'B2'.

5.0 Root protection areas (RPAs):

5.1 The British Standard BS 5837:2005 makes recommendations for the provision of areas around trees where their roots should be protected, known as Root Protection Areas, or RPAs, expressed in square meters. For any tree, BS5837:2005 prescribes this area according to a formula[2] using stem diameter measurements of the trees in question. The RPA is usually expressed as radial distance as measured from the centre of the stem for the relevant tree.

5.2 However, because of the nature of the tree stock found on the Sandrock site, and because there are no accurate stem positions for the surveyed trees, RPAs can only be dealt with generically. Fortunately, except for G1 and G9, almost all trees are relatively young and therefore have relatively small diameters; hence the combined RPA for each tree group usually extends for only a small distance beyond the canopy spread or dripline of each tree grouping. These are plotted on drawing 12.007.2.TPP.

6.0 Arboricultural Implications Assessment:

6.1 The site contains an assortment of trees which mainly quite young, however, the Leylandii and the Poplars have attained large dimensions quickly. In particular the Leylandii of G1, G4 and G7 are not suitable for retention within a residential layout due to their robust growth and propensity to become a nuisance if not regularly managed. The Leylandii found on this site have developed beyond the point where they may be effectively brought back into management if the surrounding area is to be developed

6.2 Similarly the Norway Spruce of G3 are unsuitable to be incorporated into a layout, on account of their form of growth, need to produce buttress rooting, and site requirements.

6.3 The two groups of Ash trees planted as rows may be subject to selective thinning to enable some to be retained for the benefit of the development. However, given their relative small size it is probably more cost effective to remove them to facilitate development and integrate new planting within the layout.

6.4 Of all trees on the site, perhaps the Birch in G6 and the Oaks of G9 have the

[2] Section 4.6, pages 10 and 11.

best potential for long term retention. The Poplar trees have some potential, although this potential is limited by this type of tree's fast and dominant growth habit, and tendency to shed limbs when mature. If there are opportunities to retain the Poplars within large areas of low use and occupancy then the Poplars may be kept. However, as before, it may be more cost effective to consider their replacement with a bespoke landscaping scheme.

6.5 It is important to avoid the excessive shading of plots by trees, both over the buildings and their outside recreational space. This is particularly important when the plots are positioned to the north of existing trees. Drawing 12.007.1.TCP has been plotted with 'shade arcs', or shade areas to roughly illustrate shade impacts, as a design aid for the layout. The shade arcs have only been applied to the tree groups which have potential for retention.

6.6 The hedgerows comprising Elm are recommended to be coppiced and or layered so as to produce a thick, effective boundary treatment, and consolidated with other planting if necessary. For the west boundary individual Oak or Ash (or other species) may be retained subject to more detailed inspection.

6.7 Therefore the only trees which are recommended to be retained for the benefit of the development are the Birch in G6 and the Oaks of G9.

7.0 Tree protection measures

7.1 The accompanying Tree Protection Plan (12.007.2.TPP) shows the RPAs of the Birch of G6 and the Oaks of G9. Their RPAs are to be considered as Construction Exclusion Zones (CEZs).

7.2 The accompanying plan (12.007.2.TPP) details the position, extent and specification for the temporary tree protective fencing which is recommended to ensure that the trees to be retained are adequately protected during construction. The TPP is indicated in light green as:

7.3 **The following are precautions that must be taken within the RPA/CEZ**:

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

- Where existing vegetation is to be replaced with new landscaping within the CEZ it shall be treated with a translocated herbicide e.g. glyphosate prior to removal.
- 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.

7.4 **Protective measures outside the CEZ**: In addition to the ground protection within the CEZ the following should be addressed:

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. Any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times.
b) Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10m of a 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 trees.

8.0 Legal constraints

8.1 **Trees subject to statutory controls:** It is not known if Sandrock is subject to a Tree Preservation Order (TPO) or within a conservation area. Except for the removal of dangerous trees or removal of dead wood, the existence of a TPO will require an application for consent to undertake tree works to be made to Exeter City Council (ECC). It is advised to consult with the Council to check for the presence of a TPO before undertaking exempt works. If the land is within a conservation area, then advance written notice of intent to undertake tree works must be submitted to ECC, unless the same exemptions are met.

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 Residential development is proposed for a nursery site known as Sandrock on Gypsy Hill Lane in the Monkerton area of Exeter, Devon. This report presents the results of a tree survey for the site in accordance with BS5837:2012 (Trees in relation to design, demolition and construction – Recommendations). An Arboricultural Implications Assessment and Tree Protection Plan accompany the report, reference 12.007.2.TPP.

9.2 All trees grow as groups, of mixed species or same species. Monoculture tree groups are Ash, Norway Spruce or Leylandii. It is advised that Norway Spruce and Leylandii in particular are not appropriate for retention within a residential layout.

9.3 There are no outstanding specimens of tree noted by the survey which deserve to act as constraints to the layout, but Birch trees in G6 and Oaks of G9 are recommended to be retained for the benefit of the development. For all other trees it is considered more cost effective and sustainable to remove them to facilitate a landscaping scheme within the overall layout, rather than isolate individual trees for retention.

9.4 The Elm hedgerows bordering the site are in particularly poor condition, and are recommended to be brought into management by laying and consolidation planting.

Signed: *D P Pratt* Dated: 8th May 2012.

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Appendix 1 - Tree inspection/survey results

The following pages show the results of the tree inspection. An ‘E’ adjacent to a figure within the table indicates an estimated measurement.

SURVEY KEY: Abbreviations and categories used in the survey are as follows:

Tree No.	Tag number and corresponding number on plan.
Species.	Common name and botanical name in italics.
Height (Ht.).	Estimated height.
Stem diameter. (Dia.).	Diameter measured in millimetres at 1.5m above ground level. B indicates a basal measurement. OI indicates where stem diameter has been measured over Ivy.
Branch spread.	Measured on the four compass points.
Height of crown clearance (HCC).	The height to the lowest branch attachments
Age Class.	Young (Y). Middle aged (MA). Mature (M). Over Mature (OM). Veteran (V).
Condition: Physiological and Structural.	Good. Fair. Poor. Dead. In addition specific diseases, defects or faults are described.
Action and/or comments.	Recommendations for tree work where observed as necessary, including further investigations of suspected defects which may require more detailed assessment. If blank no works are recommended.
ERC: Estimated remaining contribution in years.	Less than 10 years. 10-20 years. 20 -40 years. More than 40 years.
Cat: Category Grading (BS5837).	R or A, B, C.
Root Protection Area (RPA).	The root protection in m², as area and radial distance as measured from the centre of the tree stem. Where an * is present the R.P.A. cannot be achieved due to ground constraints, or it is located outside the site.

Table 1 – Cascade chart for tree quality assessment (extract from British Standard for trees in relation to construction (BS 5837:2012)

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *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 **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 **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 **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

Appendix 1

TREE SURVEY SCHEDULE

Client: Strategic Land Partnerships.
Site: Sandrock Nursery, Gypsy Hill Lane, Exeter.
Weather: Occasional showers.

Surveyor: Doug Pratt.
Date of Survey: 10th April 2012.

Tree Ref. No.	Species	Ht. (m)	Dia. (mm)	HCC (m)				HCC (m)	Age Class	Condition	Action and/or comments	ERC	Cat.	RPA (m²)	Radial RPA (m)
				N	E	S	W								
G1	Leyland Cypress *Cuppressocyparis leylandii* Eucalyptus *Eucalyptus* spp. Oak *Quercus robur* Sycamore *Acer pseudoplatanus*	Up to 20	-	-	-	-	-	0 to 2	M	Eucalyptus is rather etoliated and spindly. Conifers are varied condition, overall no specific individuals worth saving or capable of enhancing potential development. Hardwood component tend to be self set multiple stemmed trees of poor structural form and limited long term retention.	Overall long term retention limited by poor structural condition. Remove for development.	<20	B2	See	Plan
G2	Ash *Fraxinus excelsior*	10	160 Ave.	See	Plan	-	-	0.5	MA	Good vigour, varied structural condition.	Some capacity to select individuals and thin out. Remove for development.	20+	B2	See	Plan
G3	Norway Spruce *Picea abies*	7	60 Ave.	See	Plan	-	-	0	MA	Vigour fair, good structural condition. All trees pot bound.	Remove for development.	<20	C2	See	Plan
G4	Leyland Cypress *Cuppressocyparis leylandii*	8	300 Max	See	Plan	-	-	0	MA	Good vigour, varied structural condition.	Remove for development.	20+	B2	See	Plan
G5	Ash *Fraxinus excelsior*	7	140	See	Plan	-	-	0	MA	Good vigour, varied structural condition. Some with extensive basal damage due to rabbit grazing.	Some capacity to select individuals and thin out. Remove for development.	20+	B2	See	Plan
G6	Poplar *Populus* spp. Birch *Betula pendula* Cherry *Prunus* spp.	16 10 6	400 B 230 200 Max	See	Plan	-	-	0 – 1	M/MA	Good vigour, varied structural condition. Cherry with extensive basal damage due to rabbit grazing.	Birch and Poplar B category, Cherry C category. Retain Birch trees, remove Cherry and Poplar for development.	20+	B2	See	Plan
G7	Leyland Cypress *Cupressocyparis leylandii*	12	300 Max	See	Plan	-	-	0	M	Good vigour, varied structural condition.	Remove for development.	20+	B2	See	Plan

Tree Ref. No.	Species	Ht. (m)	Dia. (mm)	HCC (m)				HCC (m)	Age Class	Condition	Action and/or comments	ERC	Cat.	RPA (m^2)	Radial RPA (m)
G8	Cherry *Prunus* spp. Poplar *Populus* spp.	6 16	130 510 B	See	Plan	-	-	1 0	MA M	Good.	Cherry C category, but Poplar within B category. Remove for development.	20+	B2	See	Plan
G9	Oak *Quercus robur*	10	450 at 1m	-	4	9	4	1	M	Good vigour, varied structural condition.	Retain.	20+	B2	See	Plan
G10	Cherry *Prunus* spp. Ash *Fraxinus excelsior* Field Maple *Acer campestre* Lime *Tilia* spp.	6 7	Var.	See	Plan	-	-	0	M/MA	Good vigour, varied structural condition. Cherry and Ash dominate with other species under 100mm diameter.	Access limited by dense scrub. Remove for development.	20+	B2		