

Trees and Construction

BS5837 Method Statement

Site: Maelor Place, Ruabon,
Wrexham, LL14 6NN

Ref: 13982/A3_AMS

Client: Wales & West Housing



(Mail) 7 Greenbank | Hoole | Chester | CH2 3RW

0333 123 7080 | info@indigosurveys.co.uk

www.IndigoSurveys.co.uk

Arboricultural Consultant (Author):
Andrew Turnbull <i>FDS Sc MArborA</i>

- June 2014 -

TABLE OF CONTENTS

Chapter	Title	Page
1	Introduction	3
2	Arboricultural Method Statement	4 - 9
	Arboricultural Inspection / Monitoring	4
	Tree Works	5
	Tree Protection Fencing	5
	Ground Protection	6
	Underground Utilities	6
	Sensitive Ground Works	7
	Replacement Planting	8
	Summary of Construction Restrictions	9
	Report Handling	9

Appendices

Caveat	I
Terms and Definitions	II
Tree data table & Tree Protection Plan	III

1. INTRODUCTION

- 1.1 **Instruction:** This report has been prepared on behalf of Wales & West Housing (hereafter; client) in relation to the Maelor Place, Ruabon, Wrexham, LL14 6NN (hereafter; site).

It is in respect of the tree related planning conditions of a granted planning application and is produced in accordance with British Standard 5837 : 2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter; BS5837).

- 1.2 **Scope of this report:** This report has been produced in accordance with BS5837 and is intended to demonstrate how trees have been properly considered in relation to the accepted scheme. The objective is to provide recommendations for tree protection relating to the scheme's potential impact on trees and vice versa.

- 1.3 Following instruction the site was surveyed by Andrew Turnbull FDS Sc MA ArborA (hereafter; Consultant) on the 23rd September 2013. Pursuant to the agreed brief a site assessment and a BS5837 tree survey were carried out with summary arboricultural advice for the client in the form of the '*BS5837 Tree Survey*' ref: 13982/A1.

This was followed by a site meeting and scheme review with the council's Tree Officer resulting in a supporting '*Trees and Construction - BS5837 Arboricultural Assessment Report*' ref: 13982/A2; approved as part of the planning application.

The previous arboricultural advice supported the approved planning application which, together with tree related planning conditions, will inform this arboricultural method statement / tree protection advice.

- 1.4 The details herein are subject to caveat at Appendix I, outlines relevant terms and definitions at Appendix II and constitutes the findings of the preliminary site survey, the assessment of the accepted scheme and the tree related planning conditions.

- 1.5 The tree survey data and site observations were used to illustrate the arboricultural constraints in plan format as a 'Tree Constraints Plan'. This has been used as a base layer together with a review of the approved site plan (ref: C830.04); this informs the resulting Tree Protection Plan (hereafter; TPP) which shows illustrations relating to the approved scheme for reference; the tree survey data table and TPP are at Appendix III.

2. ARBORICULTURAL ASSESSMENT & METHOD STATEMENT

- 2.1 The following information, as with the prior contents of this report, is to be read in conjunction with the tree survey data table and the appended TPP (13982/TPP/01); it is referred to as the Method Statement (hereafter; AMS).

Additionally, the recommendations of this AMS require approval by the Council in accordance with the tree related planing condition as per the TPP.

2.2 Arboricultural Site Monitoring / Supervision

- 2.2.1 The local authority require '*a scheme of supervision for the arboricultural protection measures*'. This will require site inspections by a qualified arboriculturist (i.e. Andrew Turnbull *FDSc MArborA* from Indigo Surveys Ltd) during construction.
- 2.2.2 In this instance, as the majority of the trees are clear of works and will be able to be fenced off during construction, phased works will be used with protective barrier fencing (hereafter; PBF) for tree protection and site management and supplemented by arboricultural supervision / inspection for the hard landscape works within RPAs.
- 2.2.3 Once protective barrier fencing is in place with retained hard surfaces, a higher frequency of visits is not essential as risk to trees is considered to be limited on this site. It is necessary for *intermittent inspections* which are *recommended monthly* to ensure this advice is adhered to and the consultant is available for onsite tree queries; this will require the council's approval as a supplement to the planning conditions.
- 2.2.4 A record of each site visit will be kept and a summary letter drafted for the client, the site manager and the local authority (to be sent to the client by email for distribution). The arboricultural supervision/monitoring is therefore recommended thus:
- Unless the below points are within consecutive months, additional inspections will be undertaken to provide a '1 month frequency' for arboricultural visits;
 - Onsite observation/guidance at the time of PBF installation;
 - Induction of site management regarding arboricultural considerations and the assignment of key personnel (site manager) responsible for maintaining the AMS;
 - On construction completion, onsite guidance for the sensitive surface works and new landscape installations (paving / turf) within RPAs (see; TPP);
 - On completion of the hard landscaping works, onsite observation/guidance regarding removal of the protective measures and to sign off the site as having correctly adhered to this AMS.

2.3 Tree Works

2.3.1 The following tree works are required and are to be undertaken with the approval of the council prior to site works / construction commencing, thus -

TREE WORK SUMMARY

REFERENCE	TREE REMOVALS / PRUNING WORKS
G3a, G3e, G3g, G3h, T5, T6, T9, T10, T11, T12, T14 and T15	Remove - in order to facilitate the scheme. - to be replaced with new trees as part of the site landscaping and new tree planting proposals (specification required).
G3 and T2	Pruning - crown clean (removed deadwood) and remove epicormic growth from around the stem base and from the stem of T2.
Retained Trees	Protection - fixed Heras panels around the crowns and RPAs (whichever the greater area), to have no access during construction, or, to have sensitive works within RPAs prior to construction activity then fixed Heras panels around soft surfaced RPA sections.

2.3.2 All approved tree works must be undertaken with the written permission of the council and must be undertaken to BS3998 by a tree service contractor who is suitably qualified, experienced and insured to carry out the arboricultural contracting.

2.4 Tree Protection Fencing

2.4.1 Protective barrier fencing (hereafter; PBF) is to be installed to prohibit access, exclude ground works, material storage and construction processes etc. from trees' RPAs.

It is to be used in conjunction with sensitive ground works for hard surface removal, walkways and parking bay installation within RPAs. Sensitive ground works may be undertaken prior to construction, or after, but needs to ensure the adequate fencing of the RPAs (surface works within RPAs will be undertaken sensitively - detail to follow).

2.4.2 PBF is to be installed as illustrated on the TPP prior to site works commencing and is to remain in place until construction completion unless otherwise agreed by the council. It is to have tree protection signs with "**TREE PROTECTION ZONE – KEEP OUT**" is to be fixed onto each panel of the PBF (see TPP illustration).

2.4.3 The PBF, due to the degree and proximity of works around trees, is to be 'a vertical and horizontal (scaffold) framework, well braced to resist impacts, with the vertical tubes spaced at a maximum of 3m. Onto this, weld mesh panels are to be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not to be used' (see TPP).

2.5 Ground Protection

2.5.1 Although retained trees are clear of the new build, access, storage and works may be undertaken in proximity to trees (crowns, stems and RPAs) unless otherwise restricted.

As a cautionary measure, RPAs will be fenced off during construction, or installation of parking bays and walkways within RPAs will be undertaken prior to construction. This will provide hard surfaces for use where possible. This will be supplemented with ground protection for exposed soft surfaced RPA sections adequate for the load atop.

2.5.2 Where exclusion of works or installation and use of hard surfaces within RPAs cannot be maintained, or additional access space is required within soft surfaced RPAs, temporary ground protection will be installed, i.e. for exposed areas/soils within RPAs.

Specifically, the ground is to be protected from impact where it may be subject to direct pedestrian/vehicular movements. The ground protection is to be appropriate for the intensity of the pedestrian or vehicular movements thus -

- a) For pedestrian movements within an exposed RPA, the ground protection is to consist of *"a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold"*; and
- b) For wheeled or tracked movements within an exposed RPA, the ground protection is to *"be designed by an engineer to accommodate the likely loading"*.

2.6 Underground utilities

2.6.1 Due to the alignment of existing underground utilities, there is a potential for RPA incursion where new utility links are created.

2.6.2 Where RPA avoidance can be demonstrated by a re-routing of the proposed underground utilities, this will ensure no impact on trees and have no restriction to site processes. However, where works are required within RPAs, the following restrictions will apply to new underground utilities or surface water drains within RPAs:

- An alternative location is to be sought outside of RPAs;
- Any necessary excavations to be undertaken sensitively using either a no-dig method (e.g. Air-Spade) and/or under arboricultural supervision;
- Any exposed roots shall be packed with a clean damp sand (not builders sand) and wrapped in hessian sacking to protect them;
- Small roots which are identified (those less than 25mm diameter) may be carefully pruned back with a clean sharp tree saw; and
- Larger roots which are identified (those greater than 25mm in diameter) are to be retained and protected as they may be necessary for a tree's health and stability.

2.7 Sensitive Ground Works (under arboricultural supervision)

- 2.7.1 The existing walkway which to be lifted and relayed from the RPA of T2's is to be undertaken sensitively and manually. This is also to apply to ground preparations for the walkway within the RPA of T1 and the new parking bays within the RPAs of T7, T8 and T16 Cellweb system (to be detailed on a proposed levels plan).
- 2.7.2 The *ground preparations for the new hard surfaces* (as illustrated on the TPP) will:
- Be undertaken when the construction works are completed;
 - Prepare the grounds for Cellweb installation but retain the existing soil level;
 - Use sensitive excavation techniques to protect the tree roots and their existing growing conditions, i.e. sensitive manual excavations;
 - Be undertaken manually, level the grounds but retain the existing soil levels;
- 2.7.3 The RPA preparation areas are to be marked out [as per the TPP] on the turf and undertaken by hand with the use of manually operated (hand held) tools.
- 2.7.4 The Cellweb system is to be installed manually, without bonded gravels of hoggins, onto the existing soil level. It is to be manually filled with the clean angular stone (not filled using vehicle/driven/tracked machinery) and have the new surface installed.
- 2.7.5 The *excavation of the existing hard surfaces* (as illustrated on the TPP) will:
- Be undertaken when the construction works are completed;
 - Be undertaken in conjunction with the Cellweb installation;
 - Be undertaken manually to break out the existing surface, remove the spoil and retain the existing sub-base (if possible - hence retaining soil levels);
 - Install sub-base (if required) and surface finish layer.
- 2.7.6 The excavations will be preventative and avoid damage to tree roots; individual 50mm driveway layers are to be excavated at a time. This is to ensure that excavations do not incur on the existing soil levels, i.e. no downward regrading of soil levels within RPAs.
- 2.7.7 Small roots (those less than 25mm in diameter) may be carefully pruned back with a clean sharp tree saw. However, pruning large roots (those greater than 25mm in diameter) will require the advice of the consultant and permission of the council.
- 2.7.8 As the existing walkway is hard surfaced and the proposed surfaces are similar or more preferable, the surface installations can be undertaken in a traditional manner.
- Where the new surfaces can use more preferential treatments to encourage percolation of surface water and encourage aerated soils with nutrient availability, this is encouraged, i.e. the new walkway and parking bay installations to use a permeable surface installation (to be illustrated on the proposed levels plan).

2.8 Replacement Planting

2.8.1 The notable trees are retained and protected as part of this AMS. Taking account of the predominantly poor and low quality trees which will be removed for both health and safety purposes and in conjunction with the scheme, 5x new replacement trees are recommended and to be planted on site.

2.8.2 It is necessary for the client to provide a tree planting proposal (i.e. within a landscape scheme which demonstrates well delivered tree planting, an enhancement to the site's landscape and biodiversity as well as a long term amenity from trees.

The landscape scheme is to illustrate the planting locations of trees and outline a detailed specification of species and nursery stock selection, locations, volume, planting process and maintenance as per BS 8545 : 2014 ; an overview is included below.

2.8.3 New tree planting is to be based on the quality of trees removed and the availability of new planting space. It is recommended that no fewer than 5x new trees to be planted; the site may accommodate a greater number of trees although suitable species selection of a smaller tree volume is preferable to avoid future conflicts with buildings etc.

2.8.4 The selection of healthy specimens of a suitable species is necessary in order to promote and enhance biodiversity, continuity of tree cover and suit the spatial constraints of the site, favour native species of mixed ultimate scale.

This could concentrate on UK grown native tree stock of mixed year round interest to promote amenity, i.e. Rowan and Sorbus verities (Wild Service Tree), Field Maple or more ornamental stock such as Amelanchier x grandiflora, Paperbark Maple etc.

Thereafter, the open amenity space could be utilised between T1 and T2 possibly for the planting of 1x or 2x non-native specimen trees, i.e. Liriodendron, Liquidambar etc.

2.8.5 Each new tree location will be illustrated on the landscape scheme to suit the ultimate tree scale. Planting pits are to be properly prepared with adequate drainage and room for future development (an example planting illustration is included on the TPP) thus -

- a) A planting pit is to be excavated to accommodate the root-ball, allowing a minimum of 1.0m clearance, with the additional breaking up of the planting pit's sides (not base).
- b) The tree is to be planted at the same depth as in the nursery (not above the root collar). It will have an irrigation system ($\geq$ 5cm diameter perforated pipe laid around the root ball 10cm below the surface) and be back-filled with high grade soil and firmed in.
- c) The tree is to have a non-intrusive and adjustable supportive system installed in the form of either staking or above/underground guying.
- d) A wood-chip mulch is required around the base (at least 2m radius and < 5cm depth) and a maintenance program for watering, fertilizing, weed control and mulching.

2.8 Summary of Construction Restrictions

2.8.1 The following restrictions (including those on the following page) apply for tree protection purposes: as illustrated on the Tree Protection Plan (TPP/13982/01):

- a) No additional tree works are permitted unless further agreed in writing by the council.
- b) PBF is to be installed prior to site works commencing, i.e. the delivery of materials, site set up, site preparation and/or construction as per the TPP (appended). This is to be supplemented with sensitive hard surface installation and ground protection for RPAs.
- c) Once the PBF is in place the enclosed areas are to act as Construction Exclusion Zones (no access is permitted); the site cabins and materials are to be delivered using the existing access and ensure all storage is clear of tree crowns and RPAs.
- d) No chemicals or materials are to be transported or stored or used or mixed within an exposed RPA or Construction Exclusion Zone (CEZ).
- e) No fires are to be lit and no machinery, plant or vehicles are to be washed down within 10m of a tree's canopy or within a RPA or CEZ.
- f) During construction processes RPAs / CEZs may not be breached, i.e. no surface work, without the consultant's prior advice and council consent; this is with the exception of extension foundations clear of RPAs, sensitive garage foundation and driveway works.
- g) No mechanical digging or scraping is permitted within a RPA / CEZ.
- h) When all construction is complete the retained hard surfaces within RPAs can be sensitively excavated, the grounds prepared within RPAs for the new walkway and parking bays, the Cellweb installed, the existing walkway surface relayed and any remaining hard landscape works completed elsewhere.
- i) Only following hard landscaping completion can the PBF be removed and any remaining soft landscaping / tree planting works be undertaken.

2.9 Report Handling

2.9.1 This report is released to the for distribution and the consultant is available for any queries relating to this report and/or any other matter relating to arboriculture.

2.9.2 This AMS and the TPP are to be approved by the council as a means of authorised tree protection measures of which all site personnel are to have access to a copy and the details herein are to be inspected as pers.2.2.

This concludes our advice.

Appendix I

Caveat

Any and all information supplied to Indigo Surveys Ltd by/on behalf of the client is assumed to be accurate unless otherwise informed. | This report is limited to the observations made on the date of inspection as detailed herein and any deletion, editing or alteration will result in the report being null and void in its entirety. | This report in its entirety may be deemed null and void if remedial works are undertaken on any area of the site, on or after the date of the survey. | No liability is assumed by the author or by Indigo Surveys Ltd for any misuse, misinterpretation or misrepresentation of this report. | This report is not valid in adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events. | No responsibility is assumed either by the author of this report or by Indigo Surveys Ltd for any legal matters that may arise as a consequence. | Neither the author nor Indigo Surveys Ltd will be required to attend court or give testimony as part of this agreement. | The responsibility for any works undertaken on the basis of the recommendations of this report does not form part of this agreement.

Appendix II

Terms and Definitions

“Arboriculturist” - person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.

“Competent Person” - person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

“Topographical survey” - an accurately measured land survey undertaken to show all relevant existing site features. *A method of carrying out topographical surveys is given in RICS specification* Surveys of land buildings and utility services at scales of 1:500 and larger.

“BS5837 Tree survey” - should be undertaken by an arboriculturist to record information about the trees on or adjacent to a site. The results of the tree survey, including material constraints arising from existing trees that merit retention, should be used (along with any other relevant baseline data) to inform feasibility studies and design options. For this reason, the tree survey should be completed and made available to designers prior to and/or independently of any specific proposals for development.

“Tree categorisation method” - trees should be categorised in accordance with the BS5837 cascade chart by an arboriculturist. This is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

“Root protection area (RPA)” - layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure is treated as a priority, shown as an arboricultural constraint in m². The radius is calculated using the BS5837 calculation method. An arboriculturist may change the shape of an RPA but not reduce its area.

“Arboricultural implications assessment” - a study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

“Arboricultural method statement” - methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.

“Tree protection plan” - a scale drawing, informed by descriptive text where necessary, based upon the finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures.

Appendix III

Data Table: As appended (BS5837 Tree Survey Key & Table)

Tree Protection Plan: As appended (13982/TPP/01)

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012
'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'

FIELD KEY:

TPO/CA - On client request: presence of Tree Preservation Orders (TPO) / site location within a Conservation Area (CA) & date checked;

TREE REF. # - Tree reference number: tag or plan number (T - individual tree, G - group of trees/shrubs, H - hedge);

SPECIES - Genus, species and/or common name;

AGE - Age classification (Y - young, SM - semi mature, M - mature, LM - late mature, OM - over mature);

HEIGHT (in m) - Approximate height of tree in metres;

CANOPY (in m) N - S - E - W - Approximate branch spread in metres of the four principal compass points;

STEM (in mm) - Stem diameter in millimetres: measured in accordance with s.4.6 of BS5837;

RPA (in m²) - Root Protection Area: calculated as a function of the STEM measurement (single stem/multiple stem variant, as outlined within BS5837);

CLEARANCE (in m) - Crown clearance in metres above the adjacent ground level and to first significant branch and direction of growth (where relevant);

LIFE & VITALITY - Estimated useful life expectancy and physiological condition typically gauged from annual extension growth (good, fair, poor, dead);

NOTES - Structural and physiological condition observations;

ESTIMATED REMAINING CONTRIBUTION - Approximate number of years the tree will continue to make a contribution without the need for oppressive arboricultural intervention, categorised in years as <10, 10-20, 20-40 and >40;

- BS5837 tree quality assessment category: resulting from structural/physiological condition and remaining contribution (approximate useful life expectancy);

- Standard retention category **U**: in such a condition that any existing value would be lost within 10 years;

- Standard retention category **A**: high quality and value, in such a condition as to be able to make substantial contribution of 40+ years;

BS CAT.

- Standard retention category **B**: moderate quality and value, in such a condition as to make a significant contribution of 20+ years;

- Standard retention category **C**: low quality and value, currently in adequate condition to remain until new planting could be established 10+ years;

- Standard retention sub-category, mainly due to: **1**- Arboricultural values, **2**- Landscape values, **3**- Cultural values, including conservation;

MANAGEMENT - Preliminary management recommendations (as appropriate);

' * ' - Within the survey schedule denotes an estimate

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'

SITE: Maelor Place, Ruabon, Wrexham, LL14 6NN

ARBOR CONSULTANT: Andrew Turnbull FDS Sc ArborA

CLIENT: Wales & West Housing (13982_Rev.A)

SURVEY DATE: 23 Sept 2013 and 13 January 2014

TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W	STEM (in mm)	RPA (in m ²)	CLEARANCE (in m)	LIFE & VITALITY	NOTES	BS CAT.	MANAGEMENT
T1	Sycamore; <i>Acer, Aceraceae</i>	M	17	6.5 7 7 7	858	333	4 (5m - West)	Fair	4x stems (490, 360, 310 & 520mm), grows on mounted soils at boundary edge, included multiple stems at 1.0-1.5m, no dominant leader, overhangs neighbour's garden.	A 1/3	Monitor tree's condition - likely to need management by reduction due to multiple stem union and long elongated laterals.
T2	Lime; <i>Tilia, Tiliaceae</i>	M	18	6 4 7 7.5	900 *	366	0	Fair	Congested with epicormic covering to base, fair form but some branch dieback and large deadwood noted, no access to stem, large branch attachment at 1.5m.	A 2/3	Crown clean and remove epicormic growth from base and stem.
T3	Cherry; <i>Prunus, Rosaceae</i>	M	8.5	5.5 5 4.5 7	470	100	1.5 (1.5m - N.West)	Normal	Multiple stems at 1.5m+, previously crown raised which as encouraged a wide lateral spread.	B 3	
G1	Offsite: Golden Cypress	SM / M	6	/ / / /	/	/	1	Fair	At rear of residential garden with 1m overhang of site boundary, no access.	C 2	
T4	Sycamore; <i>Acer, Aceraceae</i>	SM	14	5 6 6 4.5	490	109	2.5 (4m - East)	Fair	In direct conflict with boundary wall, self seeded, decay pocket at base, canopy overhang of buildings.	U	Removal recommended.
G2	Offsite: Golden Cypress	SM	6	/ / / /	/	/	1	Normal	Offsite screen planting along boundary, 1m site overhang.	C 2	
G3	Sycamore copse	SM	14 - 18	/ / / /	210 - 600	/	1.5 - 3	Fair	Group line with mostly collective canopy form, growing on mounded soils raised roots, some decay and conflicts noted with lower individual quality.	B 2	If retained: crown clean and reduce / removed decayed and long laterals and decayed / suppressed stems from group.
G3 - a	Sycamore; <i>Acer, Aceraceae</i>	Y / SM - M	/	/ / / /	/	/	/	Fair / Poor	In G3, lost leader and decay pocket on tension stem side at 3m.	/ /	Removal recommended.
G3 - b	Sycamore; <i>Acer, Aceraceae</i>	M	/	/ / / /	/	/	/	Fair	In G3, multiple stems <1m, growth lean West.	/ /	Crown clean and balance recommended.
G3 - c	Sycamore; <i>Acer, Aceraceae</i>	M	/	/ / / /	/	/	/	Fair	In G3, large tear-out at 1.5-2.0m, included tight forks throughout.	/ /	Crown clean and reduce by 20%.
G3 - d	Sycamore; <i>Acer, Aceraceae</i>	SM	/	/ / / /	/	/	/	Normal	In G3, single stem, fair form.	/ /	Crown clean and monitor tree's condition.
G3 - e	Sycamore; <i>Acer, Aceraceae</i>	Y / SM	/	/ / / /	/	/	/	Fair	In G3, single stem leans East, scarring on tension side and girdling roots, limited future potential.	/ /	Removal recommended.
G3 - f	Sycamore; <i>Acer, Aceraceae</i>	M	/	/ / / /	/	/	/	Normal	In G3, network of raised roots on mound, fair form, large branch attachment at 1.5m.	/ /	Crown clean and monitor tree's condition.
G3 - g	Sycamore; <i>Acer, Aceraceae</i>	Y / SM	/	/ / / /	/	/	/	Poor	In G3, single stem, leans East, decay on stem to 1m.	/ /	Removal recommended.
G3 - h	Sycamore; <i>Acer, Aceraceae</i>	Y / SM	/	/ / / /	/	/	/	Fair	In G3, single stem, suppressed.	/ /	Removal recommended.
G3 - i	Sycamore; <i>Acer, Aceraceae</i>	M	/	/ / / /	/	/	/	Normal	In G3, on end of group, included multiple stem union at 2m, previously crown raised, fair form.	/ /	Crown clean and monitor tree's condition.
T5	Goat Willow; <i>Salix, Salicaceae</i>	M	7	4 2 3 3	380	65	1 (3m - North)	Fair	On edge of parking area, sprouting base, fair form but small scale and limited amenity.	C 3	
T6	Sycamore; <i>Acer, Aceraceae</i>	SM / M	11	2 7 5 4.5	360	59	2 (2.5m - East)	Fair	Corrected growth lean / fallen stem base with decay noted - limited future potential.	C 3	
T7	Ash; <i>Fraxinus, Oleaceae</i>	SM / M	12.5	4 5 4 5	370	62	2 (6m - South)	Normal	Single stem with good future potential.	B 3	
T8	Hawthorn; <i>Crataegus, Rosaceae</i>	M	7.5	2 3.5 2.5 3	311	44	1 (3m - all)	Fair	3x stems (150, 160 & 220mm), multiple stem crown, scrubby form and dead ivy on structure, fair canopy cover.	C 3	
T9	Birch; <i>Betula, Betulaceae</i>	SM / M	13	4 2 3.5 3.5	280	35	1.5 (2.5m - North)	Normal	Upright form, co-dominant at 2m, fair leaf cover.	B 3	
T10	Birch; <i>Betula, Betulaceae</i>	SM	9.5	2 2 2.5 2	140	9	2 (3m - East)	Poor	Multiple snapped laterals, dieback and poor leaf cover.	U	Removal and replacement recommended.
T11	Birch; <i>Betula, Betulaceae</i>	SM	12	2 2.5 2.5 3	280	35	1.5 (3m - South)	Normal	Central to small scrub border, upright form, ivy on stem, fair leaf cover.	B 3	
T12	Birch; <i>Betula, Betulaceae</i>	SM	6	2 1.5 2.5 1	110	5	1.5 (2.5m - East)	Fair	Small scale, scrubby form, co-dominant at 2.5m, limited current and future function.	C 3	
T13	Sycamore; <i>Acer, Aceraceae</i>	SM	13	3.5 5 4.5 5	420	80	6	Fair	Multiple stem crown and fair form, epicormic base, evidence of decay, old dead ivy on stem.	B 3	Monitor tree's condition.
T14	Hawthorn; <i>Crataegus, Rosaceae</i>	M	5	2.5 2 3 0.5	310	/	1	Poor	Ivy covered and poor form.	U	Removal and replacement recommended.

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'

SITE: Maelor Place, Ruabon, Wrexham, LL14 6NN

ARBOR CONSULTANT: Andrew Turnbull *FDS* *MArborA*

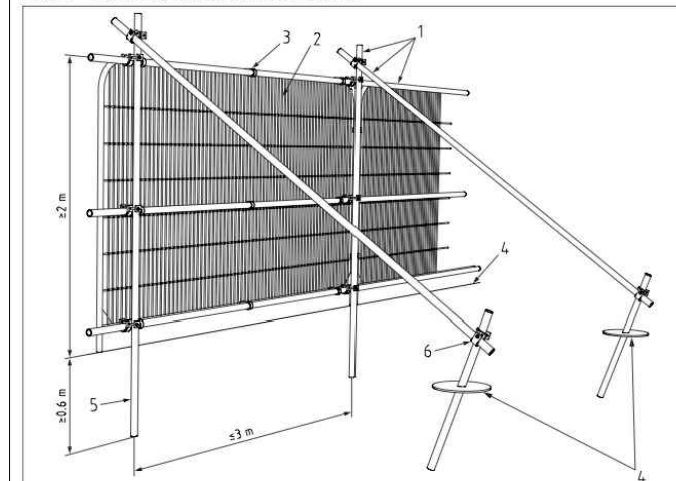
CLIENT: Wales & West Housing (13982_Rev.A)

SURVEY DATE: 23 Sept 2013 and 13 January 2014

TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m ²)	CLEARANCE (in m)	LIFE & VITALITY	NOTES	BS CAT.	MANAGEMENT
T15	Ash; <i>Fraxinus, Oleaceae</i>	SM / M	14	7	4	2	8.5	488	108	2 (5m - West)	Fair	2x stems (360 & 330mm), wide spread co-dominant base, one stem over neighbouring property, limited form and future.	C 3	
T16	Sycamore; <i>Acer, Aceraceae</i>	M	16	6	5	5	3	420	80	2 (5m - North)	Normal	Single stem base, multiple stem crown, fair form and future.	A 3	
T17	Ash; <i>Fraxinus, Oleaceae</i>	M	15	6	2.5	5	4	390	69	2 (5.5m - South)	Fair	Single stem, very close to wall, multiple stem crown, fair form, growth lean away from neighbouring property.	C 3	

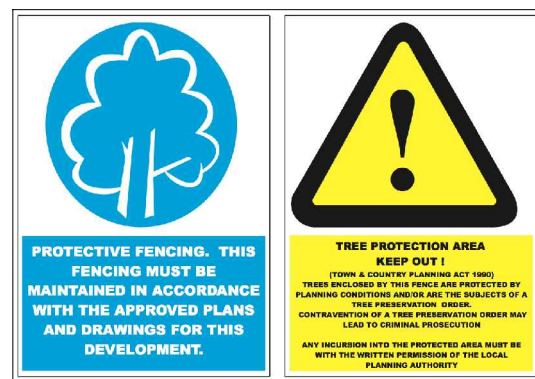
Protective Barrier Fencing — Example Design

Figure 2 Default specification for protective barrier



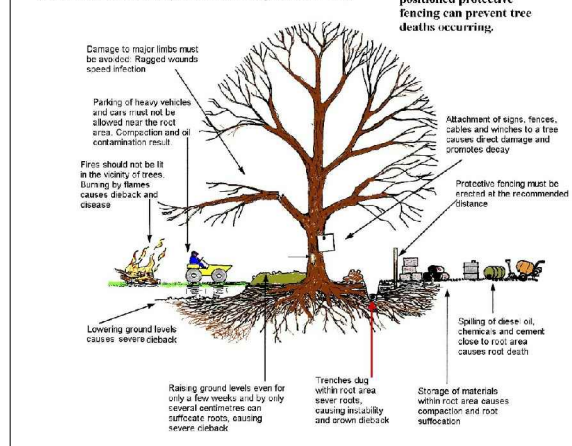
- Key
- 1 Standard scaffold poles
 - 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
 - 3 Panels secured to uprights and cross-members with wire ties
 - 4 Ground level
 - 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
 - 6 Standard scaffold clamps

(c) British Standards Institute (www.bsigroup.com)



Common causes of Tree Death

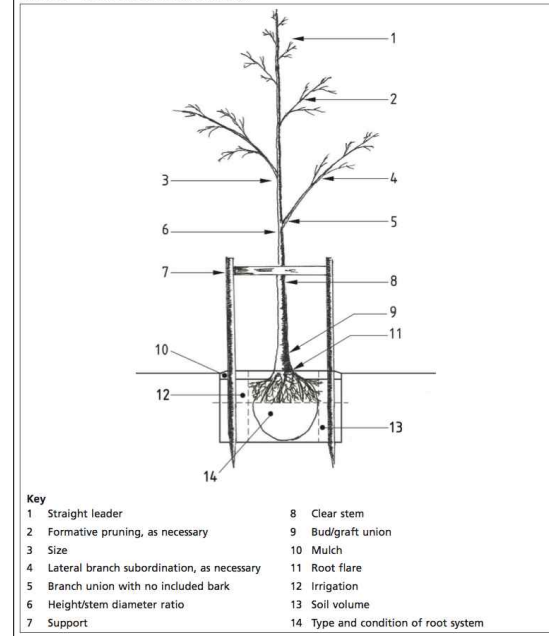
(Source: Arboricultural Information Exchange website, 2005)



New Tree Planting — 3x new trees to be planted, additional details required within the client's planting plan to show the nursery selection, planting specification, maintenance — all tree planting to be in accordance with the guidance of BS 8545 : 2014

Tree Planting Pit — Example Design

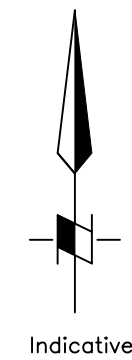
Figure F.8 Factors involved in tree planting



(c) British Standards Institute (www.bsigroup.com)

DO NOT SCALE FROM DRAWING

The original of this drawing was produced in colour — a monochrome copy should not be relied upon.



KEY

- Tree Crown Spread
- Root Protection Area (RPA)
- Tree Stem
- T1 Tree No.
- Tree Condition Category
 - A
 - B
 - C
 - U

The surveyed trees are illustrated on this Tree Protection Plan as prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction — Recommendations'

Sensitive ground works to lift and relay the existing walkway (if included within the landscape works) — hand excavation, retention of existing sub base and installation atop the existing driveway line — level to match the surrounding turf.

Sensitive path installation to be sensitive to tree roots, use a load bearing engineered solution (i.e. Cellweb) and a permeable surface treatment (where possible — although incursion will be within 20% allowance for increased new hard surfaces within a RPA). Further detail required from the Architect / project manager on retained soil levels, proposed finish levels, installation methods and a cross section specification from GeoSynthetics — hard landscape scheme.

Constriction Exclusion Zone — all areas enclosed by PBF to have no landscaping until construction completion, soil levels to be retained and works to be undertaken manually (turf, planting etc.)

Protective Barrier Fencing — with tree protection signs.

— this may be installed prior to construction and need to remain in place until completion, then to be removed to allow for sensitive ground works within RPAs, or
— to be installed after the sensitive hard surface installations, prior to construction or other site works and then allow use of parking bays with PBF soft surfaced RPAs.

Constriction Exclusion Zone — all areas enclosed by PBF to have no landscaping until construction completion, soil levels to be retained and works to be undertaken manually (turf, planting etc.)

Sensitive driveway installation to be sensitive to tree roots, use a load bearing engineered solution (i.e. Cellweb) and a permeable surface treatment (where possible — although incursion will be within 20% allowance for increased new hard surfaces within a RPA). Further detail required from the Architect / project manager on retained soil levels, proposed finish levels, installation methods and a cross section specification from GeoSynthetics — hard landscape scheme.

TREE PROTECTION LEGEND —

- Tree Removal(s)
- Approved scheme overlay (C830.04)
- Protective Barrier Fencing (PBF)
- Load bearing surface solution (Cellweb)
- Sensitive hard surface works

REV.	Use of 13982/TCP/01_Rev.B	AT	RK	20/06/14
DESCRIPTION	DWN	CHK'D	DATE	

CLIENT
Wales & West Housing

PROJECT
13982
Maelor Place, Ruabon,
Wrexham, LL14 6NN

TITLE
Tree Protection Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RCK	20/06/2014	AT	20/06/2014			1:500



(Mail) 7 Greenbank, Hoole, Chester, CH2 3RW
Telephone: 0333 123 7080 www.indigosurveys.co.uk

Drawing Number
13982/TPP/01
A2
REV.

THIS DRAWING IS CONFIDENTIAL AND MUST NOT BE REPRODUCED WITHOUT THE CONSENT OF INDIGO SURVEYS LTD.