

Trees and Construction

BS5837 Tree Survey, AIA & AMS

Site: Maelor Place, Wrexham, LL14 6NN

Ref: 13982 / A2_AIA

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 MArborA

- January 2014 -

TABLE OF CONTENTS

Chapter	Title	Page
1	Introduction	3
2	Site & Application Information	4
3	Findings & Recommendations	5 - 8
4	Scheme / Impact Assessment	9 - 10
5	Method Statement 'Considerations'	11 - 13

Appendices

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

1. INTRODUCTION

- 1.1 **Instruction:** This advice has been prepared for Wales & West Housing (hereafter; client) in conjunction with Ainsley Gommon Architects and is in respect of the tree related considerations at the Maelor Place, Wrexham, LL14 6NN (hereafter; site).

As the proposal relates to development works at site, the advice herein is produced in accordance with the British Standard 5837 : 2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter; BS5837).

- 1.2 **BS5837:** The scope of BS5837 is to provide guidance on how trees and other vegetation can be integrated into construction and development design schemes. The overall aim is to ensure the protection of amenity by trees which are appropriate for retention.
- 1.3 **Scope of this advice:** This assessment has been produced in accordance with BS5837 and is secondary to arboricultural constraints advice which assisted with the design process. The objective is to systematically assess and provide suitable recommendations regarding the proposal's potential impact on trees and vice versa.
- 1.4 Following instruction the consultant surveyed the site on the 23rd September 2013 where a site walkover and BS5837 tree survey were carried out; all trees on site and around the application boundary were surveyed from ground level and plotted as either an individual or a tree group.
- A site visit with Moray Simpson (Council Arboricultural Officer) and Simon Venables (Ainsley Gommon Architects) was also undertaken on the 13th January 2014. This was to discuss tree retention / removal, scheme alterations and tree protection options; the discussions have advised this assessment and the detail herein.
- 1.5 This advice is subject to caveat at Appendix I, outlines relevant terms and definitions at Appendix II and constitutes the findings of the preliminary site assessment and associated arboricultural recommendations.

2. SITE INFORMATION & TREE ASSESSMENT

- 2.1 The site currently comprises multiple sections which includes buildings, parking space and landscaped areas all separated by access roads and driveways.

The site sections are all directly accessible off Maelor Place with open access for vehicles and pedestrians. This is due to the roads, parking and open landscape space with only the buildings, small walls, residential and neighbouring property boundaries acting as restrictions to onsite movement.

- 2.2 **Proposal:** At the time of writing the initial tree survey advice, it was understood that a proposed scheme involved the construction of residential properties at site to include a general scheme of landscape improvement and parking provision around the site.

This is now confirmed as being mixed residential construction with parking provision off Maelor Place and adjacent to said residences. The arrangement is shown as per the most recent scheme revision ref: C830.04D 'Proposed Site Plan'.

- 2.3 The site requires consideration from an arboricultural perspective due to the presence of trees on and around the site; these trees are deemed to be within impacting distance of the existing property and potential construction area.

- 2.4 The tree survey and assessment as well as the walkover survey resulted in the BS5837 quality/retention categories of 'A - high', 'B - moderate' and 'C - low' being attributed to trees/tree groups as well as those categorised as 'U' for either small scale trees or those dead, dying or dangerous trees needing to be removed.

There are established features on site in the form of the mature Sycamore and Lime trees (T1 and T2) and the Sycamore tree line internally to the site (G3). There are also self set semi-mature trees of varying quality in amongst the screen planting along the southern border, i.e. T15 - T16.

There are identified defects to some of the surveyed trees which has resulted in the recommendation for tree removal, i.e. the category 'U' trees. Also, the defects to some other trees require monitoring, pruning works and/or may warrant their removal in the context of the development, i.e. T15.

- 2.5 The survey data and site observations use the supplied topographical survey to illustrate the surveyed trees in plan format as a 'Tree Constraints Plan' (hereafter; TCP); the TCP and the tree survey data table are at Appendix III.

The trees are illustrated as per BS5837, i.e. crown spread as N-S-E-W. However, it is worth noting that the tree's RPAs have been augmented to account for known root growth restrictions and anticipated influences on root growth extents; i.e. RPAs halt at the existing properties and have been influenced by hard landscaping.

3. FINDINGS & RECOMMENDATIONS

3.1 The following information is based on the information supplied as part of the initial tree survey. As with the prior contents of this report, this should be read in conjunction with the appended tree data table and tree constraints plan (13982/TCP/01_Rev.A).

3.2 General Considerations for Tree Retention / Removal

3.2.1 There were only a small number of trees / hedge groups noted which were considered to be either offsite or outside of the site's red line boundary. These include T3, T4, G1 and G2 and remain to be within influencing distance of the potential development. Hence, where they are offsite retention and protection is to be assumed.

As an aside to the above, the self seeded nature of T4 and poor growing conditions are such that removal is recommended irrespective of the proposed development.

3.2.2 In addition to T4, the poor quality and declining condition of T10 and T14 are such that their removal would be advisable in conjunction with the site's development. Certainly they should not constrain the scheme and could also be considered for removal for H&S site management irrespective of the proposals.

3.2.3 G1 and G2 are offsite and to the rear of the existing building. Where the building is to be removed this may then raise the pressure on the hedge overgrowth to be cleared back from site. However, these are only small scale and simple shearing back to solid green form closer to the boundary will be suitable.

3.2.4 Following the removal of some poor quality trees, it may be likely that some low quality trees will also need to be removed. This includes the likes of T5, T6, T8, T12, T15 and T17 as well as some stems within G3 (G3-a and G3-g etc.). They have structural defects, unsuitable growing locations and a curtailed remaining life expectancy. As such, the reduced amenity of an already limited quality tree is not considered suitable for retention on this basis, hence these trees could be considered for removal as part of the site's development, i.e. remove the low quality 'C' category trees.

3.2.5 The remaining better quality trees also have defects and limitations due to structure and growing positions. However, they are either established with a notable current contribution or have a significant future growth and amenity potential. Based on their current and future contribution to the site and surrounding area, it is recommended that they be retained, protected and be accommodated as part of the scheme.

3.2.6 The location of T1, T2, T3, T7, T13 and T16 towards the boundaries are unlikely to present a significant constraint on the scheme. However, consideration will be required for the light / shade impact, specifically those in the most southern positions.

- 3.2.7 Elsewhere, the 'B' quality trees internal to the site are likely to guide and constrain the scheme more so than others. This includes those within G3 as well as T9 and T11. It would be suitable to accommodate these established features of the site, however, depending on the layout and new frequency of site use, clearances will be required from G3 for H&S, i.e. minimum of 2m crown clearance recommended.

It would also be suitable to explore the potential for said trees' removal. This may present a good opportunity to remove an otherwise notable constraint to the centre of the site as well as integrating new trees throughout the site by way of mitigation planting, e.g. new tree planting to be on a 1:1 basis for medium / large tree species, or 1:2 basis for small / medium tree species for those removed..

- 3.2.8 The removal of the above trees or vegetation may have an impact on the green cover in the first instance, however, the scheme presents a significant enhancement opportunity. Said removals would have no impact on the long term amenity of the site and will allow for the selection of a wider range of native species to be planted throughout the site to enhance amenity and biodiversity; currently centrally dominated by Sycamore.

3.3 Tree Protection

- 3.3.1 The design and layout of the site is to incorporate the essential components of retained trees (crown and rooting area) and provide a suitable level of clearance to allow for their long term safe retention, i.e. RPA protection and crown clearance as well as for any new tree(s) being planted.

- 3.3.2 Depending on the level of tree retention/removal, the protection methods for the retained trees is likely to vary. However, it is likely that a combination of construction restrictions be used with protective barrier fencing (to protect RPAs).

The process of site operations will be an important aspect to confirm by way of a construction layout plan, i.e. showing storage areas, parking, delivery area, access routes etc., all outside of retained trees' RPAs or with a provision for ground protection. As a basis for tree protection the following points will need to be considered:

- Removal of all agreed trees and any agreed pruning works prior to works commencing by a suitably qualified arboricultural contractor;
- Induction of construction personnel regarding the exclusion of works (including access and storage) from the retained trees' RPAs;
- Secure temporary barrier fencing around the site to exclude the retained tree's crowns and RPAs from the working site;
- The storage of materials clear of all retained trees and conditions to ensure no contamination/run-off into soils in proximity to trees or on higher ground;
- For the removal of existing structures and / or hard surfaces from RPAs the works to be undertaken separate to construction, manually and sensitively.

3.4 General Overview

- 3.4.1 The considerations for trees which are to be retained as part of the proposal need to be addressed in order to ensure their protection. This is to account for the potential impact on trees and the growing environment from the proposal and vice versa (these follow).

Tree Works

The tree removals to facilitate the scheme are to be justifiable in the context of the site layout and are to be mitigated by way of a landscape scheme; new tree planting will be required to replace and enhance the site's canopy cover with a general scheme of landscaping in acknowledgement for the removal of poor quality trees.

Any trees which are to be removed should be well indicated to ensure that the retained trees are suitably protected. Hence, all trees which are to be removed are to be marked by a suitably qualified person [spraying the stems with a cross] prior to tree works.

Tree Crowns

Taking account of the previous encroachment on structures, providing the previous conditions remain or the clearance is increased this should demonstrate no change of circumstance or an improvement to the existing conditions and should be acceptable.

Consideration is required for existing and newly planted trees; proposed construction is to take account of trees reaching their full growth potential. It is always prudent to provide adequate clearance from a tree's current crown for future growth, i.e. to allow a tree adequate space to reach maturity without conflicts with new structures.

Root Protection Areas (RPA)

As a minimum it is suitable to consider the outer extents of retained trees' RPAs [up to the previous foundations and inner roadside curbs] as construction exclusion zones.

It is *sometimes* possible to undertake construction activities within the rooting areas of retained trees which requires greater attention to tree protection, foundation designs, phasing of works etc. If it is proposed to undertake works within these areas, more specific advice should be sought from a qualified arboriculturalist with a view to assessing the feasibility of said proposal and forming a suitable method statement.

Demolition/Excavation Works

Any removal of existing built structures (including stairways, retaining walls etc.) or hard surfacing will need to be undertaken with great care where this occurs within or near to the RPAs of retained trees.

Said works should adhere to the RPA restrictions, be undertaken manually with hand held non mechanical tools and ensure that existing ground levels are retained.

Hard Landscape Works

As with previously mentioned arboricultural restrictions to demolition/construction, the proposed works should avoid retained trees' RPAs. However, where ground works are proposed within RPAs, construction methods [for hard surfacing, walls etc.] should retain the existing ground levels, be undertaken sensitively and using a no dig design.

Throughout the site are hard surfaced walkways and roads as well as the interlinked parking areas. These can be suitably considered for replacement surfacing on a like for like basis or of a preferential surface treatment.

Elsewhere, conversion of soft surfaced areas within RPAs to hard surfaced walkways, parking areas etc., will need to utilise a no-dig product to ensure no negative impact on the tree roots and/or growing conditions.

- 3.4.2 For any proportion of tree removal, new tree planting is to be integrated into a landscape scheme. The new trees should be of a suitable volume, species, scale, in suitably prepared planting locations with adequate space for future growth and development and enhance the site's long term amenity contribution.

Planting Species and Volume

New tree planting should incorporate a range of species, select mixed characteristics and take account of the availability of space, i.e. concentrate on selecting suitable scale species based on the ultimate growth extents.

Depending on the volume and quality of trees to be removed, new tree planting will need to account for those removed. As such, only small scale low volume planting is required for poor and low quality tree removal whereas more significant instant impact trees of a higher volume are recommended for moderate quality trees.

Planting Specification

A detailed specification should be included within a landscape scheme (could form part of planning conditions). This should outline the proposed tree species, stock selection, location, planting process and ongoing maintenance (watering, mulch and pruning).

Planting Location

The new planting sites should take account of the future growth potential of the chosen species and should allow for the amenity space to be utilised, minimise the potential conflict with structures and facilitate the contribution to amenity from the site.

4. SCHEME / IMPLICATIONS ASSESSMENT

- 4.1 For the purpose of this assessment, the 'proposed site plan' (ref: C830.04D) has been used as a basis for consideration. This takes account of anticipated tree removals, tree protection options and potential alterations to account for arboricultural features.
- 4.2 As per s.3.2.1, T3, T4, G1 and G2 are offsite and are clear of construction. However, due to the self set poor location and conflicting growth position of T4 it is recommended that removal is agreed in conjunction with the scheme. Thereafter, only a requirement for light shearing of G1 is anticipated as part of regular hedge management.
- NOTE: This is not necessary for the scheme or to be assumed but is recommended.
- 4.3 As per s.3.2.2 and in conduction with the scheme, T10 and T14 are to be removed due to their poor condition. In addition and in reference to s.3.2.4, due to the identified tree defects and limited safe future retention the removal of G3a, G3e, G3g, G3h and T15 are to be undertaken in conjunction with the scheme for H&S risk management.
- 4.4 Thereafter, and due to direct conflict with the proposed layout (parking arrangement), the removal of T5, T6, T9, T11 and T12 is also required. It is worth noting that this was discussed and agreed during the most recent Tree Officer site meeting due to the tree's limited quality and/or scale and in the interests of avoiding better quality trees. This is evident in the car park arrangement whereby the removal of T5 and T6 allows for the parking to be closer to the existing car parking and increase clearance from T16.
- 4.5 The parking layout to the south of Maelor Place shows 12x bays and has been moved further west to avoid the better quality trees (namely T16). Although a minor incursion is observed at the outskirts of T16's RPA, this is at the outer edge and is considered tolerable in this instance. That said, it would be suitable to propose permeable surface treatments for bays 10, 11 and 12 to present a maintained preferential rooting area; this can be enhanced further by way of retained soil levels and a Cellweb installation.
- 4.6 As with s.4.5, an incursion on the RPAs of T7 and T13 is also noted. During the site visit, removal of said trees was discussed and considered acceptable where necessary with simple mitigation planting being suitable. However, as the incursion is only minor and again at the outer extents of the RPAs, it is recommended that the trees be retained. No adverse impact is antiquated, however, maintaining preferential conditions for future root growth could again propose a permeable surface treatment for bays 5 and 6 to be enhanced further by way of retained soil levels and a Cellweb installation.
- 4.7 In reference to the above s.4.5 and s.4.6 and in order to maintain permeability and available soils for root growth (for both retained trees and new tree planting), it is recommended that the parking bays 1 - 6 and 7 - 12 use a permeable surface treatment.

In the interests of maintaining existing conditions, a no-dig solution is recommended and hence, where possible, a load bearing solution such as Cellweb is to be installed.

This is also to be the case for bays 5 - 8 and 'V' due to the proximity to those retained within G3. Although the scheme is clear of the illustrated RPAs, it is recommended that the permeability and conditions are maintained again for future root growth.

- 4.8 It is understood that a proportion of the existing pedestrian walkway is to be retained and the realignment of the path to connect to High Street in avoiding the construction.

Where this is within the RPA of T1, this will be converting existing turf (preferential root growth conditions) into a hard surfaced area. As this is well below the accepted 20% hard surface cover for an RPA within BS5837 and the path is at the outer edge of the RPA, no notable impact will occur. However, in the interests of maintaining the preferential conditions for root growth, it is again recommended that the Cellweb system be used for the new path section up to the High Street connection.

Where this is within the RPA of T2, only a small section will be converted from turf to hard surface cover with no notable resulting impact. In any case, the construction of the path as above will retain and protect conditions. The existing path section within the RPA of T2 is being retained and as such no impact will occur. It is necessary for the works to be undertaken manually with hand operated tools which will retain the existing sub-base, i.e. manual surface strip where a new surface is to be installed.

- 4.9 The scheme accommodates the retained trees' RPAs and has the new structures clear of tree crowns. The clearances observed between the crown and buildings are suitable to allow for construction without conflicts and the sensitive works (new hard surfaces) can be undertaken post construction / manually to ensure tree protection.

As an additional measure, it is recommended that the sensitive ground works be undertaken after construction and use a permeable treatment, i.e. Protective Barrier Fencing during construction, removal of PBF to allow hard surface works, retained soil levels in the RPA and permeable surface installed where within RPAs.

TREE WORK SUMMARY

NUMBER	TREE REMOVALS / PRUNING WORKS	
G3a, G3e, G3g, G3h, T5, T6, T9, T10, T11, T12, T14 and T15	Remove	Remove in conjunction with the scheme: - to be replaced with new tree planting as part of the site landscaping and new tree planting proposals.
G3 and T2	Pruning	Crown clean (remove deadwood) and remove epicormic growth from around base and from the stem of T2.
Retained trees		Protection by fixed Heras panels around the crown / RPA extents to have no access during construction.

5. METHOD STATEMENT 'CONSIDERATIONS'

5.1 Arboricultural Construction Restrictions

5.1.1 The following restrictions are considered relevant for tree protection purposes which are to be illustrated on a detailed Tree Protection Plan as part of planning conditions:

- a) Tree works are to be completed prior to any and all site works: no tree works not specified within the associated arboricultural method statement (or leaning against or attaching of objects to a tree) are permitted unless agreed in writing by the council.
- b) A secure section of Protective Barrier Fencing (hereafter; PBF) is to be installed around the edge of approved parking bays / RPAs and tree crowns (to secure the largest RPA sections possible) after the tree works and prior to the site works commencing.
- c) Following the installation of PBF the fenced off section is to act as a Construction Exclusion Zone (hereafter; CEZ).
- d) No chemicals / materials are to be transported / stored / used / mixed within the CEZ.
- e) No fires are to be lit and no machinery, plant or vehicles are to be washed down within 10m of the tree's canopy or in a CEZ.
- f) During construction processes the RPA / CEZ may not be breached, i.e. no surfacing works, without the prior advice of the consultant and the consent of the council.
- g) No mechanical digging or scraping is permitted within a RPA / CEZ.
- h) Only following construction completion can the protective barrier fencing be removed. The ground work preparations and parking bay / walkway installations can then be undertaken within RPAs, i.e. sensitive works undertaken, including any remaining soft landscape works (ground levels to be retained within RPAs and works undertaken manually with non-mechanical hand tools).

5.2 Arboricultural Site Monitoring / Supervision

5.2.1 The site should be checked by a qualified arboriculturist throughout the construction processes to ensure the tree protection measures are adhered to, i.e. prior to tree work operations to approve the marking of all trees to be removed, following barrier fence installations, during the manual excavations and surface installations within RPAs and prior to the removal of the protective measures. Monthly visits are not considered necessary in this instance as the retained trees are clear of the construction, however, the aforementioned inspections are recommended in order to sign off the site as having correctly adhered to the arboricultural method statement.

5.3 Protective Barrier Fencing (PBF) Specification

5.3.1 Barrier fencing is to be installed (and signed off by way of arboricultural supervision) following the completion of the tree works. It is illustrated on the Tree Protection Plan to aid ease of installation and is to remain in situ for the entire duration of the demolition/construction processes unless otherwise agreed in writing by the council.

5.3.2 The barrier fencing is to consist of a series of Heras panels secured in place by driven scaffold posts or a scaffold frame to ensure that the fencing lines are well braced to resist impact, prevent access to RPA/CEZ around retained trees.

5.4 Underground utilities

5.4.1 Any new underground utilities are to utilise the construction area and hard surface extents for new installations and avoid the need for works in proximity to trees. Certainly, utility installations are to be:

- Located outside of RPAs and construction exclusion zones; and
- Installed only following the installation of the protective barrier fencing to ensure the retained trees and their RPAs are protected.

5.5 Ground Works within RPAs

5.5.1 As all construction works are clear of retained trees and vegetation, no significant RPA incursion is anticipated [other than for hard surface works as indicated at s.4.7 / 4.8] - retained levels detail to be demonstrated by the client in the form of a 'site levels plan'.

5.5.2 Any excavations within a RPA or designated CEZ (the area enclosed by PBF) must:

- Only be undertaken when the construction works are completed; and
- Use sensitive excavation techniques to protect the tree roots and their existing growing conditions.

5.5.3 The new hard surfaced area within the RPA / CEZ is to be marked out and preparations undertaken by hand with the use of manually operated (hand held) tools. The turf level can be manually stripped and the grounds prepared for the installation, i.e. sand bed, geotextile, Cellweb system and permeable surface.

5.5.4 The excavation of existing surfaces are to be preventative and carefully avoid damage to tree roots; i.e. individual 50mm layers of existing hard surfaces are to be excavated at a time within an RPA/CEZ. This is to ensure that excavations do not incur on the existing soil levels, i.e. no downward regrading of soil levels within RPAs.

- 5.5.5 For the existing pathway, as the existing surface being removed is hard surfaced, and the proposed surface is reinstalled walkway, the surface treatment installations can be undertaken in a traditional manner for this section (RPA of T2).

Where the proposed hard surfaces can use more preferential treatments to encourage percolation of surface water and encourage aerated soils with nutrient availability, this will demonstrate retained current conditions or an enhancement to existing conditions (where hard surfaced are replaced) for tree root growth; this is to be encouraged where possible (to be confirmed on the landscape scheme).

5.6 Landscape Detail

- 5.6.1 The surveyed trees have been subject to a detailed inspection and the arboricultural considerations detailed within this advice. The scheme accommodates the trees, their crowns and RPAs and the minor conflicts can be addressed by way of construction and installation detail. It is anticipated that the aforementioned considerations will form part of tree related planning conditions which can then be confirmed within a detailed method statement based on the approved plans, additional detail, an indication of the construction programme and work stages.
- 5.6.2 The general landscape arrangement and new trees are shown on the proposed site plan and considered suitable. It is necessary for the client to provide a detailed landscape scheme or a proposed levels plan to show retained soil levels within the retained trees' RPAs and annotate the closest proximity parking bays and walkway within the RPAs as being installed sensitively and using permeable solutions (ideally a no-dig system).
- 5.6.3 The new tree planting illustrated on the 'proposed site plan' will need supplementary detail on species and nursery selection, planting method and maintenance; suggested selection would be for a mixture of smaller scale direct replacement trees, i.e. Hawthorn and Birch. However, the scheme will also take advantage of the open available space in choosing larger scale specimen tree stock to enhance the site.

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 advice is limited to the observations made on the date of inspection as detailed herein and any deletion, editing or alteration will result in the advice being null and void in its entirety. | This advice 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 advice. | This advice 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 advice 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 advice 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 Constraints Plan:	As appended (13982/TCP/01_Rev.A)
'Draft' Tree Protection Plan:	<i>PENDING</i> (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 FDSc 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
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'

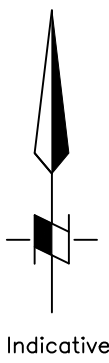
SITE: Maelor Place, Ruabon, Wrexham, LL14 6NN

ARBOR CONSULTANT: Andrew Turnbull *FDS* *M 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
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	



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 Constraints Plan which is prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'

TCP_Rev.A - RPA augmentation to reflect known root influences and anticipated root growth distribution (as referenced within the Tree Report ref: 13892) - avoidance of existing foundations and offset away from roads, pathways and parking areas

TCP_Rev.A - Tree crown hatch removed and tree labels moved to provide the Tree Officer a clearer view of the tree labels

TCP_Rev.A - Shade segments shown as per BS5837:2012 s.5.2.2 'NOTE 1'

A	Addition of detail as annotated	AT	RK	25/11/13
REV.	DESCRIPTION	DWN	CHK'D	DATE

CLIENT	Wales & West Housing
PROJECT	13982 Maelor Place, Ruabon, Wrexham, LL14 6NN
TITLE	Tree Constraints Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RCK	01/10/2013					1:500



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

Drawing Number	A2
13982/TCP/01	REV. A

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

DO NOT SCALE FROM DRAWING

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