

Trees and Construction

BS5837:2012 Tree Survey, Arboricultural Implications Assessment & Method Statement

Site: Site off Gatewen Road, Wrexham, LL11 6UY

Ref: 18164/S3/A1

Client: Wrexham Glydwr University



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Revision	Description	Date
/	/	/

1. INTRODUCTION

- 1.1 **Instruction:** This advice has been prepared for Wrexham Glydwr University (hereafter; client) and is in respect of the tree related planning considerations at the site off Gatewen Road, Wrexham, LL11 6UY (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 is produced in accordance with BS5837 and is secondary to arboricultural constraints advice as the '*Tree Survey*' ref: 18164/S3/A1. The objective of this report is to assess the proposed scheme and provide recommendations regarding the potential impact on trees and vice versa with associated tree works, tree protection details and recommendations for the scheme in consideration for trees.

- 1.4 Following instruction the consultant surveyed the site on the 17th May 2018 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.

- 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.

- 1.6 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 was supplied with arboricultural advice and has an overlay of the proposed scheme to enable review. The TCP informs this assessment and is used as a base layer for the appended 'Tree Protection Plan' (hereafter; TPP); the TCP, tree survey data table and TPP are at Appendix III.

2. SITE INFORMATION & TREE ASSESSMENT

2.1 The site currently comprises an open field bound by Gatewen Village and residential properties to the north and east, Gatewen Road to the south and footpath to the west.

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

The scheme is now confirmed as per the client's 'Proposed Site Plan' (see; TCP / Scheme Overlay) which is therefore referenced and considered herein directly.

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 potential construction area.

2.4 The trees -

2.4.1 The tree survey and assessment 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 those of curtailed life expectancy not to constrain the site's development.

2.4.2 The BS5837 tree survey is a means of objective assessment and reflects the trees' condition, quality contribution, remaining life expectancy and spatial considerations (stem, crown and roots). On this basis and in order to consider the trees' accurate constraints, the survey data is used to illustrate the trees as the TCP; this has the crown extents for north, east, south and west, the stem diameter measurement, and the calculated root protection areas (hereafter; RPAs). Hereafter, the trees are therefore reviewed and considered on their own merits and in line with the guidance of BS5837.

3. FINDINGS & RECOMMENDATIONS

- 3.1 The following information, as with the prior contents of this report, should be read with the appended tree data table and tree constraints plan (18164/S3/TCP/01).

NOTE: This information as s.3 for the '*tree survey assessment*' was provided as an informative of the arboricultural considerations and constraints to site as the tree report. It is included herein for reference and context and is supplemented with a review of the scheme as the AIA (section 4) and the AMS 'considerations' (section 5).

3.2 General Considerations for Tree Retention / Removal

- 3.2.1 Due to the poor condition and signs of overall tree decline of the 'U' category trees T21, T22, T31 and T32, it is recommended that these trees should be removed as part of H&S tree management irrespective of the proposed scheme.

- 3.2.2 Further to the above, based on the defects and restricted rooting environment of the 'U' category tree T24, it is also recommended that this tree be removed in conjunction with the scheme.

- 3.2.3 There are smaller scale trees and trees with defects or limitations on the current amenity contribution or useful remaining life expectancy, these are categorised as 'C - low'.

These 'C' category trees should not constrain nor significantly guide a scheme, although protection may be preferable to retain landscape maturity. For any proposed tree removals, mitigation tree planting is recommended as part of a landscape scheme and can suitably replace and enhance the initial loss of copy cover.

- 3.2.3 The moderate quality 'B' category trees are noted as such due to their fair future potential and/or fair current amenity contribution. These should be retained and protected where possible as part of the site's development. Their protection is best achieved by avoidance where their crowns and RPAs are accommodated in the design and layout.

Whilst the retention and protection of 'B' category trees is preferable, the removal of some trees may also be mitigated. This will require higher grade larger nursery planting stock than that to mitigate the removal of 'C' category trees, however, this will be necessary to provide an instant impact and enhance the site in the long term; replacement tree planting would require adequately allocated amenity space within a well delivered landscape scheme.

- 3.2.5 Based on the individual prominence, lack of significant defects, good current contribution and/or fair future potential of T47, this is categorised as 'A - high'. It is

recommended that this tree be retained, protected and be clear of the proposal. This is best achieved by avoidance where there crowns and RPAs are accommodated in the design and layout.

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 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; and
- 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 retained trees and their growing environment from the proposed development and vice versa (these follow).

Tree Works

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

Consideration is required for both existing and newly planted trees whereby the proposed construction should 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)

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, small outbuildings, retaining walls etc.) or hard surfacing will need to be undertaken with great care where this occurs within or near to the anticipated rooting areas 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.

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 should directly proportionate; a 1:1 removal to replacement ratio is considered suitable.

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.

Based on the residential use of the site, good tree planting space is anticipated. It is necessary however to consider and avoid future canopy / shade conflicts.

- 3.4.3 Further to the above information, the proposed scheme (see; TCP) is reviewed hereafter at s.4 as an Arboricultural Implications Assessment (hereafter; AIA).

4. SCHEME / IMPLICATIONS ASSESSMENT

4.1 For the purpose of this assessment, the proposed site plan is used as a basis for consideration. This takes account of anticipated tree removals, tree protection options and potential alterations to account for arboricultural features; as per s.1.6 and s.2.2 herein, the TCP shows the '*proposed site plan*' as an overlay for review.

4.2 The proposed scheme is clear of the 'U' category trees, however, as per s.3.2.1 and s.3.2.2, the removal of T21, T22, T24, T31 and T33 is recommended as part of H&S tree risk management irrespective of the proposed scheme. Therefore, T21, T22, T24, T31 and T33 should be removed in conjunction with the scheme and replaced by new tree planting as part of a landscape scheme.

NOTE: Replacement tree planting details to be included within a landscape scheme.

4.3 The proposed scheme encroaches the 'C' category tree group G8. However, as per s.3.2.3, this group is a small scale, low quality group which should not significantly constrain nor guide the scheme. Therefore, G8 should be removed to facilitate the scheme and replaced by new tree planting as part of a landscape scheme.

NOTE: Replacement tree planting details to be included within a landscape scheme.

4.4 The proposed scheme reduces the clearance to the crowns of the 'B' category tree group G6. However, a minor lateral branch will be suitable to provide 1.5 - 2m crown clearance to the proposed building footprint.

4.5 Following the above considerations for trees, the trees are clear of the active construction area. However, the installation of temporary tree protection will be required to ensure no impact on trees from access, vehicles, material storage etc.

4.6 Further to the above review and in consideration for the need to protect retained trees, the following section contains said details as an Arboricultural Method Statement (Application Stage).

5. METHOD STATEMENT (Application Stage)

5.1 Arboricultural Construction Restrictions

5.1.1 The following restrictions are considered relevant for tree protection purposes which are illustrated on the appended Tree Protection Plan:

- a) Protective Barrier Fencing (hereafter; PBF); is to be installed around the retained trees immediately after the tree works and prior to the site works commencing.
- b) Construction Exclusion Zone (hereafter; CEZ); following the installation of PBF the fenced off section is to act as a CEZ and be supplemented with ground protection for RPA sections outside of fenced off areas as the CEZ.
- c) Material Handling; no chemicals / materials are to be transported / stored / used / mixed within exposed grounds on site; all chemical / cement storage, transport or use will be pre-prepared with impermeable liner and detail within a Construction Management Plan.
- d) Site Management; no fires are to be lit and no machinery, plant or vehicles are to be washed down within 10m of a tree's canopy, within a RPA / CEZ, and the RPA / CEZ may not be breached, i.e. no mechanical digging or scraping is permitted within a RPA / CEZ.
- e) Sensitive Landscape; only following construction completion can the PBF be removed and any remaining soft landscape works be undertaken (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, thus -

- (a) pre-commencement to confirm tree removals;
- (b) after PBF installation;
- (c) during construction to ensure adherence to this AMS; and
- (d) prior to removal of site hoarding after construction completion to sign off the site for correct tree protection and planting.

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 and is to remain in situ for the entire duration of preparation/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, and site hoarding around the application boundary to prevent access to the RPA/CEZ areas around the approved works.

5.4 Underground utilities

5.4.1 Underground utilities are to be installed as per a dedicated plan and be clear of RPA by design. Otherwise, and if RPAs cannot be avoided, the following restrictions are recommended for underground utilities within 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.

5.5 Ground Works within RPAs

5.5.1 No direct RPA incursion is anticipated, with exception of soft and hard landscaping.

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.

5.6 Landscape Detail

5.6.1 The finer details of the site landscaping proposals are to be illustrated on a landscape plan. This is to include the exact proposals for hard and soft landscaping together with the details for any new trees' planting locations, species and stock selection, installation and maintenance; this is to be undertaken by the appointed landscape architect who will have the full support of the arboricultural consultant where required.

5.7 Report Handling

- 5.7.1 This report is released to the client and architect to be distributed at their discretion and the consultant is available for queries relating to this report and/or trees.
- 5.7.2 The proposed scheme is reviewed in respect of the arboricultural constraints and is considered to be achievable in line with the BS5837 guidance. The recommendations herein may be approved by the council as a means of authorised tree works and tree protection, for which the planning approval will be subject to a final and detailed Arboricultural Method Statement based on the approved information and other detail perhaps not available at the pre-planning approval stage, i.e. utility layout, final landscape plan, construction management plan (CMP) etc.
- 5.7.3 This AMS and the TPP may be approved by the council in support of the application, subject to a conditioned final AMS and TPP as a means of authorised tree protection measures; all site personnel will have access to a copy and the tree work and protection details are to be inspected as per s.5.2 for '*Arboricultural Monitoring / Supervision*'.

This concludes our advice.

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: (TCP / Scheme Overlay)	As appended (18164/S3/TCP/01)
Tree Protection Plan:	As appended (18164/S3/TPP/01)

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

FIELD KEY:

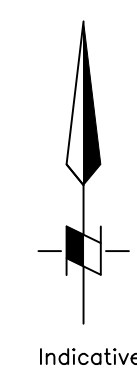
TPO/CA	-	On client request: presence of Tree Preservation Orders (TPO) / site location within a Conservation Area (CA) & date checked;
TREE REF. #	-	Tree reference number: tag or plan number (T - individual tree, G - group of trees/shrubs, H - hedge);
SPECIES	-	Genus, species and/or common name;
AGE	-	Age classification (NP - new planting, Y - young, SM - semi mature, EM - early 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 m)	-	Circle radius of the Root Protection Area: calculated using the stem diameter (single/multiple stem variant, as outlined within BS5837);
CLEARANCE (in m)	-	Crown clearance in metres above the adjacent ground level;
1ST BRANCH (in m)	-	Clearance in metres to first significant branch and direction of growth (where relevant);
VITALITY	-	Physiological condition typically gauged from canopy cover and annual extension growth (good, fair, poor, dead);
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;
NOTES	-	Structural and physiological condition observations;
BS CAT.	-	BS5837 tree quality assessment category: resulting from structural/physiological condition and remaining contribution (approximate 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; 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 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'																
CLIENT: Wrexham Glydwr University			PROJECT REF: 18164/S3			SITE: Site off Gatewen Road, Wrexham, LL11 6UY										
CONTACT: /			SURVEY DATE: 17th May 2018			ARB CONSULTANT: Tony Banner TechCert (ArborA) TechArborA										
TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m)	CLEARANCE (in m)	1st BRANCH (in m)	VITALITY	LIFE EXPEC.	NOTES	BS CAT.	MANAGEMENT
G1	Hawthorn, Sycamore & Ash group	M	4 - 8	/	/	/	/	200	2.4	0	/	Normal	20 - 40	Growing on embankment at boundary, mainly hawthorn with occasional sycamore/ash sapling.	C 2	
G2	Mixed group (Sycamore, Hawthorn, Ash, Oak)	M	4 - 16	/	/	/	/	350	4.2	0	/	Normal	40 +	Growing towards boundary and on embankment around offsite footpath on old railway line, mature stemulti-stem on embankment with hawthorn hedge line as understorey.	B 2	
T1	Sycamore; Acer, Aceraceae	M	16	3	3	7	3	494	5.9	1	2	Normal	20 - 40	In G2, one of the larger stemulti-stem in G2, multi-stem base.	B 2	
T2	Ash; Fraxinus, Oleaceae	M	14	2.5	3	5	3	335	4.0	0	/	Normal	20 - 40	Edge of G2, multi-stem base, sparse canopy in parts.	B 2	
T3	Sycamore; Acer, Aceraceae	EM	12	2	2.5	3.5	2	217	2.6	0	/	Normal	20 - 40	Edge of G2, multi-stem base.	C 2	
T4	Sycamore; Acer, Aceraceae	EM	11	2.5	4	4	2	270	3.2	0	/	Normal	10 - 20	Edge of G2, multi-stem base, conflicting stemulti-stem.	C 2	
T5	Oak; Quercus, Fagaceae	EM	11	3.5	3.5	5	3	450 *	5.4	1.5	/	Normal	40 +	In G2, single stem, good future potential.	B 2	
G3	Hawthorn group	M	8	/	/	/	/	250	3.0	0	/	Normal	20 - 40	Planted line at boundary with offsite footpath, managed on footpath side for clearance to footpath.	B 2	
G4	Sycamore, Hazel & Hawthorn group	M	4 - 12	/	/	/	/	150 - 300	3.6	0	/	Normal	20 - 40	Mixed group growing toward the boundary, 3 / 4 self-seeded sycamore with hazel/hawthorn understorey.	B 2	
T6	Sycamore; Acer, Aceraceae	M	11	3	3	3.5	3	265	3.2	1.5	/	Normal	10 - 20	In G4, multi-stem base, previously topped with leggy regrowth.	C 2	Monitor base and regrowth.
T7	Sycamore; Acer, Aceraceae	M	12	3.5	3.5	3.5	3.5	256	3.1	1.5	/	Normal	10 - 20	In G4, multi-stem base, previously topped with leggy regrowth.	C 2	Monitor base and regrowth.
T8	Sycamore; Acer, Aceraceae	M	11	3	3.5	3	3	342	4.1	0	/	Normal	10 - 20	In G4, multi-stem base, previously topped with leggy regrowth, next to pedestrian access.	C 2	Monitor base and regrowth.
T9	Sycamore; Acer, Aceraceae	M	12	4	4	3	3.5	347	4.2	0	/	Normal	10 - 20	In G4, multi-stem base, previously topped with leggy regrowth, next to pedestrian access, thick ivy.	C 2	Monitor base and regrowth, and sever ivy.
T10	Sycamore; Acer, Aceraceae	M	12	3.5	4	3.5	3	291	3.5	0	/	Normal	10 - 20	In G4, multi-stem base, previously topped with leggy regrowth, next to pedestrian access, thick ivy.	C 2	Monitor base and regrowth, and sever ivy.
G5	Hazel, Hawthorn & Blackthorn group	M	4 - 6	/	/	/	/	200	2.4	0	/	Normal	20 - 40	Field boundary group.	B 2	
T11	Hawthorn; Crataegus, Rosaceae	M	6	4.5	4.5	4.5	4.5	250 *	3.0	0	/	Normal	20 - 40	Growing at field boundary inset to site, self seeded elder and bramble, no access to stem.	B 3	
T12	Field Maple; Acer, Aceraceae	M	7	2	5	4	2.5	284	3.4	1.5	1.5	Normal	20 - 40	One of larger stemulti-stem in G6, co-dominant base, conflicts with barb wire fence.	B 2	
G6	Field Boundary Group (Hazel, Hawthorn, Field Maple & Holly)	M - OM	7	/	/	/	/	200	2.4	2	/	Normal	20 - 40	Field boundary group, many interesting old hazel coppices and over mature field maples.	B 2	
T13	Field Maple; Acer, Aceraceae	OM	8	4.5	4.5	4.5	4.5	400	4.8	0	/	Normal	10 - 20	Over mature field maple with mature sycamore twisted around stemulti-stem and girdling roots.	B 2	Attempt to fell sycamore for betterment of field maple.
T14	Hazel; Corylus, Betulaceae	M	7	4	4	4	4	250	3.0	1	/	Normal	20 - 40	Example of hazel coppice hazel in G6, growing at field boundary.	B 2	

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CONTACT: /			SURVEY DATE: 17th May 2018			ARB CONSULTANT: Tony Banner TechCert (ArborA) TechArborA										
TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m)	CLEARANCE (in m)	1st BRANCH (in m)	VITALITY	LIFE EXPEC.	NOTES	BS CAT.	MANAGEMENT
G7	Field Boundary Group (Hazel, Elder & Holly)	M	7	/	/	/	/	200	2.4	0	/	Normal	20 - 40	Field boundary group.	B 2	
G8	Blackthorn Group	M	4	/	/	/	/	100	1.2	0	/	Normal	10 - 20	Inset to G7 but forming partial understorey.	C 2	
T15	Sycamore; Acer, Aceraceae	M	10	5	5	5	5	524	6.3	/	/	Normal	10 - 20	In boundary group, multi-stem base with tight unions, conflicting with hawthorn stemmulti-stem at base.	C 2	Monitor basal unions.
T16	Goat Willow; Salix, Salicaceae	M	10	4.5	4.5	4.5	4.5	433	5.2	1.5	/	Normal	10 - 20	Outside fence line, multi-stem below 1.0m with tight unions.	C 2	
G9	Field Boundary Group (Ash, Sycamore, Rowan, Hawthorn, Hornbeam & Cherry)	M	12	/	/	/	/	350	4.2	/	/	Normal	20 - 40	Field boundary group next to footpath on embankment, ivy throughout, saplings and mature stemmulti-stem.	B 2	
T17	Ash; Fraxinus, Oleaceae	M	12	3.5	5	8	4	500	6.0	/	/	Normal	10 - 20	In G9, thick ivy, possibly more than one tree, gaping crown - evident of some subsiding stemmulti-stem due to ivy cover/weight or splitting at base.	C 3	Sever ivy and reassess tree's condition, and monitor base union.
T18	Ash; Fraxinus, Oleaceae	M	12	5	4	9	6.5	880	10.6	/	/	Normal	20 - 40	Part of collective canopy group inset to boundary, growing on mound, fire damaged base and lower stem, sparse canopy, dieback and deadwood noted, self-seeded sycamore conflicting at base.	B 2	Monitor tree's condition.
T19	Sycamore; Acer, Aceraceae	M	14	3.5	3.5	3.5	3.5	350	4.2	/	/	Normal	10 - 20	Part of collective canopy group growing on mound inset to boundary, next to deep brick lined pit.	B 2	
T20	Sycamore; Acer, Aceraceae	M	14	3.5	4	3.5	3.5	420 ivy	5.0	/	/	Normal	10 - 20	Part of collective canopy group growing on mound inset to boundary, very close to deep brick lined pit - restricting rooting on pit side of tree, thick ivy.	C 2	Sever ivy and reassess tree's condition.
T21	Sycamore; Acer, Aceraceae	M	12	3	3	5	3	300	3.6	/	/	Poor	< 10	Part of collective canopy group growing on mound inset to boundary, fire damage and decay from base to 4.0m.	U	Fell tree.
T22	Sycamore; Acer, Aceraceae	M	8	0	0	0	0	280	3.4	/	/	Dead	< 10	Part of collective canopy group growing on mound inset to boundary, standing dead tree.	U	Fell tree.
T23	Sycamore; Acer, Aceraceae	M	12	2	6	4	4.5	827	9.9	1.5	/	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, multi-stem base, partially included wound on stem, exposed roots and compacted soils.	B 2	
T24	Hawthorn; Crataegus, Rosaceae	M	5	2	2	2	2	290	3.5	1.5	/	Poor	< 10	Part of collective canopy group growing on mound inset to boundary, under T23, very close to brick lined pit.	U	Consider removal as preventative H&S measure.
T25	Ash; Fraxinus, Oleaceae	M	14	10	1.5	2	6	340	4.1	3.5		Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, exposed roots, leans north, self seeded hawthorn conflicting with base.	B 2	
T26	Hawthorn; Crataegus, Rosaceae	M	6	3	2	2	3	261	3.1	1	1	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, close to brick lined pit, co-dominant base.	B 2	Monitor tree's condition.

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'																
CLIENT: Wrexham Glydwr University			PROJECT REF: 18164/S3			SITE: Site off Gatewen Road, Wrexham, LL11 6UY										
CONTACT: /			SURVEY DATE: 17th May 2018			ARB CONSULTANT: Tony Banner TechCert (ArborA) TechArborA										
TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m)	CLEARANCE (in m)	1st BRANCH (in m)	VITALITY	LIFE EXPEC.	NOTES	BS CAT.	MANAGEMENT
T27	Sycamore; Acer, Aceraceae	M	14	4.5	4.5	4.5	4.5	590	7.1	2	2.5	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, close to brick lined pit, co-dominant base.	B 2	Monitor tree's condition.
T28	Sycamore; Acer, Aceraceae	M	14	3.5	3.5	3.5	3.5	360	4.3	2	4	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary.	B 2	Monitor tree's condition.
T29	Sycamore; Acer, Aceraceae	M	14	5	4	4	4	640	7.7	2	2	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, close to brick lined pit.	B 2	Monitor tree's condition.
T30	Sycamore; Acer, Aceraceae	EM	6	8	1.5	3	2	347	4.2	2.5	3.5	Normal	10 - 20	Part of collective canopy group growing on mound inset to boundary, crown suppressed by T31 with regrowth and lean north, co-dominant below 1m.	C 2	Monitor growth once T31 removed.
T31	Sycamore; Acer, Aceraceae	M	16	5	5	5	5	1039 *	12.5	/	/	Poor	< 10	Part of collective canopy group growing on mound inset to boundary, dieback, major deadwood, tree in decline - most likely caused by surrounding soil contamination.	U	Fell tree.
T32	Sycamore; Acer, Aceraceae	M	8	4	4	4	4	400 *	4.8	/	/	Dead	< 10	Part of collective canopy group growing on mound inset to boundary, dead tree - most likely caused by surrounding soil contamination.	U	Fell tree.
T33	Hawthorn; Crataegus, Rosaceae	M	7.5	1.5	5.5	2.5	3	344	4.1	/	/	Normal	20 - 40	Part of collective canopy group growing on mound inset to boundary, multi-stem base.	B 2	
T34	Ash; Fraxinus, Oleaceae	EM	10	3	3	3	3	260	3.1	2	/	Normal	10 - 20	Part of collective canopy group growing on mound inset to boundary, dead branch attached at base, stem damage (part included), sparse crown.	C 2	
G10	Ash, Hawthorn & Elder group	M	4 - 12	/	/	/	/	200	2.4	/	/	Normal	10 - 20	Mainly hawthorn and elder with occasional mature stem.	C 2	
T35	Ash; Fraxinus, Oleaceae	M	10	4	4	4	4	400	4.8	/	/	Normal	10 - 20	In G10, self seeded tree on half demolished wall, exposed damage roots.	C 3	
T36	Sycamore; Acer, Aceraceae	M	12	5	4	4.5	7.5	940	11.3	/	/	Normal	20 - 40	In G10, multi-stem crown at 3m, conflicting with hawthorn base.	B 2	
T37	Sycamore; Acer, Aceraceae	M	12	3	3	3.5	5	552	6.6	2	/	Normal	20 - 40	In G9 on embankment outside fence line, multi-stem base.	B 2	
T38	Sycamore; Acer, Aceraceae	M	12	3	3	3.5	6	711	8.5	2	/	Normal	20 - 40	In G9, multi-stem base.	B 2	
T39	Ash; Fraxinus, Oleaceae	M	14	4	3	2.5	4.5	510	6.1	2	/	Fair	20 - 40	In G9, multi-stem base, ivy into crown, sparse crown in parts.	B 2	
T40	Ash; Fraxinus, Oleaceae	M	14	3.5	3.5	3.5	5	380	4.6	2	/	Fair	20 - 40	In G9, multi-stem base, ivy into crown.	B 2	
T41	Sycamore; Acer, Aceraceae	M	14	4.5	4.5	3.5	5	544 ivy	6.5	2	/	Normal	20 - 40	In G9, ivy.	B 2	
T42	Sycamore; Acer, Aceraceae	M	14	4	2.5	3.5	6	654 ivy	7.8	/	/	Normal	20 - 40	In G9, multi-stem base, ivy.	B 2	
T43	Sycamore; Acer, Aceraceae	M	14	3.5	2.5	5.5	7	686 ivy	8.2	/	/	Normal	20 - 40	In G9, multi-stem base, ivy.	B 2	
T44	Sycamore; Acer, Aceraceae	M	14	4	4.5	5	5.5	571	6.9	/	/	Normal	20 - 40	In G9, multi-stem base.	B 2	
T45	Sycamore; Acer, Aceraceae	M	14	4	4	6	2	400 ivy	4.8	/	/	Normal	20 - 40	Part of collective canopy group, thick ivy limits visual tree assessment.	B 2	Sever ivy and reassess tree's condition.

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'																
CLIENT: Wrexham Glydwr University				PROJECT REF: 18164/S3						SITE: Site off Gatewen Road, Wrexham, LL11 6UY						
CONTACT: /				SURVEY DATE: 17th May 2018						ARB CONSULTANT: Tony Banner TechCert (ArborA) TechArborA						
TREE REF. #	SPECIES	AGE	HEIGHT (in m)	CANOPY (in m) N - S - E - W				STEM (in mm)	RPA (in m)	CLEARANCE (in m)	1st BRANCH (in m)	VITALITY	LIFE EXPEC.	NOTES	BS CAT.	MANAGEMENT
T46	Sycamore; Acer, Aceraceae	M	14	4.5	4.5	3.5	3.5	500 ivy	6.0	/	/	Normal	20 - 40	Part of collective canopy group, thick ivy limits visual tree assessment.	B 2	Sever ivy and reassess tree's condition.
T47	Sycamore; Acer, Aceraceae	M	14	8	5	2.5	8	738	8.9	2	/	Normal	20 - 40	Part of collective canopy group, co-dominant below 1.5m.	A 2	
T48	Sycamore; Acer, Aceraceae	M	14	3.5	4.5	4.5	4	460	5.5	1.5	/	Normal	20 - 40	Growing on embankment at boundary with road, previosuly raised over road with regrowth noted.	B 3	
T49	Hazel; Corylus, Betulaceae	M	6	2.5	2.5	2.5	2.5	320	3.8	1	/	Normal	20 - 40	Old coppice.	B 2	
G11	Field Boundary Group (Ash, Sycamore & Hawthorn)	M	10 - 16	/	/	/	/	100 - 500	6.0	1.5	/	Normal	20 - 40	Growing along boundary with road, barb wire and fence conflicts throughout, multi-stem throughout, ivy in parts.	B 2	Sever ivy and monitor trees' condition throughout group.
T50	Sycamore; Acer, Aceraceae	M	16	6	3	5	3	706	8.5	2.5	/	Normal	20 - 40	One of largest in G11, multi-stem base, outside fence atop of embankment.	B 2	
T51	Sycamore; Acer, Aceraceae	M	14	5.5	2	3.5	2	283	3.4	2	/	Normal	10 - 20	In G11, co-dominant base, barb wire.	C 2	
T52	Ash; Fraxinus, Oleaceae	M	14	3.5	3	4	2.5	411	4.9	3.5	/	Fair	10 - 20	In G11, co-dominant below 1.0m, barb wire.	C 2	
T53	Ash; Fraxinus, Oleaceae	M	14	4.5	3	4.5	2.5	511	6.1	2.5	/	Fair	20 - 40	In G11, multi-stem base, barb wire.	B 2	
T54	Ash; Fraxinus, Oleaceae	M	14	4	4	4	4	744	8.9	2	/	Fair	20 - 40	In G11, impact damage lower stem to 1.5m.	B 2	
T55	Ash; Fraxinus, Oleaceae	M	14	4	4	4	4	544	6.5	/	/	Normal	10 - 20	In G11, multi-stem base with acute unions, sparse crown.	B 2	Monitor tree's condition.
T56	Ash; Fraxinus, Oleaceae	M	14	2	4.5	3	3	250 ivy	3.0	2	/	Fair	10 - 20	In G11 on roadside of group outside fence line, ivy into crown leaning towards road.	C 2	Sever ivy and reassess tree's condition.
T57	Ash; Fraxinus, Oleaceae	M	14	2	4.5	3	3.5	250 ivy	3.0	2	/	Fair	10 - 20	In G11 on roadside of group outside fence line, ivy into crown leaning towards road.	C 2	Sever ivy and reassess tree's condition.
T58	Ash; Fraxinus, Oleaceae	M	14	1.5	4.5	3	3.5	250 ivy	3.0	2	/	Fair	10 - 20	In G11 on roadside of group outside fence line, ivy into crown leaning towards road.	C 2	Sever ivy and reassess tree's condition.
T59	Ash; Fraxinus, Oleaceae	M	14	1.5	4.5	3	3.5	250 ivy	3.0	2	/	Fair	10 - 20	In G11 on roadside of group outside fence line, ivy into crown leaning towards road.	C 2	Sever ivy and reassess tree's condition.



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'

Recreation Ground

Play Area

18.3m

Haywardsale

Area of scrub (rose, bramble etc)

Elm Cottages

Springfield

Gwyn

Greenfield Terrace

13.4m

Proposed scheme ref: AL-00-001



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Scheme Overlay for review		TB	AT	14/06/19
REV.	DESCRIPTION	DWN	CHKD	DATE

CLIENT
Wrexham Glydwr University

PROJECT
18164/S3
Site off Gatewen Road,
Wrexham, LL11 6UY

TITLE
Tree Constraints Plan
(TCP/Scheme Overlay)

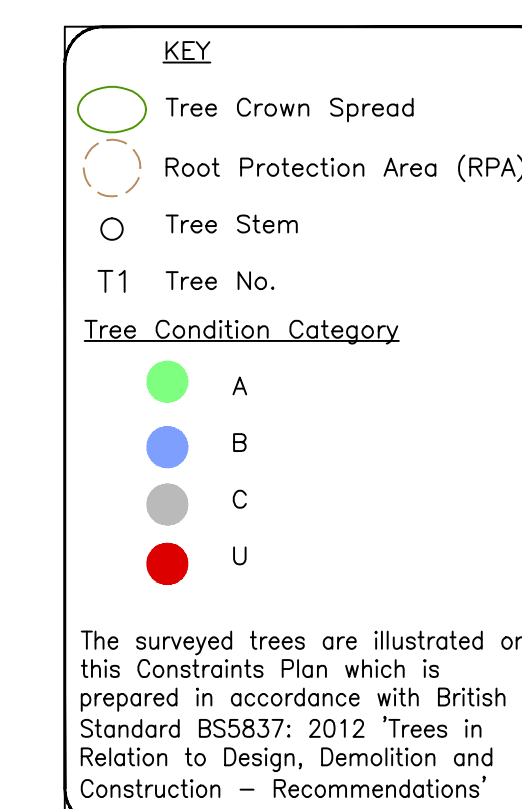
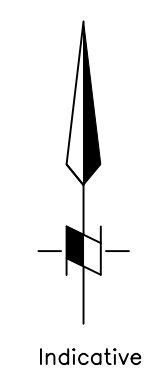
DWN	DATE	CHKD	DATE	APPD	DATE	SCALE
RCK	14/06/19	TB	14/06/19			1:500

Indigo
SURVEYS
(Wals) Second Floor, 1 Hunter's Walk, Canal Street, Chester, CH1 4EB
Telephone: 0333 123 7080 www.indigosurveys.co.uk

Drawing Number
18164/S3/TCP/01

REV. A0

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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'

Protective Barrier Fencing (Site Hoarding) – aligned along application boundary to exclude retained trees from construction works with tree protection signs, fixed in place for the duration of site works for tree protection

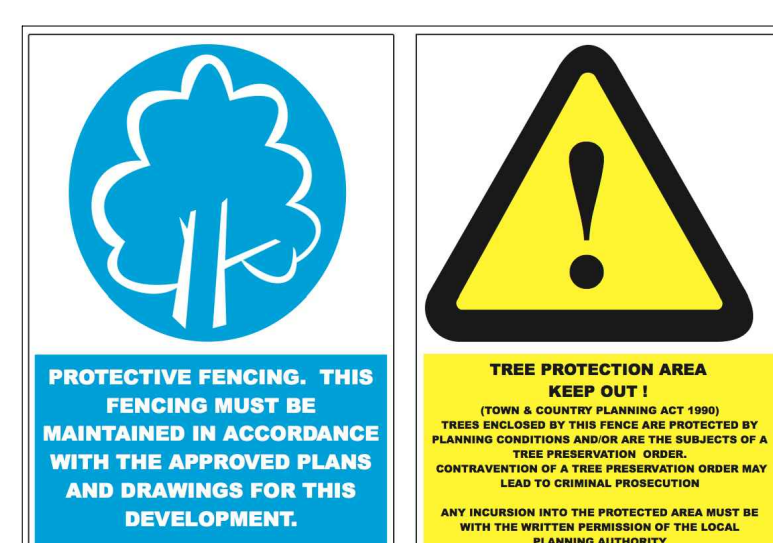
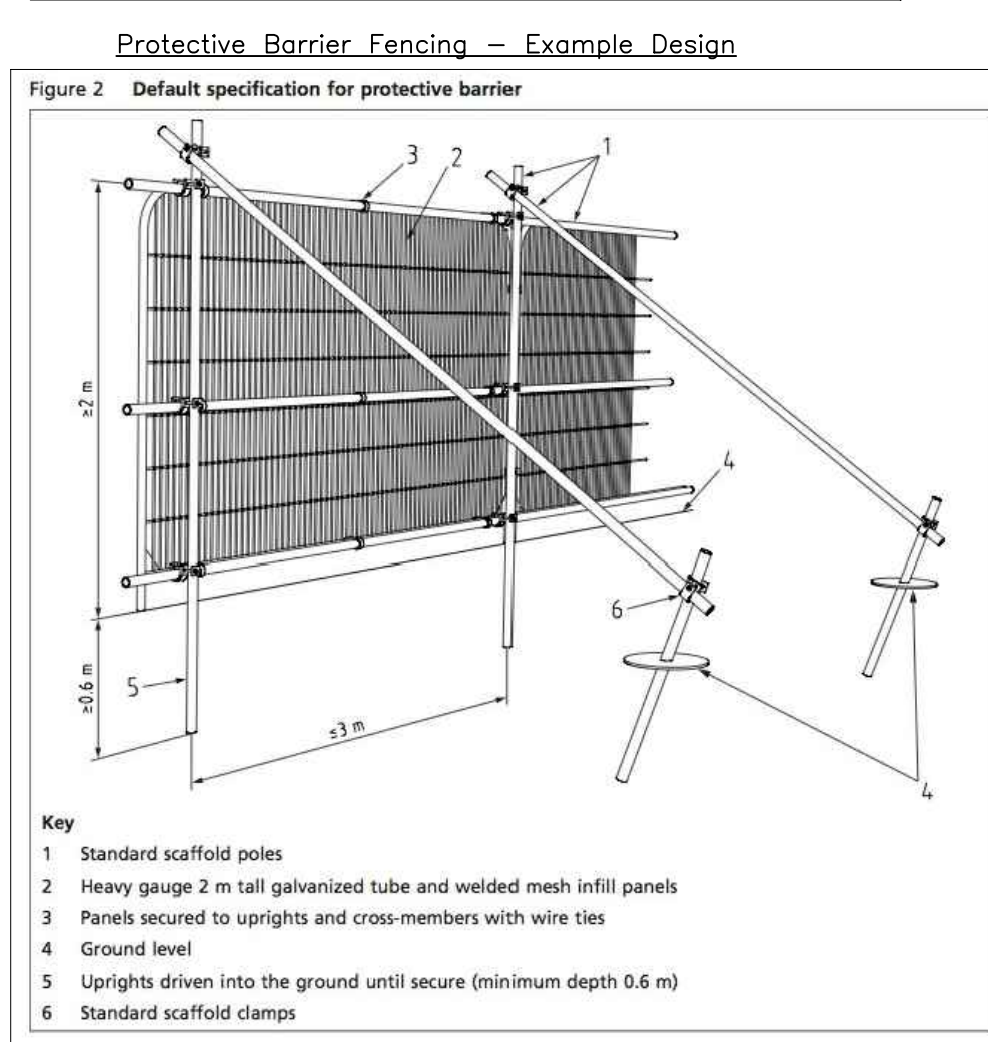
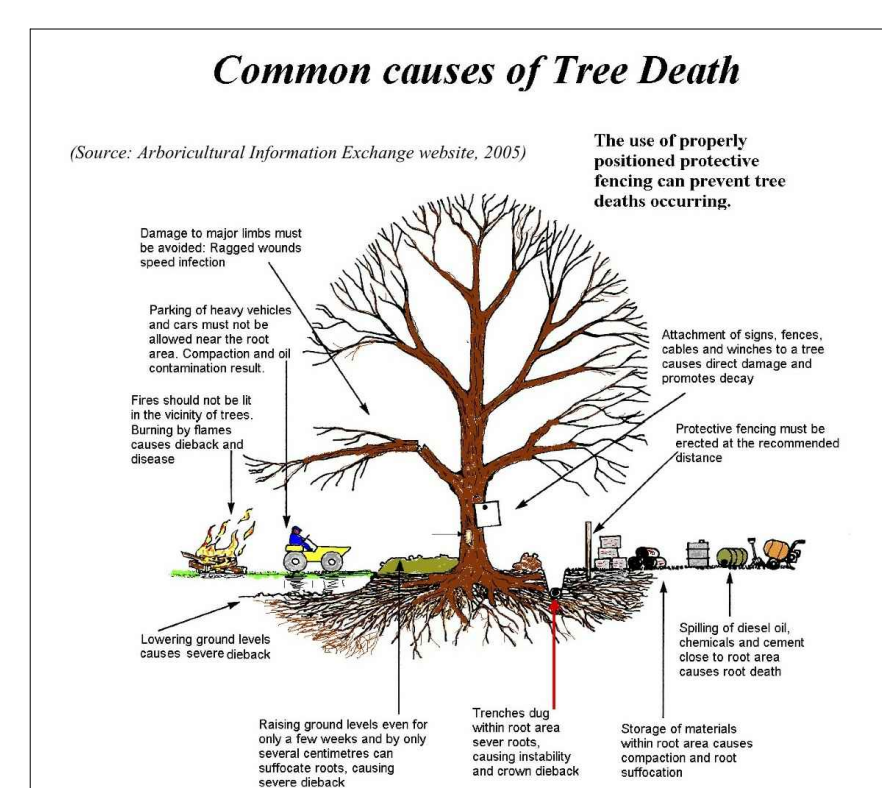
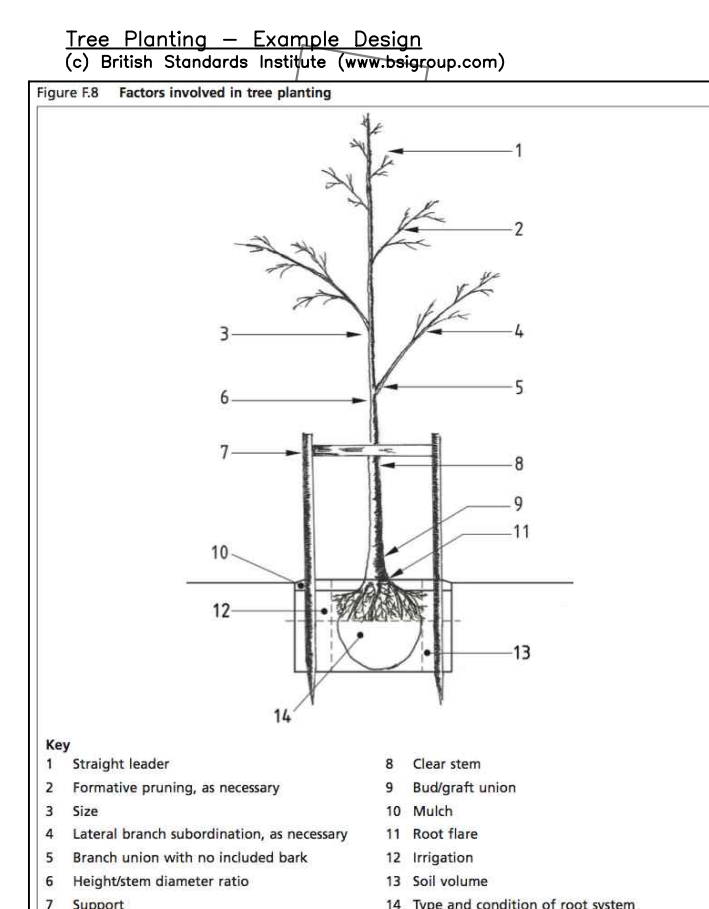
Tree Pruning – part of G6 and part of G11 to be pruned by lateral branch reduction to provide 1.5m crown clearance to the proposed footprint.

Tree Removals – G8 to be removed to facilitate the scheme, and T21, T22, T24, T31 & T32 to be removed as part of H&S tree works in conjunction with the scheme; replacement tree detail to be included within the landscape scheme.

Protective Barrier Fencing (PBF):
Heras panels to be installed (as per the illustration on this plan) aligned to exclude retained trees from construction with tree protection signs, to be fixed in place for the duration of site works for tree protection and to remain until construction completion, then to be realigned for landscape works.

Construction Exclusion Zone – all RPAs on site, and areas enclosed by tree protection fencing are to have no landscaping until construction completion, soil levels to be retained and works to be undertaken manually (turf, planting etc.)

- Tree Pruning – part of G6 and part of G11 to be pruned by lateral branch reduction to provide 1.5m crown clearance to the proposed footprint



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/	Uses 18164/S3/TSP on bone layer			TB	AT	14/06/
REV.	DESCRIPTION			OWN	CHGD	DATE
CLIENT						
Wrexham Glydwr University						
PROJECT						
18164/S3						
Site off Gatewen Road, Wrexham, LL11 6UY						
TITLE						
Tree Protection Plan						
OWN	DATE	CHGD	DATE	APPD	DATE	SCALE
5/04/	06/06/04		06/06/04			1:50

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18164/S3/TPP/01

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