

Trees and Construction

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

Site: Bersham Hall, Bertram Road, Wrexham, LL14 4HS

Ref: 20102.23 / A2_AIA

Client: Bersham Hall



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- February 2024 -

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Revision	Description	Date
/	/	/

1. INTRODUCTION

- 1.1 **Instruction:** This advice has been prepared for Bersham Hall (hereafter; client) and is in respect of the tree related planning considerations at Bersham Hall, Bertram Road, Wrexham, LL14 4HS (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 advice has been produced in accordance with BS5837 and is secondary to arboricultural guidance as a 'Tree Survey Assessment' ref: 20102.23/A1 (hereafter; tree report). The tree report was provided to the client, intended to demonstrate the realistic arboricultural constraints and assist with the design process.

This advice is further to the tree report. Hence, the objective is to assess and provide recommendations regarding the proposal's potential impact on trees and vice versa.

- 1.4 Following instruction the consultant surveyed the site on the 27th October 2023 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 in-use school with associated structures, access, parking and grounds. The site is accessed directly off Bertram Road.
- 2.2 **Proposal:** It is understood that a proposed scheme involves the construction of parking bays at site. This is confirmed as per the client's proposed site plan as illustrated on the TCP.
- 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 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 of curtailed life expectancy which need to be removed as part of H&S tree risk management.
- 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 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 (20102.23/TCP/01).

NOTE: This information as s.3 for the '*tree survey assessment*' is included as an objective and general overview of the trees and consideration for retention and protection. 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 defects noted to the trees categorised as 'U' and in the context of the site's use with regular future site use, it is recommended that T27 and T70 be removed as part of health and safety tree risk management.

- 3.2.2 There are smaller scale trees and those 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 function and 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 canopy cover.

- 3.2.3 The moderate quality 'B' category trees are noted as such due to their fair future potential and good current amenity contribution. These should be retained and protected where possible as part of the site's development.

Whilst the retention and protection of 'B' category trees is recommended, the removal of some may also be mitigated. Subject to supplementary details for tree selection as part of a well delivered landscape scheme, proposals of this nature may then be accepted by the council. However, this will require higher grade larger nursery planting stock than that to mitigate the removal of 'C' category trees.

- 3.2.4 The more notable trees, based on the individual prominence, lack of significant defects, current contribution and/or future potential, are categorised as 'A - high'. It is recommended that these trees be retained, protected and be clear of the proposal. Situated around the site boundaries, this is best achieved by avoidance where their crowns and RPAs are avoided or 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)

As a minimum it would be suitable to consider the outer extents of retained trees' RPAs as construction exclusion zones and be protected.

As above, 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.
- 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 encroaches the 'C' category tree group G11 (3x Cherry Plum). Due to proximity to the proposed parking, tree pruning would need to remove approximately 50% of their crowns to clear the proposed parking access. Hence, pruning is not consider suitable to allow the retention of G11. However, as per s.3.2.3, the low quality 'C' category trees should not significantly constrain nor guide the scheme. Therefore, G11 should be removed to facilitate the scheme and mitigated by new tree planting as part of a landscape scheme is recommended; a 1:1 removal to replacement ratio as mitigation is recommended for 'C' category trees.
- 4.3 The proposed new access is within the RPAs of the trees T51, T53 - T57, T59, T60 and T71, and encroaches the crowns of T53, T54, T56, T57 and T71. In order to minimise the impact on the RPA's and ground, the new parking area will need to utilise sensitive design and installation methods i.e., the existing soil level to be retained, use Cellweb/ Geocell, manual installations and preferably a permeable surface treatment.
- For the crowns, T53, T54, T56 and T57 currently have 3m ground to crown clearance. These will need to be pruned to provide suitable ground to crown clearance over the new parking area i.e. 3.5 - 5.0m. For the offsite tree T71, the crown will need to be pruned by lateral branch reduction back towards the boundary.
- 4.4 Following the above considerations for trees, the trees are clear of the active construction area.
- 4.5 Further to the above, the following tree works are required prior to site works.

TREE WORK SUMMARY

NUMBER	TREE REMOVALS / PRUNING WORKS	
T53, T54, T56, T57	Prune	Prune to provide 3.5 - 5m ground to crown clearance over the proposed new parking.
T71	Prune	Lateral branch reduction back to the boundary.

G11	Remove	Remove in order to facilitate the scheme: - to be replaced with new tree planting/site landscaping.
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- 4.6 Further to the above review and in consideration for the tree removals and 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) Tree works; are to be completed prior to any and all site works: tree works not specified within the associated arboricultural method statement (or leaning against or attaching of objects to a tree) are not permitted unless agreed in writing by the council.
 - b) 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.
 - c) 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.
 - d) 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.
 - e) 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.
 - f) 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 Tree Protection

- 5.3.1 In this instance, the retained trees are to be retained to protected by sensitive and manually ground works in RPAs.

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 Sensitive Ground Works within RPAs

- 5.5.1 The proposed new hard surfaces are within retained trees' RPAs, and will require sensitive installation methods to minimise ground and RPA impact.
- 5.5.2 Excavations within a RPA or designated CEZ (the area enclosed by PBF) must:
- Be undertaken prior to construction works with a temporary wear layer; and
 - Use sensitive excavation techniques to protect the tree roots and their existing growing conditions i.e. prepare grounds manually stripping the existing soil surface/hard surface and turf only, retain soil levels, use load bearing system (Cellweb / Geocell or similar), manual installations and preferably permeable surface treatment.

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:	As appended (20102.23/TCP/01 & 02)
Tree Protection Plan:	As appended (20102.23/TPP/01)

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'																
CLIENT: Bersham Hall				PROJECT REF: 20102.23				SITE: Bersham Hall, Bertram Road, Wrexham, LL14 4HS								
CONTACT: /				SURVEY DATE: 30th October 2023				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
T1	Variegated Holly; Ilex, Aquifoliaceae	M	5	4	2	3.5	4	210	2.5	1.5	1.5	Normal	10 - 20	Sitauted in soft border next to access.	C 2	
T2	Yew; Taxus baccata	M	5	3	4	2.5	4	350	4.2	1	/	Normal	20 - 40	Sitauted in soft border next to access, multi-stem base.	B 2	
T3	Variegated Holly; Ilex, Aquifoliaceae	M	5	3	3	3	3	190	2.3	2	2	Normal	10 - 20	Sitauted in soft border next to access, ivy.	C 2	
T4	Monkey Puzzle; Araucaria araucana	M	15	6	7	5	6	730	8.8	10	/	Normal	40+	Sitauted in soft border next to access.	A 2	
T5	Yew; Taxus baccata	M	5	3	5	3	5	390	4.7	0	/	Normal	20 - 40	Sitauted in soft border next to access, multi-stem base.	B 2	
T6	Sycamore; Acer, Aceraceae	M	20	7	5	7	6	680	8.2	4	6	Normal	20 - 40	Part of collective canopy group towards the boundary next to access, co-dominant below 2m with natural brace above union, pruning wounds lower crown.	B 2	
G1	Holly & Laurel	M	< 6	/	/	/	/	200	2.4	0	/	Normal	20 - 40	Collective canopy group as understorey.	C 2	
T7	Ash; Fraxinus, Oleaceae	SM	18	5	6	3	6	284	3.4	4	4	Fair	10 - 20	Sitauted towards the boundary, G1 as understorey, co-dominant below 1.5m, minor deadwood and ivy in crown.	C 2	
T8	Holly; Ilex, Aquifoliaceae	M	10	3	3	3	3	290	3.5	1	2	Fair	10 - 20	Sitauted towards the boundary, thick ivy into limits visual tree assessment.	C 2	Sever ivy at base and reassess tree condition once ivy has diedback.
T9	Sycamore; Acer, Aceraceae	SM	14	3	6	4	3	280	3.4	/	/	Normal	10 - 20	Part of collective canopy group towards the boundary, G1 as understorey, ivy in crown, telegraph wire through crown.	C 2	Sever ivy at base and reassess tree condition once ivy has diedback.
G2	Sycamore, Laurel, Holly, Hazel, Laburnum	SM	< 8	/	/	/	/	150	1.8	0	/	Normal	10 - 20	Sapling and shrub group towards the boundary.	C 2	
T10	Sycamore, Laurel, Holly	M	18	8	5	6	6	660	7.9	3.5	5	Normal	20 - 40	Sitauted towards the boundary, G2 as understorey, dead ivy in crown, partially occluded stem wound.	B 2	Monitor tree's condition.
T11	Pine; Pinus, Pinaceae	M	20	4	6	3	7	730	8.8	8	/	Normal	20 - 40	Sitauted towards the boundary G2 as understorey, deadwood in crown, wall and level changes near base.	B 2	
T12	Holly; Ilex, Aquifoliaceae	M	10	4	4	3	4	343	4.1	3	3	Fair	10 - 20	In collective canopy group, multi-stem with included bark union and stem decay.	C 2	Consider removal as part of H&S tree risk management. If retained, monitor tree's condition.
T13	Yew; Taxus baccata	M	14	5	5	5	4	700	8.4	5	/	Normal	20 - 40	Part of collective canopy group close to the boundary wall.	B 2	
T14	Yew; Taxus baccata	M	12	2	3	5	7	760	9.1	3	/	Normal	20 - 40	Part of collective canopy group close to the boundary wall.	B 2	
T15	Yew; Taxus baccata	M	14	2	2	8	4	650	7.8	3	/	Normal	20 - 40	Part of collective canopy group close to the boundary wall.	B 2	
T16	Yew; Taxus baccata	M	14	3	2	5	6	840	10.1	3	/	Normal	20 - 40	Part of collective canopy group close to the boundary wall.	B 2	
T17	Yew; Taxus baccata	M	14	4	5	5	6	860	10.3	3	/	Normal	20 - 40	Part of collective canopy group close to the boundary wall.	B 2	
T18	Ash; Fraxinus, Oleaceae	M	20	5	7	4	6	630	7.6	5	/	Normal	20 - 40	Part of collective canopy group, G2 as understorey.	B 2	
T19	Western Red Cedar; Thuja	M	20	4	5	5	5	860	10.3	5	/	Normal	40+	Part of collective canopy group, multi-stem below 2m.	A 2	
T20	Holly; Ilex, Aquifoliaceae	M	12	2	4	3	3	343	4.1	1	2	Normal	20 - 40	Part of collective canopy group, multi-stem base.	B 2	
T21	Ash; Fraxinus, Oleaceae	M	22	5	6	4	6	575	6.9	5	/	Normal	20 - 40	Part of collective canopy group, co-dominant base.	B 2	
T22	Sycamore; Acer, Aceraceae	M	20	1	6	6	4	470	5.6	3.5	5	Normal	20 - 40	Part of collective canopy group, multi-stem base, ivy in crown, included bark union.	B 2	Sever ivy at base and monitor tree's condition.
T23	Sycamore; Acer, Aceraceae	M	20	6	5	7	5	608	7.3	3.5	5	Normal	20 - 40	Part of collective canopy group, co-dominant below 1m, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T24	Beech; Fagus, Fagaceae	M	24	5	7	9	9	1090	13.1	4	5	Normal	40+	Part of collective canopy group, co-dominant below 2m, minor bark damage.	A 2	
T25	Ash; Fraxinus, Oleaceae	M	20	4	5	6	3	470	5.6	5	/	Normal	20 - 40	Part of collective canopy group, dead ivy and deadwood in crown.	B 2	
T26	Sycamore; Acer, Aceraceae	M	18	3	4	2	5	310	3.7	5	/	Normal	10 - 20	Part of collective canopy group, deadwood in crown.	C 2	
T27	Ash; Fraxinus, Oleaceae	M	22	5	6	10	3	840	10.1	5	/	Fair	< 10	Part of collective canopy group next to access and parking, large internal crack in included bark union from base up to 7.5m with slight lean east.	U	Fell due to large included bark union with risk of stem failure.

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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
T28	Ash; Fraxinus, Oleaceae	M	20	10	0	4	6	720	8.6	5	/	Fair	20 - 40	Part of collective canopy group, dieback and reaction growth in crown, large lateral to north.	B 2	Monitor tree's condition.
T29	Yew; Taxus baccata	M	8	4	4	4	3	330	4.0	2.5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown, minor deadwood in crown.	B 2	Sever ivy at base and monitor tree's condition.
G3	Yew & Hawthorn	SM	< 8	/	/	/	/	250	3.0	0	/	Normal	20 - 40	Collective canopy group of semi-mature stems towards the boundary under T30.	C 2	
T30	Sycamore; Acer, Aceraceae	M	20	4	5	4	4	390	4.7	4	6	Normal	20 - 40	Part of collective canopy group, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T31	Sycamore; Acer, Aceraceae	M	18	4	6	6	5	360	4.3	5	/	Normal	20 - 40	Part of collective canopy group, dead ivy in crown, co-dominant upper crown.	B 2	
T32	Yew; Taxus baccata	M	10	3	4	2	4	331	4.0	1	2	Normal	20 - 40	Part of collective canopy group, co-dominant base.	B 2	
T33	Sycamore; Acer, Aceraceae	SM	18	4	5	5	5	330	4.0	5	/	Normal	20 - 40	Part of collective canopy group, stem damage lower stem.	B 2	Monitor tree's condition.
T34	Yew; Taxus baccata	M	12	4	4	4	3	394	4.7	1	/	Normal	20 - 40	Part of collective canopy group, co-dominant base.	B 2	
T35	Ash; Fraxinus, Oleaceae	M	20	6	6	7	5	830	10.0	5	/	Normal	20 - 40	Part of collective canopy group.	B 2	
T36	Yew; Taxus baccata	M	6	2	4	3	3	380	4.6	5	/	Normal	20 - 40	Part of collective canopy group.	B 2	
T37	Sycamore; Acer, Aceraceae	M	20	4	5	5	5	520	6.2	5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T38	Sycamore; Acer, Aceraceae	M	20	4	5	5	5	550	6.6	5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T39	Sycamore; Acer, Aceraceae	M	20	3	5	9	1	955	11.5	5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown, co-dominant below 2m with include bark union.	B 2	Sever ivy at base and monitor tree's condition.
T40	Ash; Fraxinus, Oleaceae	M	20	7	2	5	4	580	7.0	5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T41	Sycamore; Acer, Aceraceae	M	20	4	5	5	4	570	6.8	5	/	Normal	20 - 40	Part of collective canopy group, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T42	Holly; Ilex, Aquifoliaceae	M	12	3	4	2	4	389	4.7	0	/	Normal	10 - 20	Situated in rear garden, multi-stem base, lower stem decay.	C 2	Monitor tree's condition.
T43	Western Red Cedar; Thuja	M	14	5	3	5	1	410	4.9	2	2	Normal	20 - 40	Situated in rear garden, partially occluded stem damage.	B 2	Monitor tree's condition.
T44	Sycamore; Acer, Aceraceae	M	18	4	6	8	7	840	10.1	4	5	Normal	20 - 40	Sitauted towards the boundary, G4 as understorey.	B 2	
G4	Hawthorn & Holly	SM	< 8	/	/	/	/	250	3.0	2	/	Normal	10 - 20	Shrub and sapling group towards the boundary.	C 2	
T45	Oak; Quercus, Fagaceae	M	20	7	11	9	8	1220	14.6	2.5	3	Normal	40+	Large prominent tree in rear garden, signs screwed to stem and straps in crown, pruning wounds and deadwood in crown.	A 2	Remove screws from stem and straps from crown. If signage is required use string or cable ties and avoid screws or nails in to the stem.
T46	Sycamore; Acer, Aceraceae	M	18	6	7	10	4	957	11.5	2.5	3	Normal	20 - 40	Multi-stem base included bark, rope swing in crown, dead ivy in crown.	B 2	Remove rope swing or fit cambium savers to avoid branch damage and risk of failure.
G5	Hazel, Holly, Ash	SM	< 10	/	/	/	/	250	3.0	1	/	Normal	10 - 20	Collective canopy group sitauted towards the boundary, scrub, shrub and sapling as understorey.	C 2	
T47	Ash; Fraxinus, Oleaceae	M	15	0	3	12	0	400	4.8	3	3	Normal	10 - 20	Growth influenced by now removed tree with stem growing with a strong lean.	C 2	
G6	Hawthorn, Holly & Bird Cherry	M	3 - 6	/	/	/	/	200	2.4	1	/	Normal	10 - 20	Collective canopy group sitauted towards the boundary.	C 2	
T48	Sycamore; Acer, Aceraceae	M	16	4	6	3	6	390	4.7	2	2	Normal	20 - 40	Sitauted towards the boundary in rear garden, G6 as understorey.	B 2	
T49	Sycamore; Acer, Aceraceae	M	16	5	4	3	4	470	5.6	2	2	Normal	10 - 20	Sitauted towards the boundary in rear garden, G6 as understorey, thick ivy in crown.	C 2	Sever ivy at base and reassess tree condition once ivy has diedback.
T50	Sycamore; Acer, Aceraceae	M	18	5	6	7	5	726	8.7	2	2	Normal	20 - 40	Sitauted towards the boundary, multi-stem base.	B 2	
G7	Holly & Sycamore	M	< 12	/	/	/	/	250	3.0	2	/	Normal	10 - 20	Collective canopy group towards the boundary.	C 2	
T51	Sycamore; Acer, Aceraceae	M	20	10	7	9	5	1010	12.1	3	3	Normal	20 - 40	Co-dominant at 4m, stem lean north corrected in crown.	B 2	
T52	Birch; Betula, Betulaceae	M	20	9	5	3	5	700	8.4	2	3	Normal	20 - 40	Stem lean north corrected in crown, thick ivy in crown.	B 2	Sever ivy at base and reassess tree condition once ivy has diedback.

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'																
CLIENT: Bersham Hall				PROJECT REF: 20102.23				SITE: Bersham Hall, Bertram Road, Wrexham, LL14 4HS								
CONTACT: /				SURVEY DATE: 30th October 2023				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
G8	Hawthorn, Horse Chestnut, Syacmore & Holly	SM	< 10	/	/	/	/	200	2.4	1	/	Normal	10 - 20	Collective canopy group of shrubs and saplings.	C 2	
T53	Sycamore; Acer, Aceraceae	M	18	8	0	5	6	600	7.2	3	3	Normal	20 - 40	Part of collective canopy group, dead ivy.	B 2	
T54	Sycamore; Acer, Aceraceae	M	18	5	4	6	6	630	7.6	3	3	Normal	20 - 40	Part of collective canopy group, thick ivy in crown.	B 2	Sever ivy at base and reassess tree condition once ivy has diedback.
T55	Sycamore; Acer, Aceraceae	M	18	3	5	0	8	830	10.0	3	2	Normal	20 - 40	Part of collective canopy group, thick ivy in crown.	B 2	Sever ivy at base and reassess tree condition once ivy has diedback.
G9	Sycamore & Hawthorn	SM	< 8	/	/	/	/	200	2.4	2	/	Fair	10 - 20	Collective canopy group, thick ivy in crown.	C 2	Sever ivy at base and reassess tree condition once ivy has diedback.
T56	Sycamore; Acer, Aceraceae	M	18	5	6	7	8	990	11.9	3	3	Normal	20 - 40	Part of collective canopy group, co-dominant at 3m, ivy in crown.	B 2	Sever ivy at base and monitor tree's condition.
T57	Sycamore; Acer, Aceraceae	SM	14	2	4	6	0	320	3.8	3	3	Normal	10 - 20	Part of collective canopy group, thick ivy in crown, crown suppressed by T56.	C 2	Sever ivy at base and monitor tree's condition.
T58	Horse Chestnut; Aesculus, Aesculaceae	M	20	8	6	7	9	1120	13.4	3	3	Normal	40+	Multi-stem crown at 4m, impact damage to surface roots, partially occluded stem wound, old pruning wounds with decay pockets in some.	A 2	Monitor tree's condition.
G10	Hawthorn, Holly, Elder & Bird Cherry	M	5	/	/	/	/	200	2.4	1	/	Normal	10 - 20	Shrub group.	C 2	
G11	Cherry Plum; Prunus cerasfera	M	6	/	/	/	/	250	3.0	1	/	Fair	10 - 20	Old pruning wounds in crowns, deadwood and dieback in parts.	C 2	
T59	Sycamore; Acer, Aceraceae	M	20	5	6	5	4.5	580	7.0	3	3	Normal	20 - 40	G10 as understorey, stem damage.	B 2	Monitor tree's condition.
T60	Sycamore; Acer, Aceraceae	M	18	6	3	4	5	490	5.9	3	3	Normal	10 - 20	Multi-stem crown at 3m, ivy in crown, lower stem damage.	C 2	Monitor tree's condition for signs of dieback.
G12	Bird Cherry & Hawthorn	SM	< 8	/	/	/	/	200	2.4	2	/	Normal	10 - 20	Group by footpath, ivy in parts.	C 2	Sever ivy at base.
T61	Oak; Quercus, Fagaceae	M	18	8	3	4	6	380	4.6	3	2	Normal	20 - 40	Sitauted towards the boundary, crown growth influenced by now removed tree.	B 2	
T62	Yew; Taxus baccata	M	12	2	4	4	5	510	6.1	2	2	Poor	10 - 20	Sparse crown with dieback throughout crown, possible overall decline.	C 2	Monitor tree's condition for signs of decline, and remove if crown dieback worsens.
T63	Holly; Ilex, Aquifoliaceae	M	12	3	4	4	4	270	3.2	2	2	Normal	10 - 20	Part of collective canopy group next to access.	C 2	
T64	Holly; Ilex, Aquifoliaceae	M	12	3	4	3	3	320	3.8	2	2	Normal	10 - 20	Part of collective canopy group next to access.	C 2	
T65	Yew; Taxus baccata	M	14	3	4	5	7	540	6.5	2	2	Normal	20 - 40	Part of collective canopy group next to access.	B 2	
T66	Yew; Taxus baccata	M	14	3	4	4	3	450	5.4	2	2	Normal	20 - 40	Part of collective canopy group next to access.	B 2	
T67	Holly; Ilex, Aquifoliaceae	M	10	3	3	3	3	290	3.5	2	2	Normal	10 - 20	Part of collective canopy group next to access.	C 2	
T68	Holly; Ilex, Aquifoliaceae	M	10	3	4	4	4	300	3.6	2	2	Normal	10 - 20	Part of collective canopy group next to access.	C 2	
T69	Holly; Ilex, Aquifoliaceae	M	10	3	4	3	4	330	4.0	2	/	Normal	10 - 20	Part of collective canopy group next to access.	C 2	
T70	Laurel; Prunus	M	12	3	3	4	3	260	3.1	/	/	Fair	< 10	Co-dominant at 3m with one stem failed at union at resting in crown of adjacent tree.	U	Fell as part of H&S tree risk management.
T71	Hawthorn; Crategus	M	6	2	2.5	2.5	2.5	300	3.6	2.5	/	Fair	10 - 20	Offsite tree, ivy smothered limits visual assessment.	C 3	
TREE SURVEY 'KEY' - BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'																
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, EM - Early-Mature, SM - semi mature, M - mature, LM - late mature, OM - over mature);													

TREE SURVEY IN ACCORDANCE WITH BRITISH STANDARD 5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION & CONSTRUCTION - RECOMMENDATIONS'												
CLIENT: Bersham Hall			PROJECT REF: 20102.23			SITE: Bersham Hall, Bertram Road, Wrexham, LL14 4HS						
CONTACT: /			SURVEY DATE: 30th October 2023			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
	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;									
	IST 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 a tree will continue to contribute 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 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; 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									



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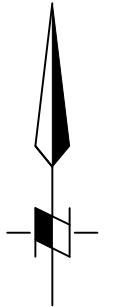
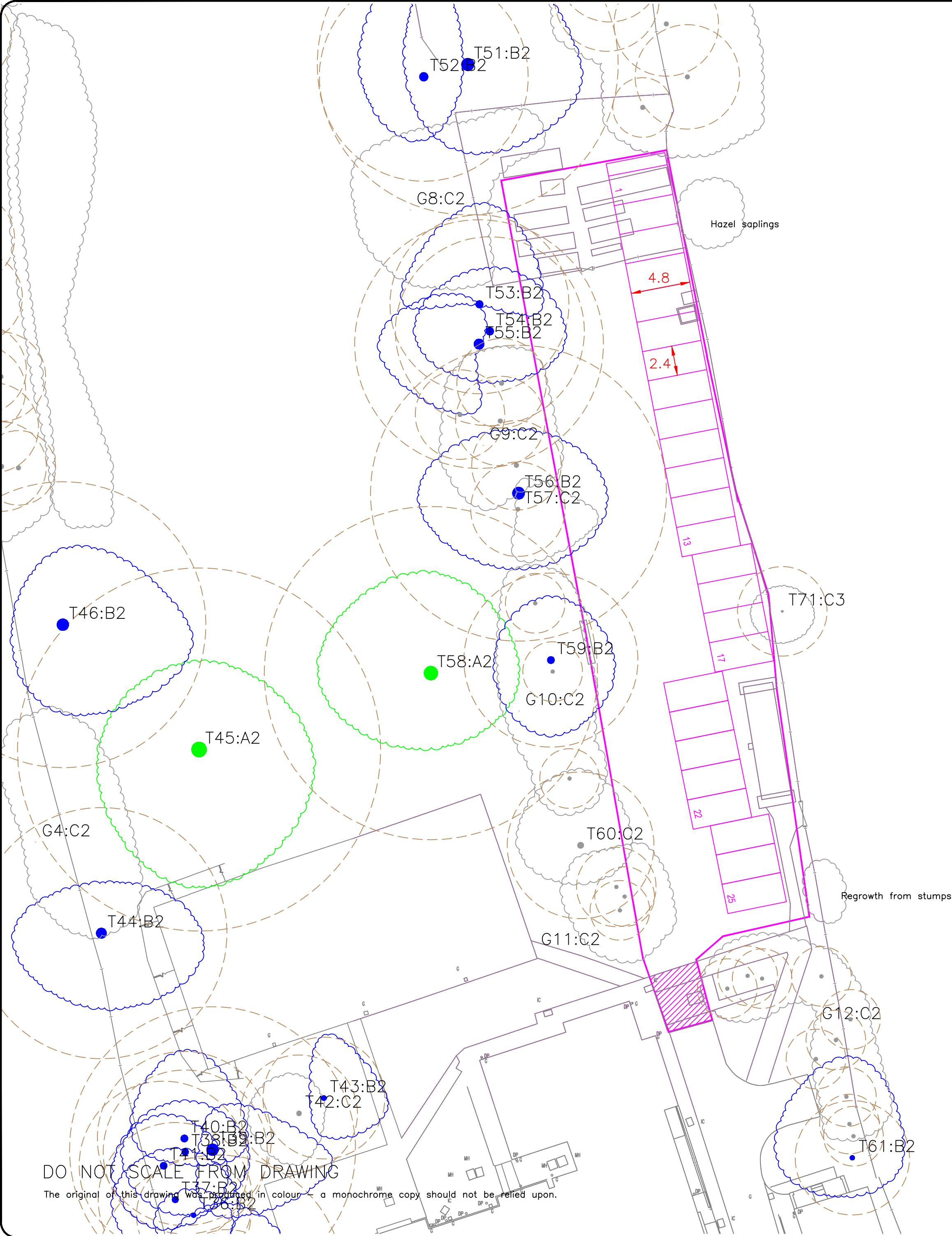
The surveyed trees are illustrated on this Constraints Plan which is prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'



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Indicative

KEY

Tree Crown Spread

Root Protection Area (RPA)

T1 Tree No.

Tree Condition Category

ABCU

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'

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/	Proposed scheme overlay	TB	AT	27/02/24
REV.	DESCRIPTION	DWN	CHK'D	DATE

CLIENT

Bersham Hall

PROJECT

20102.23
Bersham Hall,
Bertram Road, Wrexham, LL14 4HS

TITLE

Tree Constraints Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RCK	10/11/2023	TB	13/11/2023			1:500

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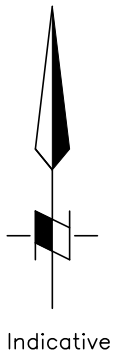
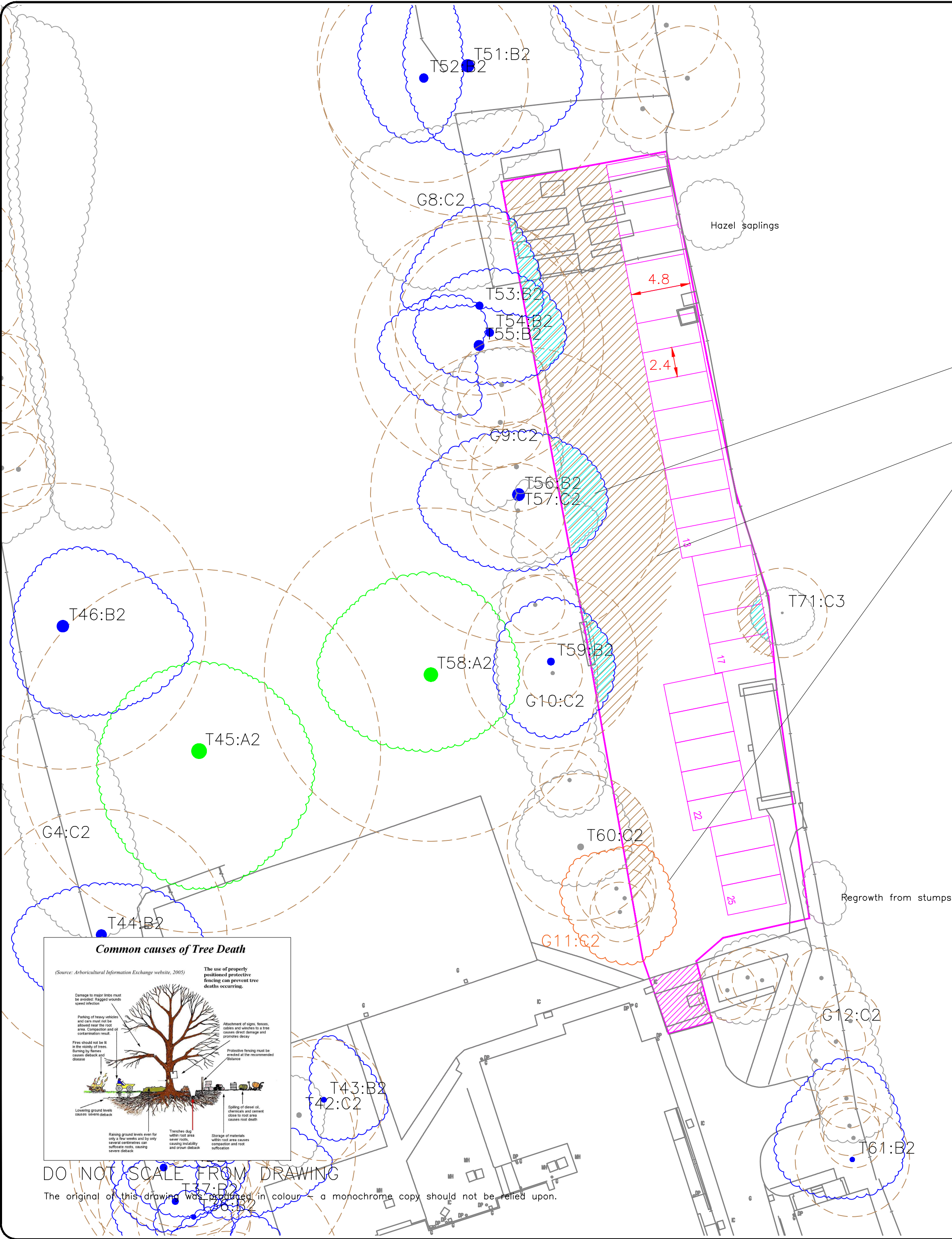
Drawing Number

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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'

Tree Removals – G11 to be removed to facilitate the scheme; replacement tree detail to be included within the landscape scheme.

Tree Pruning – T53, T54, T56, T57 to be pruned to provide 3.5 – 5m ground to crown clearance over the proposed parking. T71 to be pruned by lateral branch reduction back towards the boundary to clear the proposed parking area.

Sensitive Ground Works – prepare grounds manually stripping the existing soil surface and turf only, retain soil levels, use load bearing system (Cellweb/Geocell or similar), manual installations and preferably a permeable surface treatment.

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.

Material Handling – no mechanical digging or scraping is permitted within a RPA/CEZ.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.

Common causes of Tree Death

(Source: Arboricultural Information Exchange website, 2005)

Damage to major stems must be avoided: Ragged wounds speed infection

Pruning of heavy limbs and canopies must be avoided near the root area. Competition and/or contamination must

Fires should not be lit in the vicinity of trees. Burning by flares causes bark damage and disease

Lowering ground levels causes severe damage

Raising ground levels even for only a few weeks and by only lateral perforation can suffocate roots, causing severe damage

Trenches dug within root area sever roots, causing instability and crown damage

Storage of materials within root area causes compaction and root suffocation

Protective fencing must be erected at the recommended distance

Cutting of stems at oblique angles causes decay to root area causes root death

The use of properly positioned protective fencing can prevent tree deaths occurring.

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/	Uses TCP as base layer	TB	AT	27/02/24
REV.	DESCRIPTION	DWN	CHK'D	DATE

CLIENT	Bersham Hall
PROJECT	20102.23 Bersham Hall, Bertram Road, Wrexham, LL14 4HS
TITLE	Tree Protection Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RCK	10/11/2023	TB	13/11/2023			1:500

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