

Wrexham PEA

Arboricultural Impact Assessment

Ionity GmbH

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Quality information

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1. Introduction

1.1 Background

AECOM has been instructed by Ionity GmbH (The Applicant) to carry out an Arboricultural Impact Assessment of the development proposals within the carpark to the immediate west of Ramada Plaza by Wyndham Wrexham, LL13 7YH (hereafter referred to as 'the Site' and 'Proposed Development') in support of a planning application. This report identifies the likely direct and indirect impacts of the Proposed Development along with suitable mitigation measures, as appropriate. The Tree Protection Plan (included within Appendix E) identifies trees to be removed and how retained trees are to be successfully protected.

1.2 Trees and the Planning Process

The National Planning Policy Framework (NPPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses a recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaptation. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally, it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

Local Planning Authorities (LPA) in the UK have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration.

'BS5837:2012 Trees in relation to design demolition and construction – Recommendations (BS5837)' provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

An Arboricultural Impact Assessment is then developed to identify the likely direct and indirect impacts of the Proposed Development, and a Tree Protection Plan is prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in proximity to retained trees. These elements are the minimum normally required for a planning application and are intended to ensure both a sustainable and harmonious relationship between trees and new development.

1.2.1 Local Policy Context

Wrexham Borough Council has a statutory duty to consider tree retention and new planting when assessing planning applications. The Wrexham Unitary Development Plan¹ was adopted in February 2005. It sets out the long-term strategic policies for Wrexham Borough Council's future development and will form the framework against which planning applications will be assessed. It should be noted that Wrexham Borough Council are currently producing their Local Development Plan (LDP2)² which will eventually replace the current adopted Unitary Development Plan.

A summary of the local planning policy context pertaining to trees, hedgerows and woodlands within the current adopted Unitary Development Plan is provided below.

Policy EC4 - Hedgerows, Trees and Woodland

'Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.'

¹ <https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-unitary-development-plan>

² <https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-local-development-plan-2-ldp2-2013-2028>

Section 5.5 states that *'Much of the landscape's quality stems from the pattern of hedgerows, trees and woodland and other natural features such as ponds. The conservation, planting and proper management of such features must be encouraged in order to maintain and enhance the landscape, to conserve wildlife habitats, and to reverse some changes made to the rural landscape by modern agriculture. Developments and land use changes may therefore be resisted if they adversely affect, directly or indirectly, the integrity or continuity of landscape features which are designated as of major importance for wild flora and fauna. A development may be acceptable if mitigating measures can be provided for within the control of the developer which would reinstate the integrity or continuity of these features. Management of these features will generally be encouraged and, where appropriate, conditions will be imposed on planning permission. Planning obligations may be entered into with landowners or developers to secure long term management. TPO's will be used to prevent loss, destruction or damage to trees which form notable features of the landscape or townscape. Certain hedgerows are protected by the Hedgerow Regulations, and the Council will use its powers under this legislation to exercise control over important hedgerows. Where damage to woodland is unavoidable, appropriate mitigation measures will be required.'*

1.3 Methodology

The tree survey has been based on the topographical survey plan provided by Malcolm Hughes Chartered Land Surveyors (ref: 59538-1).

A small number of trees were not included on the topographical survey plan and have been plotted indicatively with reference to site features and publicly available aerial photography. Such trees have been marked with an '**' on the Tree Survey Schedule included as Appendix B. As such all positions for these trees must be considered to be indicative only and the relative distances of features must be measured out on the Site as required.

The survey was otherwise conducted in accordance with the requirements of BS5837.

The initial fieldwork was undertaken in February 2023, during which time dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site.

Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

The Root Protection Area (RPA) is the notional extent of what is considered to be the key rooting area for tree health and function. This is generally depicted as a circle but can be amended to a polygon with an equivalent area in accordance with Section 4.6.2 of BS5837 where the RPA is likely to have developed asymmetrically. The RPA of all individually surveyed trees is depicted as a circle although the RPA for G36 has been amended due to the location of a drainage ditch which will have influenced root development. No other RPAs have been amended.

A Tree Constraints Plan showing the position of trees and the spatial constraints associated with them is included as Appendix A of this report, which corresponds with the Tree Survey Schedule presented in Appendix B.

The tree categorisation process recommended by BS5837:2012 is summarised in the table below and corresponds with the tree canopy outline shown on the Tree Constraints Plan (Appendix A) and the information in the Tree Survey Schedule (Appendix B).

Table 1: BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2. General Arboricultural Principles

2.1 General Principles

Trees are dynamic living organisms which provide essential benefits to society and the wider environment. Any proposed development with the potential to impact on trees must take into consideration the value of trees on site; the impact of any proposed activity along with any potential future conflicts on the Site. Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

Tree branches and roots frequently grow across site boundaries and off-site trees can pose a significant constraint and should be carefully considered when assessing the developable space within a site.

2.2 Below Ground Constraints

Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil) which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement-based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long-term impacts for tree health.

The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

The Root Protection Area (RPA) is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

RPAs are calculated as per BS5837: 2012 Annex C, D and Section 4.6 in the BS 5837 2012 Document.

The RPA of the existing tree stock is an important material consideration when considering Site constraints and planning development activities. The RPA of significant trees on Site is shown on the Tree Constraints Plan (Appendix A).

The default position must be that all development, including any associated services will occur outside the RPAs of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPAs which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

Further steps to improve or increase the useable rooting area available to the tree may also be required.

2.3 Soils

On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards Chapter 4.2: *Building Near Trees* (2021) to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

2.4 Above Ground Constraints

Tree stems and branches can restrict available space on site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and decay, with significant long-term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, shade etc.) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2.5 Trees and Risk in the Context of Development

Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

AECOM can provide surveys and advice in relation to tree risk management if required. Further guidance is available from the National Tree Safety Group³.

The tree survey carried out as the basis of this report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on Site. However, when obvious issues have been identified recommendations have been included in the Tree Survey Schedule.

The Construction (Design and Management) Regulations (2015) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2.6 Trees and Wildlife

Full consideration must be given to the presence of species protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017), in particular the presence of bats and nesting birds. It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September. The advice of a suitably qualified Ecologist is recommended in relation to any potential impacts on protected species.

2.7 Tree Works

Any tree surgery recommendations contained within this report are to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors. Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general, the optimum period for works is between November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

³ National Tree Safety Group (NTSG), 2011. Common sense risk management of trees. Forestry Commission.

3. Field Work Observations

3.1 The Site

The Site boundary is shown on the Tree Constraints Plan included within Appendix A (ref: 60695026-ACM-XX-XX-AB-TCP-002) of this report.

The Site is located within the carpark to the immediate west of Ramada Plaza by Wyndham Wrexham, LL13 7YH.

The existing use is a hard surfaced car parking area adjoining the hotel with landscape amenity features. To the north of the Site is a government office. To the west of the Site is a childrens nursery. To the south is a small area of open grassland with trees bordering Croesnewydd Road. To the east of the Site is a technology park occupied by commercial premises.

3.2 The Trees

There are a total of 34 tree features recorded on the survey, including 29 individual trees, one tree group and four hedgerows. The trees on the Site are predominantly semi mature and in good condition. Species present include apple (*Malus sp.*), beech (*Fagus sylvatica*), cockspur hawthorn (*Crataegus crus-galli*), common alder (*Alnus glutinosa*), elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), lime (*Tilia sp.*) and Norway maple (*Acer platanoides*).

The most significant trees included within the survey are two lines of formally planted limes growing within two hedgerows, all of which are of moderate quality (Category B) and provide good landscape value for the surrounding site. A large off-site group, G31, was also noted to be of moderate quality and contained trees which varied in age, size and condition.

Site photography can be found at Appendix D located to the rear of this report.

3.3 Statutory and Non-Statutory Designations

3.3.1 Statutory Designations:

AECOM contacted Wrexham Borough Council on 26th February 2023 via email and it was confirmed on 27th February 2023 that there are no Tree Preservation Orders or Conservation Area designations identified which could affect trees within or immediately adjacent to the Site.

A review of Magic Map⁴ confirmed that there are no Sites of Special Scientific Interest within or within proximity of the Site.

A felling licence may be required by the Forestry Commission to fell more than 5m³ in any calendar quarter (subject to relevant exceptions including trees in gardens, designated public open spaces or churchyards).

Full planning consent is an exemption from the need to apply for consent for works to trees protected by a Tree Preservation Order, the need to give notice of the intention to undertake works within a Conservation Area and the need to apply for a Felling Licence with the Forestry Commission (to fell more than 5m³ per calendar quarter). Prior to any tree works the status of trees to be removed or pruned must be verified with the LPA and the Forestry Commission as appropriate.

3.3.2 Non-Statutory Designations

Following a review of Magic Map it was confirmed that the Site does not include any tree related non-statutory designations which have the potential to be a material consideration in the planning process.

AECOM checked the Woodland Trust's Ancient Tree Inventory⁵ and it was confirmed that there are no recorded ancient, veteran or notable trees within or immediately adjacent to the Site. However, this is not a complete dataset and is reliant on individuals putting trees forward for consideration and inclusion. None of the trees identified during the survey were assessed to be of Ancient or Veteran status.

⁴ <https://magic.defra.gov.uk/MagicMap.aspx>

⁵ <https://ati.woodlandtrust.org.uk/tree-search/?v=2077588&ml=map&z=15&nwLat=53.80553200461051&nwLng=-1.432670902382358&seLat=53.79592602040674&seLng=-1.3784688226094088>

4. The Proposed Development

The Proposed Development is detailed on the Tree Protection Plan included as Appendix E (ref: 60695026-ACM-XX-XX-AB-TCP-001) and includes construction of electric vehicle (EV) charging site and associated infrastructure and works to create 20no.parking spaces on the car park and land associated with the Ramada Plaza Hotel, Wrexham.

5. Arboricultural Impact Assessment

5.1 Purpose

This impact assessment sets out the likely principal direct and indirect impacts of the Proposed Development on the trees on or immediately adjacent to the Site and suitable mitigation measures to allow for the successful retention of significant trees or to compensate for trees to be removed, where appropriate.

A brief summary of trees to be removed, tree works, and incursions related to the Proposed Development are detailed within the table below.

Table 2: Summary of Removals, Incursions and Pruning to Facilitate the Proposed Development

Impact	Category A	Category B	Category C	Category U
Trees to be removed to facilitate the Proposed Development	-	T5, T6, T7, T8, T9, T10, T14, T16, T17, T18, T19, T20	H3 (part), H12 (part), H15 (part), T27, T28, T29, T30, T32, T33, T34	-
Total	-	12 individual trees	7 individual trees and 3 part hedges	-
Trees which may require some incursion into their construction exclusion zone to allow the Proposed Development.	-	-	-	-
Total	-	-	-	-
Trees to be pruned to facilitate the Proposed Development	-	-	-	-
Total	-	-	-	-

5.2 Trees to be Removed

19 individual trees and three partial hedges are to be removed to facilitate the Proposed Development; this includes 12 semi mature trees of relatively low stature classed as moderate quality (Category B) and the remaining seven trees and three partial hedges classified as low quality (Category C).

All of the trees to be removed are within the red line application boundary.

The loss of these trees is necessary to achieve the construction and landscaping proposals for the Site.

Tree removals will be mitigated with a high quality scheme of new tree planting and associated landscaping works as detailed in Tree Planting Proposals which will represent an opportunity to enhance the quality, benefits and resilience of trees on Site.

All of the remaining recorded trees can be retained and protected.

5.3 Tree Works

Tree removals to facilitate the Proposed Development are detailed in the Tree Survey Schedule included as Appendix B.

No additional works to retained trees are likely to be required. All tree work is to follow the principles of *BS3998: 2010 Treework – Recommendations* and must be carried out by suitably qualified and insured contractors. The

Arboricultural Association provides a list of contractors who meet these requirements which can be found at www.trees.org.uk.

Should the requirement for additional tree works be identified, this will be discussed with an arboriculturist and no works will be undertaken without the consent of the Local Planning Authority (LPA).

Some tree works are included in the Tree Survey Schedule based on good arboricultural practice, regardless of any development proposals, and should be carried out within the recommended timescales. Some of this work is to trees which are located outside of the red line boundary for the Site. Prior to any works the ownership of these trees must be established and the consent of the tree owner obtained in writing as necessary.

5.4 Incursions within the RPA or Canopy Spread

No incursions within the RPA of canopy spread of any retained trees will be required to facilitate the Proposed Development. Retained trees can be fully protected with tree protection fencing as detailed on the TPP.

5.5 The Future Impact of Retained Trees

The future impact of retained trees in conjunction with the Proposed Development and intended use of the Site has been considered.

Retained trees will require periodic inspection to assess their structural condition and safety. Occasional removal of dead wood or other remedial works to address significant defects may be required in areas of frequent access. This is unlikely to be overly onerous and will be the responsibility of the tree owner. This will not represent a significant change from the current situation on the Site.

All tree works recommended as a result of the preliminary tree survey of the Site which considered trees in the context of the current use of the Site (these works are included as preliminary management recommendations in the Tree Schedule in Appendix B of this report) should be actioned within the recommended timescales.

All of the trees on the Site are broadleaved and will drop leaves and fruits in autumn and will produce flowers in the spring. Lime trees are often associated with aphids which secrete a sticky liquid called 'honeydew'. This can be a nuisance for parked cars and potentially areas of hard surfacing as the deposits can lead to the development of sooty moulds and staining. This can be easily cleaned with warm soapy water or equivalent and is likely to be less visible on darker surfaces, alternatively it is possible that the trees could be regularly pruned back to manage overhanging canopies. This potential future maintenance requirement should be considered in relation to the future use of the Site beneath the canopy of these trees where they are to be retained.

5.6 Tree Protection

Retained trees are vulnerable to damage from construction activities which can include physical damage to stems and branches following impacts with plant, root severance following trenching, root death or dysfunction following damage to soil structure (caused by the movement of people or machinery on unsurfaced ground) or via the spillage of materials toxic to tree health. The default position is that the RPA and canopy spread of trees to be retained will form an effective Construction Exclusion Zone, secured with robust fencing where no access will be permitted.

Where access is necessary within this area special measures such as the use of ground protection and arboricultural supervision are generally required.

Outline tree protection measures are considered in Appendix G of this report. An Arboricultural Method Statement is often required as a condition of planning consent to set out the phasing of site operations, the finalised tree protection measures for the Site and to provide detail on how sensitive elements of work are to be achieved in proximity to retained trees. Issues to be addressed by the Method Statement are listed in the Conclusion of this report.

5.7 Site Organisation, Storage and Use of Materials, Plant and Machinery.

All construction site facilities including site huts, staff and contractor parking and areas for storage will be located outside of the RPA or crown spread of retained trees, including those not specifically covered in this report. Space is likely to be constrained on the Site and will need to be carefully considered. The Construction Exclusion Zones identified on the Tree Protection Plan must be fully respected and their location and significance is to be highlighted to all site staff and contractors during the formal site briefing.

The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides) and can result in the death of tree roots and beneficial soil organisms and can have a significant impact on the future health and appearance of the tree.

The storage of materials and arising's can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

For these reasons the storage of materials and any washing, mixing or refuelling will take place in agreed allocated areas at least 5m from the edge of the RPA of retained trees.

Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.

Particular care is required where high sided vehicles, long reach machinery and plant with jibs, booms and counterweights are to operate with in proximity to retained trees. A banksman will be used where the movement of plant or long reach machinery occurs within 5m of any part of a retained tree to ensure no damage is sustained.

5.8 Tree Planting

Existing areas of unsurfaced ground must be protected during the demolition and construction phases if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.

Where new trees are to be planted, the minimum planting distances detailed in Annexe A, Table A.1 of BS5837:2012 must be adhered to, to prevent direct damage to services and structures from future tree growth.

New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations.

5.9 Services

No information in relation to services has been made available at this stage although all services are likely to be located within the central area of the Site which will be clear of trees.

Where services to be removed or installed within proximity to trees the following should be taken into account:

Where existing services become redundant within the RPA of a retained tree, the default position must be that they be decommissioned and left in situ. Where this is not feasible the existing services are to be removed by winching out from an access/inspection chamber located outside of an RPA. It may be acceptable to fill redundant pipe work with an inert material or undertake pipe bursting where necessary within the RPA of retained trees.

Excavation to install services has the potential to result in unacceptable root severance which could result in instability, dysfunction or the death of trees. Repeated incursions are particularly damaging and must be avoided by bundling services wherever possible.

The default position will therefore be that all services be routed outside of the RPA of retained trees. The following general principles will apply and where services must be routed within the RPA of a retained tree this process will be subject to a detailed method statement with approval from the Planning Authority. The principles of the National Joint Utilities Group (NJUG) Volume 4 guidance must be adhered to.

All services must be bundled as far as possible and installed within RPAs using hand/compressed air excavation (e.g. for shallow service runs) or trenchless techniques such as impact moling (thrust boring) with all access pits and inspection chambers being located outside of the RPA. The route must run as far from the main stem of a retained tree as possible and must be at a minimum depth so that the upper 1m of the soil profile is undisturbed. The depth of the run may need to be adjusted to account for soil type and species variation and this must be determined subject to the advice of an arboriculturist.

This operation must take place as specified in an Arboricultural Method Statement. Any water pipes must be constructed so as to be resistant to ingress by tree roots (both existing trees, and newly planted trees) which could include the use of root barriers where appropriate.

6. Summary and Conclusion

The Proposed Development will require the removal of 19 trees and three partial hedgerows; this includes 12 semi mature trees of relatively low stature classified as moderate quality (Category B) and the remaining seven trees and three partial hedgerows classified as low quality (Category C).

The loss of these tree features is necessary to achieve the proposed development of the Site including the positioning of electric vehicle (EV) charging site and associated infrastructure.

Tree loss will be mitigated with a robust and high-quality scheme of new tree planting as detailed in the Tree Planting Proposals (ref: ACM-WRE-00-DR-LA-1001, ACM-WRE-00-DR-LA-1002 by AECOM) which represents an opportunity to increase the quality, impact, diversity and resilience of the local tree stock.

Soil structure for areas of new tree planting where the ground is currently unsurfaced will either be protected using ground protection or fenced exclusion zones; or the soil structure will be ameliorated or replaced following the completion of construction works on the Site.

6.1 Issues to be addressed by an Arboricultural Method Statement:

- Conditions of planning consent
- Pre commencement meeting and site briefing
- Order and phasing of operations
- Tree works
- Tree protection fencing
- Ground Protection
- Site storage and facilities
- Movement of people, plant and materials
- Demolition
- Enabling works
- Installation of new surfacing
- Installation of new services and/or diversion of existing services
- Hard landscaping
- Soft Landscaping
- Removal of tree protection measures

7. References

British Standards Institution (BSI), BS5837:2012. Trees in relation to design, demolition and construction – Recommendations. BSI

British Standards Institution (BSI), BS3998:2010. Tree work – Recommendations. BSI

British Standards Institution (BSI) BS8545: 2014 Trees: from the nursery to independence in the landscape – Recommendations

Ministry of Housing, Communities and Local Government (MHCLG), 2021. National Planning Policy Framework (NPPF). MHCLG

National House Building Council (NHBC) Standards, (2022). Chapter 4.2: Building Near Trees

National Joint Utilities Group (NJUG) Volume 4, Issue 2, (2007). NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

National Tree Safety Group (NTSG), 2011. Common sense risk management of trees. Forestry Commission.

Appendix A Tree Constraints Plan



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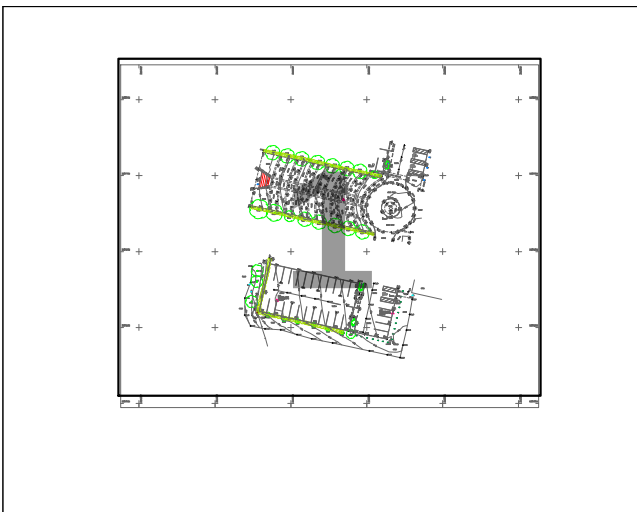
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GENERAL NOTES

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3. * INDICATES A TREE / GROUP WHOSE POSITION IS APPROXIMATE AS BASED UPON AERIAL PHOTOGRAPHY AND ON SITE OBSERVATIONS.
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60695026_ACM_CDE_WRE_SK_AR_0001_07-Sheet - 0001 - WREXHAM SKETCH.dwg
59538 Utility Survey (Z1-12-22).dwg
59538-Topo-2D-RevA.dwg

KEY PLAN



KEY

- SITE BOUNDARY
- A CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (HIGH QUALITY & VALUE)
- B CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (MODERATE QUALITY & VALUE)
- C CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (LOW QUALITY & VALUE)
- U CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (UNSUITABLE FOR RETENTION)
- ROOT PROTECTION AREAS (RPA) (AS DEFINED BY BS 5837:2012)
- APPROXIMATE SHADING ARC (AS DEFINED BY BS 5837:2012)

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TREE CONSTRAINTS PLAN
(SHEET 01)

SHEET NUMBER

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P01

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Appendix B Tree Survey Schedule

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Work Required to Facilitate the Proposed Development	Estimated Remaining Contribution (yrs)	Category	RPA (m²)	RPA Radius (m)
				N	S	E	W												
H1*	Firethorn (<i>Pyracantha</i>)	1	<80#	0.5	0.5	0.5	0.5	n/a	0	Good	SM	Good				10+	C2	32.8	0.96m
T2*	Common Alder (<i>Alnus glutinosa</i>)	10	290	4	4	4	4	2.0/S	2	Good	EM	Good				20+	B2	50.1	3.48m
H3	Beech (<i>Fagus sylvatica</i>)	0	<80#	0.5	0.5	0.5	0.5	n/a	0	Good	SM	Good	Well maintained hedgerow.		Fell in part as per TPP	10+	C2	31.6	0.96m
T4	Lime (<i>Tilia sp.</i>)	8	250	3.5	3	2	3	2.0/N E	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value. Slight suppression to east.			20+	B2	25.4	3m
T5	Lime (<i>Tilia sp.</i>)	8	250	3.5	3.5	3.5	3.5	2.0/SE	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	38.4	3m
T6	Lime (<i>Tilia sp.</i>)	8	190	3	3	3	3	2.0/SE	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.28m
T7	Lime (<i>Tilia sp.</i>)	8	170	3	3	3	3	1.0/W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.04m

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Work Required to Facilitate the Proposed Development	Estimated Remaining Contribution (yrs)	Category	RPA (m²)	RPA Radius (m)
				N	S	E	W												
T8	Lime (<i>Tilia sp.</i>)	8	180	3	3	2	2	2.0/E	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	18.8	2.16m
T9	Lime (<i>Tilia sp.</i>)	8	150	3	3	2	2	2.0/E	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	18.8	1.8m
T10	Lime (<i>Tilia sp.</i>)	8	180	3	3	3	3	2.0/E	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.16m
T11	Lime (<i>Tilia sp.</i>)	4	140	2	2	2	2	2.0/S	2	Good	SM	Good				10+	C2	12.5	1.68m
H12	Beech (<i>Fagus sylvatica</i>)	0	<80#	0.5	0.5	0.5	0.5	n/a	0	Good	SM	Good	Well maintained hedgerow.		Fell in part as per TPP	10+	C2	29.2	0.96m
T13	Lime (<i>Tilia sp.</i>)	8	250	4	4	4	4	1.5/N	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.			20+	B2	50.1	3m
T14	Lime (<i>Tilia sp.</i>)	8	200	4	4	4	3	1.5/N	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value. Slight suppression to west.		Fell	20+	B2	43.8	2.4m

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Work Required to Facilitate the Proposed Development	Estimated Remaining Contribution (yrs)	Category	RPA (m²)	RPA Radius (m)
				N	S	E	W												
H15	Beech (<i>Fagus sylvatica</i>), Firethorn (<i>Pyracantha</i>)	0	<80#	0.5	0.5	0.5	0.5	n/a	0	Good	SM	Good	Well maintained hedgerow.		Fell in part as per TPP	10+	C2	52.3	0.96m
T16	Lime (<i>Tilia sp.</i>)	8	170	3	3	3	3	1.5/N W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.04m
T17	Lime (<i>Tilia sp.</i>)	8	180	3	3	3	3	1.5/N W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.16m
T18	Lime (<i>Tilia sp.</i>)	8	200	4	4	4	4	1.5/N W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	50.1	2.4m
T19	Lime (<i>Tilia sp.</i>)	8	170	3	3	3	3	1.5/N W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.04m
T20	Lime (<i>Tilia sp.</i>)	8	170	3	3	3	3	1.5/N W	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.		Fell	20+	B2	28.2	2.04m
T21	Lime (<i>Tilia sp.</i>)	8	200	3	3	3	3	2.0/E	2	Good	SM	Good	Forming part of formal line of trees growing within hedgerow. Good form. Good landscape value.			20+	B2	28.2	2.4m

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Work Required to Facilitate the Proposed Development	Estimated Remaining Contribution (yrs)	Category	RPA (m²)	RPA Radius (m)
				N	S	E	W												
T22*	Common Alder (<i>Alnus glutinosa</i>)	8	260	4	4	4	4	2.5/E	2	Good	EM	Good	Good form. Good landscape feature. Dominant tree in area. Previously pruned to west to keep PROW clear. Black staining at base, potential symptoms of phytophthora..			20+	B2	50.1	3.12m
T23*	Common Alder (<i>Alnus glutinosa</i>)	6	90,100,120,100	2.5	0.5	2	2	2.0/N	2	Good	SM	Good	Multistemmed from base. Suppressed crown to south. Minor wound on Western stem circa 20cm x 8cm.			10+	C2	9.4	2.47m
T24	Common Alder (<i>Alnus glutinosa</i>)	8	300	2	3	3	3.5		2	Good	EM	Good	Growing in grassy area. Good form. Good landscape feature. Forks into multiple leaders at circa 0.5m			20+	B2	25.4	3.6m
T25	Common Alder (<i>Alnus glutinosa</i>)	8	250	1	3	4	3		2	Good	SM	Good	Growing in grassy area. Good form. Good landscape feature. Suppressed crown to north.			20+	B2	21.9	3m
T26	Common Alder (<i>Alnus glutinosa</i>)	8	250	3	3	3	3		2	Good	SM	Good	Growing in grassy area. Good form. Good landscape feature. Previously crown lifted. branches blocking streetlamp to east.	Prune crown to east to clear streetlamp (When funds allow)		20+	B2	28.2	3m
T27	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	5	150	2.5	2.5	2.5	2.5	1.5/E	2	Good	SM	Good	Growing within hedgerow.		Fell	10+	C2	19.6	1.8m

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Work Required to Facilitate the Proposed Development	Estimated Remaining Contribution (yrs)	Category	RPA (m²)	RPA Radius (m)
				N	S	E	W												
T28	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	4	120	2	2	2	2	1.5/E	2	Good	SM	Good	Growing within hedgerow.		Fell	10+	C2	12.5	1.44m
T29	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	4	130	2	2	2	2	1.5/E	2	Good	SM	Good	Growing within hedgerow.		Fell	10+	C2	12.5	1.56m
T30	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	4	130	2	2	2	2	1.5/E	2	Good	SM	Good	Growing within hedgerow.		Fell	10+	C2	12.5	1.56m
G31*	Norway Maple (<i>Acer platanoides</i>), Elder (<i>Sambucus nigra</i>), Hawthorn (<i>Crataegus monogyna</i>), Common Alder (<i>Alnus glutinosa</i>)	16	<550	4	4	4	4	n/a	2	Good - Dead	Y-M	Good - Dead	Minor deadwood within group. Trees of varying age and size.			20+	B2	814.5	6.6m
T32	Apple (<i>Malus sp.</i>)	2	75	0.5	0.5	0.5	0.5	1.0/S	2	Good	Y	Good	Growing within hedgerow.		Fell	10+	C2	0.8	0.9m
T33	Hawthorn (<i>Crataegus monogyna</i>)	3	100	1	1	1	1	2.0/N E	2	Good	SM	Good	Growing within hedgerow.		Fell	10+	C2	3.1	1.2m
T34	Beech (<i>Fagus sylvatica</i>)	1	80#	0.5	0.5	0.5	0.5	0.3/N	0	Good	SM	Good	Isolated section of beech hedge.		Fell	10+	C2	0.8	0.96m

Appendix C Key to Abbreviations Used in the Survey

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedge/G=Group/W=Woodland.	
Species	Common name followed by botanical name shown in <i>italics</i>	
RPA	Root Protection Area (As defined by BS5837)	
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C)	Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.	
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.	
#	Estimated dimensions	
*	Indicates estimated position of tree (not indicated on topographical survey).	
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation) A=High quality/value 40yrs+ (light green). B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).	
Life stage	Young (Y): Newly planted tree 0-10 years. Semi-Mature (SM): Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size). Early Mature (EM): Tree in the second third of its normal life expectancy for the species (some potential for future growth in size) Mature (M): Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size). Over Mature (OM): Tree beyond the normal life expectancy for the species. Veteran (V): Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.	
Structural condition	Good: No significant structural defects Fair: Structural defects which can be resolved via remedial works. Poor: Structural defects which cannot be resolved via remedial works. Dead: Dead.	
Physiological condition	Good: Normal vitality including leaf size, bud growth, density of crown and wound wood development. Fair: Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds. Poor: Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species. Dead: Dead Fair/Good = Indicates an intermediate condition Fair – Good = Indicates a range of conditions (e.g. within a group)	
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).	

Appendix D Site Photography



Image 1 Showing H15 with multiple low quality trees all for removal



Image 2 Section of H15 to be retained with T22 - T26 on the right

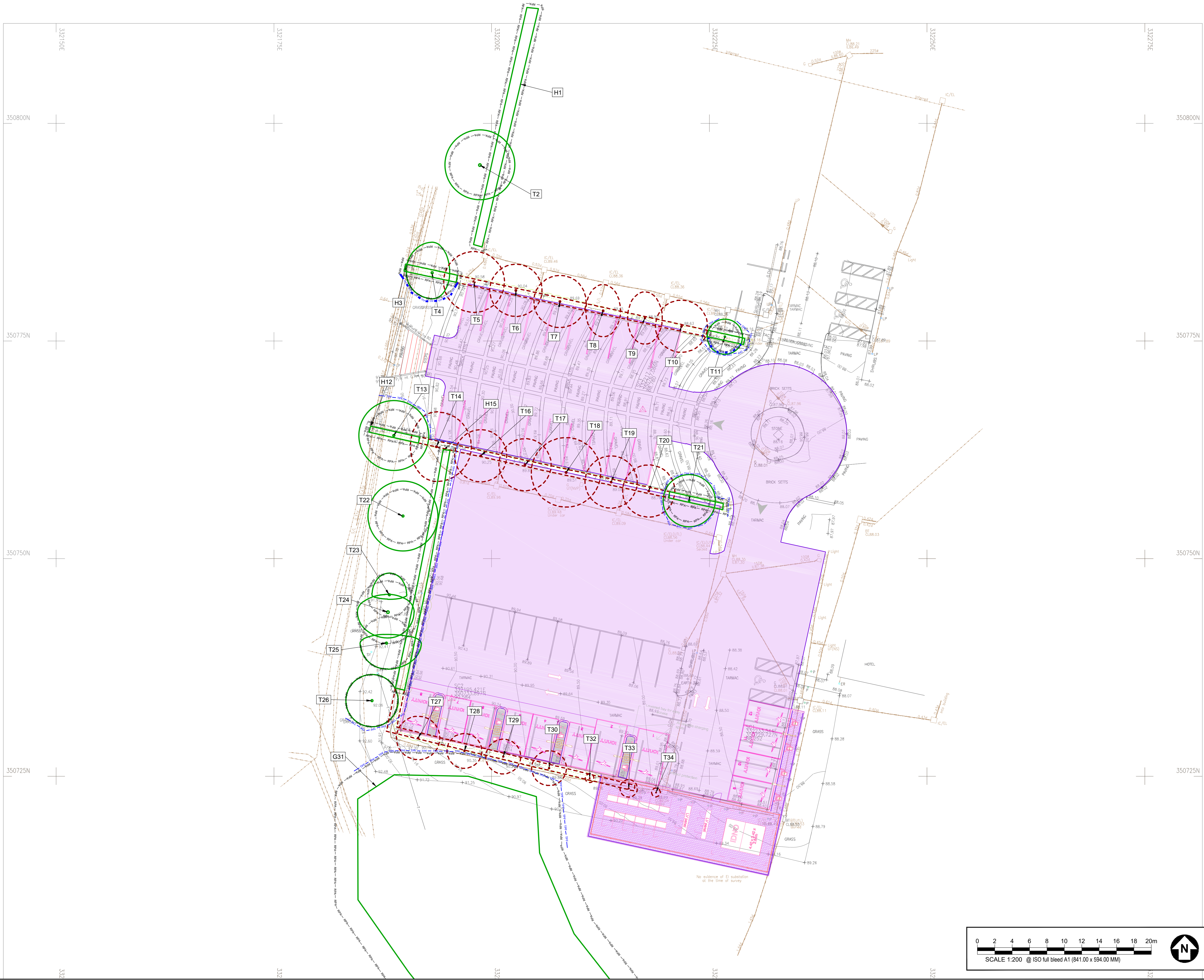


Image 3 H12 with multiple moderate quality trees T13, T14 and T16 – T21



Image 4 H3 with multiple moderate quality trees within T4 – T10

Appendix E Tree Protection Plan



PROJECT

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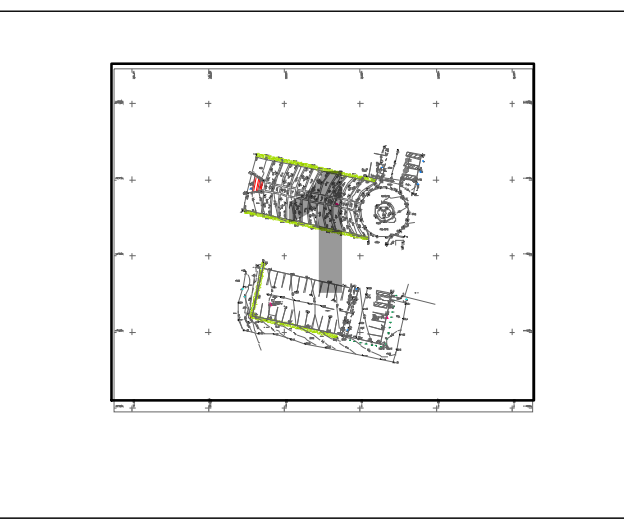
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59538_Utility Survey (21-12-22).dwg
59538-Topo-2D-RevA.dwg

KEY PLAN



KEY

- EXISTING TREE, GROUP, WOODLAND, OR HEDGE TO BE RETAINED
- EXISTING TREE, GROUP, WOODLAND, OR HEDGE TO BE REMOVED
- ROOT PROTECTION AREA OF RETAINED TREES (AS DEFINED BY BS 5837:2012)
- TREE PROTECTION FENCING
- PROPOSED DEVELOPMENT LAYOUT (BASED UPON DRAWING REFERENCES LISTED IN THE GENERAL NOTES SECTION)

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TREE PROTECTION PLAN
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Appendix F Outline Tree Protection Measures

F.1 Outline Tree Protection Measures

The default position as set out by BS 5837:2012 is that retained trees must be protected from construction operations and this is generally achieved with the erection of robust protective fencing positioned on the outer edge of the RPA or crown spread (whichever is greatest).

The default position as set out by BS 5837:2012 is that retained trees must be protected from construction operations with the erection of robust protective fencing positioned on the outer edge of the RPA or crown spread (whichever is greatest). All site operations will be restricted to the area outside of tree protection fencing and this area will form a Construction Exclusion Zone (CEZ) unless agreed otherwise. Protection measures will be installed as set out in the Tree Protection Plan included as Appendix E of this report.

The area inside the fence and any additional tree protection measures will be sacrosanct and must not be removed or altered without the prior approval of the LPA Tree Officer. Any damage to tree protection measures must be reported immediately.

Fencing shall be constructed with robust vertical and horizontal scaffold framework with weldmesh panels firmly attached as per BS 5837:2012 Figure 7 (included below). Vertical support poles and bracing poles must be located with care to avoid underground utility services and will be sited to avoid the structural roots of retained trees.

Alternative equivalent robust and immovable fencing specification including site hoarding will also be appropriate.

Suitable all weather signage will be fixed to fencing to notify site staff and visitors of the construction exclusion zone and its purpose (example included as Appendix G).

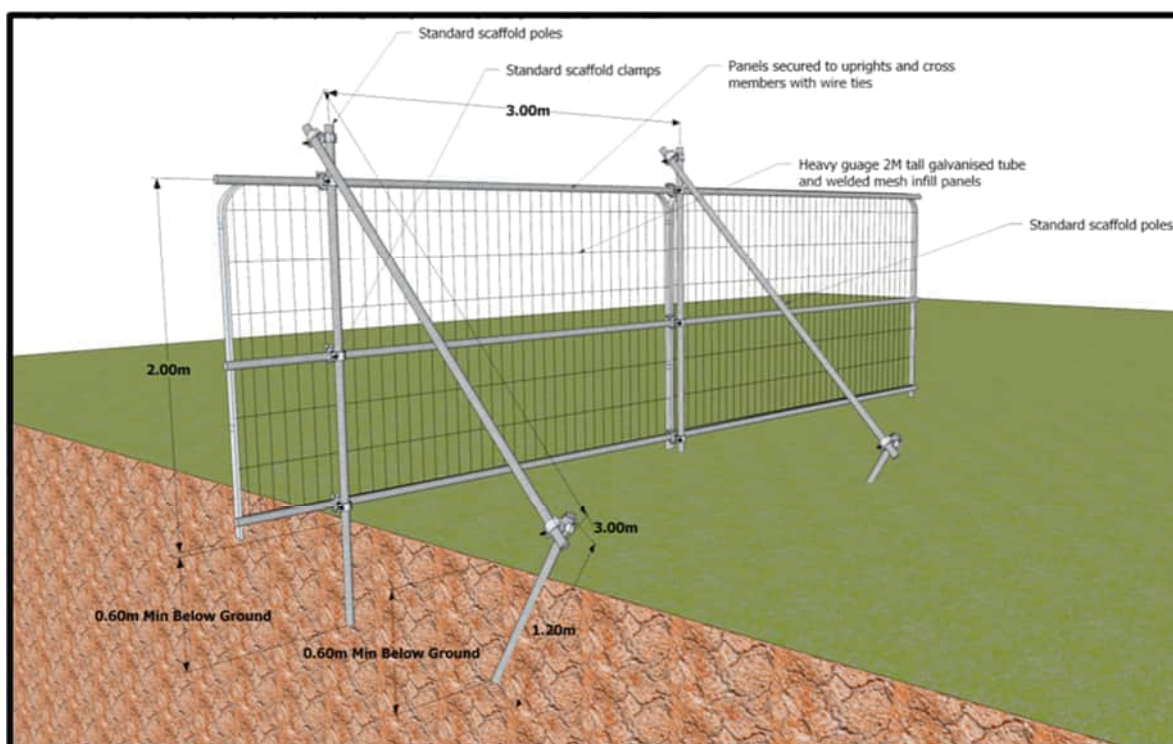


Figure 1 Default specification for protective barrier

F.2 Ground Protection

Should access be unavoidable within the RPA of a retained tree, fit for purpose ground protection must be in place which is sufficient to protect the structure of the soil from damage based on the heaviest anticipated load.

As set out in section 6.2.3.3 of BS5837:2012 the following ground protection measures will be appropriate:

- Suitable ground protection for pedestrian only access will comprise a single thickness of scaffold boards set on a compressible layer of 100mm of woodchip on a geotextile separation layer.
- Pedestrian operated plant up to two tonnes in weight would require the use of a proprietary ground protection system (such as Ground Guards or Eve Trakway or equivalent) set on a minimum depth of 150mm woodchip or sharp sand.
- Heavier loads will require ground protection to an engineering specification in conjunction with arboricultural advice.

As a guide the threshold beyond which root development is significantly affected is a bulk density ranging from 1.4g per cm³ for clay soils, to 1.75g per cm³ for sandy soils.

Tree protective measures shall stay in place until all construction operations are completed and removal is agreed with the Site arboriculturist and/or the Local Authority Tree Officer as appropriate.

F.3 General guidance for the management of exposed roots

Excavation must only take place within the RPA of a retained tree with the prior agreement of an arboriculturist and the Local Authority Tree Officer. All excavation must be undertaken using hand tools or compressed air (such as an air spade).

The following general principles will apply:

- Individual or small groups of roots less than 25mm in diameter will be retained where possible but can be severed with a sharp tool such as secateurs or pruning saws to leave a clean cut end (ideally 100mm back from the face of the excavation to account for future regrowth) where they pose an obstruction.
- Where roots are encountered which are larger than 25mm in diameter or where significant groups of smaller roots are found, the advice of an arboriculturist must be sought to decide an appropriate course of action (following consultation with the Local Authority Tree Officer where appropriate).
- Roots must only be exposed for the minimum period possible. In the interim period any exposed roots must be completely covered with dampened hessian sacking (which may require ongoing re wetting) to avoid drying out and exposure to light (which can result in the death of roots). Backfill for excavations should utilise the parent material and must not be significantly compacted.

F.4 Storage, use and mixing of materials

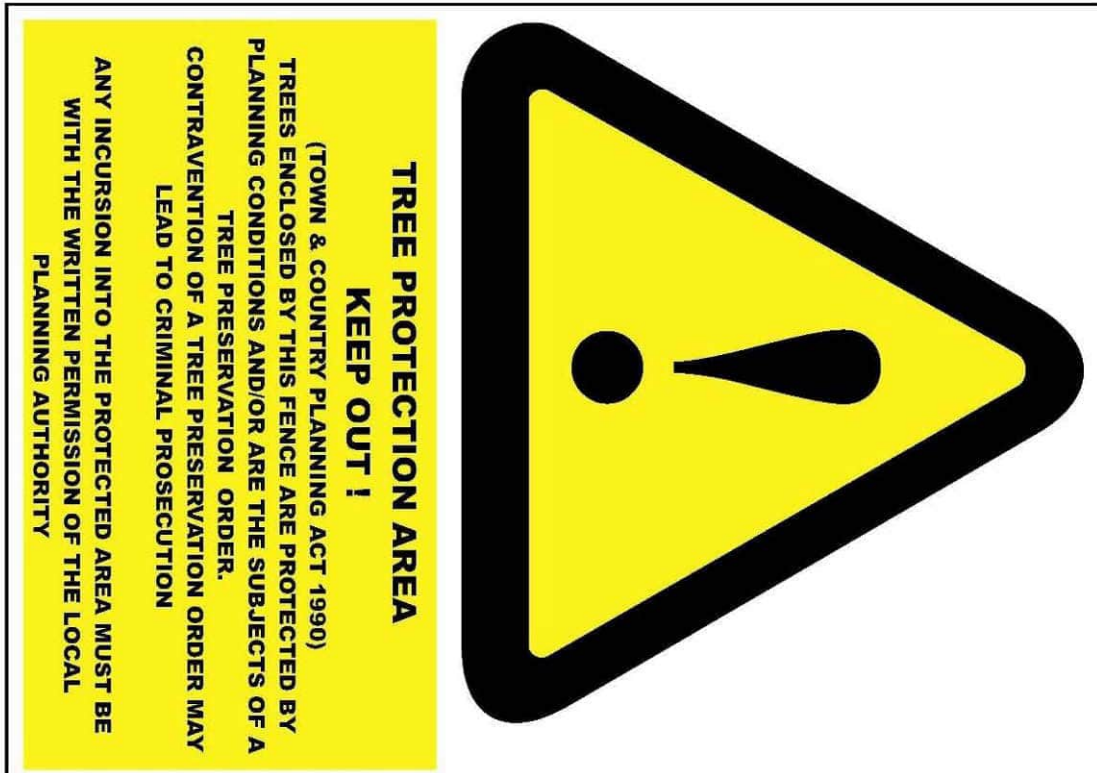
The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides), can result in the death of tree roots and beneficial soil organisms; and have a significant impact on the future health and appearance of trees.

The storage of materials can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

For these reasons the storage of materials and any washing, mixing or refuelling must take place in agreed allocated areas at least 10m from the edge of the RPA of retained trees.

Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.

Appendix G Tree Protection Signage (Example)



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