



Arboricultural Impact Assessment
Unit 6 Pacific Park, Wrexham
24th August 2020

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Executive Summary

- S.1. This report has been prepared by Tyler Grange Group on behalf of Unimaq Limited to accompany a planning submission for two new industrial units at land at Pacific Park, Wrexham (OS Grid Reference SJ 38521 49881), hereafter referred to as 'the site'.
- S.2. The report sets out the baseline findings of a BS5837 Tree Quality Survey and assesses the impact of the proposed development in relation to the existing surveyed tree stock.
- S.3. The site's tree cover comprises structure planting and road side trees to the site boundaries. Much of the surveyed tree cover has been left to naturalise in a developed context without active management. While some trees offer a degree of maturity and screening to the periphery of the site, none are considered to be of high arboricultural value (Category A) or of notable maturity. Several moderate value (Category B) trees and groups are present among lower value (Category C) trees.
- S.4. Landscape proposals (see **Appendix 5**) have been prepared to demonstrate how the site will be replanted in conjunction with the new development coming forward. The scheme shows how a layout can be designed around the principal south eastern boundary stock where possible, but would require the selected removal of a mixture of naturalised self-seeded tree cover to the roadside frontage to facilitate the proposed development.
- S.5. The proposed development requires the removal of 9no individual Category C trees, 9no Category B trees and approximately 60m² of young scrub and regenerative trees to the northern site boundary. The proposed tree removals are considered unavoidable due to direct conflicts with the proposed development but the landscape proposals demonstrate a suitable mitigation response which includes for the implementation of 18 new individual trees and 88m of new native hedgerows in conjunction with 182m² of new planting beds.
- S.6. It is recommended that a detailed Arboricultural Method Statement is prepared in accordance with a suitably worded pre-commencement planning condition to provide details in terms of protecting retained trees during the course of the proposed development.

Section 1: Introduction

- 1.1. This Arboricultural Impact Assessment (AIA) has been prepared by Tyler Grange Group Ltd (TG) on behalf of Unimaq Limited. It sets out the findings of a tree survey and associated assessment of development impacts in relation to a proposed industrial development comprising two new units and associated hardstanding / access at land at Pacific Park, Wrexham (OS Grid Reference SJ 38521 49881), hereafter referred to as 'the site'.
- 1.2. The purpose of this report is to:
 - Set out the findings of a baseline / pre-development tree survey of the site which has been undertaken in accordance with British Standard BS5837:2012 'Trees in Relation to Design, Demolition and Construction – Recommendations' (hereafter referred to as BS5837); and
 - Provide an assessment of the development layout / landscape proposals to ascertain the extent of tree removal works needed to accommodate the proposed layout, and the likely implications for development in relation to the retained tree cover within the site alongside a review of the mitigation response to inform the overall planning balance.

Section 2: Baseline Information

Site Description

- 2.1 The site extends to approximately 1ha and comprises an area of hardstanding and strips of grassland, shrub, and linear screening belts with scattered roadside tree planting. The site is located off Bridge Road North in Wrexham industrial estate to the east of Wrexham, just north of Pentre Maelor and is surrounded primarily by commercial buildings within the wider industrial estate. Scattered patches of grassland and ornamental structure planting.
- 2.2 Existing vegetation has been largely left to naturalise and comprises a mix of screening belts to the south east (G1, G2, G3) and scattered roadside trees with emergent regenerative scrub with younger scattered boundary trees to the north (G4). Some of the boundary roadside cover is more mature (T1, T2) with others more recently planted and / or self-seeded (T3, T4). All trees are influenced by the existing developed context with hard surfacing and disturbed ground present to the site-side rooting environments.

Tree Survey Summary

- 2.3 A full tree survey of the site was undertaken in June 2020.
- 2.4 The survey was completed in accordance with BS5837 and the methodology as detailed at **Appendix 2** to the rear of this report. In accordance with the above recommendations, the tree survey included all trees within / in influence of the site and the site boundaries that were over 75mm diameter at breast height (dbh).
- 2.5 Measured topographical survey data was used to inform the locations and surrounding context of the sites individual and groups of trees. Any trees not included within the topographical survey have been approximated using measurements taken during the tree survey and further informed by aerial photography.
- 2.6 A total of 4no. individual trees and 4no. groups of trees were identified during the tree survey of the site. The survey findings are illustrated on the **Tree Constraints Plan (TCP 13257/P02)** located at the rear of this report. The **TCP** shows the distribution of the trees surveyed together with details of their constraints to new development in accordance with BS5837, including:
- Tree Quality Gradings;¹
 - Root Protection Areas (RPA's);²
 - Tree canopy spreads;³

¹ The value of arboricultural features surveyed in accordance with the methodology set-out in Appendix 3.

² A 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. See further explanation at Appendix 3.

³ Dimensions of the trees crown spread and clearance from ground level. See further explanation at Appendix 3.

- Tree Shading.⁴

2.7 Findings for each of the trees surveyed are detailed in the **Tree Survey Schedule** (see **Appendix 4**). This provides a tabulated record of the trees surveyed, including reference numbers, species composition, tree dimensions, life stage, physiological and structural condition, and the arboricultural value of each survey entry.

Tree Grading Summary

- 2.8 The trees surveyed have been categorised using the 'cascade chart for tree quality assessment' (see **Appendix 3**) recommended by the BS5837. Grading subcategories (1, 2 and 3) are intended to reflect the arboricultural, landscape and cultural values, respectively. The grading system allows informed decisions to be made concerning the design and impact of potential development in relation to the arboricultural value of the trees surveyed.
- 2.9 Surveyed trees are predominantly Low Value (Category C) specimens with a number of Category B (Moderate Value / Quality) trees also present. No trees have been surveyed as 'Category A' (High Value / Quality) specimens.
- 2.10 Category B trees are denoted by a 'Blue' tree canopy outline as illustrated on the **TCP**.
- 2.11 This level of classification has often been assigned to trees which attract a higher collective rating than they might as individuals, particularly in terms of their visual appearance where contributing to a cohesive group of trees. Category B trees predominantly include specimens or groups with maturity and / or good future potential, whilst not representing a tree or groups of trees with notable or distinct arboricultural functions.
- 2.12 All remaining trees represent largely unremarkable examples of the species and are classed as Category C specimens. Category C trees are trees represent trees of low arboricultural quality and value. Category C trees are denoted by a Grey tree canopy outline as illustrated on the **TCP**. These provide limited or transient benefits in the existing site context which may be readily replaced. The integration of Category C trees into the design has been recognised as important where practicable as they contribute to the overall tree cover within the site vicinity, nonetheless, they are of less priority for retention, particularly where their removal benefits to the retention of Category B tree cover.

Tree Preservation Orders

- 2.13 Wrexham Borough Council have confirmed via email on 24th August 2020 that no Tree Preservation Orders (TPOs) are present on or within influence of the site.
- 2.14 The site does not lie within a Conservation Area

⁴ Shade cast by existing trees which may affect the availability of sunlight and daylight within a new development. See further explanation at Appendix 3.

Section 3: Arboricultural Impact Assessment

- 3.1. This Arboricultural Impact Assessment has been undertaken to set out the required tree losses and impacts in response to the development proposals prepared by Pace Architecture.
- 3.2. The assessment is informed by a composite of the tree survey findings and the proposed layout drawings with the tree losses described below.

Tree Retention and Removal

- 3.3. In accordance with BS5837, the tree losses required to implement the proposed layout are illustrated on the **Tree Retention and Removal Plan (Ref. 13257/P03) (TRRP)** located to the rear of this report and this is also listed in the table below.

Tree Number / Grading Category	Description of Tree Loss
G1 (Category C)	Removal of a stand of young south eastern boundary Ash trees due to direct conflicts with development footprint of the southernmost on-site unit within the RPAs.
G2 (Category B)	The proximity of the proposed turning head and extent of new hardstanding within the RPAs and canopy line requires the removal of this tree group.
G3 (Category B) (partial)	Removal of a single lower value tree to the northern corner of the group due to direct conflicts with the northern on-site unit and associated external hard-surfacing. The site-side canopy of the larger northernmost Sycamore within the group will be reduced by 3.5m to achieve a suitable clearance from the northernmost unit. Ground works along the site-side RPA will also require a sensitive construction methodology utilising manual excavation techniques (hand tool working) to ensure that any identified tree roots can be safeguarded and appropriately addressed. Where the northernmost unit conflicts with the RPA of the northern Sycamore, this may also require the use of spot pile or bridging foundations to protect any significant tree roots which are encountered.
G4 (Category C) (partial)	Removal of approximately 60m ² of young scrub and regenerative trees to the northern site boundary to achieve a suitable clearance in relation to the northern unit and associated hard-surfacing along the northern edge of the new building.
T1 and T2 (Category B)	Removal of western boundary roadside tree cover as a result of direct conflicts with the northernmost unit and proposed site access arrangement. A landscape proposals plan is included at Appendix 5 to the rear of this report to illustrate the mitigation response resulting from the proposed removal of Category B and C tree stock on-site.
T3 and T4 (Category C)	

Table 3.1. Extent of Tree Losses Required to Implement Scheme Proposals

Works within Root Protection Areas

- 3.4. Construction of the northern unit foundations incurs within the RPA of a larger Sycamore within G3 at the north eastern corner of the site. This is a moderate value specimen and monitored manual excavation will be required within the RPA to determine the extent of the rooting volume to inform any specific foundation design measures to bridge or spot pile around any roots which are required to be retained to ensure the long term retention of the tree.
- 3.5. A detailed and sensitive construction methodology will be required, outlining how contractors will deal with any significant roots found during initial air-spading / hand tool exploratory excavation works, including the possibility of pruning minor roots deemed acceptable by an appointed arboricultural consultant who will be required to monitor such works under a specific clerk of works.
- 3.6. The building footprint incursion into the RPA of the G3 Sycamore amounts to approximately 16% of the RPA. As stated above, flexibility will be required in terms of the buildings final foundation design (bridging foundations or similar, for example) if exploratory excavation works indicate the presence of significant tree roots which cannot be severed if the tree is to be retained. Should significant roots be located during initial excavation works that are unavoidable the arboricultural clerk of works will advise on the suitability for retaining the tree. If the tree cannot be safely retained, then replacement options will have to be explored.
- 3.7. Tree Protection Measures will also be required during the construction phase, including protective fencing for the canopy and tree stem of all retained trees and hedgerows. Track-mats or similar ground protection will be required to prevent soil compaction within the RPA and use of heavy machinery should be minimised near the RPAs. Given that existing hardstanding is present across many of the site-side RPAs this will serve to protect the root protection areas during construction where the existing sub-base can be left in situ.

Tree Pruning Works

- 3.8. If during the initial monitored excavation works and foundation design process described above it is deemed viable to retain the northernmost Sycamore within G3, the site-side canopy will need to be reduced to allow for construction space and future growth of the tree without causing a nuisance or structural damage to the building. It is advised that a site-side (eastern) lower to mid canopy reduction is undertaken to reduce the canopy by approximately 3 – 3.5m.

Construction Mitigation

- 3.9. As noted above, it will be necessary to demonstrate how the above and below ground structures of retained tree cover will be protected during the site preparation and construction phases of development in accordance with BS5837:2012. It is therefore recommended that a full Arboricultural Method Statement (AMS) is prepared as part of a reserved matters application, or to discharge applicable and suitably worded pre-commencement planning Conditions.
- 3.10. An AMS will set out a practical and robust strategy for the protection of retained trees for the site preparation, construction of the proposed access arrangement and the wider development works. The AMS scope would typically be agreed in writing with the LPA but is recommended to include:

- a schedule and specification of any tree works;
- specifications for barriers and ground protection;
- procedures for any specialist construction techniques and any supervised excavations within RPAs;
- phasing of work;
- an auditable system of site monitoring; and
- a Tree Protection Plan.

New Tree Planting Opportunities

- 3.11. The proposed development requires the removal of 9no individual Category C trees (T3, T4, approximately 6 trees from G1 and a single lower value specimen from G3), 9no Category B trees (including T1, T2 and approximately 7 trees from G2) and approximately 60m² of young scrub and regenerative trees to the northern site boundary (from G4). Notwithstanding the trees that will likely need to be removed to facilitate development, there is scope to maintain many of the trees across the eastern edge of the site, as this assessment demonstrates.
- 3.12. The proposed tree removals are considered unavoidable due to direct conflicts with the proposed development but the landscape proposals included at **Appendix 5** demonstrate a suitable mitigation response which includes for the implementation of 18 new individual trees and 88m of new native hedgerows in conjunction with 182m² of new planting beds. This will create a net-gain in tree and hedgerow numbers with scope for re-stocking the eastern boundary should gaps be created following the selected removal of identified boundary trees. With the proposals allowing for the provision of new planting across the scheme, this suggests that notable arboricultural benefits could be achieved through the delivery of the soft landscape elements of the development. No high value trees, veteran specimens, important hedgerows or ancient woodland will be impacted by the proposed development and with the quantum of new planting being provided, balanced against the extent and nature of the proposed vegetation to be removed as a result of the new development, it is considered that the development proposals are acceptable in arboricultural terms and in line with local policy objectives.

Appendix 1: Planning Policy Context

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National Planning Policy

- A1.1 Planning Policy Wales, Edition 10, (PPW10, December 2018) is the land use planning policy for Wales and should be taken into account when preparing development plans. It is supplemented by a series of Technical Advice Notes (TANs).
- A1.2 PPW10 Paragraph 6.4.24 states that *“Trees, woodlands, copses and hedgerows are of great importance for biodiversity. They are important connecting habitats for resilient ecological networks and make a valuable wider contribution to landscape character, sense of place, air quality, recreation and local climate moderation. They also play a vital role in tackling climate change by locking up carbon, and can provide shade and shelter, a sustainable energy source and building materials. The particular role, siting and design requirements of urban trees in providing health and well-being benefits to communities, now and in the future should be promoted as part of plan making and decision taking”*.
- A1.3 PPW10 Paragraph 6.4.25 adds that *“Planning authorities should protect trees, hedgerows, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial and identified green infrastructure function. Planning authorities should consider the importance of native woodland and valued trees, and should have regard, where appropriate, to local authority tree strategies or SPG. Permanent removal of woodland should only be permitted where it would achieve significant and clearly defined public benefits. Where woodland or trees are removed as part of a proposed scheme, developers will be expected to provide compensatory planting”*.
- A1.4 TAN 5 “Nature Conservation and Planning” (2009) addresses the role of the planning system in nature conservation stating at paragraph 1.6.1 that *“biodiversity conservation and enhancement is an integral part of planning for sustainable development”* noting that *“Development can also present significant opportunities to enhance wildlife habitats and the enjoyment and understanding of the natural heritage”*.
- A1.5 TAN 5 paragraph 3.3.2 states that local development plans should include policies that *“Protect ancient woodlands, veteran trees and other trees of nature conservation value”*, adding at Paragraph 4.6.2 that planning Conditions can *“enhance aspects of the natural heritage and its enjoyment”* by *“Requiring the protection and planting of trees”*.

Local Planning Policy

- A1.6 The site falls within the administrative borough of Wrexham. Wrexham County Borough Council (WCBC) planning policies are set out in the Unitary Development Plan (UDP) which was adopted in February 2005. It will be replaced by the Local Development Plan (LDP 2, 2013 – 2028), which is currently being prepared. A summary of WCBC’s local planning policies relating to arboricultural matters is provided below.

Wrexham Unitary Development Plan, adopted February 2005

A1.7 Policy PS2 states that:

“Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.”

A1.8 Policy EC4 (Hedgerows, Trees and Woodland) states that:

“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”.

Emerging Local Plan Policies: Wrexham Local Development Plan 2 (LDP2) 2013 to 2028 (Deposit Plan March 2018)

A1.9 Wrexham County Borough Council is preparing the Local Development Plan (LDP) which will replace the current adopted UDP. The LDP will be a long-term land use and development strategy focused on achieving sustainable development and will guide development for housing, employment, retail and other uses, set out policies that will be used to decide planning applications and safeguard areas of land requiring protection or enhancement.

A1.10 Policy SP13: Design Principles & Masterplanning Framework states that:

“All development will be required to be of a high quality, sustainable design which makes a positive contribution to the creation of locally distinctive places by ensuring compliance with the masterplanning framework and KSS schematics. Proposals must demonstrate how they have taken account of the local characteristics of surrounding areas and how innovative design solutions will enhance the quality of the built and natural environment”.

A1.11 Policy SP15: Natural Environment states that *“Development will only be supported where it protects conserves and enhances the natural environment including Natural landscape features such as trees, hedges and woodland and the green networks between them which contribute to the quality and diversity of the natural environment and play an important role in mitigating the impact of climate change”.*

A1.12 Policy SP20: Green Infrastructure states that *“Wrexham’s distinctive natural heritage provides a network of green and blue infrastructure. Protection, conservation and enhancement of natural heritage networks needs to be reconciled with the benefits of development”.*

A1.13 The policy adds that *“Development will be required to maintain or enhance the extent, quality and connectivity of the County Borough’s multi-functional green infrastructure network, and, where appropriate:*

- i. Create new interconnected areas of green infrastructure between the proposed site and the existing network,*
- ii. Fill gaps in the existing network to improve connectivity,*
- iii. Protect the features most valuable for both nature and people, and*
- iv. In instances where loss of green infrastructure is unavoidable, provide mitigation and compensation for the lost assets”.*

A1.14 Policy NE3: Trees, Woodlands and Hedgerows states that *“Development will only be permitted where it does not cause unacceptable harm to trees, woodlands and hedgerows of significant public amenity, natural or cultural heritage value or those that provide important ecosystem services including mitigating the effects of climate change”, adding that “Development affecting all existing and new proposed woodlands should:*

- Support proposals which assist in the respectful and appropriate use and protection of woodlands and boundary edges,*
- Promote sustainable management to deliver multiple benefits, and*
- Support the relevant aims and objectives of the Wrexham Tree & Woodland Strategy*
- 2016-2026 and all subsequent amendments.*

A1.15 The policy adds that *“Avoiding adverse or detrimental impact on trees, woodlands and hedgerows should be the primary objective of any proposal however, where adverse effects cannot justifiably be avoided and sustainable integration is not possible then adequate mitigation will be required. In such cases development should include proposals for the planting of new trees, woodlands, and hedgerows within the site, ensuring connectivity between proposed and existing green infrastructure”.*

Wrexham Tree and Woodland Strategy (2016 - 2026)

A1.16 The purpose of this strategy is to deliver the aims and objectives for trees and woodlands in the County Borough by:

- Providing a mechanism to improve the provision and care of trees in the County Borough;
- Ensuring that decisions and activities undertaken in relation to trees are made in a structured and consistent way; and
- Monitoring the action plan and policies for the care, management and enhancement of the County Borough’s tree population.

A1.17 The document sets out in detail the social, economic and environmental benefits of retaining and providing tree cover. The document promotes the use of larger trees and for increasing canopy coverage across the County Borough. The following objectives will ensure that the strategy’s overall aim is delivered:

Objective 1: Increase urban canopy cover relative to available planting space and aim to increase overall urban tree canopy cover to a minimum of 20% by 2026.

Objective 2: Ensure that the County Borough's tree population is healthy, varied in age and diverse in species.

Objective 3: Sustainably manage, protect and enhance the County Borough's tree population to maximise ecological, social and economic benefits.

Objective 4: Manage the risks to people, property and infrastructure from trees ensuring that they are as low as reasonably practicable, taking into account best practice, legal obligations and the costs of undertaking action in relation to the benefits that trees provide.

Objective 5: Appropriately manage and protect 'Trees of Special Interest' (ancient, veteran & notable trees) ensuring none within the control of the Council are lost due to preventable reasons.

Objective 6: Ensure sufficient data and resources are in place to enable the efficient and sustainable management of the County Borough's tree population.

Objective 7: Promote the value of trees and actively involve the community in the management, protection and enhancement of the County Borough's tree population.

Green Infrastructure Framework for North East Wales, Cheshire and Wirral – March 2011

- A1.18 This Framework was commissioned in 2010 by a partnership of local authorities and environmental agencies with responsibility for overseeing the planning and delivery of green infrastructure (GI) across North East Wales, Cheshire and the Wirral. The Framework considers the natural environment of Denbighshire, Flintshire, Wrexham, Cheshire West and Chester, Cheshire East and sets out a vision for how a healthy natural environment can help sustain economic growth and thriving self-supporting communities by highlighting opportunities for green infrastructure.
- A1.19 The Framework includes six long-term aims: 1. Create a setting for urban and rural prosperity, 2. Support and enhance the visitor experience and economy, 3. Build healthier communities, 4. Maintain and enhance quality of place, 5. Ensure urban and rural areas are resilient to the effects of climate change, 6. Protect and enhance biodiversity and natural networks, providing opportunity for people to experience the natural environment.

Woodlands for Wales (2009)

- A1.20 Woodland for Wales is the Welsh Government's fifty year strategy for woodlands and trees in Wales and includes the following policies, amongst many others:
- Trees and woodlands to be used to enhance the quality of the environmental and in doing so, making a positive contribution to biodiversity, landscape and heritage and the reduction of other environmental pressures.
 - That woodlands and trees to be used more creatively in new developments and in the restoration of industrial sites to provide people with better quality, easily accessible green space.

Appendix 2: Tree Survey Methodology, Constraints, Mapping and Limitations

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Field Work

- A2.1 In accordance BS5837, the tree survey included all trees within / in influence of the site and the site boundaries that were over 75mm diameter at breast height (1.5m).
- A2.2 Measured topographical survey data (supplied by others) was used to inform tree locations their surrounding context. Any trees not identified on the topographical survey are prefixed with (*) and their locations have been approximated using measurements during the tree survey and further informed by aerial photography where required.
- A2.3 The trees surveyed were visually inspected from ground level only. No invasive investigations or climbing inspections were necessary to confirm visual or audible signs of defect or debility and no tissue or soil samples were undertaken. For further clarification please refer to the tree survey explanatory notes in below.

Tree Numbers

'T' prefixes have been used to identify individual trees and commence with 'T1'.

'G' prefixes have been used to identify groups of trees.

'H' prefixes have been used to identify hedgerows.

'W' prefixes have been used to identify woodlands.

Species

- A2.4 Species are listed by their common name, both in the schedule and in the report text.

Height and Stem Diameter

- A2.5 The stem diameter is measured at 1.5m above ground level and given in millimetres (mm). Tree heights are measured in metres (m) using a clinometer where access and land topography allowed. In instances where access to tree's stem and height measurements were not possible, the dimensions have been estimated by eye.

Crown Spread and Height of Crown Clearance

- A2.6 Radial crown spread is measured in metres and is listed for each of the four cardinal points where access has been possible to obtain a measurement. Where access was not possible to measure the spread of the canopy, such distances have been estimated by eye or informed by aerial photography.
- A2.7 The measured canopy shapes have been plotted on the **Tree Constraints Plan** at the four cardinal points. For groups of trees, the extent of the canopy has been measured as an average across the group and plotted using the topographical survey mapping. In some instances, Tyler Grange will use aerial photography to inform the canopy spread of larger tree groups and woodlands where topographical data is limited for such features.
- A2.8 The distance between the ground level and the first significant branch or radial tree crown, whichever is the lower, has been measured in metres.

Age Class

A2.9 The age of each tree is defined as follows:

Young - within the first third of reaching full maturity;

Semi-Mature - within the second third of reaching full maturity;

Early-Mature - within the last third of reaching full maturity;

Mature - specimen at full maturity; and

Veteran – tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Physiological and Structural Condition

A2.10 The physiological or structural condition of each tree is defined as either; good, fair, poor or dead. For each tree, where appropriate, notes on the structural integrity are provided on form, taper, forking habit, storm damage, decay, fungi, pests, etc.

A2.11 An assessment of a tree's physiological condition is defined as:

Good – fully functioning biological system showing expectant vitality for the species i.e. normal bud growth, leaf size, crown density and wound closure.

Fair – fully functioning biological system showing below average vitality i.e. reduced bud growth, smaller leaf size, lower crown density and reduced wound closure.

Poor – a biological system with limited functionality showing clear physiological decline, disease or significantly below average vitality i.e. limited bud growth, small and chlorotic leaves, low crown density and limited wound closure.

Dead – tree observed to fully dead with no living parts.

A2.12 An assessment of a tree's structural condition is defined as:

Good – no significant structural defects.

Fair – structural defects which could be alleviated through remedial tree surgery or arboricultural management practices

Poor – structural defects which cannot be alleviated through tree surgery or arboricultural management practices.

Tree Quality Gradings

A2.13 The value of trees have been assessed in accordance with the BS5837 Cascade Chart for Tree Quality Assessment (See **Appendix 3**). Grading subcategories (1, 2 and 3) reflect arboricultural, landscape and cultural values respectively.

Root Protection Areas

- A2.14 The **Tree Constraints Plan** shows the approximate extent of Root Protection Areas (RPAs). The RPAs have been plotted and calculated in accordance with the methodology set out in Appendices C and D of BS5837, using the tree stem diameter dimensions obtained during the site visit.
- A2.15 Plotted RPAs serve as a 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.
- A2.16 Where pre-existing site conditions or other factors indicate that rooting may occur asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution observed on-site. Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:
- a) the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures and underground apparatus);
 - b) topography and drainage;
 - c) the soil type and structure; and
 - d) the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.
- A2.17 The plotted RPAs have therefore informed the design of the proposed development where possible. While developing within RPAs should be avoided, special working methods can be adopted to alleviate the RPA disturbance for cases where the development is considered necessary and unavoidable.

Tree Canopies and Shading

- A2.18 The distribution of tree canopy cover on and within influence of the site is illustrated on the **TCP**. Canopies have been plotted at cardinal points for individual and groups of trees. The Tree Survey Schedule included at **Appendix 4** to the rear of this report lists the vertical clearance from site ground level to significant tree branching of individual trees. This measurement informs the impacts of accessibility and development beneath tree canopies.
- A2.19 The principal tree shadow constraints are shown on the **TCP** and have been plotted in accordance with BS5837 using the current height of surveyed trees. The indicative shade cast by existing surveyed trees signifies the area within which the amenity interests of shading, available daylight and the proximity of trees to any future site uses may be impacted upon should a tree be retained as part of development.
- A2.20 Where shading is unavoidable, the potential adverse impact of shadowing should also be reviewed on balance with the positive aspects of retaining a degree of canopy shade. BS5837:2012 (para. 5.3.4, a) NOTE 1) states that "shading can be desirable to reduce glare or excessive solar heating, or to provide comfort during hot weather. The combination of shading, wind speed/turbulence reduction and evapotranspiration effects of trees can be utilised in conjunction with the design of buildings and spaces to provide local microclimatic benefits".

Limitations

- A2.21 The comments made are based on observable factors present at the time of inspection. Although the health and stability of trees in their current context is an integral part of their suitability for retention, it must be understood that this report is not a tree risk assessment and should not be construed as such. While every attempt has been made to provide a realistic and accurate assessment of the trees' condition at the time of inspection, it may have not been appropriate, or possible, to view all parts or all sides of every tree to fulfil the assessment criteria of a risk assessment.
- A2.22 No tree can be considered entirely safe, given the possibility that exceptionally strong winds could damage or uproot even a mechanically 'perfect' specimen. It is therefore usually accepted that hazards are only recognisable from distinct defects or from other failure-prone characteristics of the tree or the site. An assessment of the potential influence of trees upon existing buildings or other structures resulting from the effects of trees upon shrinkable load-bearing soils or the effects of incremental root or branch growth, are specifically excluded from this report.

Un-assessable Risks

- A2.23 Any alteration to the application site or development proposals could change the current circumstances and may invalidate this report and any recommendations made.
- A2.24 The Wildlife and Countryside Act (WCA) 1981 (as amended) makes it an offence to disturb nesting birds or recklessly endanger a bat or its roost. Bats are also a European protected species and are additionally protected under the Conservation (Habitats & c) Regulations 1994 and 2010 (as amended). The survey findings, constraints, opportunities and design or mitigation recommendations included within that report must be read alongside this document.
- A2.25 A lack of recommended work does not imply that a tree does not pose an unacceptable level of risk and likewise, it should not be implied that a tree will present an acceptable level of risk following the completion of any recommended work.

Appendix 3: BS 5837:2012 Cascade Chart for Tree Quality Assessment

Appendix 3: BS 5837:2012 Cascade Chart for Tree Quality Assessment

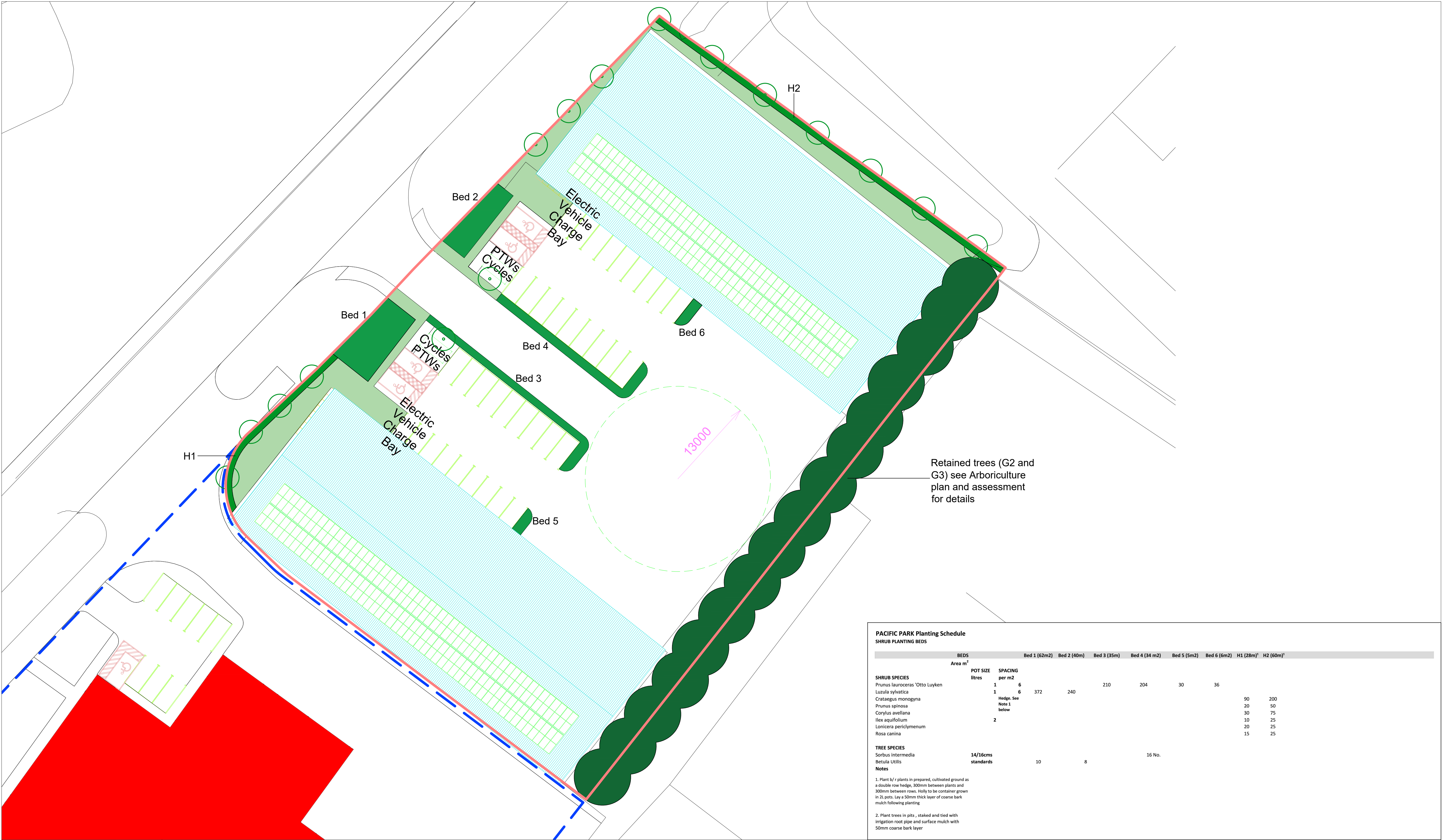
TREES FOR REMOVAL				
Category and Definition	Criteria			Identification on Plan
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning). Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. Trees infected with pathogens of significance to the health and/or safety of other trees nearby or very low-quality trees suppressing adjacent trees of better quality. (NOTE: Category U trees can have existing or potential conservation value which it might be desirable to preserve)			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
Category and Definition	Criteria - Subcategories			Identification on Plan
	1. Mainly Arboricultural Values	2. Mainly Landscape Values	3. Mainly Cultural Values, including Conservation	
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN

TREES TO BE CONSIDERED FOR RETENTION				
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remedial defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation.	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural benefits.	MID BLUE
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or temporary/transient landscape benefit.	Trees with no material conservation or other cultural value.	GREY

Appendix 4: Tree Survey Schedule

Tree Number	Common Species Name	Height (m)	Trunk Diameter (mm)	Crown Spread (m)				Height of Crown Clearance (m)	Age Class	Physiological Condition	Structural Condition	BS5837 Category	Comments/Preliminary Management Recommendations	RPA Radius	Root Protection Area (m2)
				N	S	E	W								
G1	Ash	5 - 6m	Mixed	1.5	1.5	1.5	1.5	1.8	Y	Good	Fair - Good	C.2	Stand of self-seeded / younger ash planting to southern site boundary. Hardstanding to north of stems, grass / scrubby mound to south. Mix of multitemmed and clear stem trees, typical form for age and context.	Refer to TCP	—
G2	Western Red Cedar	12m	Mixed	4.00	4.00	4.00	4.00	0	M	Fair	Fair - Good	B.1.2	Mature belt of southern boundary Cedar trees atop mounded bank. Structure planting providing screening function. Car parking to north. Minor lower canopy dieback and discoloration - selected thinning advised.	Refer to TCP	—
G3	Ash, Oak, Apple, Hawthorn, Goat Willow, Silver Birch, Alder, Lime, Sycamore	6 - 12m	Mixed			Mixed		0.00	Y - EM	Fair - Good	Fair - Good	B.1.2	Southern boundary structure planting. Mixed screening belt forming verdant enclosure. Collective value, with pockets of maturity, but largely younger trees of limited individual value and left to naturalise.	Refer to TCP	—
G4	Ash	2 - 6m	75	0.50	0.50	0.50	0.50	0.00	Y	Fair - Good	Fair	C.2	Eastern boundary scrubby trees, self seeded stock of limited value and maturity.	0.9m	—
T1	Ash	14m	490	4.00	5.00	5.00	5.00	1.50	M	Good	Fair - Good	B.1	North eastern boundary ash at base of mounded bund. Palisade fence line to east of stem. Dense G4 vegetation to lower crown. Roadside context.	5.88m	109
T2	Horse Chestnut	11m	400	4.00	5.00	6.00	5.00	0.00	M	Good	Fair - Good	B.1	High canopy roadside specimen. Slight conflict / eastern canopy suppression owing to proximity to T1, otherwise a well-rounded canopy with good vigour.	4.8m	72
T3	Ash	6m	2x80	2.00	2.50	2.50	0.50	0.00	Y	Fair - Good	Poor	C.1	Self-seeded northern boundary Ash. Unmanaged young tree suppressed by adjacent T4 ash.	1.4m	6
T4	Ash	9m	2x250, 2x100	3.00	3.00	3.00	3.00	0.00	EM	Fair - Good	Fair - Good	C.1	Northern boundary roadside planting. Multi-stem form. Conflicts with adjoining self-seeded T3, otherwise no significant issues.	4.6m	66

Appendix 5: Landscape Proposals (drawing no. PP20.1)



PACIFIC PARK Planting Schedule										
SHRUB PLANTING BEDS										
	BEDS		Bed 1 (62m2)	Bed 2 (40m)	Bed 3 (35m)	Bed 4 (34 m2)	Bed 5 (5m2)	Bed 6 (6m2)	H1 (28m)	H2 (60m)
	Area m ²									
SHRUB SPECIES	POT SIZE litres	SPACING per m2								
Prunus lauroceras 'Otto Luyken	1	6			210	204	30	36		
Luzula sylvatica	1	6	372	240					90	200
Crataegus monogyna	Hedge. See Note 1 below								20	50
Prunus spinosa									30	75
Corylus avellana									10	25
Ilex aquifolium	2								20	25
Lonicera periclymenum									15	25
Rosa canina										
TREE SPECIES										
Sorbus intermedia	14/16cms					16 No.				
Betula Utilis	standards		10	8						
Notes										
1. Plant b/ r plants in prepared, cultivated ground as a double row hedges, 300mm between plants and 300mm between rows. Holly to be container grown in 2l pots. Lay a 50mm thick layer of coarse bark mulch following planting										
2. Plant trees in pits , staked and tied with irrigation root pipe and surface mulch with 50mm coarse bark layer										

Do not scale from this drawing.

Verify all dimensions on site before commencing work. Any discrepancies should be reported without delay to Chris Burnett Associates.

Date	Details	Revision

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Landscape Proposals



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Landscape Architects

Client
Mr B De Jong

Project
Pacific Park

Scale 1:250 @ A1

Date
29.07.20

Drawn
HB

Checked
CB

Dwg No.
PP20.1

Revision



Plans

13257/P02: Tree Constraints Plan

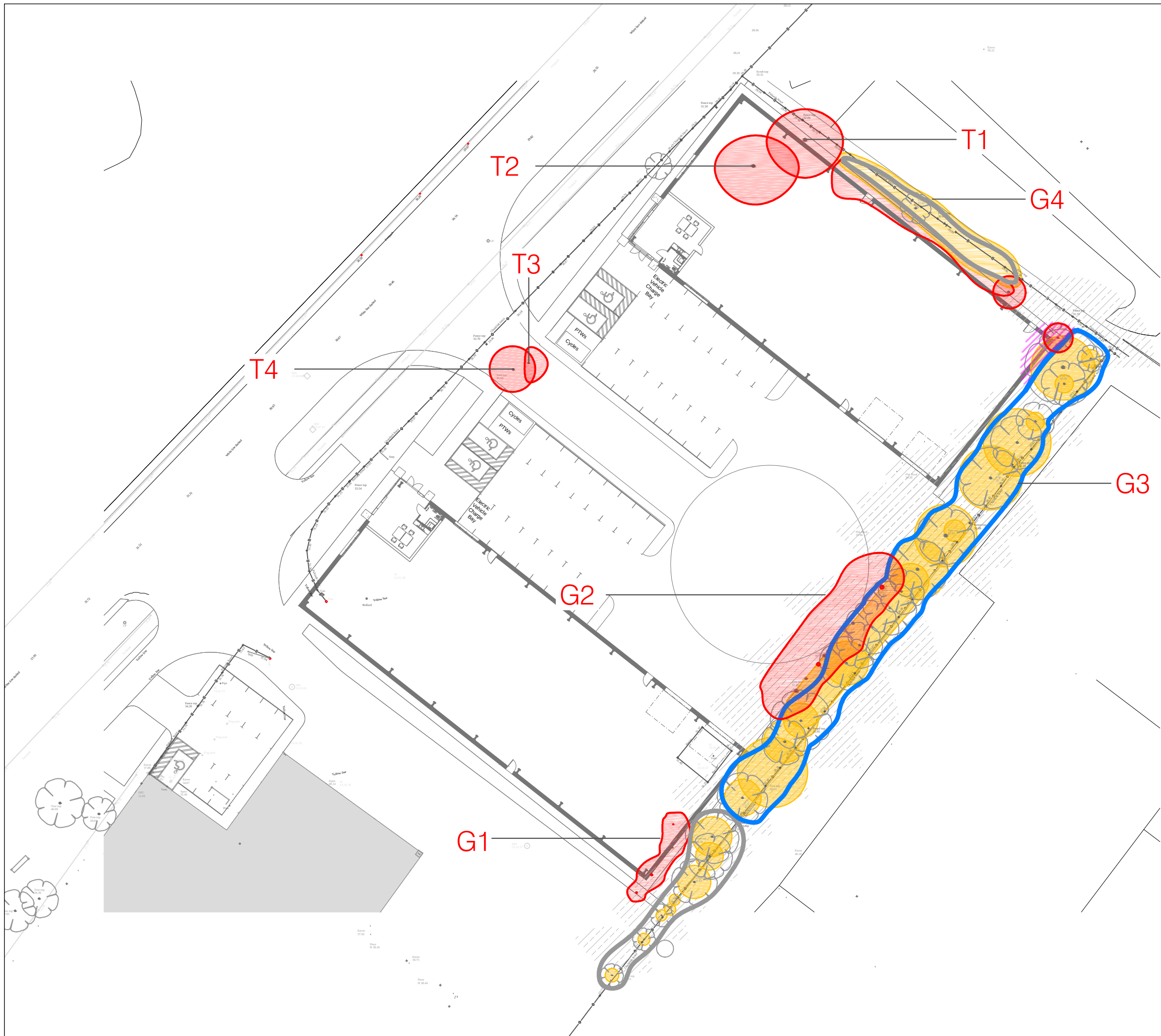
13257/P03: Tree Retention and Removal Plan



-  Category B - Trees of Moderate Quality and Value
-  Category C - Trees of Low Quality and Value
-  Approximate Extent of BS5837 Calculated Root Protection Areas (RPAs)
-  BS 5837 Calculated Tree Shadow Constraints

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Project	Unit 6, Pacific Park, Wrexham
Drawing No	13257/P02
Date	August 2020



-  Category B - Trees of Moderate Quality and Value
-  Category C - Trees of Low Quality and Value
-  Approximate Extent of BS5837 Calculated Root Protection Areas (RPAs)
-  BS 5837 Calculated Tree Shadow Constraints
-  Proposed tree removals
-  Site-side 3.5m canopy reduction works in relation to northernmost G3 Sycamore. Manual excavation works / sensitive construction and foundation design within RPA.



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Tree Retention and Removal Plan



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Project	Unit 6, Pacific Park, Wrexham
Drawing No	13257/P03
Date	August 2020



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