



Vauxhall Industrial Estate Arboricultural Impact Assessment

Report Ref: TEP.3068.002
June 2012

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Arboricultural Impact Assessment

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1.0 INTRODUCTION

- 1.1 TEP has been commissioned by NJL Consulting to conduct an arboricultural survey of land at Vauxhall Industrial Estate in Wrexham. This report details the arboricultural impact of developing the site, subsequent mitigation recommendations and protective measures.
- 1.2 The survey was carried out in June 2012 by means of inspection from ground level by a qualified Arboricultural Consultant. Trees were assessed in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.
- 1.3 Under the British Standard the assessment of trees is made objectively. The categorisation method identifies the quality and value of the existing tree stock.
- 1.4 A topographical survey was used to record the position of trees and vegetation (Ref: PMS11184). Where the age distribution and species mix of tree cover was relatively uniform, trees were plotted as groups. For the purposes of this report it is assumed that the detail on the drawing is accurate. A number of trees were not shown on the topographical surveys and therefore TEP's surveyor estimated their locations.
- 1.5 A total of T28 individual trees (T1-T28) and 8 groups of trees (G1-G8) were surveyed and mapped (refer to Drawing 1). All arboricultural information recorded during the survey is presented at Appendix 1.
- 1.6 The nature of the soils on site was not assessed during the survey. The possibility of minor soil movement due to tree root activity cannot be discounted. Prior to the undertaking of foundation depth calculations the exact location of all trees in relation to structures will be required.
- 1.7 This report provides the results of the survey and includes the following:
 - A schedule of all trees located on, or within influencing distance of the proposed development site (Appendix 1);
 - An assessment based on *BS 5837:2012*, of trees in terms of their potential value within any future development. On the basis of this assessment trees have been categorised into one of four categories: A, B, C or U (Appendices 1 & 2);
 - An assessment, based on *BS 5837:2012*, of the requirement for protection of trees during the construction phase (Section 6);
 - Advice on removal, retention and management of trees (Sections 5 & 7);
 - A Tree Constraints Plan detailing tree quality categories, canopy spreads and Root Protection Areas (**RPA**) for all trees surveyed (Drawing 1); and
 - A Tree Removal and Protection Plan detailing the development proposals, trees to be retained and removed, tree protection fencing alignment and Construction Exclusion Zones (**CEZ**) (Drawing 2).

2.0 THE SITE AND SURROUNDINGS

- 2.1 The site lies on the western side of Vauxhall Industrial Estate approximately 5km southwest of the centre of Wrexham. The small town of Ruabon lies approximately 1.5km to the south and Johnstown lies to the north. Land use to the east and west of the industrial estate is agricultural.
- 2.2 A large derelict industrial building currently occupies the majority of the site interior. The northern section of the site is on a slightly higher ground level and is occupied by grassland, trees and scrub. The western boundary is marked by Ruabon Road and contains a hedgerow, broadleaved trees and scrub regeneration.
- 2.3 It was raining heavily during the survey.
- 2.4 Inspection of trees was restricted in some cases by dense vegetation and ivy.

Development Proposals

- 2.5 The proposed development includes the construction of a new food store and a 322 bay car park. A new roundabout will be constructed on the access road in the northeast of the site.
- 2.6 Detail of the proposals is shown on Drawing 2 and is based on the proposed site plan (Ref: BS851_P_105 Rev C) supplied by AEW Architects.

3.0 STATUTORY PROTECTION AND GUIDANCE

National Planning Policy Framework (NPPF)

- 3.1 The NPPF assumes protection of all ancient woodland and veteran trees unless it can be clearly demonstrated that the need of, or benefits of, development outweigh the loss. In this respect ancient woodland is defined as an area which has been wooded continuously since at least 1600 AD and a veteran as a tree of exceptional value for wildlife, in the landscape, or culturally because of its great age, size or condition
- 3.2 On this site there are no ancient woodland or veteran trees.

Tree Preservation Orders & Conservation Area Designations

- 3.3 Where it is considered expedient to do so, local authorities reserve the right to create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in force, lopping, topping, felling, uprooting or wilful damage caused to a tree is prohibited and such actions may be prosecuted and incur an unlimited fine. Works to TPO protected trees must only be undertaken with the written consent of the local authority.
- 3.4 Wrexham County Borough Council confirmed that no trees on or immediately adjacent to the site were subject to Tree Preservation Orders or Conservation Area status.

Protected Species – Bats

- 3.5 Mature trees often contain cavities, crevices and hollows which are a potential habitat for roosting bats. Bats are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010, and as such causing damage to a bat roost constitutes an offence.
- 3.6 A preliminary ground level appraisal of the wildlife habitat value of each tree was undertaken as part of the arboricultural survey. No trees were noted as having features suitable to support roosting bats.
- 3.7 Should the presence of a bat roost be suspected whilst undertaking works on any other trees and groups on site, operations must be halted until a licensed bat handler or ecologist can provide advice.

Protected Species - Birds

- 3.8 Trees are a potential habitat for nesting birds, which (as well as their nests and eggs) are protected under the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly, damage or destroy an active birds nest or any part thereof.
- 3.9 Due to the suitability of the trees within the survey boundary for nesting birds, all tree work should ideally be undertaken outside the bird nesting season (British bird nesting season: March to August inclusive).

- 3.10 If this is not possible then a detailed inspection of each tree should be undertaken by a qualified ecologist immediately prior to the arboricultural works. Should an active nest be found (being built, containing eggs or chicks) then any work likely to affect the nest must be halted and a working boundary of 5m left intact around the nest until the nest becomes inactive.

4.0 TREE POPULATION

- 4.1 28 individual trees (T1-T28) and 8 groups of trees (G1-G8) were recorded within influencing distance of the site. A schedule of all trees and groups in terms of species, condition, age, management recommendations and BS 5837:2012 quality categories is provided at Appendix 1.
- 4.2 The most notable area of tree cover is in the northern section of the site which ranges from low value natural regeneration to moderate value individuals. The most numerous species present here are Scots pine, Norway maple and rowan. Trees T1 (middle aged pine) and T5, T6, T14 and T15 (middle aged Norway maple) are of moderate arboricultural merit and display reasonable form and physiological condition. The remaining trees in this area are in fair to poor condition with structural and/or physiological defects. Tree T4 (middle aged Scots pine) has suffered root plate failure and currently showing regrowth from its main stem of up to 3m.
- 4.3 Trees T16, T17 and T18 and group G4 are middle aged hybrid poplar on the western site boundary. They are generally vigorous and with the exception of one tree which has had its' upper leading stem removed are of reasonable form. Overhead electricity lines run directly adjacent the western side of the group.
- 4.4 Groups G5, G6 and G7 are situated at the south western and southern peripheries of the site. They comprise vigorous natural tree and shrub regeneration with birch, ash, sycamore, hawthorn and goat willow being the most abundant species.
- 4.5 Trees T19 to T28 (cherry plum and ornamental cherry species) are formal roadside plantings along the access roads in the north and east of the site. They vary in condition from poor to good with a number of minor to moderate defects noted such as root girdling, weak branch attachments and previous failures. The ornamental cherry trees all have notable defoliating insect infestations. The majority of these roadside trees have reasonable landscape merit, especially those adjacent the main access road to the industrial estate.
- 4.6 Tree and group locations, their quality categories and canopy spreads are shown on Drawing 1.

Tree Quality Categorisation

- 4.7 Under BS 5837:2012 *Trees in relation to design, demolition and construction – Recommendations* trees and groups are objectively assigned a quality category designed to quantify their value within any future development. Table 1 (overleaf) presents a summary of the categories presented in the British Standard. The full table has been reproduced at Appendix 2.
- 4.8 Hedgerows have not been afforded a quality value as they do not fall within the scope of BS 5837:2012

Table 1: Summary of BS 5837:2012 tree quality categorisation criteria

Category A	Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value
Category B	Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value
Category C	Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits
Category U	Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infection pathogens that threaten other trees

5.0 IMPACTS OF THE PROPOSED DEVELOPMENT

- 5.1 Table 2 lists the number and quality of trees that will require removal in order to facilitate the development proposals and those that can be retained. This is the result of an assessment based on the proposed site plan and discussions with the client regarding their application strategy.

Table 2: Arboricultural implications of the proposed development

	Tree Quality Category				Hedge
	A	B	C	U	
Trees, groups and hedges that can be retained	-	T19, T24, T25, T26, T27, T28	T20, T21, T22, T23, G6	T4	H1 (part)
TOTAL	-	6	5	1	1 (part)
Trees, groups and hedges that require removal	-	T1, T5, T6, T14, T15, T16, T17, T18	T2, T3, T7, T8, T9, T10, T11, T12, T13, G1, G2, G3, G4, G5, G7, G8	-	H1 (part)
TOTAL	-	8	16	-	1 (part)

See Appendix 1, Arboricultural Data Sheets for subcategories

- 5.2 17 individual trees and 7 tree groups must be removed to facilitate the development proposals. This includes all trees that lie within the fence line of the existing industrial unit and all those located within the grass/scrubland in the north of the site. The majority of these trees lie within the footprint of the proposed development and are of low value.
- 5.3 Approximately 41 linear metres of hedgerow must be removed to facilitate the development proposals.

- 5.4 Trees T14 to T18 and group G4 are located on a higher ground level to the proposed car park. Construction of the car park will require abrupt ground level changes in close proximity to these trees. Their removal is therefore necessary as they would suffer considerable root loss as a result of this development.
- 5.5 All roadside ornamental trees may be retained with suitable protection during construction.
- 5.6 Concrete hard standing is proposed within the rooting area of third party trees (group G6). This is deemed to be achievable due to the extent of impervious surfacing and ground compaction already present in this location. The breaking-out of hard-surfacing and the excavation of material will need to be conducted in a sensitive and controlled manner.
- 5.7 Where planning permission is granted, the retention schedule shown in Table 2 and Drawing 2 would normally form a part of that permission. Any change to this schedule would therefore be likely to require an application to vary the consent.

6.0 TREE PROTECTION REQUIREMENTS

Root Protection Areas

- 6.1 As per *BS 5837:2012*, the **Root Protection Area (RPA)** is calculated using each tree's diameter at 1.5 metres (refer to Appendix 1) and represents the minimum area around each tree that must be left undisturbed to ensure their survival.
- 6.2 Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present. The majority of tree roots are found in the top 600 mm of soil and most of the fine roots that absorb water and nutrients are found in the top 100 mm.
- 6.3 The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in their extent and the **RPA** may not be a circular area centred on the tree stem.
- 6.4 The **RPA** may be adjusted or offset to most accurately represent the likely spread of roots for each individual tree (refer to Drawing 1).

Protective Fencing and Exclusion Zones

- 6.5 Due to their position outside the main construction area, tree protective fencing is not deemed necessary around the majority of retained trees provided that site hoarding is secured up to, and not beyond, the existing footpath. Site fencing/hoarding will serve to protect the **RPAs** and above ground parts of retained trees during demolition and construction.
- 6.6 Protective fencing around trees T23 and T24 will be required to demarcate a Construction Exclusion Zone (**CEZ**) during construction of the mini-roundabout. This will be to ensure grass verges within the RPAs remain undisturbed.
- 6.7 Protective fencing alignment is shown on Drawing 2.
- 6.8 The fencing must be fixed into the ground to withstand accidental impact from machinery and to ensure that a sufficient protective area is maintained. Details of recommended protective fencing are shown on Drawing 3.
- 6.9 A weatherproof notice stating 'Construction Exclusion Zone – Keep Out' must be fixed to each fencing panel. An example notice is shown on Drawing 3.
- 6.10 Any alteration to the fencing alignment to allow for approved activities will be made in agreement with the council's Arboricultural Officer.
- 6.11 The protective fencing must not be removed until the physical construction phase has been completed and all vehicles have been removed from site, to the satisfaction of the council's Arboricultural Officer.

Hard-standing Removal

- 6.12 Within the RPA of group G6 (see Drawing 1) existing surfacing should be removed by using handtools where practicable, working backwards over the area. Heavy plant movement should be restricted over exposed sub-courses. Roots less than 25mm may be pruned back using hand tools (hand saws, secateurs). No roots greater than 25mm should be removed without prior consultation with an Arboricultural Consultant.

Ground Contamination

- 6.13 Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any trees on or within proximity to the site due to the risk of soil contamination caused by accidental spillage.
- 6.14 Particular care must be taken when working on or close to sloping ground to avoid unintentional runoff into the rooting area of retained trees.

Ground Level Changes

- 6.15 A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment.
- 6.16 Existing ground levels in proximity (within RPAs) to retained trees should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

7.0 MANAGEMENT RECOMMENDATIONS

Tree Work

- 7.1 It is recommended that the majority of hedge H1 is retained and incorporated into the new development. The hedge has lapsed through a recent lack of maintenance and will require pruning back to more appropriate dimensions. It is recommended that a height of 1.5m and a width of 1m is achieved.
- 7.2 Trees located adjacent the southern boundary (G6) are on third party land but overhang the site in several places. It is recommended that pruning works take place to reduce overhanging vegetation. Cutting back vegetation flush to the boundary fence may be detrimental to the health and form of trees and should be avoided. Reduction methods in accordance with *BS 3998:2010 Tree work – Recommendations* should be adopted and carried out by a qualified contractor.
- 7.3 All tree surgery work should be discussed and agreed with the relevant landowner prior to implementation.

Pre-start Site Meeting

- 7.4 To reinforce the required tree protection measures and avoid the requirement for ongoing arboricultural supervision a pre-start meeting should be arranged between the site contractor, a qualified Arboricultural Consultant and the council's Arboricultural Officer.
- 7.5 During the meeting the alignment of protective fencing will be marked out and any technical or logistical issues discussed.

Mitigation for the removal of trees

- 7.6 17 individual trees and 7 groups of trees require removal to facilitate the development proposals. Mitigation for their loss and associated habitat may be required in the form of replacement tree planting.
- 7.7 There is sufficient peripheral space around the proposed car park layout to establish tree species of varying mature size. Suitable species for the western site border and northeast corner of the car park include silver birch, field maple, rowan, lime and oak.
- 7.8 Smaller species are recommended for the car park interior, including smaller ornamental maples and whitebeam.
- 7.9 It is recommended tree planting takes places along the narrow grass verges flanking the roadsides in the north and east of the site to supplement the tree cover that is to be retained. Species to consider include ornamental cherry, birch and walnut.
- 7.10 Aftercare is vital to the survival of newly planted trees. Provision should be made for a minimum of two years maintenance of newly planted trees and include watering, formative pruning and the checking of tree ties and stakes.

- 7.11 The National Planning Policy Framework (NPPF) is a material consideration in the planning process and promotes a presumption in favour of sustainable development. In terms of the natural environment, development should minimise impacts on biodiversity and provide a net gain in biodiversity where possible.
- 7.12 The extent of mitigation planting will ultimately be determined in agreement with Wrexham County Council.

Post Construction Tree Care

- 7.13 Hazard recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structure is constantly changing. Even those in good condition can suffer from damage or stress. Following site development, regular (annual or biennial) inspections of all retained trees should be undertaken by a qualified Arboricultural Consultant.

8.0 SUMMARY

- 8.1 Based on an objective assessment made in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, there are 14 Category B, 21 Category C and 1 Category U trees and groups on or within influencing distance of the site.
- 8.2 17 individual trees and 7 tree groups require removal to facilitate the development proposals. The majority of these are low value (Category C), refer to Table 2.
- 8.3 All roadside ornamental trees may be retained with suitable protection during construction.
- 8.4 At the time of the survey no trees within or immediately adjacent to the site were subject to Tree Preservation Orders or within a Conservation Area.
- 8.5 No trees found to have features of a size and condition desirable to bats and/or owls.
- 8.6 Due to their position outside the main construction area, tree protective fencing is not deemed necessary around the majority of retained trees provided that site hoarding is secured up to, and not beyond, the existing footpath.
- 8.7 Protective fencing around two trees will be required to demarcate a Construction Exclusion Zone (**CEZ**) around these trees during construction of the mini-roundabout. This will be to ensure grass verges around retained trees remain undisturbed.
- 8.8 It is recommended that the majority of hedge H1 is retained and reduced in height to 1.5m and width to 1m.
- 8.9 Trees located on third party land outside the southern boundary overhang the site in several places. It is recommended that pruning works take place to reduce overhanging vegetation.
- 8.10 The breaking-out of hard-surfacing and the excavation of material in this area will need to be conducted in a sensitive and controlled manner (see section 6).
- 8.11 Mitigation for the loss of trees, should it be a requirement, is recommended to take the form of replacement planting. There is sufficient peripheral space around the layout proposals to establish tree species of varying mature sizes.

APPENDIX 1

ARBORICULTURAL SURVEY DATA SHEETS

APPENDIX 1: Arboricultural Survey Data Sheets



Surveyor RNT
Date 18.06.12
Town Wrexham
Site Vauxhall Industrial Estate
Dwg Ref D3068.001

Ref	Species	Height	Stem Dia.	No. of stems/individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)

Trees

T1	Scots pine	11.0	480.0	1.0	4.0	3.0	4.5	2.5	1.0	W	Middle Age	Fair	Recent medium sized branch failures. Slightly Asymmetric crown weighted to the north. Minor stubs and dead wood in central crown. Dominant tree.	B,1	Refer to Drawing			Medium	
T2	Rowan	6.0	250.0	3.0	3.0	1.5	2.0	2.5	1.0	N	Middle Age	Fair	Scrubby, multi-stemmed form. Ivy-clad. Minor dead wood lower crown. Reasonable vitality.	C,1	Refer to Drawing			Medium	
T3	Scots pine	7.0	340.0	1.0	2.0	3.0	4.0	1.5	1.0	N	Middle Age	Fair	Poor form with abrupt bends in main stem. Stubs and broken branches in lower crown. Reasonable vitality.	C,1	Refer to Drawing			Medium	
T4	Scots pine	4.0	510.0	3.0	1.5	2.5	8.0	1.0	1.0	N	Middle Age	Poor	Roof plate previously failed. 'Phoenix' regeneration of moderate vigour.	U	Refer to Drawing			Medium	
T5	Norway maple	7.0	330.0	1.0	4.0	3.0	3.5	3.5	1.5	E	Middle Age	Good	Good form and vitality. No significant defects. String constricted some branches. Minor branch wounds.	B,1	Refer to Drawing			Long	
T6	Norway maple	9.0	410.0	1.0	3.5	4.0	4.5	2.0	1.0	E	Middle Age	Good	Asymmetric form weighted to the north. Ivy-clad. String constricting some branches. Good crown vitality.	B,1	Refer to Drawing			Long	
T7	Scots pine	8.0	470.0	1.0	3.0	3.0	4.5	2.0	1.0	N	Middle Age	Fair	Numerous medium sized branch failures. Poor form. Reduced vigour. Ivy-clad.	C,1	Refer to Drawing			Medium	
T8	Scots pine	7.0	300.0	1.0	2.0	3.0	3.0	2.0	1.0	N	Middle Age	Fair	Poor, asymmetric form. Reduced vigour.	C,1	Refer to Drawing			Medium	
T9	Scots pine	4.0	250.0	2.0	1.0	3.0	4.0	1.0	1.0	N	Middle Age	Fair	Asymmetric form heavily weighted to the north.	C,1	Refer to Drawing			Medium	
T10	Scots pine	9.0	520.0	1.0	3.0	4.0	5.0	3.0	1.0	W	Middle Age	Fair	Minor crossing limbs. Ivy-clad. Small broken branches. Stubs in lower crown. Reasonable vitality.	C,1	Refer to Drawing			Medium	
T11	Scots pine	10.0	700.0	3.0	3.5	4.0	5.0	4.0	1.0	N	Middle Age	Fair	Trifurcate at base. Partial root plate failure. Ivy-clad. Moderate dead wood and stubs in lower crown.	C,1	Refer to Drawing			Medium	
T12	Scots pine	11.0	470.0	1.0	3.5	3.0	3.5	4.0	1.0	W	Middle Age	Fair	Moderate recent branch failures. Trifurcate mid-stem.	C,1	Refer to Drawing			Medium	
T13	Rowan	6.0	220.0	4.0	2.5	2.5	2.5	2.5	1.0	W	Middle Age	Fair	Scrubby, multi-stemmed form. Densely ivy-clad.	C,1	Refer to Drawing			Medium	
T14	Norway maple	10.0	430.0	1.0	4.0	4.0	5.0	3.5	1.0	N	Middle Age	Good	Good crown vitality. Minor dead wood central crown. Slightly asymmetric crown due to T15.	B,1	Refer to Drawing			Long	

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Ref	Species	Height	Stem Dia.	No. of stems/individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)
T15	Norway maple	10.0	450.0	1.0	5.0	5.0	5.0	5.0	2.0	W	Middle Age	Good	Main stem dividing into 4 at 2.5m. Good vitality. Slightly asymmetric crown due to T14.	B,1	Refer to Drawing			Long	
T16	Hybrid poplar	18.0	670.0	1.0	5.5	3.0	5.0	5.5	2.0	W	Middle Age	Good	Large, vigorous and prominent tree. Ivy-clad lower stem. Minor asymmetric crown. Minor branch stubs in lower crown.	B,1,2	Refer to Drawing			Medium	
T17	Norway maple	7.0	260.0	1.0	2.5	2.5	3.0	3.0	2.0	N	Middle Age	Good	Bifurcate at 2.5m. Slightly asymmetric crown due to proximity to neighbouring poplars. No significant visible defects. Reasonable vitality.	B,1	Refer to Drawing			Long	
T18	Norway maple	14.0	430.0	2.0	3.5	3.5	4.0	3.5	1.0	N	Middle Age	Good	Bifurcate at base. Reasonable vitality. No significant visible defects. Tight stem union at base. Touching overhead power lines.	B,1	Refer to Drawing			Long	
T19	Cherry plum	5.0	220.0	1.0	3.0	3.0	3.0	2.5	1.5	E	Middle Age	Good	Reasonable form and vigour. Minor old stem wounds. No significant visible defects.	B,2	Refer to Drawing			Medium	
T20	Cherry species	5.0	230.0	1.0	3.0	2.5	3.0	1.5	2.0	E	Middle Age	Fair	Reduced crown vitality. Notable defoliating insect presence. Asymmetric crown.	C,1,2	Refer to Drawing			Medium	
T21	Cherry plum	3.0	120.0	1.0	1.5	2.0	2.5	1.5	2.0	S	Middle Age	Fair	Minor stem wounds. Dense crown. Crossing branches. Reasonable vitality. No significant visible defects.	C,1,2	Refer to Drawing			Medium	
T22	Cherry species	6.0	310.0	1.0	3.0	3.0	3.0	2.5	2.0	W	Middle Age	Fair	Medium sized branch failures. Split branch. Included bark at branch unions. Reduced crown vitality. Defoliating insect presence.	C,2	Refer to Drawing			Medium	
T23	Cherry plum	3.0	120.0	1.0	1.5	1.5	1.5	1.0	1.5	S	Middle Age	Poor	Broken hanging branches. Stem wounds. Moderate die-back throughout crown.	C,2	Refer to Drawing			Medium	
T24	Cherry species	6.0	280.0	1.0	2.0	2.0	3.0	2.0	2.0	N	Middle Age	Fair	Girdling root. Minor previous failure and stubs. Defoliating insects.	B,2	Refer to Drawing			Medium	
T25	Cherry plum	4.0	160.0	1.0	1.5	1.5	3.0	1.5	2.0	N	Middle Age	Fair	Sprouting at stem base. Reasonable crown vitality. Minor stem wounds.	B,2	Refer to Drawing			Medium	
T26	Cherry species	5.0	400.0	1.0	4.0	4.0	3.5	4.5	1.5	W	Middle Age	Fair	Broad crown. Stem decay and crossing branches. Reasonable crown vitality. Defoliating insects.	B,2	Refer to Drawing			Medium	
T27	Cherry plum	5.0	250.0	1.0	2.0	3.0	4.0	2.5	1.0	N	Middle Age	Fair	Dense crown. Reduced on road side. Minor stem lean to the north. Minor stem wounds and crossing branches.	B,2	Refer to Drawing			Medium	

APPENDIX 1: Arboricultural Survey Data Sheets

Ref	Species	Height	Stem Dia.	No. of stems/individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)
T28	Cherry species	6.0	330.0	1.0	3.0	3.0	3.0	3.0	2.5	N	Middle Age	Fair	Stem graft at 1.5m. Reasonable balanced form. Reduced vitality. Defoliating insects	B,2	Refer to Drawing			Medium	

Groups

G1	Rowan	to 6	to 330	14.0							Middle Age	Fair	Mainly multi-stemmed form. Reasonable crown vitality. Minor broken branches. No significant visible defects.	B,2	Refer to Drawing			Medium	
G2	Oak, rowan, Norway maple	to 4	to 140	4.0							Young	Fair	Young regeneration. Reasonable vigour. Generally poor form.	C,1	Refer to Drawing			Medium	
G3	Wych elm, rowan	to 6	to 180	15.0							Young to Middle Age	Fair	Several dead elms on road side. Some in good health. Dense and scrubby group.	C,1	Refer to Drawing			Medium	
G4	Hybrid poplar	to 10	to 300	4.0							Middle Age	Fair	Westernmost tree with previous top failure. Other three with reasonable form and vitality. No significant visible defects.	C,1	Refer to Drawing			Medium	
G5	Ash, goat willow, wych elm, sycamore, blackthorn, laurel, birch	to 8	to 200	20+							Young	Fair	Dense regeneration. Predominantly ash. Vigorous.	C,1	Refer to Drawing			Medium	
G6	Ash, sycamore, elm, birch	to 14	to 430	20+							Young to Middle Age	Fair	Dense regeneration. Mainly ash. Mainly situated outside site fenceline. Mainly multi-stemmed. Some trees growing through boundary fence.	C,1	Refer to Drawing			Medium	
G7	Birch, ash, buddleia	to 5	to 100	20+							Young	Fair	Dense regeneration growing through hardstanding alongside building.	C,1	Refer to Drawing			Medium	
G8	Hazel, hawthorn, birch, Scots pine, ash	to 7	to 270	20+							Young	Fair	Dense, neglected structure planting and regeneration. Vigorous.	C,1	Refer to Drawing			Medium	

Hedges

H1	Blackthorn	to 4	to 140								Middle Age	Good	Dense vigorous, continuous hedgerow. Encroaching on pavement		Refer to Drawing			Long	
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APPENDIX 2

SURVEY METHODOLOGY

APPENDIX 2: SURVEY METHOD

The survey of trees is conducted from ground level only. The nature of the soils on site is not assessed.

Trees are dynamic living organisms with a constantly changing structure; even trees in good condition can suffer from damage or stress. The information recorded is presented as being correct at the time of survey.

The following features of each tree, group of trees or wood may have been recorded in the Arboricultural Survey Data Sheets at Appendix 1.

Species	The common name is given. The Latin name may also be given if further clarification is required.	
Height	Top height of tree recorded in metres.	
Stem Diameter	For single-stemmed trees the measurement is taken at 1.5 metres above ground level and recorded in millimetres. For multi-stemmed trees an average all stems measured at 1.5m above ground level is used. For tree groups a range from minimum to maximum diameters is provided based on measurements taken using one of the aforementioned methods.	
No. of Stems	A count of stems arising below a height of 1.5 metres.	
Crown Spread	The N, S, E and W branch spreads are recorded in metres to provide a representative crown shape.	
Height of Lowest Branch	Crown clearance above ground level recorded in metres.	
Direction of Lowest Branch	The direction of growth of the first significant branch from the point of attachment.	
Maturity	Young	Trees than can reasonably be relocated or replaced like for like, without undue cost;
	Middle Age	Trees in the established growth stage of their life with the potential to continue increasing in size;
	Mature	Trees that have reached their ultimate size, given their location and surroundings;
Condition	Good, Fair, Poor. An overall assessment of a tree's physiological and structural state in which factors that may increase its susceptibility to the effects of development are taken into account. Veteran. Trees that are in such a condition as to significantly increase their biological, cultural or aesthetic value. This is characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.	
Comments	A brief evaluation and description of the tree with comments on form, vitality, health and any significant defects or symptoms of ill-health.	

BS 5837 Tree Quality Assessment

The tree quality assessment is based on Table 1 of BS 5837:2012 (See below). Four categories (A, B, C and U) are used to denote tree quality (A = High, B = Moderate, C = Low, U = Unsuitable for retention). Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category (the subcategories may be used in combination but do not accumulate collective weight).

Root Protection Area (RPA)

The RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m²) and as the radius of a circle (m) typically plotted from the centre of the stem.

The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.6 and Table D.1) and is based on a trees stem diameter. In some cases the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion.

Recommendations

Recommendations for arboricultural works, etc. are based on the **current** land use, and take into account the tree or group attributes without bias to the proposed development.

APPENDIX 2: SURVEY METHOD

Estimated Remaining

Contribution An estimation of the life expectancy as healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey.

Long	> 40 years
Medium	20 – 40 years
Short	less than 20 years

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
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 (e.g. 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 <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
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)	See Table 2
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 remediable 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 value	See Table 2
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 150 mm	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 only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

British Standards Institute 2012, p.9

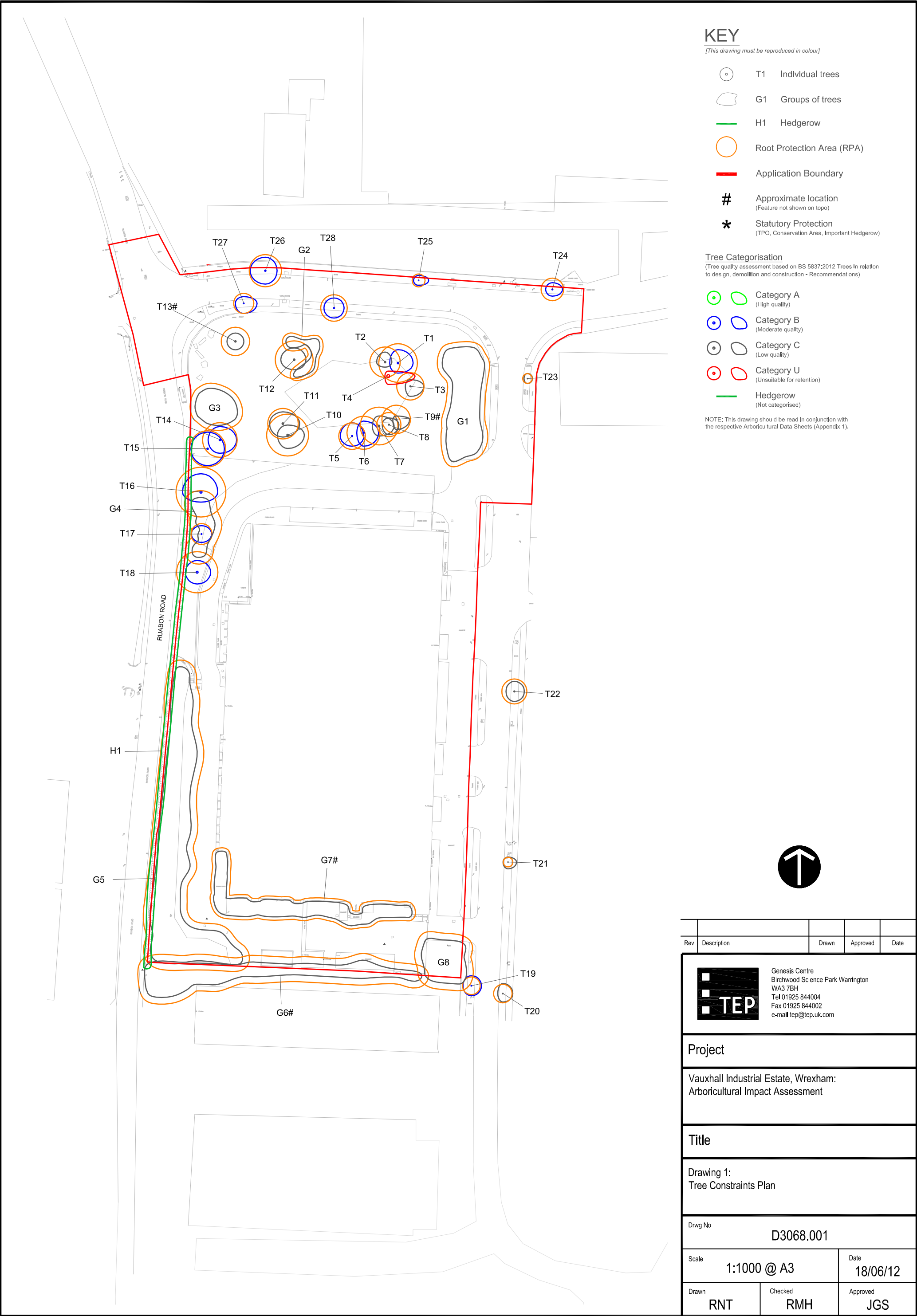
NOTES:

All young trees are assessed as quality category 'C' but this does not preclude their retention within a development.

For hedges the height, canopy spread and number of stems is recorded but they not assigned a quality category.

DRAWING 1

TREE CONSTRAINTS PLAN



KEY

[This drawing must be reproduced in colour]

- T1 Individual trees
- G1 Groups of trees
- H1 Hedgerow
- Root Protection Area (RPA)
- Application Boundary
- # Approximate location (Feature not shown on topo)
- * Statutory Protection (TPO, Conservation Area, Important Hedgerow)

Tree Categorisation
(Tree quality assessment based on BS 5837:2012 Trees In relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Unsuitable for retention)
- Hedgerow (Not categorised)

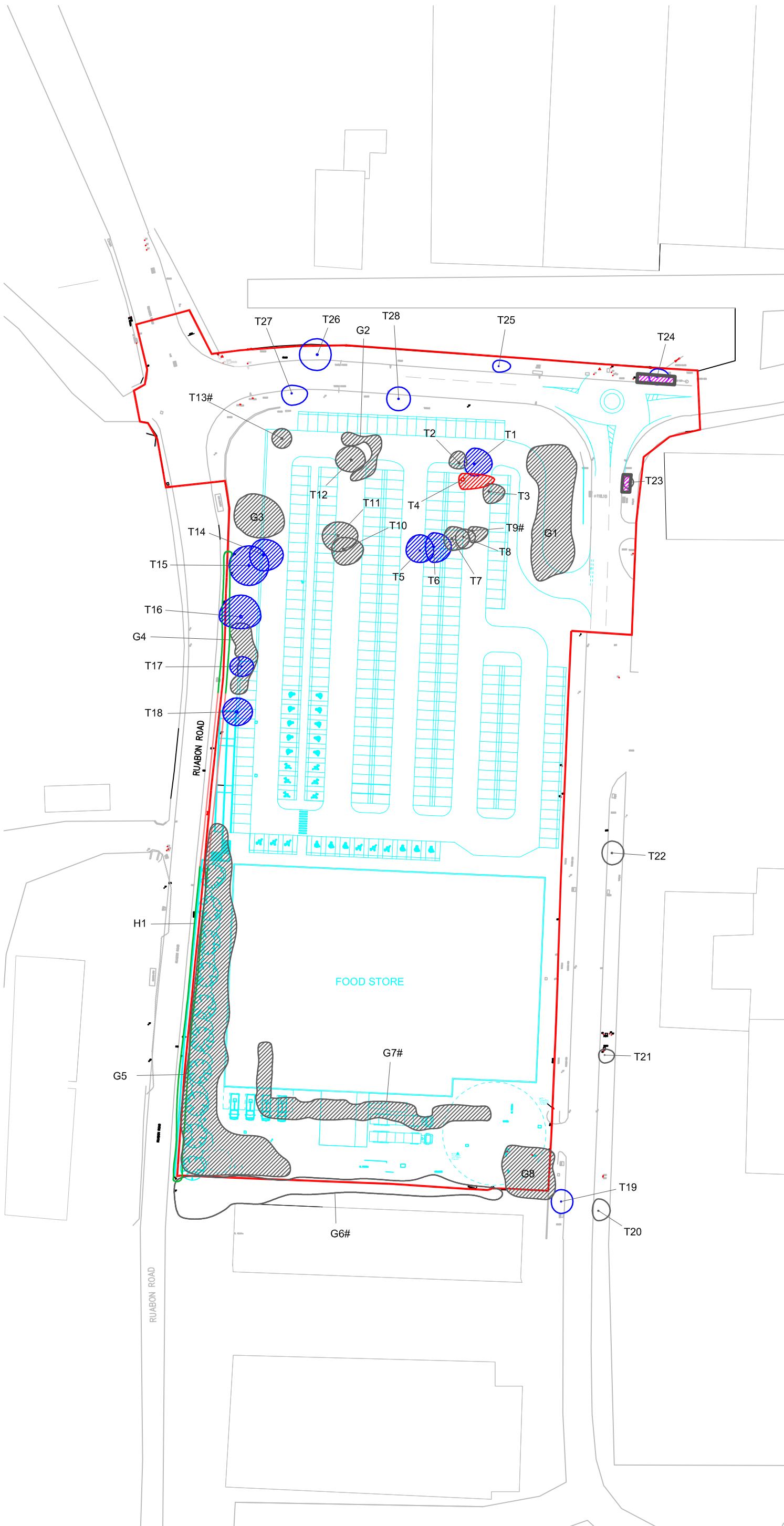
NOTE: This drawing should be read in conjunction with the respective Arboricultural Data Sheets (Appendix 1).



Rev	Description	Drawn	Approved	Date
TEP Genesis Centre Birchwood Science Park Warrington WA3 7BH Tel 01925 844004 Fax 01925 844002 e-mail tep@tep.uk.com				
Project				
Vauxhall Industrial Estate, Wrexham: Arboricultural Impact Assessment				
Title				
Drawing 1: Tree Constraints Plan				
Drwg No		D3068.001		
Scale		1:1000 @ A3		Date 18/06/12
Drawn	RNT	Checked	RMH	Approved JGS

DRAWING 2

TREE IMPLICATIONS AND PROTECTION PLAN



KEY

[This drawing must be reproduced in colour]

- T1 Individual trees
- G1 Groups of trees
- H1 Hedgerow
- Application boundary
- # Approximate location (Feature not shown on topo)
- Tree Protection Fencing (Must be installed prior to works commencing)
- Construction Exclusion Zone (CEZ)

Trees to be retained
(Tree quality assessment based on BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations)

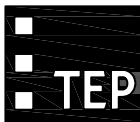
- Category B (Moderate quality)
- Category C (Low quality)

Trees to be removed

- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Unsuitable for retention)
- Hedgerow (Not categorised)

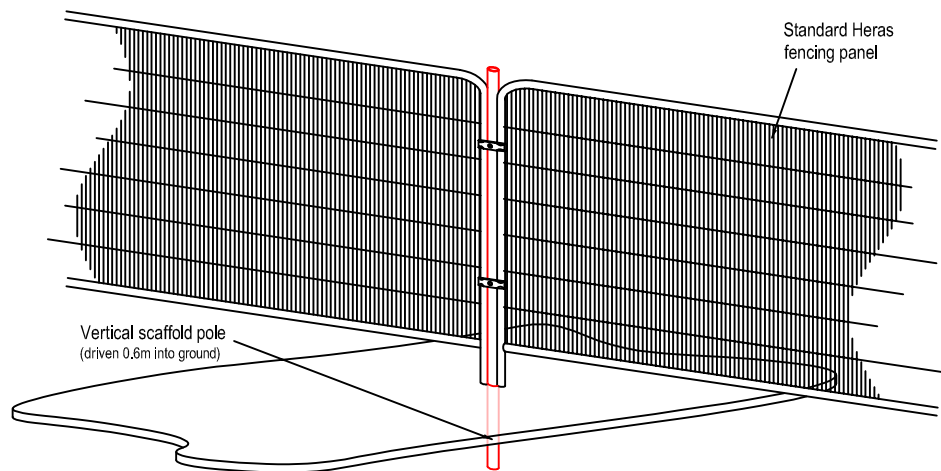
NOTE: This drawing should be read in conjunction with the respective Arboricultural Data Sheets (Appendix 1).



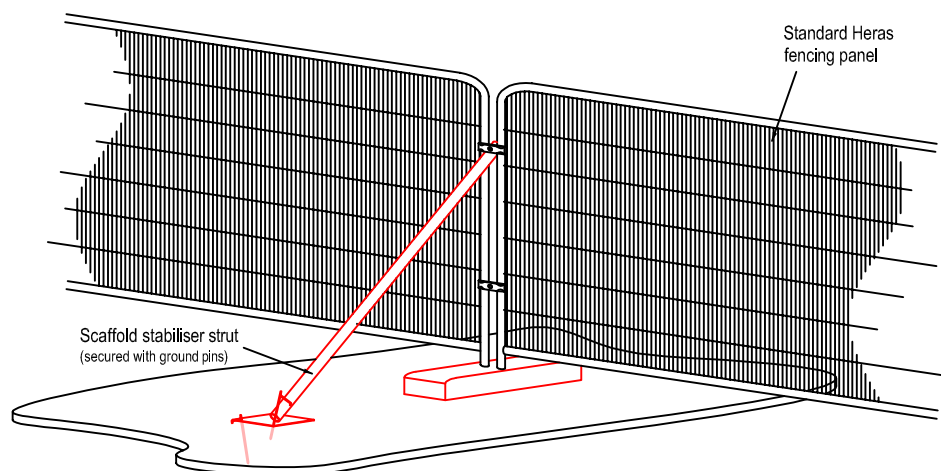
Rev	Description	Drawn	Approved	Date
		Genesis Centre Birchwood Science Park Warrington WA3 7BH Tel 01925 844004 Fax 01925 844002 e-mail tep@tep.uk.com		
Project				
Vauxhall Industrial Estate, Wrexham: Arboricultural Impact Assessment				
Title				
Drawing 2: Tree Removal and Protection Plan				
Drwg No		D3068.002		
Scale			Date	
1:1000 @ A3			22/06/12	
Drawn		Checked		Approved
RNT		ROS		JGS

DRAWING 3

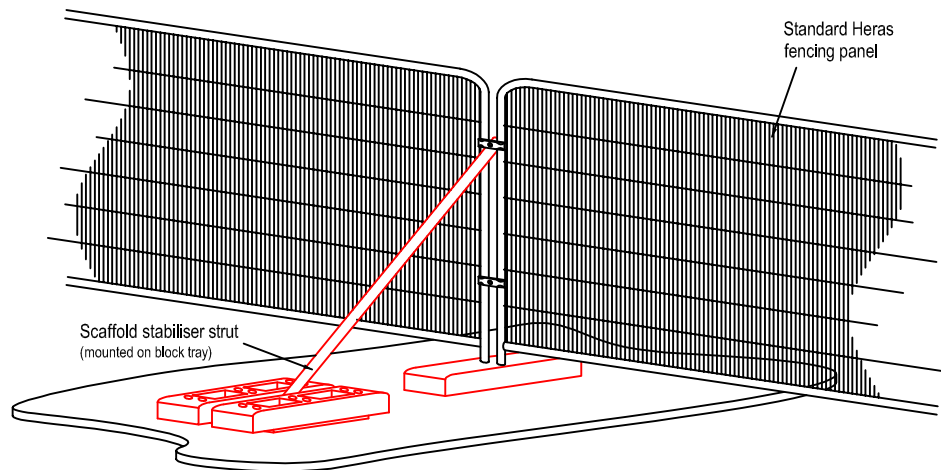
TEMPORARY TREE PROTECTION FENCING



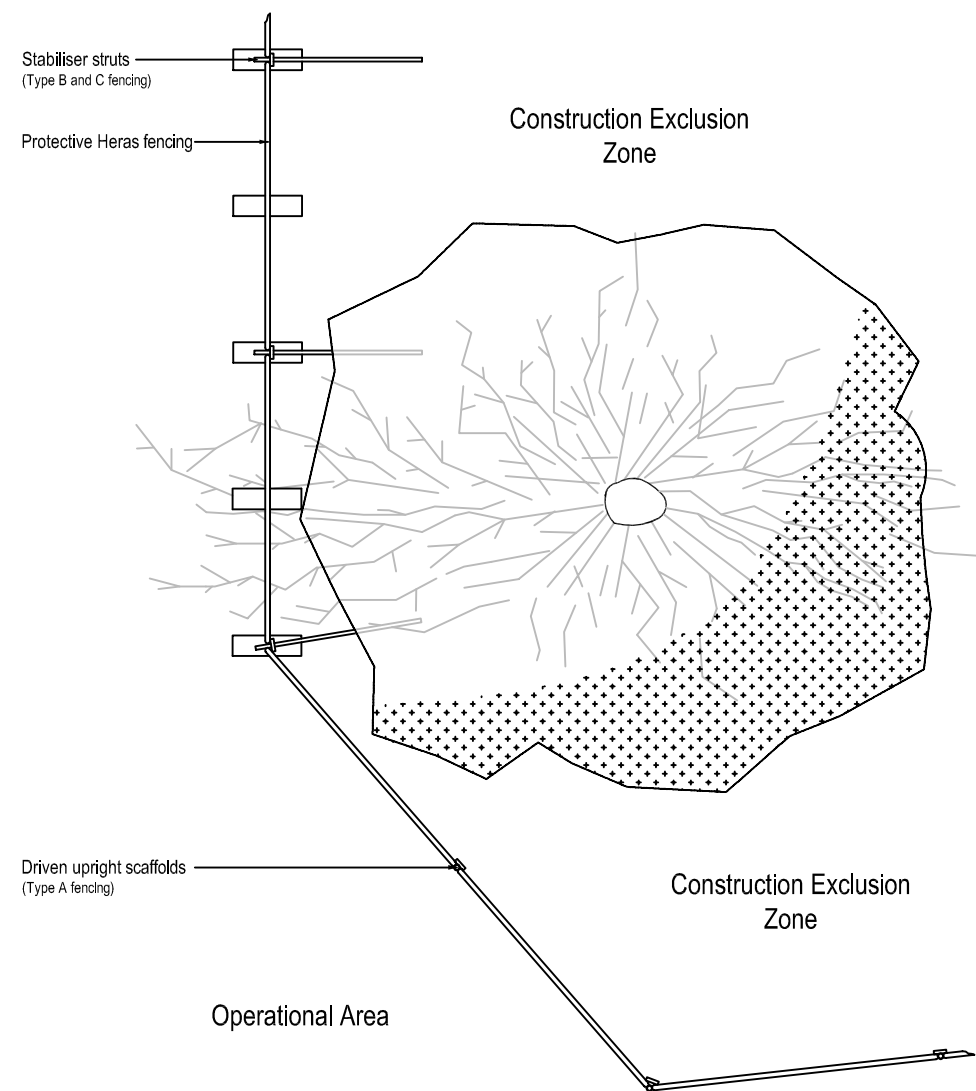
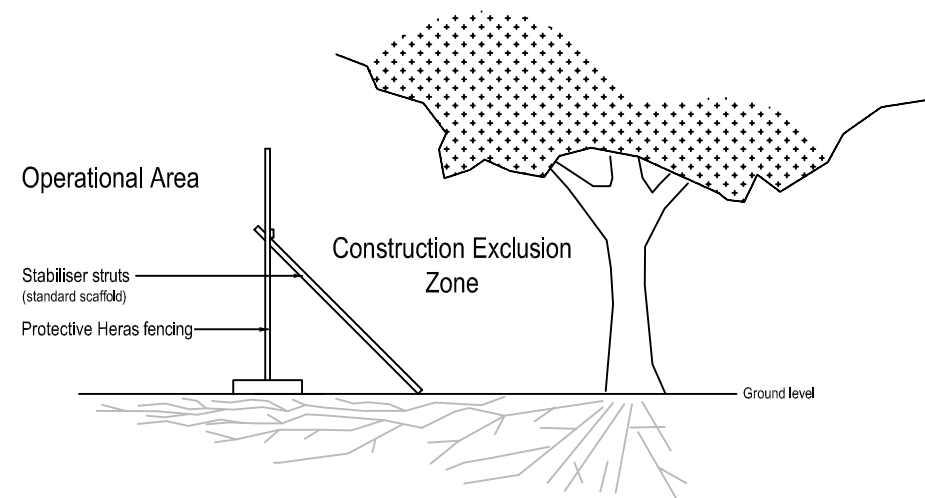
Type A Tree Protection Fencing: for use as standard
(see Tree Protection Plan for layout)



Type B Tree Protection Fencing: for use as directed
(e.g. where Type A would cause unacceptable damage to roots or underground services)



Type C Tree Protection Fencing: for use as directed
(e.g. on hard surfaces)



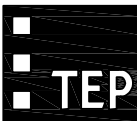
PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.



**TREE PROTECTION AREA
KEEP OUT !**
(TOWN & COUNTRY PLANNING ACT 1990)
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION
ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Tree Protection Notice to be attached to fencing 1.5m from the ground, facing out of the Construction Exclusion Zone and located at regular intervals along the fence line.

The notice must be at least A4 in size

Rev	Description	Drawn	Approved	Date
 Genesis Centre Birchwood Science Park Warrington WA3 7BH Tel 01925 844004 Fax 01925 844002 e-mail tep@tep.uk.com				
Project				
TEP Standard Detail				
Title				
Temporary Tree Protection Fencing (Detail for tree protection around Construction Exclusion Zones)				
Drwg No D.TREE_FENCING.001				
Scale		NTS @ A3		Date 30/04/12
Drawn TDP	Checked ROS	Approved JGS		