



**British Standards 5837:2012 Tree Survey
Arboricultural Impact Assessment,
Arboricultural Method Statement &
Tree Protection Plan**



**Marstons, Kingsmill PH
Kingsmill Road, Wrexham
for
Urbanacity Ltd.**

**On behalf of
Marstons Estates**

Report Reference: JH0814KINGSKMB

**Outline Trees
Arboricultural Consultancy**

October 2014

QUALITY ASSURANCE			
Client:	Urbanacity Ltd. on behalf of Marstons Estates		
Project:	Kingsmill PH, Kingsmill Road, Wrexham		
Project Ref:	JH0814KINGSKMB		
Report Content:	BS 5837:2012 Tree Survey, Arboricultural Impact Assessment (AIA), Arboricultural Method Statement (AMS) & Tree Protection Plan (TPP)		
Written & Approved for issue by:	Jason Humphreys		22 October 2014

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1 Executive Summary

1.1 The Project and Commissioned Work

- 1.1.1 Outline Trees was instructed by Susan Coen of Urbanacity Ltd., on behalf of their client (Marstons Estates), to carry out a British Standards 5837:2012 Tree Survey, in order to enable the submission, validation and the determination of (in respect of the arboricultural impact), a planning application by the Local Planning Authority whilst also providing guidance on how the proposed development can be achieved by minimising the potential for any detrimental impact to any of the retained trees on site.
- 1.1.2 A current topographical survey of the site in AutoCAD format has formed the basis for the Tree Survey Plan, whilst an AutoCAD copy of the proposed site plan (Dwg. 002c 091014 Site Layout Rev B 4216 – 01B - Kingsmill) has been used to produce the Arboricultural Impact Assessment and Tree Protection Plan.
- 1.1.3 The content and scope of this report is listed below:
- BS 5837:2012 Tree Survey and Categorisation
 - Arboricultural Impact Assessment
 - Arboricultural Method Statement
 - Tree Protection Plan

1.2 Findings and Recommendations

- 1.2.1 The survey assessed 16 individual trees and 1 group of trees with none of the surveyed trees or groups attaining a Category 'B' assessment value.
- 1.2.2 The proposed development will require the removal of 4 Category 'C' trees and the anticipated facilitation pruning of 2 Category 'C' trees as detailed in Table 7.1.
- 1.2.3 It is considered that the associated loss of amenity that the above trees provide, will not have a significant detrimental impact on the wider area or the immediate street scene and that their removal should not preclude the proposed development of the site.
- 1.2.4 At best, the overall condition of the trees has been described as fair and regardless of any development proposals any tree works detailed in the Tree Survey Schedule at Appendix A have been identified **solely** in the context of the sites current use and should be considered irrespective of any development proposals and should not be inferred as being necessary to implement the proposed development.

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2 Introduction and Background

2.1 Purpose and Scope of this Report

- 2.1.1 The purpose of the report is to enable the validation and determination, in respect of the anticipated arboricultural impact, of a planning application by the Local Planning Authority whilst also providing guidance on how the proposed development can be achieved by minimising the potential for any detrimental impact to any of the retained trees on site.
- 2.1.2 In preparing this report, consideration has been given to the proposed layout, the condition of the trees and the final use of the site with a focus on providing a harmonious, balanced environment between the trees, buildings and end users of the site.
- 2.1.3 Whilst not definitive, the findings and any associated recommendations detailed within this report are considered to be reasonable, practicable and in the interests of promoting sensible arboricultural management.
- 2.1.4 Recommendations included within this report are the professional opinion of an experienced Arboriculturist and are the view of Outline Trees. This is based on a review of the information provided by The Client, the brief and a survey of the site. This report pertains to these results only.
- 2.1.5 This report and the survey(s) on which it depends have been carried out by a competent Arboriculturist¹.

2.2 Regulatory and Policy Framework

- 2.2.1 Tree Preservation Orders (TPOs) and Conservation Areas place various statutory restrictions on the felling, pruning or damaging of trees, subject to various exemptions (Department for Communities and Local Government, 2000).
- 2.2.2 Tree felling on non-residential land is also controlled by the need to obtain a Felling Licence from the Forestry Commission before felling more than 5m³ of timber in any calendar quarter subject to various exemptions and variations (Forestry Commission, 2007).
- 2.2.3 There is an overriding exemption for the above statutory controls for tree felling and pruning for works where it has been deemed necessary to implement development that has already received full planning permission.

¹ As per the Terms and Definitions detailed in British Standards 5837:2012-*Trees in relation to design, demolition and construction – Recommendations*.

2.3 Site Location

- 2.3.1 The application site is the Marstons Kingsmill Public House located at Kingsmill Road, Wrexham, Clwyd, LL13 0NS (approximate OS Grid reference SJ 345 492), vehicular access to the site was made directly from the main highway.
- 2.3.2 The location of the site is shown in Figure 2.1 below, with the approximate extents of the tree survey area indicated by a red line.

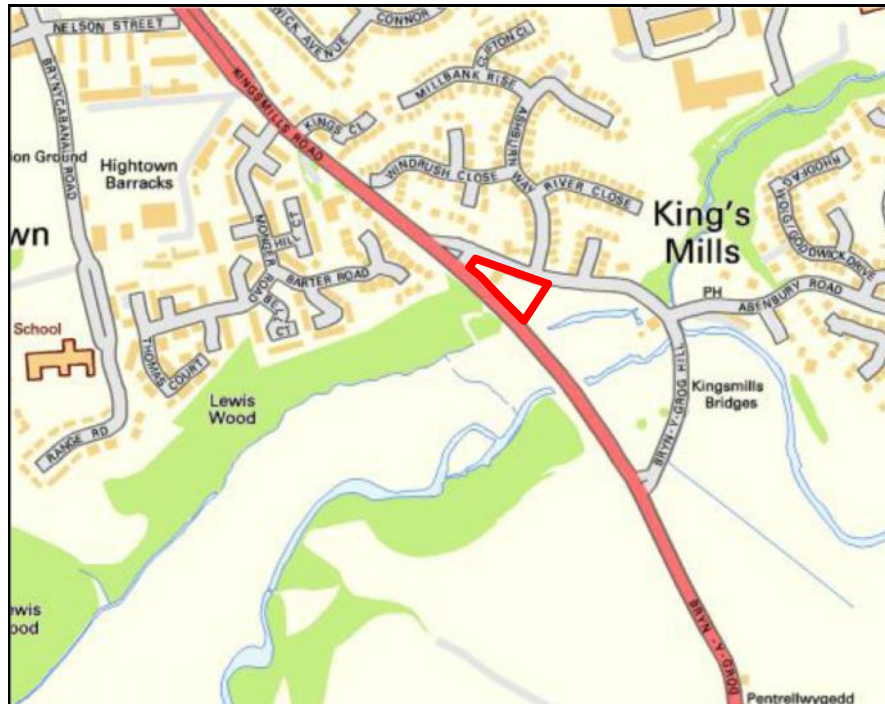


Figure 2.1: Map view of the Site © Crown Copyright and Database rights 2014 Ordnance Survey

3 Survey Methodology

3.1 Survey Methods

3.1.1 The site was visited on Friday 15th August 2014 to carry out an assessment in accordance with BS 5837:2012 – *Trees in relation to Design, Demolition and Construction - Recommendations*.

3.1.2 The weather at the time was dry, bright, clear and still and considered to be adequate for conducting the survey during which, the following information was collected for each tree:

- Sequential reference number;
- Species;
- Height;
- Stem diameter @ 1.5m height;
- Branch spread;
- Existing height above ground level of:
 1. First significant branch and direction of growth (e.g. 3 NW);
 2. Canopy;
- Life stage;
 Y – Young,
 SM – Semi Mature,
 EM – Early Mature,
 M – Mature,
 OM – Over Mature;
- General observations, particularly of structural and/or physiological condition;
- Estimated remaining contribution;
- Category 'U' or 'A' to 'C' grading with the subcategory 1, 2 or 3 reflecting arboricultural, landscape or cultural values, respectively.

3.2 Survey Personnel

3.2.1 Jason Humphreys (The Author) is a former Local Planning Authority Arboricultural Officer and experienced Arboriculturalist with approximately 13 years of experience in the Arboricultural Industry.

3.2.2 He is a Technician grade Member of the Arboricultural Association (Tech Arbor. A), a Professional member of the Consulting Arborist Society and holds the Technician's Certificate in Arboriculture and the LANTRA Professional Tree Inspection certificate.

4 Limitations

4.1 Survey

- 4.1.1 Each of the surveyed trees has been plotted and recorded as an individual tree or a tree group in accordance with the criteria detailed in section 4.4.2.5 of BS 5837:2012.
- 4.1.2 The information contained within this report is based on the author's knowledge and experience of dealing with tree related issues. Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information.
- 4.1.3 Any survey work undertaken will have been subject to limitations, including seasonal and phenological aspects.
- 4.1.4 Trees were assessed from ground level using the Visual Tree Assessment (VTA) method (Mattheck 2007). No climbed inspection, removal of ivy or detailed investigation of decay was made.
- 4.1.5 No liability can be accepted by the consultant in respect of the trees unless the recommendations of this report are carried out under his supervision and within his timescale. Acceptance of this report represents an agreement with the guiding principles and the terms listed.
- 4.1.6 The findings and recommendations contained within this report are, assuming its recommendations are observed, valid for a period of twelve months from the date of survey. Trees are living organisms and their condition can change significantly over a relatively short period of time – good practice dictates they are inspected on a regular basis for reasons of safety.
- 4.1.7 Tree rooting characteristics and soils are both enormously variable as are their interactions. This makes attempts to quantify subsidence risk assessment impossible. No effort has been made to assess subsidence risk potential nor should any be construed.
- 4.1.8 The report relates only to the trees shown on the attached tree survey schedule (Appendix A).
- 4.1.9 Where trees were extensively ivy clad this was recorded in the survey schedule. It is not possible to ascertain the presence of cavities or other defects beneath the ivy and, therefore, ivy should be removed and a re-inspection carried out.

5 Results

5.1 Statutory Tree Protection

- 5.1.1 A telephone discussion, which shortly followed the site visit and tree survey, with Elton Watson (Senior Tree Officer at Wrexham Borough Council) ascertained that none of the trees on or immediately adjacent to the site are afforded any degree of statutory protection from Tree Preservation Orders (TPOs) or Conservation Areas; this was also confirmed during a subsequent call on 22/10/14.
- 5.1.2 In the event that planning consent is granted then a final check with Moray Simpson (Arboricultural Officer at Wrexham Borough Council Tel: 01978 298763) would be considered prudent, prior to undertaking any tree works not shown for determination as part of the proposed development, i.e. any tree works not listed in Table 7.1.
- 5.1.3 In the event that future TPOs are made which might subsequently afford any of the surveyed trees Statutory Protection then it should be understood that no pruning works are to be carried out to those trees unless the works are considered exempt or prior consent for tree works has first been granted by the respective LPA following either:
- The submission of a 6 weeks notification period to carry out works to trees (Trees in Conservation Areas)
 - or the submission of a 5-day notice under section 198(6)(a) of the Town and Country Planning Act 1990.
- 5.1.4 Pruning works can also be carried out if the works are considered necessary to implement full planning consent.

5.2 Tree Survey

- 5.2.1 The survey assessed 16 individual trees, 1 group of trees, 1 section of hedgerow and 1 shrub group, the quality and value of which are summarised below whilst full results of the tree survey are provided in the Tree Survey Schedule at Appendix A.
- 5.2.2 No individually assessed trees of high quality and value (Category 'A') were recorded during the survey.
- 5.2.3 Trees assigned to this category include attractive trees with high visibility and no significant defects, which are able to make a substantial contribution for a minimum of 40 years.
- 5.2.4 No individually assessed trees of moderate quality and value category (Category 'B') were identified during the survey.
- 5.2.5 Trees assigned to this category include healthy attractive trees with remediable defects that are in a condition as to be able to make a significant contribution for a minimum of 20 years.
- 5.2.6 16 individually assessed trees, 1 tree group, 1 section of hedgerow and 1 shrub group of low quality and value category (Category 'C') were identified during the survey.
- 5.2.7 Trees in this category include unremarkable trees of limited merit that are easily replaced, small-growing, young species which have a relatively low potential amenity value, and low landscape benefits.
- 5.2.8 Trees assigned to this category typically include self-seeded trees of limited life span, small and young trees and trees of poor form and limited amenity value.
- 5.2.9 No individually assessed tree was identified as being unsuitable for retention (Category 'U').

- 5.2.10 Trees assigned to this category are 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 and/or are considered to be unsuitable for retention in the proximity of new dwellings or areas of public open space.

6 Arboricultural Impact Assessment

6.1 Tree Survey

- 6.1.1 General tree works detailed in the Tree Schedule (Appendix A) have been identified **solely** in the context of the current layout and existing site use and should not be interpreted as being necessary to implement the proposed development.

6.2 Trees Suitable for Retention

- 6.2.1 Where possible, it is generally considered desirable for Category 'A' and Category 'B' trees to be retained and incorporated into new developments and layouts. Category 'U' trees are not considered to be appropriate for retention.
- 6.2.2 In assessing the Arboricultural Impact on the trees of the proposed development and which trees might be suitable for retention in the context of the proposed layout the following factors have all been considered.
- Shading
 - Future Pressure for Tree Removal and Pruning
 - Seasonal Nuisance
 - Infrastructure
 - Direct Damage
 - Root Protection Areas
 - Future Management
 - Demolition/Ground Works
 - Construction Activity

6.3 Shading

- 6.3.1 Shading can be represented using drawn segments, with radii equivalent of the current tree height, taken from the centres of those surveyed tree stems that are considered to be relevant, drawn from due north-west to due-east.
- 6.3.2 These segments represent a basic illustration of the shade pattern through the main part of the day and based on advisory comments detailed in section 5.22, Note 1 of BS 5837:2012.
- 6.3.1 Upon consideration of the above points, no further investigation, illustration or mitigation is considered necessary due to the generally favourable layout orientation and the nature of the development i.e. non-residential.

6.4 Direct Damage

- 6.4.1 Any proposed layout should consider the likelihood of direct damage occurring from incremental root and stem growth and the possibility of the fabric of any new structure being damaged by the whipping of branches against it.
- 6.4.2 The implementation of the recommended tree works associated with the proposals (Table 7.1) will reduce the likelihood of direct damage occurring in the manner described above, in respect of retained trees.
- 6.4.3 Table 6.1 below, taken from Annex A of BS 5837:2012, provides distances that are advised as minimum distances of trees from new structures for new plantings.

Table 6.1, Minimum distance between young trees or new planting and structure to avoid direct damage to a structure from future tree growth

Type of structure	Minimum distance between young trees or new planting and structure, in metres (m)		
	Stem dia. <300 mm ^{A)}	Stem dia. 300 mm to 600 mm ^{A)}	Stem dia. >600 mm ^{A)}
Buildings and heavily loaded structures	—	0.5	1.2
Lightly loaded structures such as garages, porches etc.	—	0.7	1.5
Services			
<1 m deep	0.5	1.5	3.0
>1 m deep	—	1.0	2.0
Masonry boundary walls	—	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

^{A)} Diameter of stem at 1.5 m above ground level at maturity

6.5 Root Protection Areas (RPAs)

- 6.5.1 The erection of protective fencing as per the Tree Protection Plan (TPP) prior to the commencement of any works on site will protect the RPA of retained trees.
- 6.5.2 Existing ground levels should be retained within the RPAs. Intrusions into soil within the RPAs is generally not acceptable and topsoil within it should remain in situ.
- 6.5.3 The erection of protective fencing, in this instance, is considered likely to place minor localised constraints on elements of the construction and its associated activities and/or possibly limit the working space available, with the subsequent result that incursions into the RPAs of some of the retained trees, may prove likely (specifically T3, T4, T6, T7, T13, T14 & T15).
- 6.5.4 In this instance it is considered that, if the existing hard surfacing within the RPAs of the above trees is retained during the construction (See 6.5.6 below), any incursions into the RPAs of the trees, which are necessary to facilitate the construction and any other related activities, can be carried out without the need for additional ground protection measures and that the protective fencing specification shown in figure 7.2 will be appropriate, in this instance.
- 6.5.5 Guidance is provided below, which upon adoption, will help to minimise the potential for any detrimental effect that associated ground works and construction might have in respect of retained trees.
- 6.5.6 Suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during the construction and, development rather than being removed.
- 6.5.7 British Standards 5837:2012 advises that new temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction to underlying soil and further provides the following note:

The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

- 6.5.8 Final on-site measurements should be taken to ascertain the extent of any tree protection measures and provide an indication of whether incursions, which have not been anticipated, into the RPAs of retained trees might prove necessary.

6.6 Excavation/Ground Works

- 6.6.1 The erection of protective fencing and/or use of ground protection, if necessary (section 6.5.7), prior to the commencement of any works on site, will allow excavations and ground works to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.
- 6.6.2 All plant and vehicles engaged in ground works should either operate outside the RPAs, or run on ground protection, if necessary, in the proximity of retained trees.
- 6.6.3 Where trees stand adjacent to hard surfaces and/or buildings to be removed, excavation should be undertaken inwards, from within the footprint of the existing hard surfacing or outside of the RPAs.

6.7 Hard Surfacing Within the Root Protection Area

- 6.7.1 It is not anticipated that the installation of a 'no-dig' type surface will be necessary, general guidance on 'no-dig' surfacing is however, provided below in the event that a subsequent need transpires.
- 6.7.2 Arboricultural Practice Note No. 12 describes in detail the requirements of no-dig type installation whilst BS 5837:2012 suggests 'Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems'.
- 6.7.3 An assessment should be made to establish whether or not the existing site topography lends itself to the installation of a three-dimensional cellular no-dig product upon anticipation of the required and final level changes. Final on-site measurements should be taken to ascertain the extent of any incursions into the RPA and provide subsequent guidance on the extent of any 'no-dig' installation.
- 6.7.4 Where no-dig installations are located particularly close to the main stems of retained trees then it is recommended that the proposed route is realigned where possible in order to reduce the total area (m²) of RPAs affected in order to reduce the likelihood for future pruning pressure and minimise the potential for any detrimental impact on the retained trees.
- 6.7.5 Cross sectional drawings of a suitable product can be seen below (figures 6.1 & 6.2)

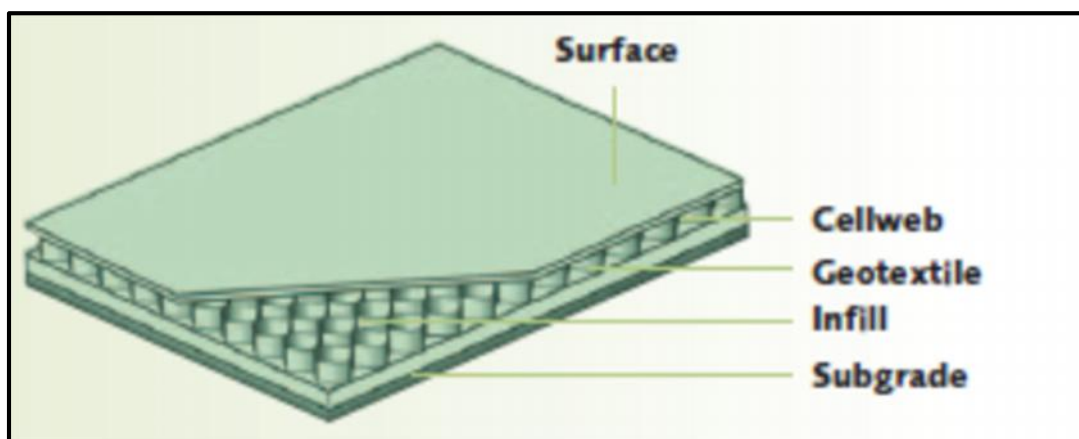


Figure 6.1, Composition of the CellWeb™ system

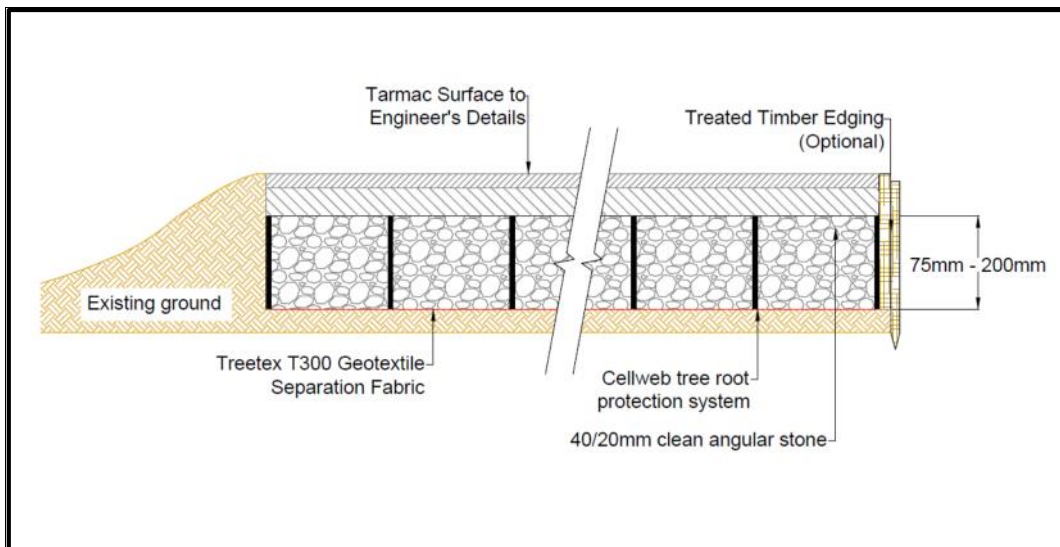


Figure 6.2, Cross section illustrating a permeable tarmac surface finish

6.8 Construction Activity

- 6.8.1 The erection of protective fencing and/or use of ground protection, if necessary, prior to the commencement of any works on site will allow the development to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.
- 6.8.2 All plant and vehicles engaged in construction works should either operate outside the RPA, and/or run on ground protection, if necessary.

6.9 Future Pressure for Tree Pruning/Removal

- 6.9.1 Whilst the presence of retained trees can often enhance the immediate environment upon completion, any proposed layout should provide sufficient space that will allow for future tree growth and to provide a subsequently reduced need for future, frequent remedial pruning.
- 6.9.2 The tree works detailed in Table 7.1 are considered, in this instance, to provide an environment and layout juxtaposition that will allow for the future growth of the retained trees whilst minimising any immediate future pruning pressures.

6.10 Seasonal Nuisance

- 6.10.1 Foliage, fruit and cone fall can be considered by some to be a nuisance and requests to Local Planning Authorities to carry out pruning works to negate these issues are often refused due in part to their brief, seasonal nature of the problem.
- 6.10.2 Providing a suitable juxtaposition when considering new layouts will help in minimising issues experienced by people living in close proximity to trees.
- 6.10.3 A degree of Autumnal leaf fall will be evident due to the generally deciduous nature of the retained trees on the site; it is however, considered to be acceptable to a reasonable level.

6.11 Infrastructure

- 6.11.1 Infrastructure requirements have been considered and there is/no evidence to suggest that retained trees will have an impact on lighting, signage, CCTV sightlines or visibility splays.
- 6.11.2 Where the installation of any underground apparatus and drainage is considered necessary then particular care should be taken in its routeing and methods of installation and wherever possible be routed outside RPAs.
- 6.11.3 Where routeing services outside RPAs is not possible then detailed plans showing the proposed routeing should be drawn up in conjunction with the project Arboriculturist. Trenchless insertion methods are considered to be appropriate for this purpose and British Standards 5837:2012 details solutions for differing utility apparatus requirements (see table 6.2 below).
- 6.11.4 British Standards 5837:2012, Section 7.7.2 suggests that in the event roots can be retained and appropriately protected during exposure, then excavation using hand-held tools might be acceptable for shallow service runs.

Table 6.2 Trenchless solutions for differing utility apparatus installation requirements

Method	Accuracy	Bore dia. ^{A)}	Max. sub. ^{B)} length	Applications	Not suitable for
	mm	mm	m		
Microtunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/ roadway undercrossings	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1 200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers ^{C)}
Pipe ramming	≈150	150 to 2 000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling ^{D)}	≈50 ^{E)}	30 to 180 ^{F)}	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5 m

^{A)} Dependent on strata encountered.

^{B)} Maximum subterranean length.

^{C)} Pit-launched directional drilling can be used for gravity fall pipes up to 20 m subterranean length.

^{D)} Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.

^{E)} Substantial inverse relationship between accuracy and distance.

^{F)} Figures given relate to single pass: up to 300 mm bore achievable with multiple passes.

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6.12 Trees to be removed

- 6.12.1 The proposed layout identified the tree removals detailed within table 7.1 as being necessary and appropriate in order to directly implement the proposals.

6.13 Trees to be pruned

- 6.13.1 Minor branch reduction to trees T14 & T15, is considered to be a likely requirement in order to facilitate construction and those works have been detailed in table 7.1 .
- 6.13.2 The complete Tree Survey Schedule (Appendix A) details pruning works **solely** in the context of the sites current use that should be considered to facilitate future inspection regimes and to promote the development of retained trees and should not be considered as being necessary to implement or facilitate the proposed development.

6.14 Landscaping

- 6.14.1 BS 5837:2012 advises that any new tree planting and associated landscaping proposals should consider the ultimate height and spread, form, habit and colour, density of foliage and maintenance implications, in relation to both the built form of the new development, and the retained landscape features.
- 6.14.2 Consideration should also be given to the advice detailed in section 6.4.3 and Table 6.1 in respect of distances of newly planted trees in relation to new structures.
- 6.14.3 No details of any proposed landscaping have been provided.

6.15 Tree loss evaluation

- 6.15.1 In terms of the level of Public Amenity Value that the trees currently provide, the tree removals detailed in Table 7.1 are not considered to be detrimental to the wider area and that that their loss will have a relatively low impact on the immediate street scene.

6.16 Issues to be addressed by an Arboricultural Method Statement

- 6.16.1 The Arboricultural Method Statement (Section 7) details the general methodology for the implementation of those aspects that have the potential to result in loss or damage to retained trees.

6.17 Tree Protection Plan

- 6.17.1 The TPP (Appendix C), when read in conjunction with this report, will inform on and describe the required tree protection measures for the retained trees in the context of the proposed layout.
- 6.17.2 The TPP should be read in conjunction with the Tree Survey Schedule (Appendix A) in order to establish the linear radial distances for the erection of the protective fencing and the extent of ground protection measures, if necessary, from the retained trees.

7 Arboricultural Method Statement

7.1 Facilitation Tree Works/Removals

7.1.1 Tree works tabled below (Table 7.1) have been identified as a result of one or more of the following reasons;

- to directly implement the proposal,
- to facilitate the implementation and construction of the proposals,
- to assist in the creation of a balanced and desirable layout juxtaposition and
- in the interests of sensible and reasonable arboricultural management.

7.1.2 Any tree works should be carried out using the principles and practices described in British Standards 3998:2010 – *Tree Work - Recommendations*

Table 7.1: Summary of Necessary Tree Works

Tree Ref. No's.	Species	BS 5837:2012 Category	Nature of Works and Necessity
T1	Willow	C	Dismantle fell to facilitate the implementation and construction of the proposed development – (achieve required ground levels for creation of service yard and plant area).
T8	Yew	C	Dismantle fell to directly implement the proposed development – (provision of additional car parking spaces).
T9	Hornbeam	C	Dismantle fell to directly implement the proposed development and to facilitate the implementation and construction of the proposed development – (facilitate visibility splay).
T10	Ash	C	Dismantle fell to directly implement the proposed development and to facilitate the implementation and construction of the proposed development – (facilitate visibility splay).
T14 & T15	Alder	C	Carry out branch reduction to north west aspect of crowns ,where necessary and required – (facilitate construction of adjacent new building).

7.2 Erection of Protective Fencing

7.2.1 Protective fencing should be erected as per the Tree Protection Plan at the linear distances specified in the Tree Survey Schedule prior to the commencement of any works on site.

7.2.2 The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 7.1 (see below).

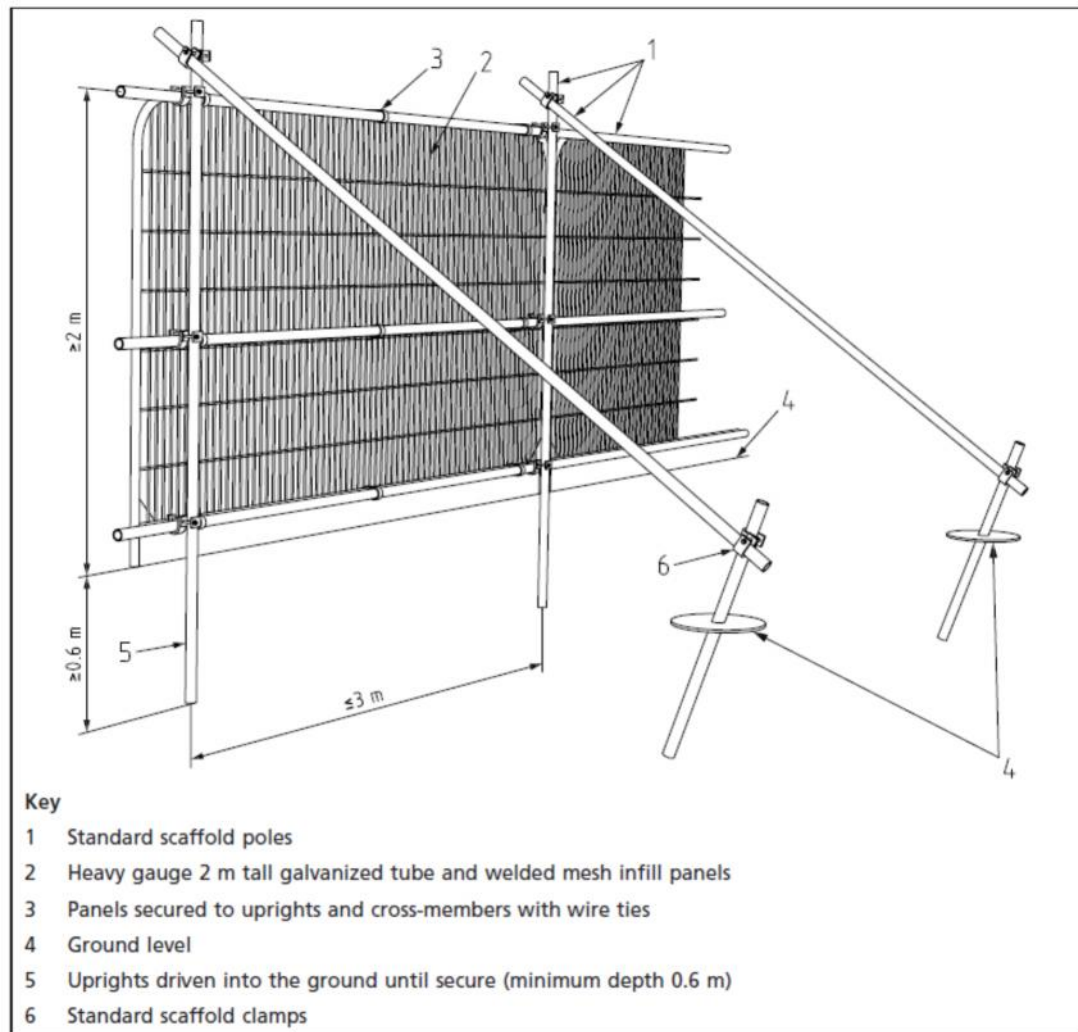


Figure 7.1 Default specification for protective barrier © British Standards Institute

- 7.2.3 All-weather notices should be attached to the fencing; a suitable example for use has been attached at Appendix D.
- 7.2.4 Once erected, the protected area should be regarded as sacrosanct and should not be removed or altered without prior recommendation by the project Arboriculturist (7.3.2) and, where necessary, approval from the local planning authority.
- 7.2.5 In this instance, where the site circumstances, the retention of existing hard surfacing and associated risk of damaging incursion into the RPAs do not necessitate the default level of protection, an alternative specification is considered to be appropriate. For example, 2m tall welded mesh panels on rubber or concrete feet as illustrated in Figure 7.2 (see below).

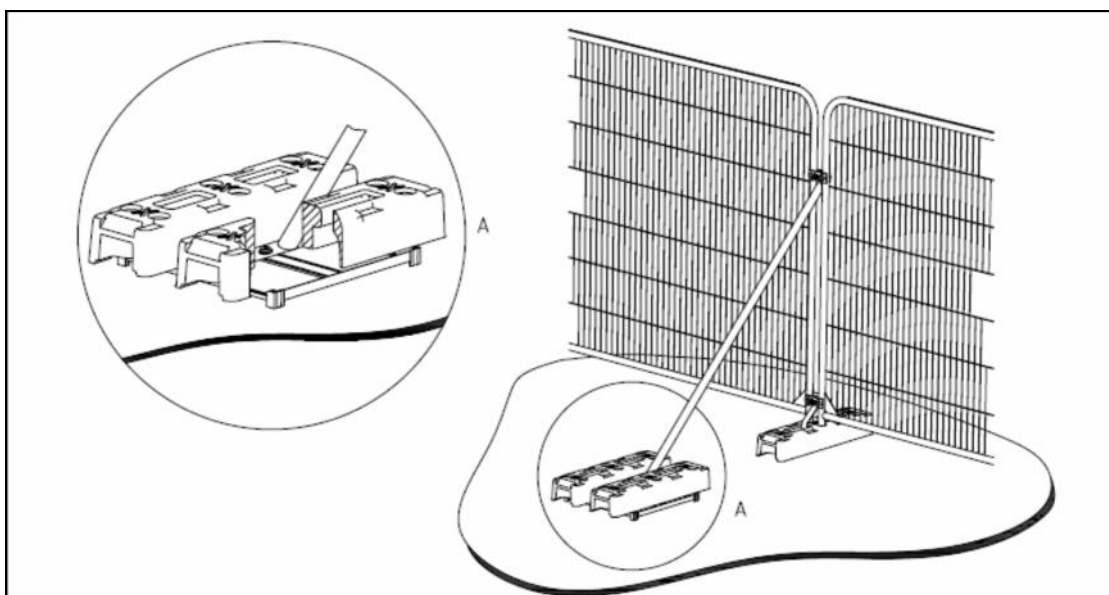


Figure 7.2 Stabilizer strut mounted on block tray © British Standards Institute

7.3 Site Monitoring

- 7.3.1 Final on-site measurements should be taken to ascertain the extent of the tree protection measures and identify whether or not any incursions into the RPAs of the retained trees which have not been anticipated, will be required to facilitate the construction and its associated activities.
- 7.3.2 It is recommended that a Project Arboriculturist is appointed prior to the commencement of any works and retained for the duration of the project.
- 7.3.3 The appointed person can assist in monitoring Arboricultural site activity using an auditable system.
- 7.3.4 The appointed person should be consulted in the event that additional ground protection measures are considered necessary, root pruning is required or incursions into the RPAs are considered necessary.

7.4 Ground Works & Demolition

- 7.4.1 The erection of protective fencing and use of ground protection measures, if necessary, as per the TPP, combined with the retention of existing hard surfacing within the RPAs of retained trees, prior to the commencement of any works on site will allow the ground works to take place whilst minimising any adverse effect and/or impact on the retained trees.
- 7.4.2 All plant and vehicles engaged in ground works should either operate outside the RPA, or run on ground protection where appropriate.

7.5 Soil Compaction and Remediation Measures

- 7.5.1 Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites.
- 7.5.2 Compacted soil will adversely affect drainage, gas exchange, nutrient uptake and organic content, and will seriously impede or restrict root growth.
- 7.5.3 Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed.

- 7.5.4 Where soil compaction has occurred in the vicinity of existing trees, remedial works might include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure.
- 7.5.5 Heavy mechanical cultivation such as ploughing or rotavation should not occur within the RPA.
- 7.5.6 Any cultivation operations should be undertaken carefully by hand in order to minimize damage to the tree, particularly the roots.
- 7.5.7 Decompaction measures include forking, spiking, soil augering and tilled radial trenching. Care should be taken during such operations to minimize the risk of further damage to tree roots.

7.6 Construction Works

- 7.6.1 Protective fencing and use of ground protection measures, if necessary, as per the Tree Protection Plan should be erected prior to the commencement of any works on site.
- 7.6.2 All plant and vehicles engaged in construction activity should either operate outside the RPAS, or run on ground protection.

7.7 Contractors Storage, Parking & Access

- 7.7.1 Provision should be made for welfare facilities, the site office, contractor parking, storage for materials, plant and spoil and space for mixing outside of the RPAs of retained trees.
- 7.7.2 In this instance it is considered that there is sufficient space for provision of the above, without placing significant constraints on the working space available for the construction and its associated activities.

7.8 No-Dig Surfacing

- 7.8.1 In the event that the use of a 3-dimensional, cellular confinement type of no-dig surfacing is confirmed, the following generic guidance is given below in respect of its installation methodology.
- 7.8.2 Existing hard surfacing should be retained as temporary ground protection within the RPA for the duration of the construction and then only removed when ready, by hand tools, immediately prior to the installation of the No-Dig surfacing.
- 7.8.3 Once the RPA beneath the existing hard surfacing has been exposed it should be treated as sacrosanct and excavation, skimming or scraping should not take place within it.
- 7.8.4 Manufacturer's installation guidelines specific to the product used should be adhered to.

7.9 Completion

- 7.9.1 Upon completion of the project, advice of the project Arboriculturist should be sought in coordination of the removal of the protective fencing and ground protection if necessary, to survey the retained trees for signs or symptoms of damage and/or stress that the construction might have had.
- 7.9.2 The protective fencing and ground protection measures should remain in situ until its use is considered unnecessary and any risk of damage to the retained trees and/or their respective RPAs e.g. soil compaction from vehicular plant or machinery, has passed.

7.10 Tree Planting & After Care

- 7.10.1 The following points summarise good after care for newly planted trees with an additional consideration to any necessary formative, corrective and maintenance pruning:



- Water immediately after planting and weekly in first growing season (10 – 20 litres) if the weather is dry.
- Do not allow weeds or grass to grow within a 500mm radius of the stem.
- Maintain mulch to a depth of approximately 50mm.
- Ensure ties are not damaging the stems and loosen if necessary.
- Ensure stake remains firm. Remove when stem can support itself, usually after 1 -3 years.
- Remove dead or crossing branches, suckers arising from the roots or weak shoots on the stems.

7.11 Contacts

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Email: info@outlinetrees.co.uk

Appendix A Tree Survey Schedule



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T1	Weeping Willow (<i>Salix X chrysocoma</i>)	14	566	6.8	145	2	5	6	3	5 E	0	M	Poor condition. A twin stemmed tree, which has been subject to extensive past branch removal to its north eastern aspect with a resultant unbalanced crown shape and form. Notable pruning wounds observed on northern stem. Evidence of branch failure and pruning in dense upper crown. No works currently necessary.	10+	C3
T2	Common Pear (<i>Pyrus communis</i>)	5	170	2	13	2.5	2	2	1.5	2 E	2	M	Fair condition. Unremarkable tree with several minor localised decay pockets on main stem and a seam of exposed heartwood at approximately 0.5m height to the south. Signs of graft incompatibility at base where swelling is present. No works currently necessary.	10+	C3



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T3	Leyland Cypress (<i>X Cupressocyparis leylandii</i> Castlewellan Gold)	11	440	5.3	88	1	2	1	1.5	2 E	1.5	M	Fair condition. Unremarkable tree with notable compression fork and associated included bark observed at approximately 2m height. Stem divides at approximately 2m height. Evidence of past branch removal of lower branches. No works currently necessary.	20+	C3
T4	Flowering Cherry (<i>Prunus 'Kanzan'</i>)	8	555	6.7	139	2.5	2	6	4	2.5 NW	3	M	Fair condition. Unremarkable tree with evidence of past branch removal of lower branches with notable pruning wound on main stem to the north. Stem divides at approximately 2.5m height. Unbalanced crown shape and form; resultant from past branch removals. Dense foliage in upper crown. Evidence of internal wood decay at base of main stem to the north east. No works currently necessary.	10+	C3



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T5	Lilac (<i>Syringa vulgaris</i>)	3	73	0.9	2	3.5	3	2	2	0	0	M	Fair condition. Unremarkable, multi stemmed tree with branches resting directly on adjacent building to the north. Prune branches 2-3m clear of building.	10+	C3
T6	Yew (<i>Taxus baccata</i>)	7	447	5.4	90	4	2	4	2	0 S	3	M	Poor condition. Unremarkable, multi stemmed tree with dense proliferation of epicormic growth rising vertically in lower crown. Evidence of past branch removal of lower branches. Sparsely foliated in upper crown. Ivy cover obscuring assessment of base of main stem where stems divide. Suppressed crown development. No works currently necessary.	10+	C3



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T7	Yew	6.5	490	5.9	109	4	4	4	1	0 N	2.5	M	Poor condition. Unremarkable, multi stemmed tree with dense proliferation of epicormic growth rising vertically in lower crown. Evidence of past branch removal of lower branches. Sparsely foliated to the north east. Suppressed crown development to the north. No works currently necessary.	10+	C3
T8	Yew	2.5	201	2.4	18	1	1	1	1	0	0	M	Fair condition. Unremarkable tree with rope tied around circumference to provide current shape. Evidence of pruning in centre. Unable to access centre to assess base of main stem; diameter estimated. No works currently necessary.	10+	C3



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T9	Hornbeam (<i>Carpinus betulus</i>)	5	184	2.2	15	1.5	1	1.5	2	1.5 S	0.5	SM	Fair condition. Unremarkable, twin stemmed tree with ivy cover obscuring assessment of main stem. Crown development suppressed to the east. Sever Ivy.	20+	C2
T10	Ash (<i>Fraxinus excelsior</i>)	10	433	5.2	85	5	5	3	4	2 W	0.5	M	Fair condition. Multi stemmed tree with ivy cover obscuring assessment of main stem, where stem divides. Some minor dead wood present. Sever Ivy.	20+	C2
T11	Hazel (<i>Corylus avellana</i>)	5.5	157	1.9	11	3	3	3	3	0	0	M	Fair condition. Unremarkable, multi stemmed hazel displaying typical form. No works currently necessary.	20+	C2



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T12	Ash	10	502	6	114	6	6	3	6	0 NE	2	M	Fair condition. Multi stemmed tree with some minor dead wood present. Ivy cover establishing on central stem to the north east. Unbalanced crown shape and form. Sever Ivy.	10+	C2
T13	Common Alder <i>(Alnus glutinosa)</i>	4	113	1.4	6	1.5	1	2	1.5	2 W	0.5	SM	Fair condition. Unremarkable, twin stemmed growing immediately adjacent to car park kerb edge. No works currently necessary.	10+	C3



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T14	Common Alder	12	350	4.2	55	7	3	4	7	4 SW	1	M	Fair condition. Peripheral group tree with suppressed crown development to the east . Dense ivy cover obscuring assessment of main stem and branch unions; diameter estimated. Unbalanced crown shape and form; lateral branches extending west. Growing on slope. Sever Ivy to facilitate reinspection.	10+	C2



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
T15	Common Alder	12	350	4.2	55	3	2	4	6	2 SW	0.5	M	Fair condition. Peripheral group tree with suppressed crown development to the east. Dense ivy cover obscuring assessment of main stem and branch unions. Unbalanced crown shape and form; lateral branches extending west. Growing at top of slope approximately 3m from car park edge. Sever Ivy to facilitate reinspection.	10+	C2
T16	Common Alder	12	220	2.6	22	2.5	1	4	1	4 SE	0.5	M	Fair condition. Unremarkable, peripheral group tree with multi stemmed form. Tall, spindly form with absence of lower lateral branches. No works currently necessary.	10+	C2



Tree Ref. No.	Species	Height (m)	Stem Ø (mm)	Protective Linear Radius (m)	RPA m ²	Branch Spread (m)				Height (m)		Life Stage	General Observations and Preliminary Management Recommendations (In bold).	Estimated Remaining Contribution	Category
						N	E	S	W	Significant Branch	Canopy				
G1	Flowering Cherry	5	240	2.9	26	4	4	10	10	2	1.5	EM	Fair condition. Group of cherry growing outside of site boundary. Compression forks observed where stem divides at approximately 2m height. Some notable basal growth present. Remove basal shoots.	20+	C2
B1	Cherry Laurel (<i>Prunus laurocerasus</i>)	2	120	1.4	7	2	1.5	2.5	2	0	0	M	Fair condition. No works currently necessary.	10+	C3
H1	Hawthorn, Hazel (<i>Crataegus monogyna</i> , <i>Corylus avellana</i>)	6	40	0.5	1	1.5	6	1.5	6	0	0	M	Fair condition. Unmanaged hedgerow, tapering in height, condition and density with evidence of branch/crown die back towards the west. No works currently necessary.	10+	C2
S1	Stump	-	-	-	-	-	-	-	-	-	-	-	-	-	-



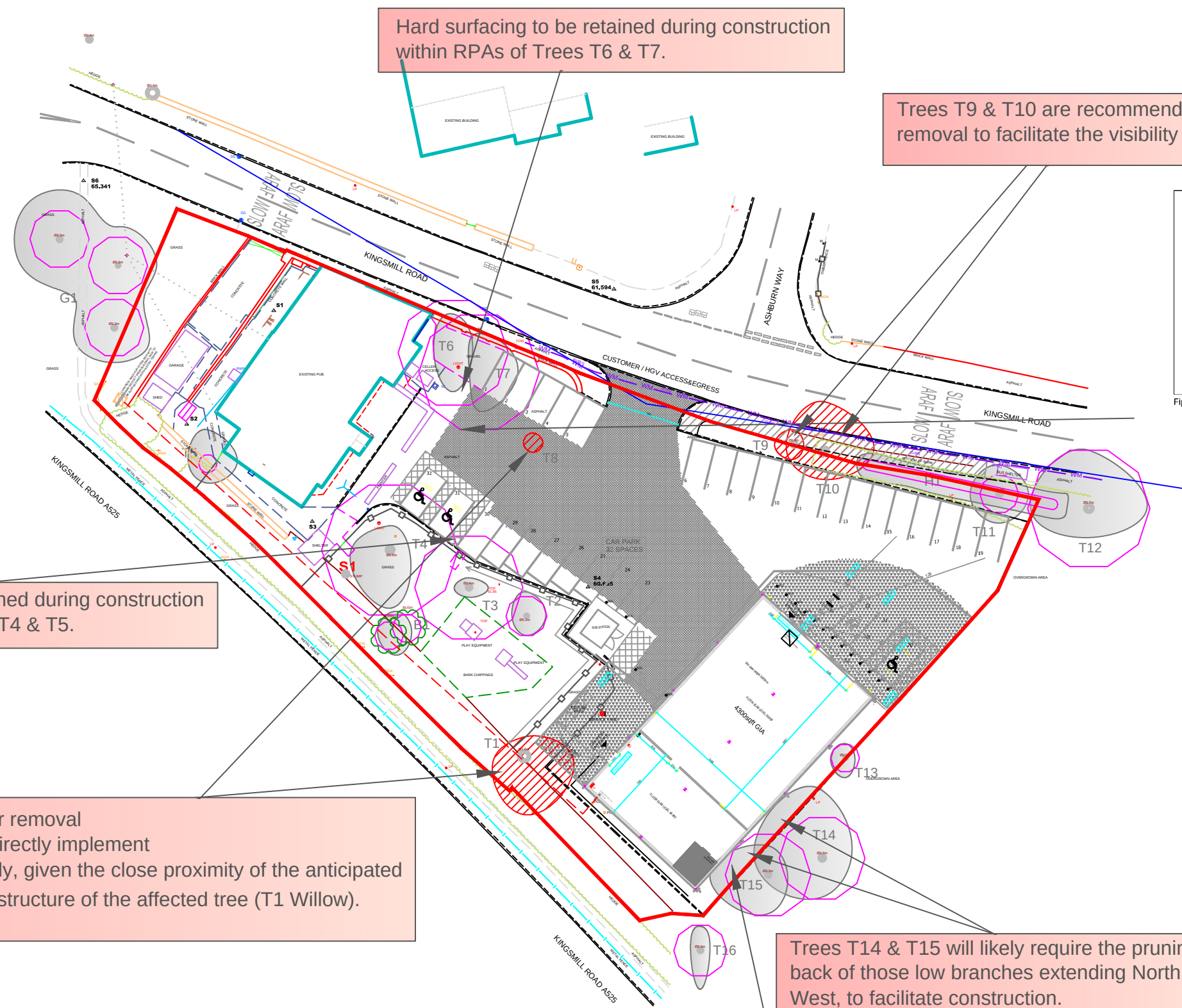
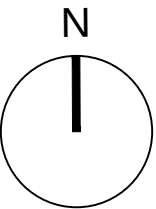
Appendix B Existing Layout and Tree Survey Plan



Appendix C Proposed Layout & Tree Protection Plan



Tree and Ground protection measures to be adopted in accordance with specifications and recommended practices detailed in sections 6 & 7 of Report JH0814KINGSKMB



Hard surfacing to be retained during construction within RPAs of Trees T6 & T7.

Trees T9 & T10 are recommended for removal to facilitate the visibility splay

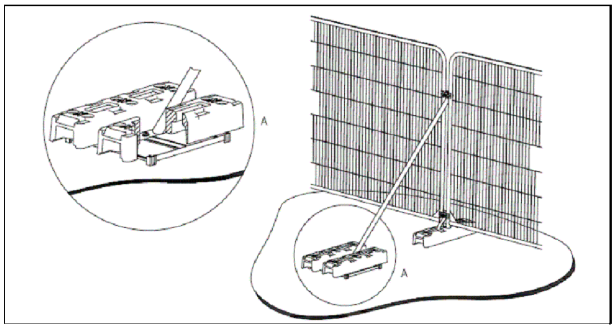


Figure 7.2 Stabilizer strut mounted on block tray © British Standards Institute

Hard surfacing to be retained during construction within RPAs of Trees T3, T4 & T5.

Trees T1 & T8 are recommended for removal to facilitate the construction. i.e. to directly implement the proposals (T8 Yew) and indirectly, given the close proximity of the anticipated construction and the relatively poor structure of the affected tree (T1 Willow).

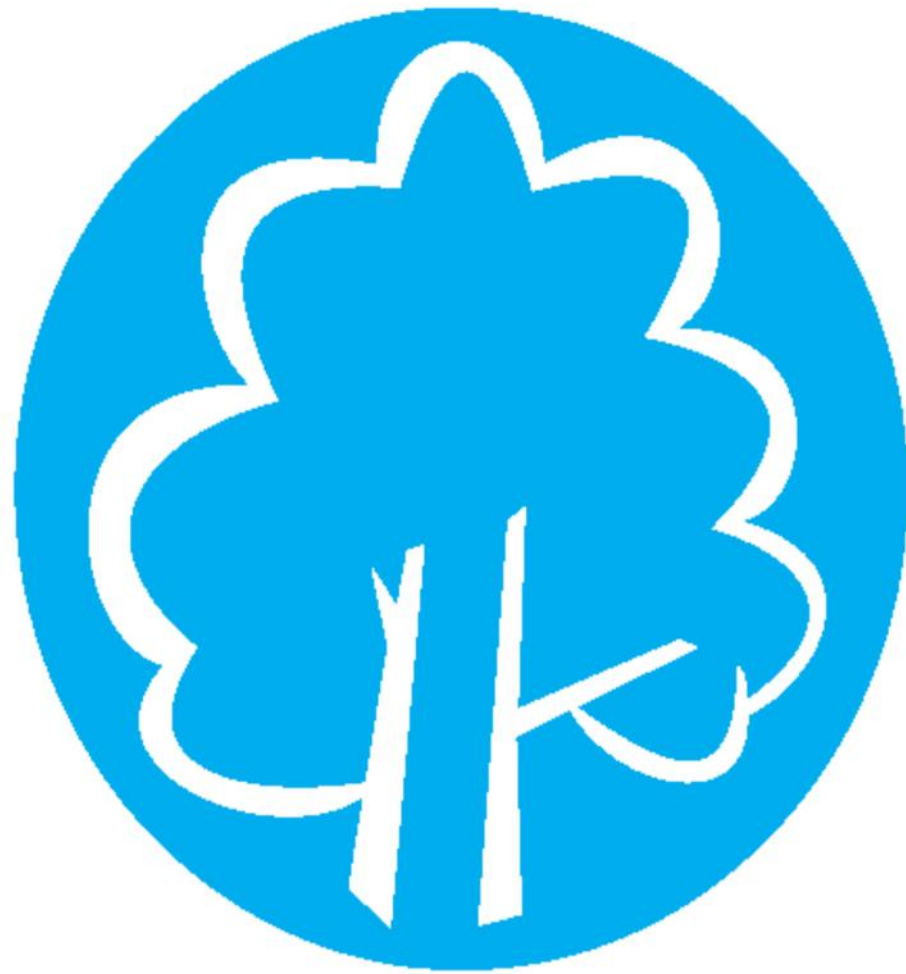
Trees T14 & T15 will likely require the pruning back of those low branches extending North West, to facilitate construction.

Hard surfacing to be retained during construction within RPA of Tree T15.

Key & Notes		
Trees For Removal		
Retained Trees		
Cat A Trees		
Cat B Trees		
Cat C Trees		
Cat U Trees		
Root Protection Areas		
T1, T2, T3, T4 etc...		Tree Tag
G1, G2, G3, G4 etc...		Group Tag
W1, W2, W3, W4 etc...		Woodland Tag
H1, H2, H3, H4 etc...		Hedgerow Tag
Outline Trees Arboricultural Consultancy 60 Normanton Lane Littleover Derby		
Date	October 2014	www.outlinetrees.co.uk
Title	Tree Protection Plan	DWG:JHTCP-A
Site	Kings Mills PH Kingsmills Rd., Wrexham	1:500 @A3

Appendix D Protective Fencing Signage





**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**



Appendix E References

British Standards Institute (BSi) BS 5837:2012, Trees in relation to design, demolition and construction – Recommendations.

(BSi) BS 3998:2010, Tree Work - Recommendations.

Department for Communities and Local Government (2000) Tree Preservation Orders: A Guide to the Law and Good Practice. (2009 Addendum)

Forestry Commission (2007) Tree Felling – Getting Permission.

National House Building Corporation (NHBC) 2003. Standards, Chapter 4.2. Building near trees.

Claus Mattheck (2007) Updated field guide for Visual Tree Assessment.

Arboricultural Practice Note Number 12 (2007) Through the Trees to Development. Arboricultural Advisory and Information Service

Davis, C., Fay, N & Mynors, C. (2000). Veteran Trees: a guide to risk and responsibility.

Helliwell, D.R. (1967). The Amenity Value Of Trees And Woodlands. Journal of Arboricultural Association 1, 128–131.

Watson G. & Green T. (2011) Fungi on Trees; An Arborist's Field Guide. Arboricultural Association



Appendix F Life Stage & Condition Key

Condition	Life Stage *
Good	Newly Planted
Those trees that are relatively free from defects and any visible signs of structural defects, which also exhibit normal signs of vitality and vigour when compared with trees of a similar species in a similar environment.	Those trees that have been planted in the past 5 years.
Fair	Young
Those trees that exhibit some minor/manageable defects or display evidence of minor remedial pruning, which also exhibit normal signs of vitality and vigour when compared with trees of a similar species in a similar environment.	Those trees that are considered to be in the first third of their life expectancy.
Poor	Semi to Early Mature
Those trees that exhibit a high level of defects and/or significant past pruning works, which also exhibit relatively low signs of vitality and vigour when compared with trees of a similar species in a similar environment.	Those trees that have not yet reached maturity and can be considered to be in the second third of their life expectancy.
In Decline	Mature
Those trees that are close to the end of the useful life expectancy and displaying associated symptoms of branch die back and low vigour.	Those trees that can be described as being in the final third of their life expectancy.
	Over Mature
	Those trees that can be described as having exceeded their life expectancy that have yet to replicate those features typical of Veteran trees.
	Veteran
	A tree that exhibits typical signs and characteristics of such as described in the introduction of Veteran Trees: A guide to risk and responsibility (Davis, Fay & Mynors 2000)

* Typical useful life expectancy of common trees. (Taken from Helliwell's Amenity Tree Valuation notes)

300+	- Yew
200-300	- Oak, Sweet Chestnut, Plane, Sycamore, Lime
150-200	- Scots Pine, Hornbeam, Beech, Tulip tree, N Maple, Lebanon Cedar
100-150	- Ash, Spruce, Walnut, Red Oak, Horse Chestnut, Field Maple, Monkey Puzzle, Mulberry, Pear
70-100	- Rowan, Whitebeam, Apple, Wild Cherry, Catalpa, Robinia, Ailanthus
50-70	- Poplars, Willows, Cherries, Alders, Birches

