

Outline Application

NW Bicester Planning Application 3

BS5837 Tree Survey Report

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A2Dominion South Ltd

Bicester Eco Development

Application 3 (Infrastructure)

BS5837 Tree Survey Report

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CONTENTS

1	SUMMARY	1
2	Introduction	2
	2.1 Background	2
	2.2 The Site Location, Topography and Land Use.....	2
	2.3 Scope and Purpose of the Report.....	2
3	Trees in relation to construction.....	3
	3.1 Introduction.....	3
	3.2 Root Protection Area (RPA) / hedgerow buffers	3
4	Methodology	4
5	Arboricultural Constraints	5
	5.1 Statutory Tree Protection.....	5
	5.2 Tree Removal	5
	5.3 Root Protection Areas (RPA)	5
	5.4 Shade and Dominance.....	5
6	Results of Tree Survey.....	6
7	Preliminary Arboricultural Impact Assessment	6
	7.2 Summary of impacts	6
8	Preliminary Arboricultural Method Statement	10
	8.2 Protective Fencing	10
	8.3 Construction Exclusion Zones (CEZ)	12
	8.4 Hedgerow breakthrough.....	13
	8.5 Hedgerow and tree translocation	13
	8.6 Turf and ground cover vegetation; topsoil from the upper soil horizon; and subsoil.	15
	8.7 Excavation within RPAs.....	15
	8.8 Changes in ground level.....	16
	8.9 General construction activity.....	16
	8.10 Hazardous materials	16
	8.11 Arboricultural Supervision.....	16
9	Conclusion	17
10	References	17
	Appendix 1: Explanation of Terms.....	18
	Appendix 2: Author’s Qualifications and Experience	20
	Appendix 3: Tree Data Schedules	21
	Appendix 4: Tree Constraints Plan	27

1 SUMMARY

- 1.1.1 This report presents the results of an Arboricultural Survey conducted to BS5837:2012. It was undertaken by Hyder Consulting (UK) Limited for A2Dominion South Ltd. Individual tree locations and the canopy extents of groups of trees and hedgerows were established using a GPS-enabled field computer and high-resolution aerial imagery.
- 1.1.2 The survey area (hereafter referred to as the 'Site') comprised an area of pasture/farmland located to the northwest of Bicester, Oxfordshire. Tree cover on the Site can be divided into three broad groups: (i) individual trees; (ii) groups of trees; and (iii) hedgerows.
- 1.1.3 The aims of the study were to assess the condition and value of trees that would constitute potential constraints to the proposals to redevelop the Site. The findings of the survey are presented in a format intended to identify areas where existing and potential arboricultural constraints exist, thus informing site layout design considerations which shall make appropriate provision for the integration of existing trees and hedgerows.
- 1.1.4 A total of 11 individual trees were surveyed and classified according to the BS5837 valuation protocol as follows: 7 trees were classified as Category B, which represents trees which should be retained wherever possible, 2 trees were identified as Category C, which represents trees of low quality and value which could readily be relocated or replaced, and 2 trees were identified as Category U which represents trees in such condition that they cannot realistically be retained in the context of the current land use.
- 1.1.5 A total of 32 groups of trees were surveyed and classified according to the BS5837 valuation protocol as follows: 29 groups of trees were classified as Category B, which represents trees which should be retained wherever possible, and 3 groups of trees were identified as Category C, which represents trees of low quality and value which could readily be relocated or replaced.
- 1.1.6 Tree constraints within the Site are discussed within Section 6. These include the removal of existing trees and hedges and root protection areas/hedgerow buffer zones.
- 1.1.7 The majority of the proposed development is located within the existing arable fields; however, the proposed development will require the removal of a number of trees and –where practicable- the translocation of sections of hedgerow. Where possible, existing trees have been retained and will be integrated into the landscaping proposals.

2 Introduction

2.1 Background

- 2.1.1 This report presents the results of an Arboricultural Survey conducted in line with the protocol recommended in BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations* at an area of pasture/farmland to the northwest of the town of Bicester, Oxfordshire. The survey was conducted by Stuart Harris of Hyder Consulting (UK) Limited for A2Dominion South Ltd during June 2014, with reference to Ordnance Survey data.
- 2.1.2 The aims of the study were to assess the condition and value of trees that would constitute potential constraints to the proposals to redevelop the Site for the provision of new highways and crossings beneath the existing railway. Two additional applications have been submitted for areas known as Application 1 (North of Railway) and Application 2 (South of Railway). These are subject to separate BS5837 assessments. A separate planning application was submitted in 2010 for the Exemplar Site, located in the north eastern corner of the North West Bicester development.
- 2.1.3 The Wildlife and Countryside Act 1981 (as amended), and subsequent legislation, provides statutory protection to birds, bats, invertebrates and other species that inhabit trees hedges or associated vegetation. These could impose significant constraints on the use and timing of access to the Site in addition to any of the tree matters, and are addressed in the Ecology chapter of the Environmental Statement.

2.2 The Site Location, Topography and Land Use

- 2.2.1 The Site is located along the north west edge of Bicester and part of it is approximately parallel to the A4095, Howes Lane. To the north west of the Site are open fields and the village of Bucknell and to the north east of the site is the village of Caversfield. The Site is irregular and linear in plan and covers an area of approximately 20ha centred upon NGR 456825 223733. At present the Site crosses open fields and borders Hawkwell Farm, Lord's Farm and a Thames Valley Police Authority Depot.
- 2.2.2 The topography of the Site is generally flat with heights ranging between 80 and 90m above ordnance datum.

2.3 Scope and Purpose of the Report

- 2.3.1 This report has been prepared in order to inform the planning process in accordance with the guidelines set out in British Standard BS5837:2012. The results of the tree survey are illustrated on the Tree Constraints Plan (TCP) (drawing number TPP03-UA005241-UE21D-01) at Appendix 4.
- 2.3.2 Individual tree locations and the canopy extents of groups of trees and hedgerows were established using an Ashtec Mobile Mapper 10 GPS-enabled field computer and high-resolution aerial imagery (Bluesky 2009). The level of detail and accuracy is adequate to inform preliminary assessments and the determination of planning consent.
- 2.3.3 The tree survey identified all trees within the Site, and those trees outside the Site which could be affected by development; for example, where the Root Protection Areas (RPAs) of adjacent trees are located inside the Site boundary. Each tree has been assessed and assigned a 'Retention Category' in accordance with BS5837:2012.
- 2.3.4 The Retention Category is based upon an assessment of tree quality and value, tree condition and life expectancy, and is assessed without regard to development proposals. The four retention categories – A, B, C and U – can be summarised as follows: Category A describes trees of high quality and value, where retention is highly desirable. Category B describes trees of moderate quality and value where retention is desirable. Category C trees are those of low

quality and value, which add little or no contribution to the local amenity in terms of arboricultural, landscape or cultural (including wildlife) value. Category C also includes young trees which can easily be replaced or, if appropriate, relocated. Category U trees are those trees which, for reasons of public safety or good arboricultural practice, have been identified for removal, and which were in such condition that they cannot realistically be retained in the context of the current land use.

- 2.3.5 The tree survey conducted and the results presented within this report are specifically designed to meet the BS5837 standard, and are not a substitute for either a full Tree Safety Survey or Management Plan designed to provide a detailed appraisal of the risk and liability associated with responsibility for individual trees or groups of trees. Trees located in areas, where lack of access prevented a detailed inspection, have not been closely inspected with regard to their condition and risk. Whilst these trees are included on the TCP, their location, crown spread and Root Protection Area are based on estimated measurements

3 Trees in relation to construction

3.1 Introduction

- 3.1.1 The British Standard BS5837 provides recommendations and guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees, including shrubs and hedgerows, with structures. It recognises the problems of development taking place in the vicinity of existing trees, as well as those associated with the planting of trees close to existing structures.
- 3.1.2 Where development, including demolition, is to occur, the standard provides guidance on how to decide which trees are appropriate for retention, on the means of protecting these trees during development, including demolition and construction work, and on the means of incorporating trees into the developed landscape.
- 3.1.3 The guidance recommends that before development, a three-stage approach incorporating: (i) initial tree survey and report; (ii) Arboricultural Implications Assessment; and (iii) Arboricultural Method Statement is undertaken. This report provides preliminary assessments of these stages.

3.2 Root Protection Area (RPA) / hedgerow buffers

- 3.2.1 The RPA is a recommendation in BS5837, and is based upon a minimum area (in m²) calculated from the measurement of the stem diameter, and a factor of the radial distance between the tree stem and the outer extent of the main lateral roots. The resulting area is usually recorded as a generalised circle on the tree survey. In this study, the RPA is represented by pink-shaded areas.
- 3.2.2 The viable retention of trees and hedgerows on construction sites is dictated by the successful protection of their root systems and canopies throughout the development process from initial site clearance to installation of the new landscape.
- 3.2.3 Healthy soils contain five basic components: oxygen, organic matter, mineral matter, living organisms and moisture. A soil's porosity allows water to drain through, carbon dioxide to escape and oxygen to enter. Any activity carried out to facilitate development which encroaches upon, or any change in the environment within, the RPA of retained trees and hedgerows, has significant potential to adversely affect these processes.

4 Methodology

- 4.1.1 Where access permitted, trees within the Site were visually surveyed from ground level using the Visual Tree Assessment (VTA) technique developed by Mattheck and Broeler (1994). No climbed inspections or specialist decay detection was undertaken, and detailed survey of a number of trees was restricted due to dense vegetation at ground level. Trees located on adjacent third-party land, or in areas of dense vegetation, were not surveyed to VTA standards due to access restrictions.
- 4.1.2 In line with the approach recommended in BS5837:2012, the following data was gathered for each tree surveyed:
- 4.1.3
- Tree number (or group number)
 - Tree species
 - Stem diameter (measured as Diameter at Breast Height (DBH), 1.5m above ground level)
 - Crown spread
 - Comments and observations on overall tree position, form, health and condition, highlighting any actual or potential defects
 - Recommendations for arboricultural works
 - BS5837 retention category
- 4.1.4 Diameter measurements were obtained at 1.5m above ground level using a diameter tape. A clinometer was used to measure tree heights, and a logger's tape was used to measure crown spread in four directions (north, east, south and west). Where access was not possible due to scrub growth or trees being located on third party land, measurements were estimated.
- 4.1.5 The physiological condition of each tree was assessed by inspecting the stem, branches and foliage for signs and symptoms of disease.
- 4.1.6 The structural condition was assessed by inspecting the stem, main branches and secondary branches (using binoculars where appropriate) to look for signs of structural weakness or symptoms of decay.
- 4.1.7 Any cavities were investigated using a metal probe to assess the extent of any decay. Where this was not possible, further inspection has been recommended, where appropriate, in the form of either a climbed inspection or specialist decay detection.
- 4.1.8 Adjacent trees of the same species and/or of similar age have been surveyed as groups.
- 4.1.9 All trees and groups of trees surveyed have been plotted on the TCP and their data recorded within the Tree Data Schedule (Appendix 3). An explanation of the categories and definitions used in producing the Tree Survey Schedule and undertaking the assessment of trees for the purposes of producing this report is provided in Appendix 1.
- 4.1.10 A desk study was carried out to investigate the presence of any Tree Preservation Orders (TPO) or designated Conservation Areas within the Site or immediately adjacent to it. This involved contacting Cherwell District Council.

5 Arboricultural Constraints

5.1 Statutory Tree Protection

- 5.1.1 On 30 July 2014 Jon Brewin, Arboricultural Officer at Cherwell District Council, confirmed that one tree within the Site is the subject of Tree Preservation Orders (TPO), this relates to a common oak (T270).
- 5.1.2 All of the hedgerows within the Site fall within the protection of the Hedgerows Regulations 1997 and, prior to planning permission being granted, any removal or translocation would require a Hedgerow Removal Notice to be submitted to Cherwell District Council.
- 5.1.3 Should significant numbers of trees need to be removed prior to full planning consent being granted under the Town and Country Planning Act 1990, a Forestry Commission Felling Licence is likely to be required.

5.2 Tree Removal

- 5.2.1 An assessment of the implications of the removal of existing trees within the Site should be informed by their respective BS5837 retention category listed in Appendix 3 and defined in Section 2.3.4.
- 5.2.2 Category B and C trees which are intrinsic to distinct landscape features within the Site are likely to attract a higher collective rating than they might as individuals, and their retention within the Site is likely to be highly desirable.

5.3 Root Protection Areas (RPA)

- 5.3.1 Changes in ground levels or excavation within the RPA of retained trees will not be permitted in most cases. It should be noted that this includes trees on third-party land adjacent to the Site.
- 5.3.2 Engineering solutions are available which allow some works to be completed within the RPA. For example, root damage can be minimised by using piles or radial strip footings, both of which can be located to avoid major tree roots. Additionally beams, slabs and suspended floors can be laid at or above ground level, and cantilevered as necessary to avoid tree roots. The impacts of increased ground levels can be reduced to acceptable levels using construction techniques and specialised products which allow the maintenance of water infiltration and gaseous exchange. Construction methods for the installation of drives and paths within the RPAs of retained trees that adopt a “No Dig” strategy can also be adopted to overcome some planning constraints. In order to arrive at a suitable solution, site-specific and specialist advice regarding foundation design should be sought from an arboriculturalist and an engineer.
- 5.3.3 Protective fencing should be erected to ensure maximum root protection of the retained trees on Site. Sales Cabins or site huts (provided they are of Jack Leg type) can be sited to act as ground protection for the duration of the construction. Any RPA beyond the line of protective barriers must be covered in ground protection based on the BSI 2012 recommendations, until there is no risk of any damage from demolition and construction works.

5.4 Shade and Dominance

- 5.4.1 Due consideration should be given to the location and species characteristics of retained trees in relation to proposed structures.

6 Results of Tree Survey

- 6.1.1 A total of 11 individual trees were surveyed and classified according to the BS5837 valuation protocol as follows: 7 trees were classified as Category B, which represents trees which should be retained wherever possible, 2 trees were identified as Category C, which represents trees of low quality and value which could readily be relocated or replaced, and 2 trees were identified as Category U which represents trees in such condition that they cannot realistically be retained in the context of the current land use.
- 6.1.2 A total of 32 groups of trees were surveyed and classified according to the BS5837 valuation protocol as follows: 29 groups of trees were classified as Category B, which represents trees which should be retained wherever possible, and 3 groups of trees were identified as Category C, which represents trees of low quality and value which could readily be relocated or replaced.

7 Preliminary Arboricultural Impact Assessment

- 7.1.1 The majority of the proposed development is located within the existing arable fields; however, the requirement for infrastructure linkages will require the removal of a number of trees and sections of hedgerow.
- 7.1.2 Where trees are to be retained at the periphery of areas of construction activity, there is significant potential for damage. Accordingly, specialist materials and construction methods (including supervision of works by an Arboriculturalist) may need to be employed.

7.2 Summary of impacts

7.2.1 **Table 1: Summary of arboricultural impacts**

Activity	Tree / Group ref.	Potential impact	Mitigation
General Construction Activity	All retained trees and hedgerows	Damage to tree stems as a result of direct contact by vehicles or machinery. Degradation of soil structure and its capacity to provide the physiological conditions suitable for root development.	Protective fencing will provide protection to tree stems and RPAs.
General Construction Activity	All retained trees and hedgerows	Damage to tree branches as a result of direct contact by vehicles or machinery.	Protective fencing will provide protection to tree canopies. Selected pruning of canopies in accordance with BS3998.

Activity	Tree / Group ref.	Potential impact	Mitigation
Excavation / removal of existing structures	Trees located at the periphery of construction areas where excavation within RPA is unavoidable.	<p>Excavation / removal of existing structures within the RPA of any tree could result in damage to, or loss of, significant structural roots (used for anchorage), coarse roots (used for the transportation of water and nutrients), and fine roots (used for the uptake of water and nutrients).</p> <p>The loss of structural roots could result in destabilisation and an increased risk of wind-throw during adverse weather conditions.</p> <p>The loss of fine and coarse roots could result in a reduction in the physiological condition of the tree, and, if affecting a significant area of the rooting zone, tree decline or mortality.</p>	<p>All excavation works will be completed in accordance with the generic methodology detailed in Section 8.7.1.</p> <p>In particularly sensitive areas, hand-digging and/or air spade excavation will be employed.</p>
Ground level alterations	Trees located at the periphery of construction areas.	<p>A reduction in ground levels could result in similar impacts as those associated with excavation and are addressed above.</p> <p>Significant increases in ground levels (build-up of more than 50mm) could prevent the permeability of air and water and could result in the loss of affected roots. The loss of fine and coarse roots could result in a reduction in the physiological condition of the tree, and, if affecting a significant area of the rooting zone, tree decline or mortality.</p>	<p>Changes in ground levels within the RPA of retained trees will be avoided where possible.</p> <p>Where ground level changes are unavoidable, specialist arboricultural advice will be sought. Where practicable, specialist construction techniques and materials will be employed to reduce impacts.</p>
Tree pruning	Trees located at the periphery of construction areas.	Poor tree pruning could result in permanent physiological damage and visual disfigurement.	All tree pruning will be completed in accordance with BS3998 by qualified Arboriculturalists.

Activity	Tree / Group ref.	Potential impact	Mitigation																																																																		
Tree removal	<p>Individual trees: 4, 118, 124, 151, 152, 168, 182, 183 184, 204, 207.</p> <table border="1"> <thead> <tr> <th>Groups</th> <th>% of total group removed</th> </tr> </thead> <tbody> <tr><td>G2</td><td>34%</td></tr> <tr><td>G3</td><td>6%</td></tr> <tr><td>G5</td><td>38%</td></tr> <tr><td>G6</td><td>100%</td></tr> <tr><td>G7</td><td>40%</td></tr> <tr><td>G9</td><td>58%</td></tr> <tr><td>G10</td><td>13%</td></tr> <tr><td>G12</td><td>11%</td></tr> <tr><td>G16</td><td>9%</td></tr> <tr><td>G48</td><td>11%</td></tr> <tr><td>G50</td><td>22%</td></tr> <tr><td>G67</td><td>11%</td></tr> <tr><td>G68</td><td>9%</td></tr> <tr><td>G80</td><td>10%</td></tr> <tr><td>G81</td><td>24%</td></tr> <tr><td>G87</td><td>4%</td></tr> <tr><td>G92</td><td>71%</td></tr> <tr><td>G93</td><td>13%</td></tr> <tr><td>G94</td><td>20%</td></tr> <tr><td>G96</td><td>73%</td></tr> <tr><td>G97</td><td>65%</td></tr> <tr><td>G100</td><td>9%</td></tr> <tr><td>G101</td><td>83%</td></tr> <tr><td>G102</td><td>100%</td></tr> <tr><td>G103</td><td>100%</td></tr> <tr><td>G104</td><td>100%</td></tr> <tr><td>G105</td><td>19%</td></tr> <tr><td>G115</td><td>35%</td></tr> <tr><td>G116</td><td>8%</td></tr> <tr><td>G145</td><td>13%</td></tr> <tr><td>G145</td><td>20%</td></tr> <tr><td>G148</td><td>19%</td></tr> </tbody> </table>	Groups	% of total group removed	G2	34%	G3	6%	G5	38%	G6	100%	G7	40%	G9	58%	G10	13%	G12	11%	G16	9%	G48	11%	G50	22%	G67	11%	G68	9%	G80	10%	G81	24%	G87	4%	G92	71%	G93	13%	G94	20%	G96	73%	G97	65%	G100	9%	G101	83%	G102	100%	G103	100%	G104	100%	G105	19%	G115	35%	G116	8%	G145	13%	G145	20%	G148	19%	Visual impact and loss of wildlife habitat.	Mitigation planting detailed within landscape proposals.
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Future tree growth	. Trees located at the periphery of construction areas.	Trees can displace light structures with limited foundations (by incremental growth) and cause damage to large structures as a result of differential soil shrinkage beneath sections of structure foundation (as a result of water extraction by adjacent roots). In addition, trees can cause a detrimental impact as a result of excessive shading, physical dominance, and nuisance (leaves, sap and debris).	<p>The design of proposed structures will be of a type able to withstand the growth of adjacent trees.</p> <p>This will include an assessment of differential soil volume changes (resulting from moisture extraction by tree roots).</p>																																																																		

Activity	Tree / Group ref.	Potential impact	Mitigation
Installation of underground services	All retained trees	As for excavation.	All excavation associated with the installation of services will be routed outside of the RPA of all retained trees. If this is not possible, National Joint Utilities Group (NJUG) guidelines will be employed.
Hazardous materials	All trees	Tree mortality. Partial die-back. Soil contamination.	Appropriate locations shall be identified away from the RPAs of all trees for the storage and handling of hazardous materials including petrol, diesel, cement, bitumen and limestone.

8 Preliminary Arboricultural Method Statement

8.1.1 This Preliminary Arboricultural Method Statement (PAMS) provides generic best practice measures to be adopted in order to protect retained trees during the development process. It has been prepared in order to inform the planning and the construction/ development process.

8.2 Protective Fencing

8.2.1 The purpose of this fencing is to provide protection to the RPAs of retained trees/groups and to protect trees and hedgerows prior to their translocation. Protective fencing will also be provided around translocated trees and hedgerows once installed in their receptor sites. The type of fencing used shall be appropriate to the level of adjacent construction activity and shall be agreed with the Local Authority tree officer. Weather-proof notices shall be attached to any protective fencing located adjacent to retained trees displaying the words “Construction Exclusion Zone” and listing restrictions which apply. All personnel must be made aware of these restrictions.

8.2.2 It is anticipated that three specifications for fencing will be employed during construction.

8.2.3 Low-use areas

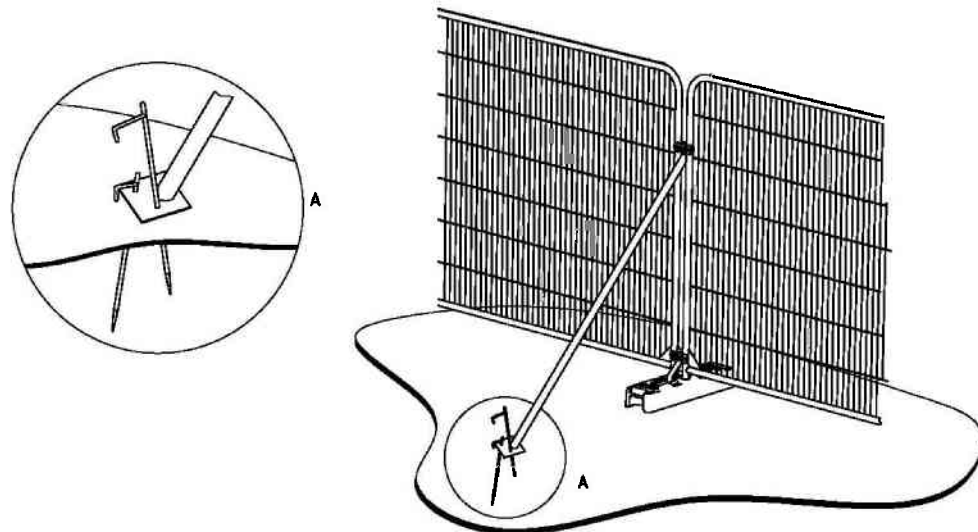
8.2.4 The system illustrated in Figure 1 is adequate to define areas of protected vegetation and exclude traffic, and comprises Cleft Chestnut Pale Fence in accordance with BS 1722 Part 4: (1991). Assembled with galvanized 14 gauge (2 mm) wire, four strands per row, peeled and pointed one end. Approximate spacing of pales 75 mm.



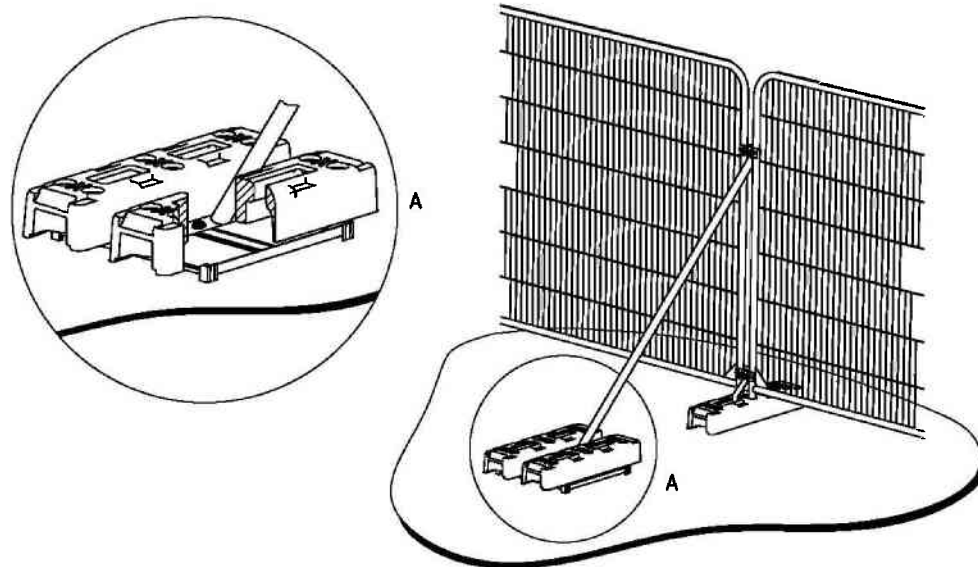
Figure 1. Tree Protection fencing example for low use areas.

8.2.5 Medium-use areas

8.2.1 This system comprises anti-climb weldmesh panels connected by clamps and supported by rubber or concrete bases and bracing struts. The system is illustrated in diagram Figure 2 and is based on BS5837 guidelines. This kind of system is robust enough to withstand occasional knocks by plant machinery.



a) Stabilizer strut with base plate secured with ground pins



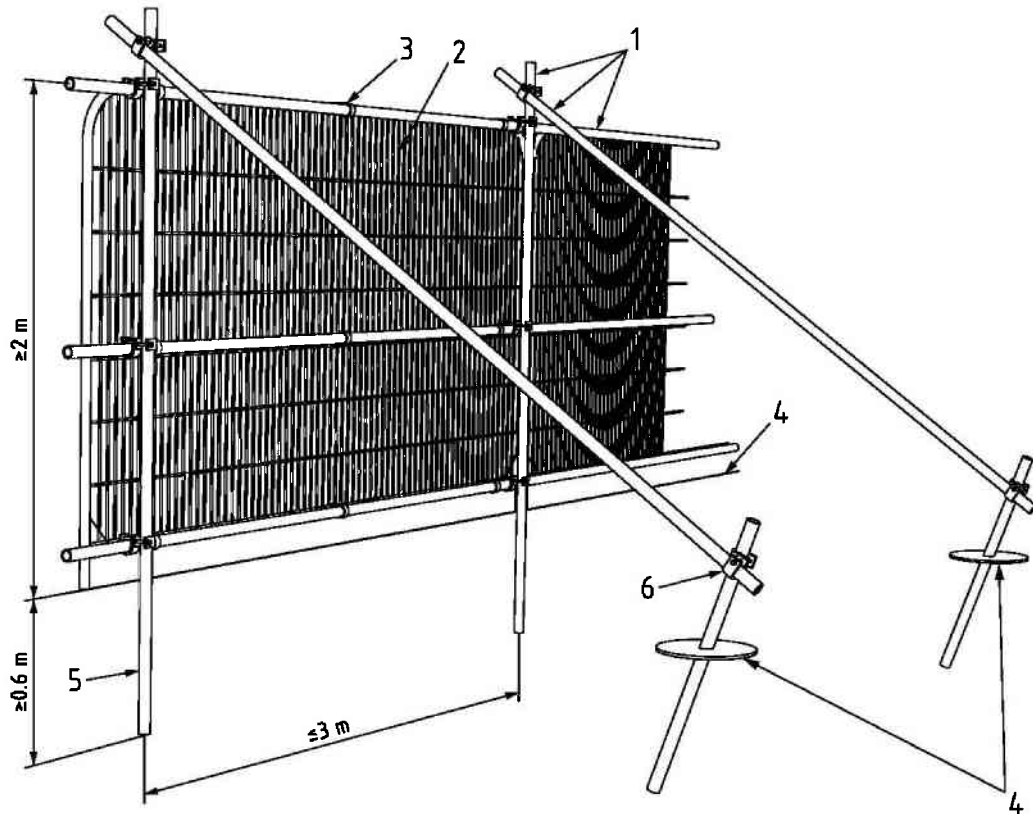
b) Stabilizer strut mounted on block tray

8.2.2

Figure 2. Tree Protection Fencing Specification (extract from BS5837)

8.2.3 High-use areas

8.2.4 This system involves driving scaffold poles into the ground, onto which are affixed horizontal scaffold poles and diagonal bracing struts. Anti-climb weldmesh panels are secured to this scaffold framework using standard scaffold clips or wire. The system is illustrated in diagram Figure. 2 and is based on BS5837 guidelines. This kind of system provides the highest level of security.



Key

- 1 Standard scaffold poles
- 2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
- 3 Panels secured to uprights and cross-members with wire ties
- 4 Ground level
- 5 Uprights driven into the ground until secure (minimum depth 0.6 m)
- 6 Standard scaffold clamps

8.2.5

Figure 3. Tree Protection Fencing Specification (extract from BS5837)

8.3 Construction Exclusion Zones (CEZ)

8.3.1 The Construction Exclusion Zone (CEZ) is the area identified by an arboriculturist to be protected during development, including site clearance and construction work, through the use of barriers and/or ground protection fit-for-purpose to ensure the successful long-term retention of a tree. The area within the construction exclusion zone is to be regarded as sacrosanct and the fencing shall not be taken down or relocated at any time.

8.3.2 All areas enclosed by protective tree fencing shall be treated as CEZs, and the following restrictions shall apply:

- No construction activity whatsoever must occur within these areas.

- No tree works, without the written consent from the Local Authority.
- No alterations of ground levels or conditions.
- No chemicals or cement washings.
- No excavation.
- No temporary structures.*
- No storage of soil, rubble or other materials.
- No vehicles or machinery to be used or parked without appropriate ground protection measures as per BS5837 recommendations. This will require the use of a proprietary system of reinforced concrete slabs/steel road plates on a compressible layer, or side butting scaffold boards/ 18mm plywood sheets on a compressible layer. The type of ground protection used shall be appropriate for the likely loading applied.
- No fixtures (lighting, signs etc.) to be attached to trees.
- No fires within 10 metres of the canopies of any tree or hedgerow.

**Sales Cabins or site huts, provided they are of the Jack Leg type, can be sited to act as ground protection for the duration of the construction.*

8.4 Hedgerow breakthrough

8.4.1 It is anticipated that all removed sections will be translocated to an appropriate receptor site within the wider NW Bicester Masterplan site. Should it not be feasible to translocate all sections, the following method for hedgerow removal in the absence of translocation will be adopted:

- Vegetation shall be clearly marked by the supervising arboriculturalist/ecologist. Vegetation shall be cut to near-ground level using chainsaws and/or hand tools as appropriate. Where cut material extends into adjacent retained vegetation, it shall be carefully removed as far as is reasonably practicable, without damaging or disturbing retained vegetation, and with the use of appropriate pruning tools.
- Cut stumps located within 3m of any retained woody plant shall be removed using a proprietary stump-grinding machine in order to avoid the likely root disturbance to adjacent vegetation which would be caused by the application of alternative methods of mechanical extraction. Following stump removal, all de-compacted material (generated by stump grinding) will be back-filled into depression created.
- Appropriate precautions in relation to biodiversity shall be taken, as set out in the Ecology chapter of the Environmental Statement.

8.5 Hedgerow and tree translocation

8.5.1 Hedgerow and tree translocation works will be carried out under direct arboricultural and ecological supervision.

Preparation of donor vegetation

8.5.2 Woody vegetation that has been selected for translocation will be clearly marked. Vegetation will be crown-reduced, pollarded or coppiced (using chainsaws and/or hand tools as appropriate)

to ensure clean pruning wounds) to reduce the above-ground weight and therefore the demand for water and nutrients from the crown. Pruning works will be overseen by the supervising arboriculturalist/ecologist in order that the extent of crown reduction and/or finished pollard height can be appropriately determined for each tree/shrub. Crown reduction and pollarding operations will ensure that a minimum stem height (above stem base) of at least 600mm is retained for each tree/shrub; however, given the importance of the hedgerow features for willife, an overall height of 1.5m stem height for each section of will be retained. An optimum translocation pruning regime resulting in tree/shrub height of 1.5m and width of 1.2m, incorporating multiple stems where appropriate, will generally be implemented. This will ensure that the pre-translocation pruning regime maximises tree/shrub survival whilst maintaining a level of functionality as a 'wildlife corridor'.

- 8.5.3 Wherever practicable, exposed roots will be clean-sawn with a chainsaw prior to tree/shrub removal, thereby minimising root shearing damage during the translocation process. This is particularly important for the larger roots of more mature specimens. Immediately following tree/shrub removal, and prior to translocation, all accessible roots above 10mm diameter will be trimmed back (using loppers or secateurs) to produce a clean cut, whilst preserving the maximum length of root.

Receptor site preparation

- 8.5.4 All donor vegetation will be translocated into specially prepared trenches, dug to a depth sufficient to ensure that at least 85% of retained roots are situated below the existing ground level on each receptor site. Finished soil levels will be reinstated around all translocated stems to carefully match those to which the vegetation has grown accustomed prior to translocation. However, the exposed ends of any significant above-ground roots should be covered with at least 150mm lightly compacted topsoil (prepared as a 50/50 mix of donor site and receptor site topsoil). This will prevent desiccation and drought-stress in newly translocated trees, and will significantly aid root growth within the receptor site.
- 8.5.5 Where above-ground roots are not present on donor vegetation, existing soil adjacent to tree stems should not be covered following translocation, in order to maintain consistent conditions for any translocated ground flora species situated within donor vegetation.
- 8.5.6 A working methodology will be adopted that seeks to minimise any soil and moisture changes between donor and receptor sites. In addition to those detailed here, specific measures to be implemented during the translocation process are described below.
- 8.5.7 Receptor site preparation will be overseen by the supervising arboriculturalist/ecologist.

The translocation process

- 8.5.8 Once the supervising arboriculturalist/ecologist has confirmed that the donor vegetation has been sufficiently crown-reduced, pollarded or coppiced, and that the receptor site has been appropriately prepared, the individual trees and shrubs and associated ground flora will be excavated using the largest available excavator bucket, to excavate the greatest possible depth of earth in order to maximise the amount of viable root material recovered intact. Each tree/shrub will be excavated complete with the block of soil, roots, coppiced stems and any associated ground flora. It is vital that the bucket is not 'shaken' to remove excess material, as this will denude the roots.
- 8.5.9 Following excavation and root trimming, donor vegetation will be transferred to the appropriate receptor site within the proposed development, ensuring that groups of trees and shrubs from the same donor site are established together within the same receptor site, thereby maximising habitat and environmental continuity.
- 8.5.10 Soil excavated from the receptor site during trench preparation should be stockpiled adjacent to the trench for backfilling in three separate piles.

8.6 Turf and ground cover vegetation; topsoil from the upper soil horizon; and subsoil.

- 8.6.1 Wherever possible, receptor site topsoil and subsoil layers should be mixed with soil from the equivalent donor site layer prior to backfilling. This greatly increases successful establishment and accelerates post-translocation tree growth by encouraging early root proliferation beyond the zone of translocated soil.
- 8.6.2 Individual trees/shrubs should be transferred to the appropriate receptor site, in the same bucket in which they were excavated, and carefully placed into the receptor trench.
- 8.6.3 Prior to the placement of translocated vegetation, the receptor trench will be prepared by loosening the top 300mm of soil in the base of the trench. Air pockets left between the trench base and the roots of translocated vegetation can result in root stress or dieback, and may become waterlogged, further reducing the chances of survival. Gentle rocking of the translocated vegetation during installation will further reduce the likelihood of air pockets.
- 8.6.4 The supervising arboriculturalist/ecologist will advise on the precise location of translocated vegetation, ensuring the appropriate placement of below-ground roots to maximise both plant survival and future stability. This operation may have to be aided by a banksman.
- 8.6.5 The translocation process has been designed to minimise the length of time between excavation and subsequent burial. However, on windy, warm or sunny days, it may be necessary to employ additional measures to alleviate root desiccation, as follows:
- Immediately following root trimming, any exposed roots should be wrapped in lightly dampened hessian sacking until ready to be lowered into the receptor trench.
 - Should receptor site soil have dried, this will need to be lightly watered prior to placement of translocated vegetation.
- 8.6.6 Once in place, the receptor trench should be carefully back-filled, using the prepared subsoil mix for initial backfill, followed by the topsoil mix. Where areas of bare soil remain, turf and ground cover material may be used to aid establishment, as directed by the supervising arboriculturalist/ecologist. Soil should be backfilled in layers of approximately 100mm, ensuring that successive layers fill all air pockets between roots, and are gently compacted using hand tools such as tampers where necessary. It is vital that both the root bark of retained vegetation and the above ground stems and branches are not damaged during this process.

8.7 Excavation within RPAs

- 8.7.1 Since excavation may be required within the RPAs of retained trees the following restrictions shall apply during these operations:
- No excavation shall be take place within any defined RPA without a permit to dig.
 - The surface within the RPA shall be cleared of all debris and vegetation (if present) using only hand-operated tools.
 - The RPA shall be measured and clearly marked on site with the use of ground pins or marker spray. All relevant personnel shall be briefed to ensure they are fully aware of the location and extent of the RPAs.
 - Excavation will proceed with caution using only hand-operated tools, or an excavator fitted with a grading type un-toothed bucket. The excavator will operate from outside the RPA or from installed ground protection materials (see Section 8.3.2). Successive thin (100mm maximum) layers of material shall be removed in a staged process.

- Should roots less than 25mm in diameter be encountered, these shall be retained undamaged wherever possible, and protected from desiccation by damp hessian sacking or a similar protective material throughout the period of exposure (which should be kept to a minimum). Roots less than 10mm diameter shall be trimmed back neatly in line with the edge of the excavation trench using secateurs. Should any roots greater than 25mm diameter be exposed, excavation works shall cease immediately and the Arboricultural Consultant called to the site for a professional judgement.

8.8 Changes in ground level

8.8.1 Significant changes in soil levels within RPAs will be avoided wherever possible by the alignment of structures away from trees, and the employment of specialist materials that limit incursion (bank stabilisation, lightweight materials, etc.).

8.8.2 Where changes in levels are unavoidable within RPAs, specialist materials will be employed to maintain, as far as possible, the physiological requirements of the tree. This is likely to include the supervised application of cellular confinement systems.

8.9 General construction activity

Since the canopies of retained trees may be in close proximity to areas of crane operation, the following restrictions will apply:

- All cranes will be sited outside the defined RPAs of retained trees / groups, and the appointed contractor will ensure all relevant personnel shall be made aware of the location of branches and the need to avoid causing damage to them.
- Prior to the implementation of lifting operations, a representative from the equipment supply company shall visit the site and ensure all operations can be completed without causing damage to retained trees. A lifting plan will be prepared and submitted for approval prior to all lifting operations. The lifting plan will make provision for the potential for damage of retained trees.
- All lifting operations will be completed under the close direction of a qualified banksman, who will be briefed by the appointed contractor as to the need to avoid damage the stems and branches of retained trees.
- Should additional tree removal or pruning be required the Local Authority Tree Officer shall be contacted and the scope of works agreed in writing.
- All materials will be stored within designated areas and no materials shall be stored within any RPA.

8.10 Hazardous materials

8.10.1 Any mixing of cement-based materials is to take place outside the RPAs of all trees. Provision shall be made to ensure that the mixing area is contained so that no water runoff enters the RPAs of any trees. All mixers and barrows shall be cleaned within this dedicated mixing area.

8.10.2 All other chemicals hazardous to tree health, including petrol and diesel, are to be stored in suitable containers as specified by COSHH Regulations (2002), and kept away from the RPAs.

8.11 Arboricultural Supervision

8.11.1 Good tree protection cannot be reliably implemented without regular arboricultural input. The nature and extent of that provision will vary according to the complexity of the site and the resources available. An Arboricultural Consultant should be instructed to work within the

guidance of subsequent detailed methodologies to oversee implementation of the protective measures and tree management proposals.

9 Conclusion

- 9.1.1 In the light of the review of the potential impacts on trees based upon the proposed layout, it is considered that the proposed development provides the basis for a sustainable development in the context of trees. Although tree loss will be required to provide adequate space for construction, retained trees and site topography will limit the impact of removal.
- 9.1.2 As long as precautions are taken, it will be possible to protect retained trees throughout the development process and integrate these trees into the final design.

10 References

- British Standards Institution (2005) *BS5837:2005 Trees in relation to construction – Recommendations*. BSI, London, UK.
- British Standards Institution (2010) *BS 3998:2010, Tree Work Recommendations*. BSI, London, UK
- British Standards Institution (1992) *BS 8206 Lighting for buildings Part 2 Code of practice for daylighting* (1992) BSi, London, UK
- Building Research Establishment. BRE Report 209 *Site layout planning for daylight and sunlight - A guide to good practice* (2003)
- Mattheck, C. and Broeler, H. (1994) *The Body Language of Trees: A Handbook for Failure Analysis Research for Amenity Trees No.4*. DETR, London, UK.

Appendix 1: Explanation of Terms

Numbering

Each tree, group of trees or hedgerow is given an individual reference, made up of sequential numbers prefixed by a letter where:

G = Group of trees/hedge

Species

Tree names and other plant names are provided as abbreviated scientific (Latin) species names (first two letters of genus and species).

Abbreviated Latin	Common Name	Latin Name
Ac ca	Field Maple	Acer campestre
Ac pl	Norway Maple	Acer platanoides
Ac ps	Sycamore	Acer pseudoplatanus
Ae hi	Common Horse Chestnut	Aesculus hippocastanum
Ai al	Tree of Heaven	Ailanthus altissima
Al gl	Common Alder	Alnus glutinosa
Be pe	Silver Birch	Betula pendula
Be vu	Barberry	Berberis vulgaris
Ca be	Common Hornbeam	Carpinus betulus
Ch la	Lawson Cypress	Chamaecyparis lawsoniana
Co av	Common Hazel	Corylus avellana
Co sa	Common Dogwood	Cornus sanguinea
Cr mo	Common Hawthorn	Crataegus monogyna
Cu le	Leyland Cypress	X Cupressocyparis leylandii
Eu eu	Euonymus europaeus	Spindle
Fa sy	Common Beech	Fagus sylvatica
Fr ex	Common Ash	Fraxinus excelsior
Li vu	Common Privet	Ligustrum vulgare
Ma sy	Crab Apple	Malus sylvestris
Pi ab	Norway Spruce	Picea abies
Pi sy	Scots Pine	Pinus sylvestris
Po ni	Black Poplar	Populus nigra
Po sp.	Poplar species	Populus species
Po tr	Aspen	Populus tremula
Pr ce	Myrobalan Plum	Prunus cerasifera
Pr do	Plum	Prunus domestica
Pr sp	Blackthorn	Prunus spinosa
Pr sp.	Cherry	Prunus species
Py co	Common Pear	Pyrus communis
Qu ce	Turkey Oak	Quercus cerris
Qu ro	Common Oak	Quercus robur
Sa ca	Goat Willow	Salix caprea
Sa fr	Crack Willow	Salix fragilis
Sa ni	Common or Black Elder	Sambucus nigra
So ar	Whitebeam	Sorbus aria
Ti sp.	Lime species	Tilia species
Ul pr	English Elm	Ulmus procera
Vi la	Wayfaring Tree	Viburnum lantana

Stem Diameter

Measured in accordance with methodology detailed within Annex C 'Measurement of tree stems' of the BS5837:2012.

Crown Diameter

Average measured in metres using a loggers tape where possible.

Notes

This section provides details, where relevant, pertaining to the tree's position, form, and an account of any significant defects observed. Any access restrictions are also noted here.

Recommendations

These are normally based upon remedial action to address any observed defects. These may be recommended for tree safety reasons, or for reasons of good arboricultural practice and tree management.

BS5837 Retention Category

Each tree, group of trees or hedge is assigned to a retention category where:

A	Trees of high quality and value, retention is highly desirable
B	Trees of moderate quality and value where retention is desirable
C	Trees of low quality and value, or young trees with a stem diameter <150mm. Category C trees may be retained, replaced or in the case of younger trees, relocated
U	Trees unsuitable for retention or trees which should be removed

In addition, each tree, group of trees or hedge is assigned to a retention sub-category where categorisation is for:

1	Mainly arboricultural qualities
2	Mainly landscape qualities
3	Mainly cultural values, including conservation

Appendix 2: Author's Qualifications and Experience

Stuart Harris N.D.Arb, N.C.H.Arb

Stuart Harris is a professional arboriculturalist with over 28 years experience in relation to trees and woodlands encompassing technical, strategic and practical roles in tree and woodland maintenance and management, tree surgery, and tree safety assessment, and has produced numerous technical Arboricultural Reports for the purposes of Development, Safety, Management and Mortgage Subsidence. He is accredited as a LANTRA Professional Tree Inspector. A qualification produced in association with the Arboricultural Association and generally recognised as appropriate for all levels of tree inspection. His career experience spans the public and private sectors including roles within the Royal Botanic Gardens Kew, local authorities and private consultancies.

Appendix 3: Tree Data Schedules

Individual Trees

Tree Ref	Abbreviated Species Name	Crown Diameter	DBH (mm)	General Notes	Defects	Actions	BS5837 Category
4	Qu ce	7	250	Isolated tree in hedge.	No major visible defects.	No action required.	B2
118	Ae hi	7	300	Isolated tree located within hedge.	No major visible defects .	No action required.	B2
124	Fr ex	18	800	Located adjacent to field margin and road.	Advanced Ivy encroachment into crown. Ivy prevented detailed inspection. Acceptable condition at present.	No action required.	B2
151	Sa fr	10	1	Located adjacent to field margin and watercourse.	Collapsed tree.	No action required	U
152	Sa fr	10	1	Located adjacent to field margin and watercourse.	Collapsed tree.	No action required.	U
168	Ac ca	12	400	Twin stemmed. Located within hedge adjacent to field margin.	No major visible defects.	No action required	B2
182	Ac pl x 2	12	400	Located within hedge adjacent to field margin.	No major visible defects.	No action required	B2
183	Ac pl, Ae hi	12	400	Closely spaced stems. Located within hedge adjacent to field margin.	No major visible defects.	No action required	B2
184	Ac pl	14	400	Located within hedge adjacent to field margin.	No major visible defects.	No action required	B2
204	Fr ex	8	500	Located within hedge adjacent to field margin.	Poor structure. Acceptable condition at present.	No action required.	C2
207	Ti sp.	4	200	Located adjacent to tarmac drive.	No major visible defects.	No action required	C2

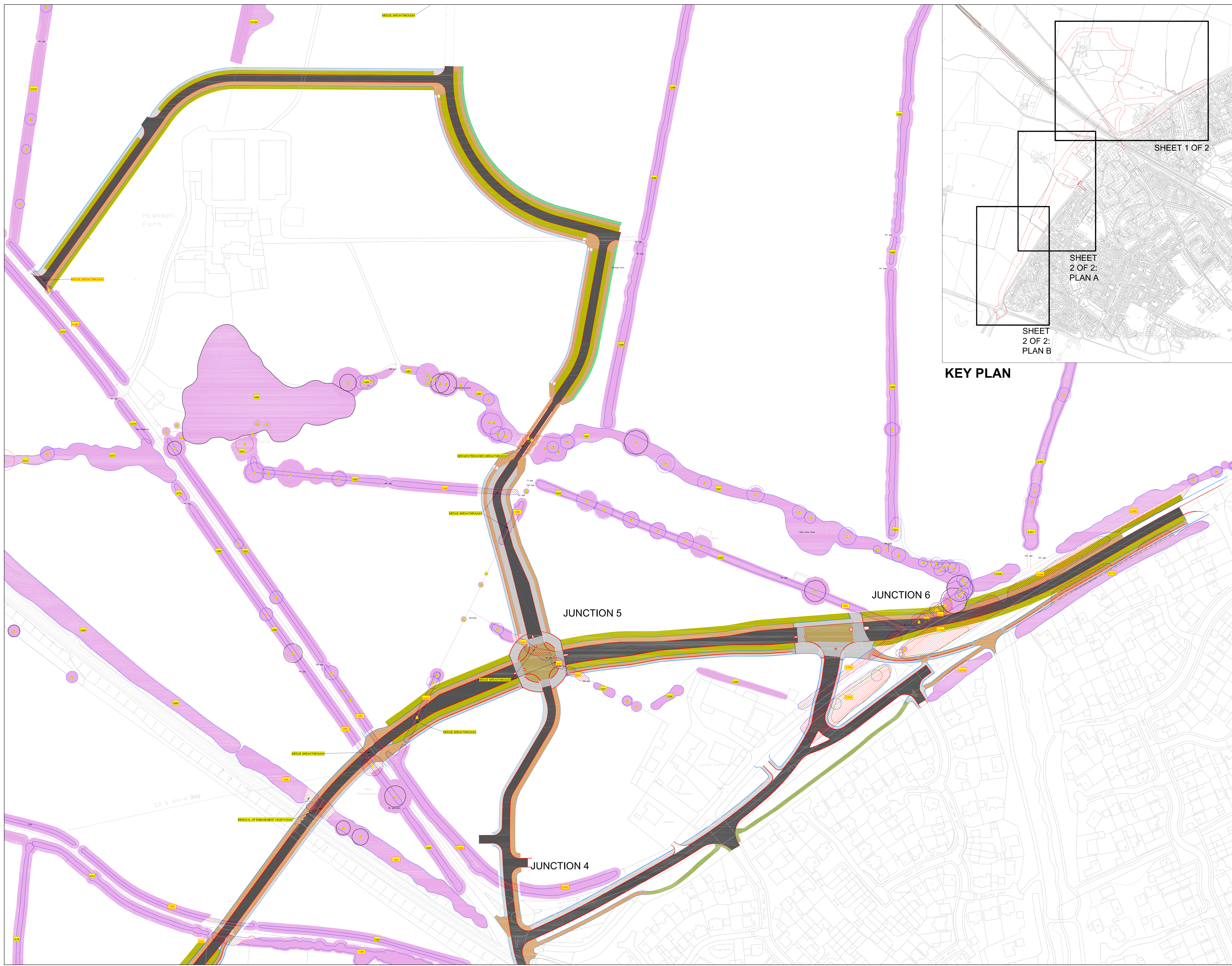
Groups

Group Ref	Abbreviated Species Name	Average DBH (mm)	Group Type	General Notes	Defects	Actions	Priority	BS5837 Category
G2	Pr sp; Cr mo; Ma sy; Sa ni; Be vu;	200	Neglected mixed species hedgerow.	Located at field margin.	No major visible defects.	No action required.	n/a	B2
G3	Ac ps; Pr sp;	250	Maintained mixed species hedgerow with isolated trees.	Located adjacent field margin. Hedge with multi-stemmed Ac ps suppressing Pr sp.	Acceptable condition at present. No major visible defects.	No action required.	n/a	B2
G5	Pr sp; Cr mo; Sa ni;	200	Neglected mixed species hedgerow.	Located at field margin.	No major visible defects.	No action required.	n/a	C2
G6	Pr sp;	150	Maintained mixed species hedgerow with isolated trees.	Poor quality section.	Heavily suppressed by bramble.	No action required.	n/a	C2
G7	Cr mo; Pr sp; Fr ex; Ac ca;	300	Neglected mixed species hedgerow with isolated trees.	Located adjacent field margin screening road.	No major visible defects.	No action required.	n/a	B2
G9	Pr sp; Cr mo; Ac ca;	200	Mixed species group.	Located adjacent to field and drainage channel.	No major visible defects.	No action required.	n/a	B2
G10	Pr sp; Cr mo; Sa ni; Ac ca; Ul pr;	200	Maintained mixed species hedgerow with isolated trees.	Located adjacent to field margin.	No major visible defects.	No action required.	n/a	B2
G12	Pr sp;	100	Maintained single species hedgerow.	Short spur extending from mature hedge.	No major visible defects.	No action required.	n/a	C2
G16	Ac ca; Pr sp.;	250	Mixed species group.	Located at end of hedge, adjacent to field margin and track.	Access prevented inspection. No major visible defects.	No action required.	n/a	B2
G48	Pr sp; Cr mo; Ac ca; Sa ni; Fr ex;	300	Neglected mixed species hedgerow with isolated trees.	Located adjacent to access track, car park, and field margin. Larger trees at western end (adj. car park and offices).	Access prevented detailed inspection. no major visible defects.	No action required.	n/a	B2
G50	Pr sp; Cr mo; Fr ex;	100	Maintained mixed species hedgerow.	Located adjacent to field margin and access track.	No major visible defects.	No action required.	n/a	B2
G67	Pr sp; Cr mo; Sa ni; Fr ex;	250	Mixed species screen	Located on/adjacent to railway embankment. Dense vegetation including good quality Cr mo.;	Access prevented detailed inspection.	Negotiate access and re survey.	n/a	B2
G68	Cr mo; Ac ca; Ma sy;	250	Mixed species group.	Located on/adjacent to railway embankment. Scattered individual trees in long grass.	Access prevented detailed inspection. No major visible defects.	No action required.	n/a	B2
G80	Pr sp; Ul pr; Ac ca; Sa ni;	200	Mixed species hedgerow with isolated trees.	Located adjacent to field margin and road.	No major visible defects.	No action required.	n/a	B2
G81	Cr mo; Ac ca; Ac ca; Sa ni; Pr sp;	200	Maintained mixed species hedgerow.	Located adjacent to field margin and road.	No major visible defects	No action required	n/a	B2
G87	Cr mo; Ul pr; Pr sp; Ac ca;	0	Mixed species shelterbelt.	Located adjacent to field margin and watercourse.	No major visible defects.	No action required	n/a	B2
G92	Cr mo; Sa ni; Pr sp; Ac ca;	200	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin and track.	No major visible defects.	No action required.	n/a	B2
G93	Pr sp; Cr mo; Ul pr; Sa ni; Ac ca;	200	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin.	No major visible defects.	No action required.	n/a	B2
G94	Pr sp; Cr mo; Sa ni;	200	Neglected mixed species hedgerow.	Located adjacent to field margin.	No major visible defects	No action required	n/a	B2
G96	Cr mo; Ul pr; Pr sp;	200	Neglected mixed species hedgerow.	Located adjacent to field margin.	No major visible defects.	No action required	n/a	B2
G97	Pr sp; Cr mo; Sa ni; Ma sy; Ac ca;	300	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin. Good examples of Ac ca; and Ma sy.;	No major visible defects.	No action required	Urgent	B2
G100	Pr ce; Ac ca; Cr mo; Po ni; Ul pr;	200	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin and road.	No major visible defects.	No action required	n/a	B3
G101	Cr mo; Ma sy; Ul pr; Ac ca;	200	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin.	No major visible defects. Some dead/dying Ul pr.;	No action required.	n/a	B2
G102	Cr mo; Ul pr; Ma sy; Ac ca; Sa ni; Co sa; Fr ex; Pr sp; Ac ps; Ae hi; Pr sp.	200	Neglected mixed species hedgerow with isolated trees.	Located adjacent to field margin and tarmac drive.	No major visible defects.	No action required	n/a	B2
G103	Pr sp; Ul pr; Ma sy; Ac ca; Fr ex; Co sa; Cr mo;	200	Mixed species shelterbelt.	Located adjacent to tarmac drive and road.	No major visible defects.	No action required	n/a	B2
G104	Pr sp; Cr mo; Pr sp.; Ul pr; Fr ex; Eu eu; Co sa; Co av; Po ni; Ac ca; Qu ro; Py co; Ac pl;	300	Mixed species shelterbelt.	Located between road and inner track.	Scattered dead Ul pr.;	No action required	n/a	B2
G105	Pr sp; Cr mo; Ul pr; Fr ex; Ac ca;	300	Mixed species shelterbelt.	Located adjacent to field margin. Larger trees (mainly Ul pr;) at western end.	No major visible defects.	No action required	n/a	B2
G115	Pr sp; Cr mo; Lime Co av; Pi sy; Co sa; Fr ex; Pr sp.; Ac ca; Qu ro	200	Mixed species shelterbelt.	Located adjacent to cycle path and residential properties.	No major visible defects	No action required	n/a	B2

Groups

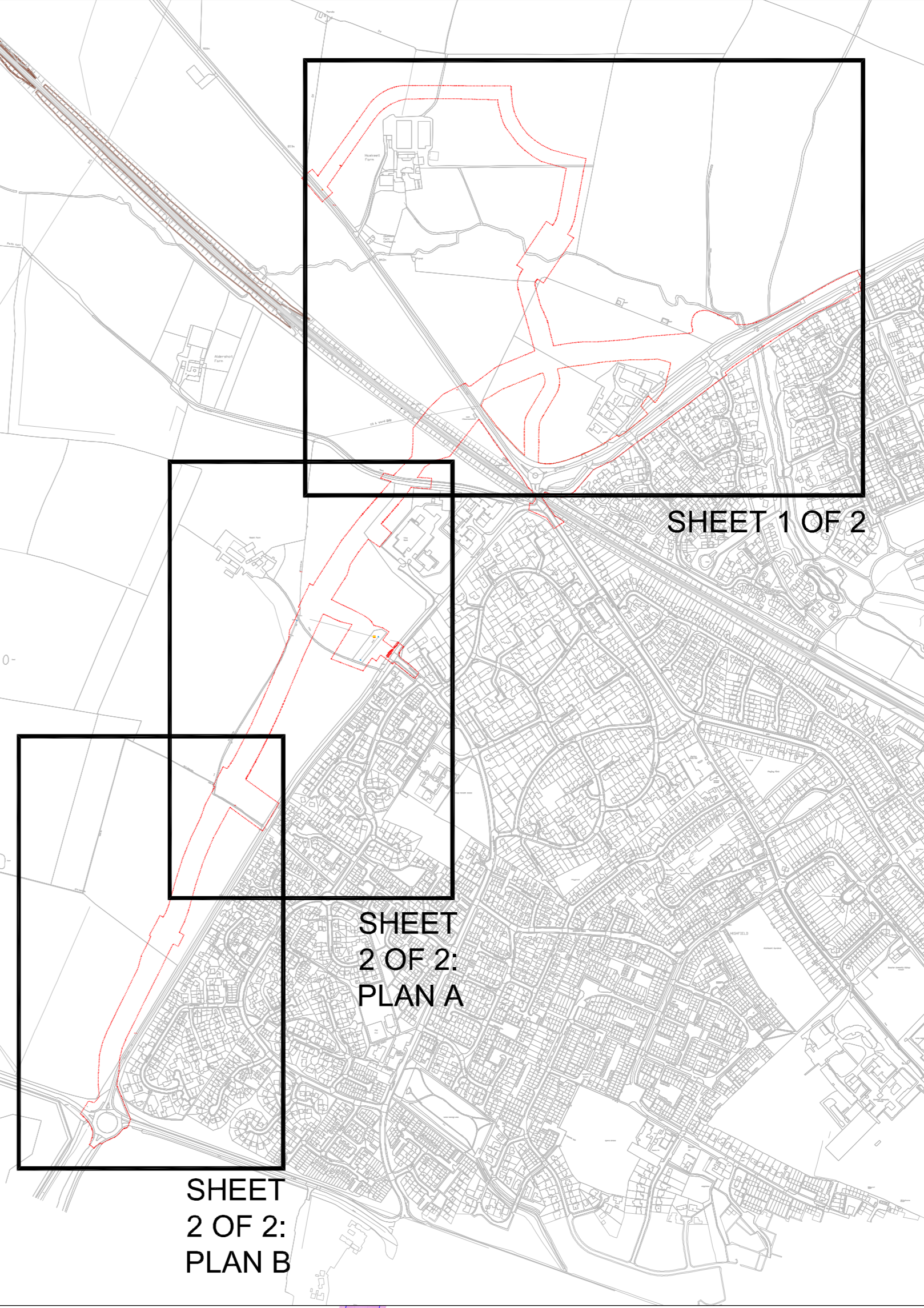
Group Ref	Abbreviated Species Name	Average DBH (mm)	Group Type	General Notes	Defects	Actions	Priority	BS5837 Category
G116	Pr sp; Cr mo; Fr ex; Ca be; Ac ca;	200	Mixed species shelterbelt.	Located adjacent to cycle path and residential properties.	No major visible defects	No action required	n/a	B2
G145	Pr sp; Co av; Ac ca; Cr mo; Sa ni; Vi la; Co sa; Fr ex; Ul pr	200	Maintained mixed species hedgerow.	Located adjacent to field margin and road.	No major visible defects.	No action required.	n/a	B2
G148	Pr sp; Cr mo; Fr ex; Sa ni; Ul pr; Ac ca;	100	Mixed species hedgerow with isolated tree.	Located at field margin screening road.	No major visible defects.	No action required.	n/a	B2

Appendix 4: Tree Constraints Plan



KEY

Abbreviated Latin	Latin Name	Common Name
Ac ca	Field Maple	Acer campestre
Ac pl	Norway Maple	Acer platanoides
Ac ps	Sycamore	Acer pseudoplatanus
Ac hi	Common Horse Chestnut	Aesculus hippocastanum
Ai al	Tree of Heaven	Ailanthus altissima
Al gl	Common Alder	Alnus glutinosa
Be pe	Silver Birch	Betula pendula
Be va	Barberry	Berberis vulgaris
Ca be	Common Hornbeam	Carpinus betulus
Ch la	Lawson Cypress	Chamaecyparis lawsoniana
Co av	Common Hazel	Corylus avellana
Co sa	Common Dogwood	Cornus sanguinea
Cr mo	Common Hawthorn	Crataegus monogyna
Cu le	Leyland Cypress	Cupressocyparis leylandii
Eu eu	Spindle	Euonymus europaeus
Fa sy	Common Beech	Fagus sylvatica
Fr ex	Common Ash	Fraxinus excelsior
Li vu	Common Privet	Ligustrum vulgare
Ma sy	Crab Apple	Malus sylvestris
Pr al	Norway Spruce	Picea abies
Pr sy	Scots Pine	Pinus sylvestris
Po ni	Black Poplar	Populus nigra
Po sp	Poplar species	Populus species
Pa tr	Ashers	Populus tremula
Pr ce	Myrobalan Plum	Prunus cerasifera
Pr do	Plum	Prunus domestica
Pr sp	Blackthorn	Prunus spinosa
Pr sp	Cherry	Prunus species
Pr co	Common Pear	Pyrus communis
Qu ce	Turkey Oak	Quercus cerris
Qu ro	Common Oak	Quercus robur
Sa ca	Goat Willow	Salix caprea
Sa fr	Crack Willow	Salix fragilis
Sa ni	Common or Black Elder	Sambucus nigra
So ar	Whitebeam	Sorbus ardo
Ti sp	Lime species	Tilia species
Ul ar	English Elm	Ulmus procera
Vi la	Wayfaring Tree	Viburnum lantana



KEY PLAN

- A Category tree/group
- B Category tree/group
- C Category tree/group
- U Category tree/group
- Tree ID number
- Abbreviated Latin name
- Group ID number
- Root Protection Area (RPA) Hedge Buffer Zones
- Tree ID number
- Abbreviated Latin name
- Group ID number
- Trees to be removed
- Vegetation clearance

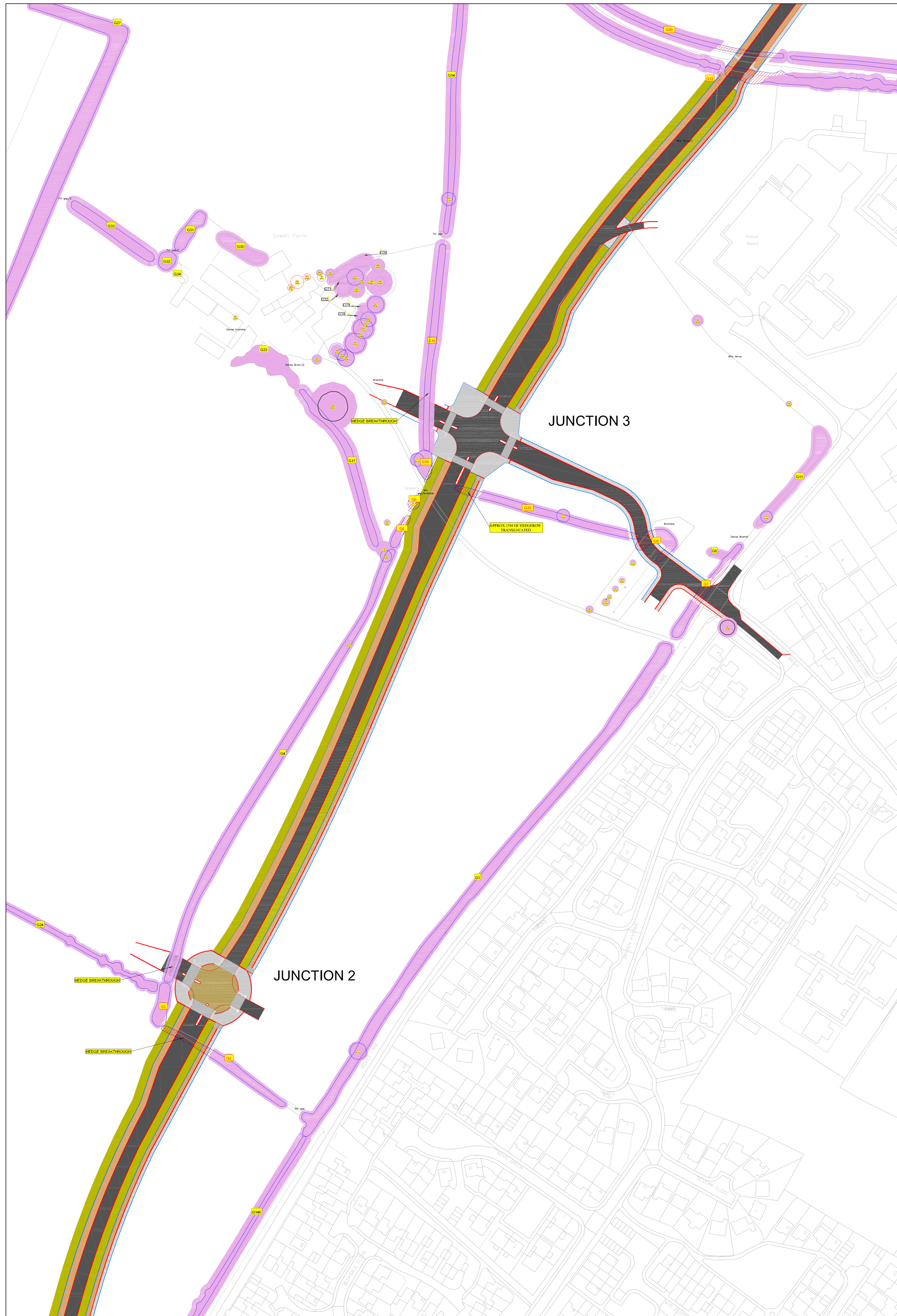
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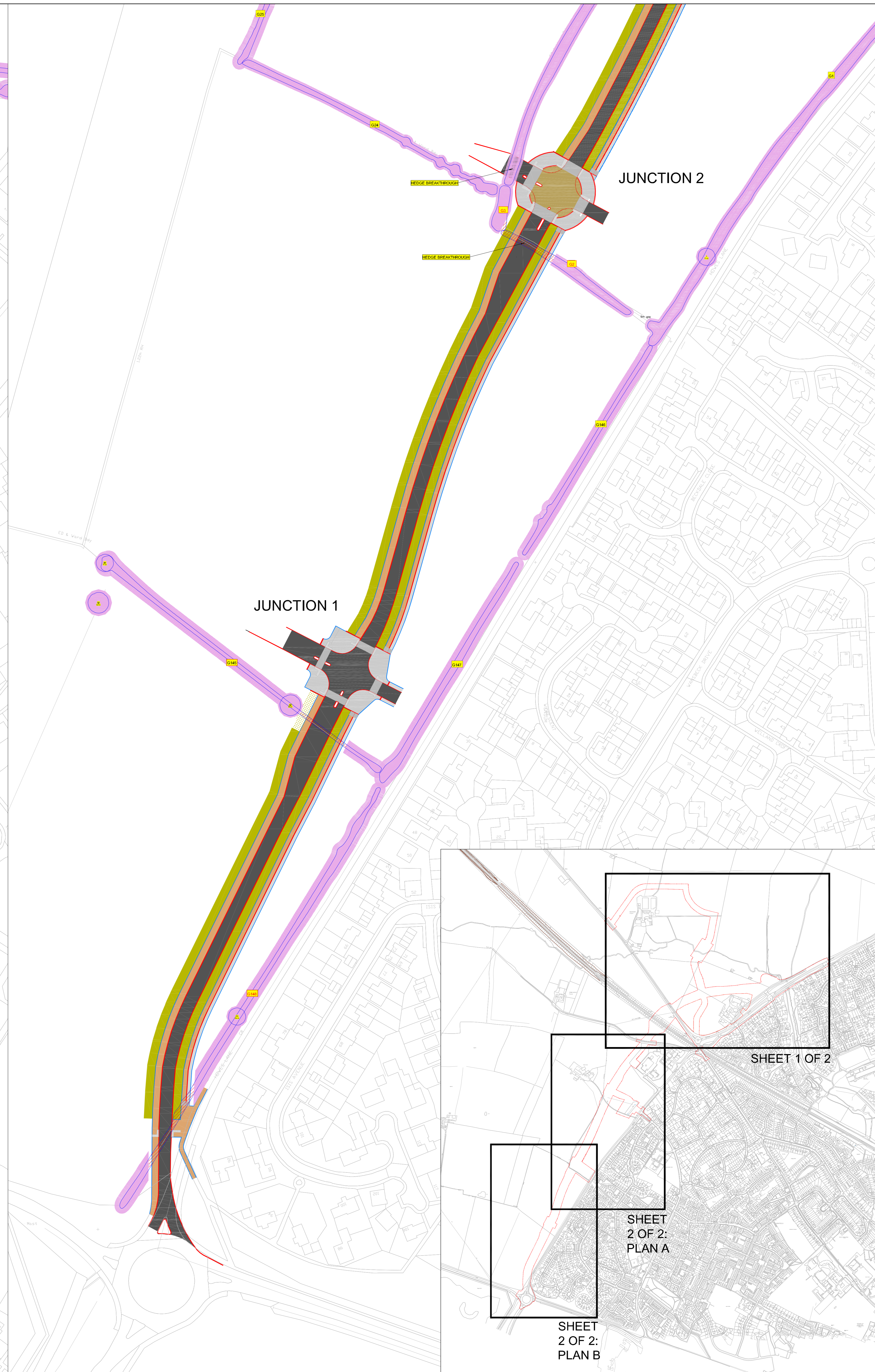
Hyder HYDER CONSULTING (UK) Limited
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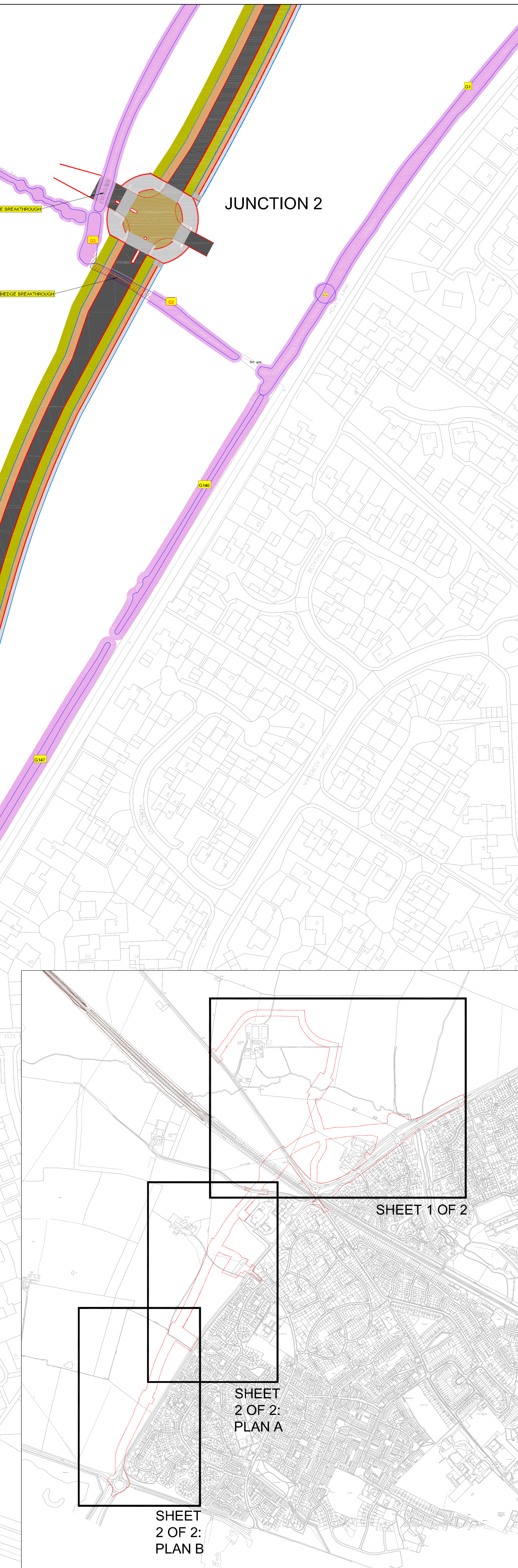
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PLAN A



PLAN B



KEY PLAN

KEY

Abbreviated Latin	Latin Name	Common Name
Ac ca	Field Maple	Acer campestre
Ac pl	Norway Maple	Acer platanoides
Ac ps	Sycamore	Acer pseudoplatanus
Ac hi	Common Horse Chestnut	Aesculus hippocastanum
Al al	Tree of Heaven	Ailanthus altissima
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Be pe	Silver Birch	Betula pendula
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Fr ex	Common Ash	Fraxinus excelsior
Li vu	Common Privet	Ligustrum vulgare
Ma sy	Crab Apple	Malus sylvestris
Pr al	Norway Spruce	Picea abies
Pr sy	Scots Pine	Pinus sylvestris
Po ni	Black Poplar	Populus nigra
Po sp	Poplar species	Populus species
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Pr ce	Myrobalan Plum	Prunus cerasifera
Pr do	Plum	Prunus domestica
Pr sp	Blackthorn	Prunus spinosa
Pr sp	Cherry	Prunus species
Pr co	Common Pear	Prunus communis
Qu ce	Turkey Oak	Quercus cerris
Qu ro	Common Oak	Quercus robur
Sa ca	Goat Willow	Salix caprea
Sa fr	Crack Willow	Salix fragilis
Sa ni	Common or Black Elder	Sambucus nigra
So ar	Whitebeam	Sorbus aria
Ti sp	Ulm species	Tilia species
Ud ar	English Elm	Ulmus procera
Vi la	Wayfaring Tree	Viburnum lantana

- A Category treegroup
- B Category treegroup
- C Category treegroup
- U Category treegroup
- Tree ID number
- Abbreviated Latin name
- Group ID number
- Root Protection Area (RPA) / Hedge Buffer Zones
- Tree ID number
- Abbreviated Latin name
- Group ID number
- Trees to be removed
- Vegetation clearance

01	FOR PLANNING	01/12/14
Issue	Description	Date
Status	PRELIMINARY	
NOT TO BE USED FOR CONSTRUCTION		
Scales	1:1000	Current Issue Signatures
Original Size	A0	Author: C.RASHLEIGH
Height		Checker: S.WALTERS
Grid		Approver: P.HARKER
Filename	© Copyright reserved	



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Project
A4095 NW STRATEGIC LINK ROAD

Title
TREE CONSTRAINTS PLAN SHEET 2 OF 2