Arboricultural Impact Assessment & Method Statement

Higher Oak, Oak Road, Wrexham, LL13 9RG

Prepared for:

A Bould

Our Ref: 17/AIA/WXM/209 (Rev A)

July 2018

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1.0 INSTRUCTION

1.1 We have been instructed by Alexandra Bould to carry out an Arboricultural Impact Assessment (AIA) in order to assess the development proposal in relation to trees in accordance with the principles of British Standard 5837 'Trees in Relation to Design, Demolition & Construction - Recommendations' 2012.

1.2 We are instructed to prepare a report in order to provide information to assist all parties involved in the planning process to make balanced judgements with regard to arboricultural features in relation to the proposed conversion and extensions to the barn at Higher Oak, Oak Road, Wrexham. As such, all trees within influencing distance to the required easement have been surveyed and are listed within a Tree Survey Schedule (***Appendix 1***) and plotted on all accompanying plans.

1.3 The tree survey was carried out on 17 August 2017 by Alistair Henderson, Principal Consultant to Tree Solutions Ltd. Our appraisal of the mechanical integrity of trees on the site is sufficient only to inform the current project. The assessment of trees is carried out from ground level without invasive investigation and the disclosure of hidden defects cannot therefore be expected. Whilst the survey is not specifically commissioned to report on matters of tree safety, we report obvious defects that are significant in relation to the existing and proposed land use. We do not carry out detailed safety inspections unless specifically instructed to do so in writing and have not carried out such inspections of trees on the proposal site.

1.4 Twelve individual tree (T1-T12), eight groups (G1-G8) and one hedgerow (H1) were surveyed and mapped on an Preliminary Tree Constraints and Impact Assessment Plan Ref: 17/AIA/WXM/209, Drawing No. 1 & 2 at ***Appendix 2/3.*** All arboricultural information recorded during the survey is presented within a schedule at ***Appendix 1***.

1.5 The Arboricultural Impact Assessment is based on the proposed site layout plan Ref: SK03 'C' provided by the project architect Tecwyn Williams.

2.0 STATUTORY CONTROLS & PLANNING POLICY

2.1 In terms of impacts on trees, the planning application will be assessed against Policy EC4 of the Wrexham County Borough Council Unitary Development Plan (2005) and Local Planning Guidance Note 17 'Trees & Development' (2010).

2.1.2 We have been unable to ascertain if any trees are subject to a Tree Preservation Order or if the site falls within a designated Conservation Area. You are advised to obtain written confirmation from Wrexham Council Borough Council on this prior to undertaking any tree works not granted consent under this planning application.

2.2 Protected Species

2.2.1 Mature trees often contain cavities, crevices and hollows that offer potential habitat for species such as bats and barn owls. Both are afforded protection under the Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as The Conservation (Natural Habitats, &c) (Amendment) Regulations 2007.

2.3 Wildlife Habitats

2.3.1 Trees and hedgerows of most species provide valuable nesting sites for a wide range of birds and it is likely that nesting birds will be present on the site during the period March to September.

3.0 THE SITE

3.1 The site contains an existing barn, car parking area and material storage yard. It is surrounded by trees along the northern and western boundary that provide screening to Oak Road and the Industrial Estate. There is a detached residential dwelling to the south 'Higher Oak'

4.0 DEVELOPMENT PROPOSAL

4.1 Barn conversion and extensions with associated vehicular access and parking.

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5.0 GENERAL CONSTRAINTS DATA - CONSTRUCTION EXCLUSION ZONES (CEZ's)

5.1 GENERAL

5.1.1 The three phases of an AIA were outlined in Section 1. In addition, during the development process for retention trees, there may be three and even four constraints to consider: Construction Exclusion Zone (CEZ's):

- CEZ 1: Root Protection Area (see 5.2)
- CEZ 2: Tree Crown Protection (see 5.3)
- CEZ 3: Tree Dominance (see 5.4)
- CEZ 4: New Tree Planting Zone (see 5.5)

CEZ's are explained below:

5.2 CEZ 1: ROOT PROTECTION AREA (RPA)

5.2.1 The RPA, calculated in m2, should be protected before and during any demolition/construction works. This ensures the effective retention of trees by safeguarding a reliable quantum of functioning tree roots. The RPA is based on a radial measure from the centre of the tree stem, which is calculated by multiplying the stem diameter by a factor of twelve or by the $\sqrt{(\text{mean stem diameter}^2)}$ x number of stems for multi-stemmed trees. With the AIA 1, the RPA is only shown indicatively on the preliminary TCP, as its shape may be subject to amendment as the design progresses.

5.2.2 During the AIA 2, the derived radial measure is converted by the arboriculturalist into the actual area to be protected, having due regard to prevailing site conditions and how these may have affected the tree(s), particularly in relation to factors affecting their likely rooting disposition. The RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.

5.2.3 The means of protecting the RPA will include the installation of tree protective fencing prior to the start of any demolition or construction work on site. The prohibition of various activities within the RPA must be adhered to (e.g. mechanical excavation, soil stripping, fire lighting, material storage, lowering levels and creating excessive sealed surfacing) and may include the use of temporary ground protection and/or special engineering solutions where construction is proposed near to retention trees or within the RPA.

5.3 CEZ 2: TREE CROWN PROTECTION ZONE

5.3.1 This is the area above ground occupied by the crown (branches) of the tree, along with allowances for working space (safe working area) and if appropriate, for future growth. The extent of CEZ 2 is determined by considering the existing and future crown spread of the tree(s), bearing in mind the possibility of this being modified by an acceptable quantum of pruning.

5.4 CEZ 3: TREE DOMINANCE ZONE

5.4.1 This is the area above ground dominated by the tree in relation to issues of shading, seasonal debris and safety apprehension. This area is calculated by considering the height and spread of the tree relative to the proposed buildings, cross referenced with intended end use. As such, what is assessed is the likely psychological effect of the tree on the end user.

5.4.2 The purpose of identifying CEZ 3 is to protect trees from post development pressure (resentment) by the site's end users, who may, if resentful of the trees, seek to procure excessive pruning treatments or even to have them removed. This is a common Planning Service concern, which has led on many occasions both to refusals of consent and to dismissed Appeals against those refusals.

5.4.3 The means of protecting CEZ 3 is likely to include optimising the site layout and room type (especially in relation to new residential dwellings), such that any adverse psychological impacts of the trees are reduced to an acceptable minimum. Key principles include ensuring adequate separation distances between trees and new buildings, in the context of the buildings' end use relative to the location of the tree(s) and avoiding excessive obstruction by trees of critical solar access.

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5.5 CEZ 4: NEW PLANTING ZONE

5.5.1 In some cases, it may be appropriate to identify and protect areas intended for new landscape planting, which can fail to establish if the soil has been heavily compacted or contaminated during the demolition/construction process. The means of protecting CEZ 4 will either be by fencing it off prior to the start of works on site, or by soil remediation once construction has finished (and prior to the start of planting). Topsoil protection in areas destined for new planting is frequently an economy measure, saving on plant replacement and soil structure remediation.

6.0 SURVEY METHODOLOGY

6.1 The method used in the preparation of this report is based on the principles of BS 5837: 2012.

1. Tree heights were surveyed to the nearest 1m.
2. Trunk diameters were measured by use of forestry girth tape
3. The category assessment (Table 1) on which the trees is based include current and long-term arboricultural, landscape, cultural and conservation values (BS5837: 2012). This table can be found at ***Appendix 1***
4. For clarity, the grading system is summarised from ***Table 2*** of the BS as follows:

U grade – trees for removal, effective for less than 10 years
A grade – trees of high quality and value, effective for more than 40 years
B grade – trees of moderate quality and value, effective for more than 20 years
C grade – trees of low quality and value, effective for 10 years

Note: We have indicated colour coding on the drawing and therefore a monochrome copy should not be relied on.

6.2 SOIL ASSESSMENT

6.2.1 A soil assessment should be undertaken by a competent person to inform decisions relating to:

- the root protection area (RPA)
- tree protection
- new planting design; and
- foundation design to take account of retained, removed and new trees (potential soil subsidence/heave)

Tree Solutions do not undertake soil assessments and the client is advised to seek specialist advice in this respect.

7.0 JUXTAPOSITION OF TREES AND STRUCTURES

7.1 Below ground constraints

7.1.1 The below ground constraints are generally summarised as the root protection area (RPA). The shape of the RPA and its exact location will depend upon arboricultural considerations including likely tolerance of the tree to root disturbance; morphology and disposition of the roots when known influenced by past or existing site conditions; soil type and structure; and topography and drainage.

7.1.2 The purpose of the RPA is to prevent physical damage to tree roots and to prevent damage to the soil structure. Tree roots are damaged by soil compaction, changes in soil levels or soil contamination which could reduce tree health and/or stability.

7.1.3 Root patterns are affected by topography and characteristics of the soil or substrate. Where trees are located within close proximity to existing hard standing or underground physical barriers they are unlikely to have an even distribution of lateral roots due to restrictions in root growth created by compacted sub-grades beneath. The RPA of all trees have been plotted unmodified as there were no underground barriers present that would prevent good radial root spread.

7.2 Underground Services

7.2.1 We have considered the broad implications of the provision of underground services but the locations of existing and proposed were not identified on the plans supplied by the Project Architect and in this regard, our advice is of a general nature.

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7.2.2 Drainage and service runs may need to be constructed within the rooting areas of retained trees. If this is a requirement of the development it will be necessary to retain significant roots and methods of excavation, such as thrust boring or hand digging, may need to be adopted to ensure that these impacts are acceptable.

7.2.3 As with foundation design, low impact construction methods for services installation are now well established. For more information regarding underground services, reference should be made to the National Joint Utilities Group (NJUG) Publication No. 10. Volume 4 *'Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees' 2007*

8.0 DEVELOPMENT IMPACT TO TREES

8.1 Tree Solutions carried out a phase one preliminary tree survey and provided the project architects with a report in which all existing trees and their respective Root Protection Areas (RPA) were identified and plotted on a Tree Constraints Plan and draft impact assessment plan. The architects have incorporated the design and layout advice contained within the phase 1 survey and the proposed layout has been determined by the retention category/value of the trees and the location of their designated RPA. As such the principals of BS5837: 2012, WCBC Planning Policy EC4 and LPG 17 have been adhered to

8.2 In order to accommodate the proposed new vehicular access off Oak Road it will be necessary to remove groups 2 and 7. In addition we have advised the removal of tree number 8 as it is in decline and represents a potential hazard to Oak Road. Upon completion of the redevelopment works it will be necessary to undertake some tree management along the frontage in order to create private utilisable garden space. This tree management will consist of the removal of group 8 which are small scrubby trees and retaining the larger mature specimens that run parallel with the boundary hedgerow. As tree cover is considered an asset to the site to screen the road and industrial estate beyond, any tree felling will be kept to the minimum required.

8.3 The proposed car parking bays encroach within the RPA of tree numbers 2, 3 & group 1 and require the removal of 2 No Birch trees (G2). In order to comply with recommendations contained within para. 7.2 of BS5837: 2012 the parking area will be constructed to a no-dig design specification using a three dimensional cellular confinement system such as 'Infraweb'. This is possible due to the land being level and containing no undulations. The parking bays to will be installed with a 75mm layer of plastic cells laid above the existing ground level and back filled with a free draining washed stone that contains no fines in order to help maintain adequate gaseous diffusion for tree roots below. The top dressing will be a gravel and as such fully porous. Details of design can be found within Infragreen example cross section drawing Ref: IG-SD-IW-G-75 at ***Appendix 5.***

Photo 1 - Proposed gravel car parking area - 2 Birch trees (G2) to be removed

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Photo 2 - Location of new garage within existing storage area & outside the RPA of all trees

Photo 3 - Northern elevation of barn

Photo 4 - T14/15 viewed from Oak Road. All trees retained & unaffected by development work

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9.0 PROPOSED REVISIONS TO THE SCHEME

9.1 We advise that all proposed revisions having implications for trees should be referred to us for review.

10.0 CONCLUSIONS

10.1 BS 5837: 2012 contains clear and current recommendations for a best practice approach to the assessment, retention and protection of trees on development sites. The proposed development has followed this guidance by:

- Seeking arboricultural advice and undertaking a phase 1 preliminary tree survey in order to inform the layout and design of the proposed development
- Respecting the constraints posed to development of the site by high or moderate quality trees
- Acting upon arboricultural advice throughout the design process in order to obtain the best development proposal whilst considering the current and future tree requirements

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Appendix One

Tree Survey Schedule

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Appendix Two

Impact Assessment Plan

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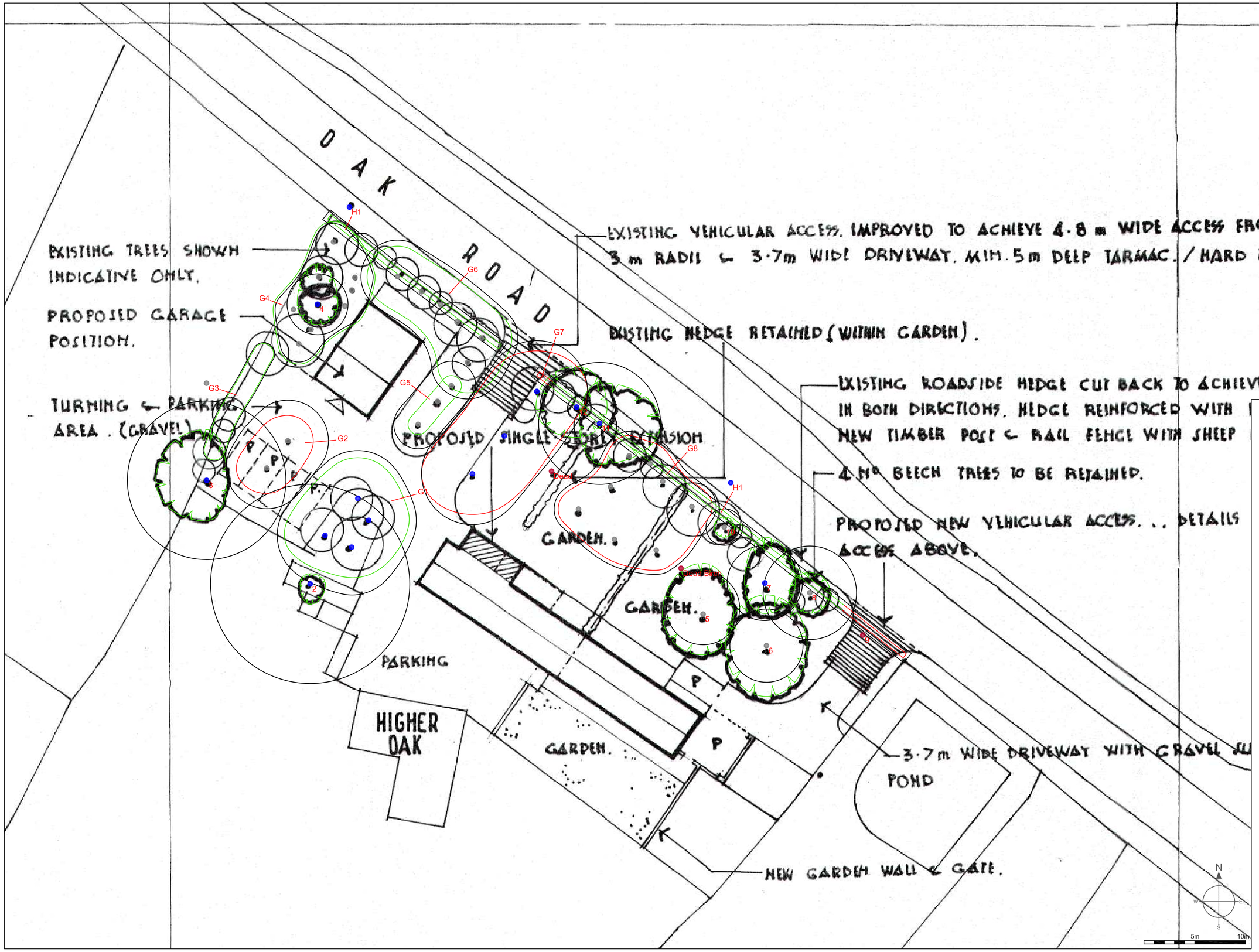

Legend

Root Protection Area Modified to Account for Site Features

Category
Crown Spread
Tree Number
13
Root Protection Area

NOTE: tree locations are approximate

- Category A (High Quality)
- Category B (Moderate Quality)
- Category C (Low Quality)
- Category U (Dead/Dying/In Decline)
- Tree Proposed for Removal

Client: A Bould	
Project: Higher Oak, Oak Road, Wrexham, LL13 9RG	
Title: Arboricultural Impact Assessment	
Scale: 1-250@A2	Date: July 2018
Drawn By: AM	Revision: A
Job Ref: 17/AIA/WXM/209	Drawing No: 01

Do not scale from this drawing all dimensions to be checked on site.

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Appendix Three

Tree Protection Plan

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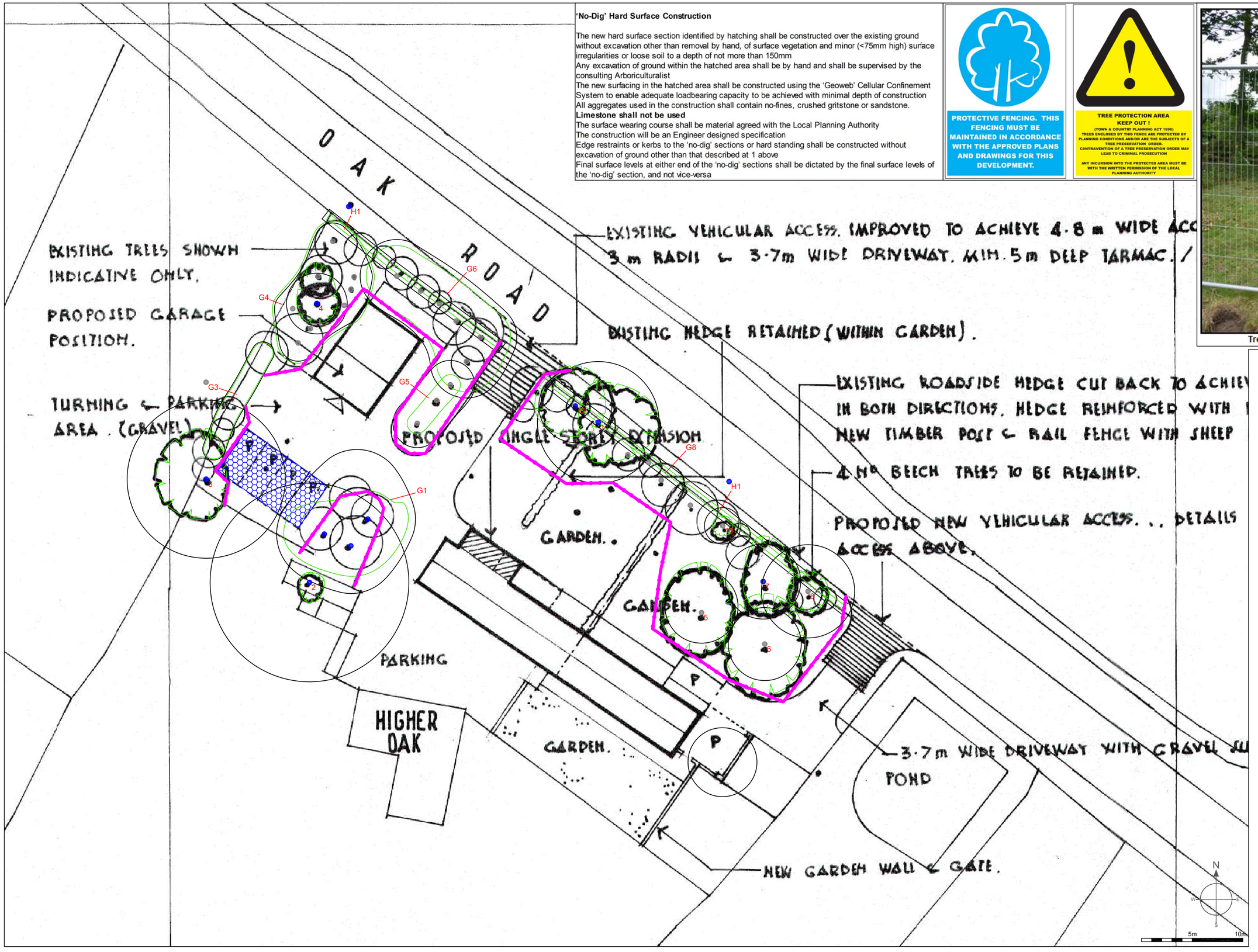
'No-Dig' Hard Surface Construction

The new hard surface section identified by hatching shall be constructed over the existing ground without excavation other than removal by hand, of surface vegetation and minor (<75mm high) surface irregularities or loose soil to a depth of not more than 150mm
Any excavation of ground within the hatched area shall be by hand and shall be supervised by the consulting Arboriculturalist
The new surfacing in the hatched area shall be constructed using the 'Geoweb' Cellular Confinement System to enable adequate loadbearing capacity to be achieved with minimal depth of construction
All aggregates used in the construction shall contain no-fines, crushed gritstone or sandstone.
Limestone shall not be used
The surface wearing course shall be material agreed with the Local Planning Authority
The construction will be an Engineer designed specification
Edge restraints or kerbs to the 'no-dig' sections or hard standing shall be constructed without excavation of ground other than that described at 1 above
Final surface levels at either end of the 'no-dig' sections shall be dictated by the final surface levels of the 'no-dig' section, and not vice-versa

Tree Protective Fencing Specification



Legend

Root Protection Area Modified to Account for Site Features

Category — Crown Spread
Root Protection Area — Tree Number (T3)

NOTE: tree locations are approximate

- Category A (High Quality)
- Category B (Moderate Quality)
- Category C (Low Quality)
- Category U (Dead/Dying/In Decline)

2.0M high heavy duty rhino panels (with extra central support bar) mounted on scaffold poles (driven in to the ground) and secured with anti tamper bolts – as illustrated.

No-Dig Surface Installation Areas - see Method Statement

Client: A Bould	
Project: Higher Oak, Oak Road, Wrexham, LL13 9RG	
Title: Tree Protection Plan	
Scale: 1-250@A2	Date: July 2018
Drawn By: AM	Revision: A
Job Ref: 17/AIA/WXM/209	Drawing No: 02

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Appendix Four

Arboricultural Method Statement

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SEQUENCE OF OPERATIONS

From commencement of the above development, the following methodology shall be implemented in the manner and sequence described:

1. Tree surgery work
2. Erect temporary hedge protective fencing
3. Main construction phase
4. Install no dig parking bays
5. Removal of temporary fencing
6. Landscaping within RPA of tree

1. Tree Surgery Works

1. Before the erection of the temporary protective fencing, all tree removal shall be implemented in accordance with the Tree Survey Schedule at ***Appendix* 1**
2. All possible efforts must be made to prevent damage to retained trees including potential root incursion or compaction caused by vehicle access.
3. All arboricultural works shall conform to the recommendations of BS 3998 (2010) 'Recommendations for Tree Work'
4. All operatives shall be equipped with and use personal protective equipment (PPE) in accordance with current Health & Safety Executive current directives and industry codes of practice.
5. Performance of all arboricultural operations and use of equipment shall be in accordance with current Health & Safety Executive current directives and industry codes of practice.

2. Erect Temporary Hedge Protective Fencing

1. Prior to commencement of any construction, preparation, excavation or material deliveries the main contractor shall erect the temporary protective fencing as detailed in the 'Hedge Protection Specification' and in the location indicated on the Landscape Plan.

2. Tree Solutions are to be given 5 days written notice as soon as all protective fencing has been erected in order to inspect the specification and location. An inspection report will be completed and returned to the LPA Tree Officer for approval. Any damage occurring to protective fencing during the demolition or construction phase shall be made good by the main contractor

3. Main Construction Phase

1. Tree protective fencing to be erected prior to any construction plant or materials entering the site
2. Tree protective barriers in accordance with BS 5837: 2012 will be erected to prevent damage to the tree stems and any movement of plant with the RPA
3. There shall be no storage of construction material, site parking, site accommodation or equipment in any area designated as the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Fencing
4. No materials that are likely to have an adverse effect on tree health such as oil, bitumen or cement will be stored or discharged within 10 metres of the trunk of a tree that is to be retained. No fires will be lit
5. The site agent shall supervise deliveries by self-loading crane, with vehicles positioned in such a manner that retained trees are not at risk of damage

Cement Mixing

- The cement mixer will be laid on top of plywood boards in a position outside the RPA of any trees. The mixer will be kept in this position throughout all development work.

On Site Storage of Spoil and Building Materials

- Prior to and during all site construction works no spoil will be stored and no cement mixing will take place within the Root Protection Area of any tree on or adjacent to the site even if proposed site work is to be within the crown spread. Any encroachment within this protected area will only be with the prior agreement of the LPA Arboricultural Officer

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4. Installation of 'No-Dig' Parking Bays

1. Upon completion of all development work and removal of associated plant and material from site, the proposed car parking bays as indicated with a blue cross hatch on the tree protection plan shall be constructed using a no-dig three dimensional cellular confinement system in accordance with the engineers and manufacturers recommendations see drawing at ***Appendix 5.***
2. Construction shall ideally be undertaken in dry weather when ground is driest and least prone to compaction
3. Ground vegetation should be killed using a translocated herbicide such as glyphosate. To prevent severe oxygen depletion in the soil during the process of decomposition, all dead organic material shall be removed
4. All major protrusions such as rocks and demolition material shall be removed minimizing ground disturbance. All hollows will be filled with sharp sand
5. Permeable matting will then be laid and the cellular confinement system laid on top and pegged in place.
6. The cellular confinement system will then be installed in accordance with the manufacturer's guidelines using **no-fines** aggregate. Fill the cells working from the area furthest from the tree first. Further filling should be carried out using the filled Cellweb/Infraweb as a platform
7. Edging will be constructed with tantalised boards attached to pegs driven into the ground. Pegs should be long enough to give adequate support during construction
8. Install a permeable wearing course, e.g. resin bonded gravel placed on the aggregate.
9. Tree Solutions will be responsible for monitoring all excavation works and issuing a certificate of practical completion
10. **Under no circumstances is limestone aggregate to be used**

5. Remove all Temporary Tree Protective Fencing

1. Tree Protective fencing will only be removed upon completion of all construction work and once all machinery associated with the works has left site.
2. The tree protection fencing shall not be removed until written confirmation has been received from the Local Planning Authority that it is acceptable to do so.

6. Landscaping within the RPA of trees

1. Landscaping works will be implemented in accordance with a scheme approved by the LPA
2. There shall be **no rotovation** of ground within any area designated as a Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Fencing.
3. No hard landscaping works or excavation for cables or any other service should be installed within the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) without the written consent of Wrexham County Borough Council

Useful Contacts

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TREE PROTECTIVE FENCING

1 Before the commencement of any site excavations and subsequent construction works (other than those set out in the schedule of tree works contained in this document), protective fencing will be erected as detailed on the Tree Protection Plan and as specified below. The LPA Tree Officer will be given 5 days notice upon completion of the fencing in order to inspect and approve prior to the commencement of any site works.

2 The fencing will consist of a scaffold framework in accordance with Figure 2 of BS 5837 – 2012 (illustration below) comprising a metal framework, both vertical and horizontal, well braced to resist impacts. Vertical tubes will be spaced at a maximum interval of 3m. Onto this, weldmesh panels shall be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not considered resistant to impact and for this reason will not be used. The site manager or other suitably qualified appointed person will be responsible for inspecting the protective fencing on a daily basis; any damage to the fencing or breaches of the fenced area will be rectified immediately.

3 Clearly legible weatherproof signage, stating “Protected Trees – Exclusion Zone” shall be attached to the fencing 1.5m from the ground, facing out of the Tree Protection Zone located at regular intervals along the fence line

4 The fencing will remain in place until completion of all site works and then only removed when all site traffic is removed from site

5 Other than works detailed within this method statement or approved in writing by the Local Planning Authority (LPA), no works including storage or dumping of materials shall take place within the exclusion zones defined by the protective fencing.

Protective Fencing Detail

The fence types are shown on the Tree Protection Plan with the following colour key:-

1. Magenta - 2.0M high heavy duty rhino panels (with extra central support bar) mounted on scaffold poles (driven in to the ground) and secured with anti tamper bolts – as illustrated below.

Tree Protective Fencing Specification

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Appendix Five

Proposed 'No-Dig' Parking Bays
Infragreen example cross section drawings
Ref: IG-SD-IW-G-75

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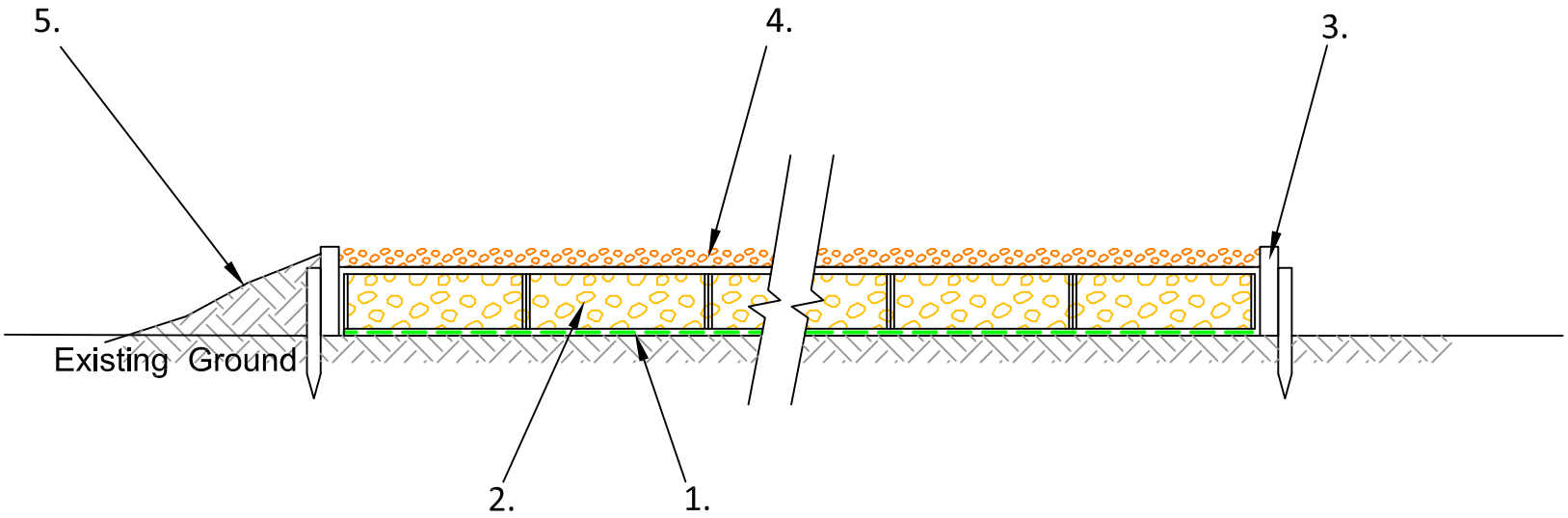
KEY

1. Permatex 300 geotextile
2. 75mm deep InfraWeb tree root protection System infilled with 4/20 Clean angular Stone to BS EN 13242 / EN 12620
3. Treated timber edging (Or other Edging detail acceptable)
4. Decorative gravel
5. Soil graded to edging (if required)



	TITLE	DRAWN BY	SCALE	DATE	CHECKED BY
	InfraWeb Section - Tree Root Protection c/w Gravel Surface	PP	1:10	01/14	RP
		DRAWING NO		REVISION	APPROVED
		IG-SD-IW-G-75			