

Arboricultural Impact Assessment & Method Statement

Land off Vicarage Lane, Gresford, Wrexham

Prepared for:

GOWER HOMES

Our Ref: 17/AIA/WXM/206 (Rev E)

April 2019

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1.0 INSTRUCTION

- 1.1 We have been instructed by Gower Homes 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 residential development on land off Vicarage Lane, Gresford, 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 in October 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 Twenty-three individual tree (T1-T23) and two hedgerows (H1-H2) were surveyed and mapped on a Preliminary Tree Constraints and Impact Assessment Plan Ref: 17/AIA/WXM/206, 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 masterplan site layout plan Ref: BA1858 PL-002 (Rev D) provided by Base Architects.

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 On 06/03/2018, Wrexham County Borough Council confirmed that there are no Tree Preservation Orders on site and the land does not fall within a designated Conservation Area. As such, statutory planning consent is not required prior to undertaking any recommended tree works.

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 is agricultural land with typical field boundary hedgerows and trees. There are residential dwellings to the north and east with open countryside to the south.

4.0 DEVELOPMENT PROPOSAL

- 4.1 Residential dwellings with associated vehicular access and parking.

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 $\sqrt{(\text{mean stem diameter}^2) \times \text{number of stems}}$ 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.

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 significant 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.
- 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 amended several times following our design input. We are therefore satisfied that the final design has been determined by the retention category/values of the trees and the location of their designated RPA's. As such the principals of BS5837: 2012, WCBC Planning Policy EC4 and LPG 17 have been adhered to.

- 8.2 There are three construction impacts two trees as listed below:

1. The proposed wall around the rear boundary of plot 18 encroaches within the RPA of tree numbers 1. We have therefore advised the applicant and architect that underlying tree root disturbance can be minimised by supporting the wall on beams set on or above the existing ground level on small diameter 'screw-piles'. This will be detailed by the project engineer in such a way as to ensure that the final design is sufficiently flexible to allow the piles to be moved if significant roots (over 25mm diameter) are encountered in the preferred pile location. The engineers design will be in accordance with recommendations contained within paragraph 7.5 of BS 5837: 2012. As the piling is required to be installed within the RPA, the smallest practical pile diameter shall be used in order to reduce the possibility of striking any major roots. All piles shall be sheathed in order to protect the soil and any adjacent roots from the potential toxic effect of concrete. Site specific foundation design shall be calculated by the project structural engineer and submitted for approval by the LPA. The installation of the piles can be carried out under the direct supervision of the project arboricultural consultant if required.
2. The driveway to plot 29 encroaches within the RPA of tree number 13. In order to comply with the provisions of the BS the driveway will be installed to a no-dig design specification using a three-dimensional cellular confinement system such as 'Infraweb' or 'Cellweb' which will involve the installation of a 75mm layer of plastic cells above the existing ground level. The cells will be 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 porous material such mono-block to be agreed with the LPA. This specification complies with recommendations contained within para. 7.2 of BS5837: 2012 and we are confident it can be installed with no adverse impact to the future health and vigour of the tree. Details of installation are at point 7 of the Method Statement at **Appendix 5** and within an example cross section drawing at **Appendix 6**.
3. The turning head to the east of plot 16 encroaches within the RPA of tree numbers 19, 20 & 22. As these trees are poor quality specimens and of no value, we have recommended that the excavations for the road sub-base are undertaken by hand and under arboricultural site supervision as opposed to amending the design to a no-dig surface that isn't justified given the trees could just as easily be removed. Hand excavation will ensure that any tree roots can be cleanly pruned by the project arboricultural consultant with no long-term adverse impact to the trees.

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

Appendix One
Tree Survey Schedule

TREE SURVEY SCHEDULE (BS5837: 2012)

SITE:	LAND OFF VICARAGE LANE, GRESFORD
CLIENT:	GOWER HOMES
BRIEF:	ARBORICULTURAL IMPACT ASSESSMENT

SURVEYOR:	A. HENDERSON
ASSESSMENT DATE:	OCTOBER 2017
VIEWING CONDITIONS:	GOOD
JOB REFERENCE:	17/AIA/WXM/206

TREE NO. T - Tree G - Group H - Hedge	SPECIES (COMMON NAME)	AGE	HEIGHT (m) + CROWN CLEARANCE/ DIRECTION OF GROWTH (N.S.E.W)	RADIAL CROWN SPREAD (m)				STEM/ MULTI-STEM DIA. (mm)	VITALITY	COMMENTS	MANAGEMENT	CATEGORY & SUB-CATEGORY GRADING BS 5837	BS 5837 RADIUS (m) RPA (m²)
				N	S	E	W						
T1	Oak	M	17 2S	3	8.5	8.5	6	1005	M	- Ivy clad - Dieback & dead wood in crown - Upper canopy sparse & tree appears stressed - E.R.C. <20	- Remove all dead wood - Monitor for further decline	B2	12 457m²
T2	Oak	FM	17 2S	5.5	7	9	7	1250	G	- Dead/decayed scaffold limb/stump to west - Dead wood in canopy - E.R.C. 40	Remove all dead wood	A2	15 707m²
T3	Sycamore	M	16 2W	3	5	3	7	400	M	- Located outside eastern boundary - Crown bias SW - E.R.C. 20	N/A	B2	5 72m²
T4	Lime	M	22 1W	4	5	3	4	550	G	- Large prominent tree located within linier group along/outside eastern boundary - E.R.C. 40	3rd party tree/N/A	A2	6.6 137m²
T5	Sycamore	EM	9 5W	1	2	1.5	2.5	200	M/P	- Poor quality self set tree with suppressed crown form - E.R.C. 10	As T4	C2	2.5 18m²

HEADINGS & ABBREVIATIONS

TREE NO.
SPECIES:
AGE RANGE/LIFE STAGE:
HEIGHT:
CROWN SPREAD:
CROWN CLEARANCE & DIRECTION OF GROWTH:
STEM DIA/MULTI-STEM DIA:
VITALITY:
E.R.C. = ESTIMATED REMAINING CONTRIBUTION:
BS 5837 CATEGORY & SUB-CATEGORY GRADING:
BS 5837 RADIUS & BS 5837 RPA:

REFERENCE NUMBER. REFER TO PLAN OR NUMBERED TAGS WHERE APPLICABLE (T = TREE, G = GROUP, H = HEDGE)
COMMON NAME (LATIN NAMES AVAILABLE ON REQUEST)
Y = YOUNG, SM = SEMI MATURE, EM = EARLY MATURE, M = MATURE, PM = POST MATURE
ESTIMATED AND RECORDED IN METRES. APPROXIMATELY 1 IN 10 TREES ARE MEASURED USING A CLINOMETER AND THE REMAINDER ESTIMATED AGAINST THE MEASURED TREES
MAXIMUM CROWN RADIUS MEASURED TO THE FOUR CARDINAL COMPASS POINTS FOR SINGLE SPECIMENS ONLY (MEASUREMENT FOR TREE GROUPS - MAXIMUM RADIUS OF THE GROUP)
HEIGHT IN METERS OF CROWN CLEARANCE ABOVE ADJACENT GROUND LEVEL (TO INFORM ON GROUND CLEARANCE, CROWN/STEM RATIO AND SHADING)
STEM DIAMETER - MEASURED AT APPROXIMATELY 1.5 METRES ABOVE GROUND LEVEL OR A COMBINATION OF STEMS FOR MULTI-STEMMED TREES
A MEASURE OF PHYSIOLOGICAL CONDITION. D = DEAD, MD = MORIBUND, P = POOR, M = MODERATE, G = GOOD
RELATIVE USEFUL LIFE EXPECTANCY (YEARS)
A = HIGH QUALITY AND VALUE, B = MODERATE QUALITY AND VALUE, C = LOW QUALITY AND VALUE, U = UNSUITABLE FOR RETENTION (SUB-CATEGORY REFERS TO ARBORICULTURAL, LANDSCAPE AND CULTURAL/CONSERVATION VALUES)
PROTECTIVE DISTANCE - RADIUS FROM THE CENTRE OF THE STEM TO THE LINE OF TREE PROTECTION (CONSTRUCTION EXCLUSION ZONE - CEZ) AND PROTECTIVE BARRIER ROOT PROTECTION AREA - BS 5837 (2012) ANNEX D (THE RECOMMENDATIONS STATE THAT THE RPA SHOULD BE CAPPED AT 707 M²) NOTE - ALL CALCULATIONS ROUNDED TO NEAREST DECIMAL

TREE SURVEY SCHEDULE (BS5837: 2012)

Tree Solutions

Arboricultural Consultants

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TREE NO. T - Tree G - Group H - Hedge W - Wood	SPECIES (COMMON NAME)	AGE	HEIGHT (m) + CROWN CLEARANCE/ DIRECTION OF GROWTH (N.S.E.W)	RADIAL CROWN SPREAD (m)				STEM/ MULTI-STEM* DIA.(mm)	VITALITY	COMMENTS	MANAGEMENT	CATEGORY & SUB-CATEGORY GRADING BS 5837	BS 5837 RADIUS (m) RPA (m²)
				N	S	E	W						
T6	Sycamore	M	15 2W	2	2	0	5	400	M/P	- Ivy clad tree within boundary hedge - Crown bias west - Tree of no existing or long-term value - E.R.C. 10	• As T4	C2	4 72m²
T7	Beech	EM	16 2W	4	3	0	7.5	400	M	- Stem leans 45° west of vertical from 3m due to suppression - E.R.C. 10	• As T4	C2	5 72m²
T8	Beech	FM	17 2W	5	7	8	7	700	M	- Large prominent tree - E.R.C. 40	• As T4	A2	8.4 222m²
T9	Beech (Purple)	FM	18 3N	4	5	6	6	650	G	- Located within garden of land to east with no access to survey - Prominent tree - E.R.C. 40	• As T4	A2	7.8 191m²
T10	Sycamore	M	10 2S	3	2	0.5	6	590	P	- Insignificant tree with poor crown form - E.R.C. 0	• N/A	C2	7.1 157m²
T11	Lime	M	16 0	4	5	4.5	5.5	600	M	- Mass of epicormic growth around base impeding inspection - E.R.C. 20	• N/A	B2	7.2 163m²
T12	Sycamore	M	15 2N	4	5	4	3	600	M/P	- Insignificant Ivy clad tree of no value - E.R.C. 10	• N/A	C2	7.2 163m²

TREE SURVEY SCHEDULE (BS5837: 2012)

Tree Solutions

Arboricultural Consultants

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TREE NO. T - Tree G - Group H - Hedge W - Wood	SPECIES (COMMON NAME)	AGE	HEIGHT (m) + CROWN CLEARANCE/ DIRECTION OF GROWTH (N.S.E.W)	RADIAL CROWN SPREAD (m)				STEM/ MULTI-STEM* DIA.(mm)	VITALITY	COMMENTS	MANAGEMENT	CATEGORY & SUB- CATEGORY GRADING BS 5837	BS 5837 RADIUS (m) RPA (m²)
				N	S	E	W						
T13	Sycamore	FM	18 3N	7.5	5.5	6.5	6	750	G	- Located within boundary hedge impeding inspection - E.R.C. 10	Remove all dead wood & crown lift to 4.5m	B2	9 255m²
T14	Ash								MD	- Significant decay in stem - E.R.C. 0	Remove	U	N/A
T15	Oak	FM	8 4N	5	6	5	5	1000	M/G	- Tree of high biodiversity value - E.R.C. 40	N/A	A3	12 452m²
T16	Oak	FM	13 0	4	4	3	3	950	M	- Located in centre of field with inevitable plough damage to roots - Decay evident on stem to east - E.R.C. 20	N/A	B2	11.5 408m²
T17	Oak	M	17 2W	5	7	4	7	1010	G	- Crown reduced to east to clear overhead power lines leaving asymmetric crown form - E.R.C. 20+	N/A	B2	12 462m²
T18	Sycamore	EM	14 0	4	3.5	3.5	4	510	M	- Naturally colonised tree of no significant value - E.R.C. 10	N/A	C2	6 118m²
T19	Oak	M	9 3N	3	4	3	3	640	M	- Located on embankment that falls from north to south - Not visually significant - E.R.C. 10+	Reduce crown back from boundary to provide suitable easement to turning head	C2	7.5 185m²
T20	Oak	M	8 3S	3	0	1	1	600	P	- Stem leans north due to suppression - Poor quality Ivy clad tree - E.R.C. 10	Remove	C2	7 163m²

TREE SURVEY SCHEDULE (BS5837: 2012)

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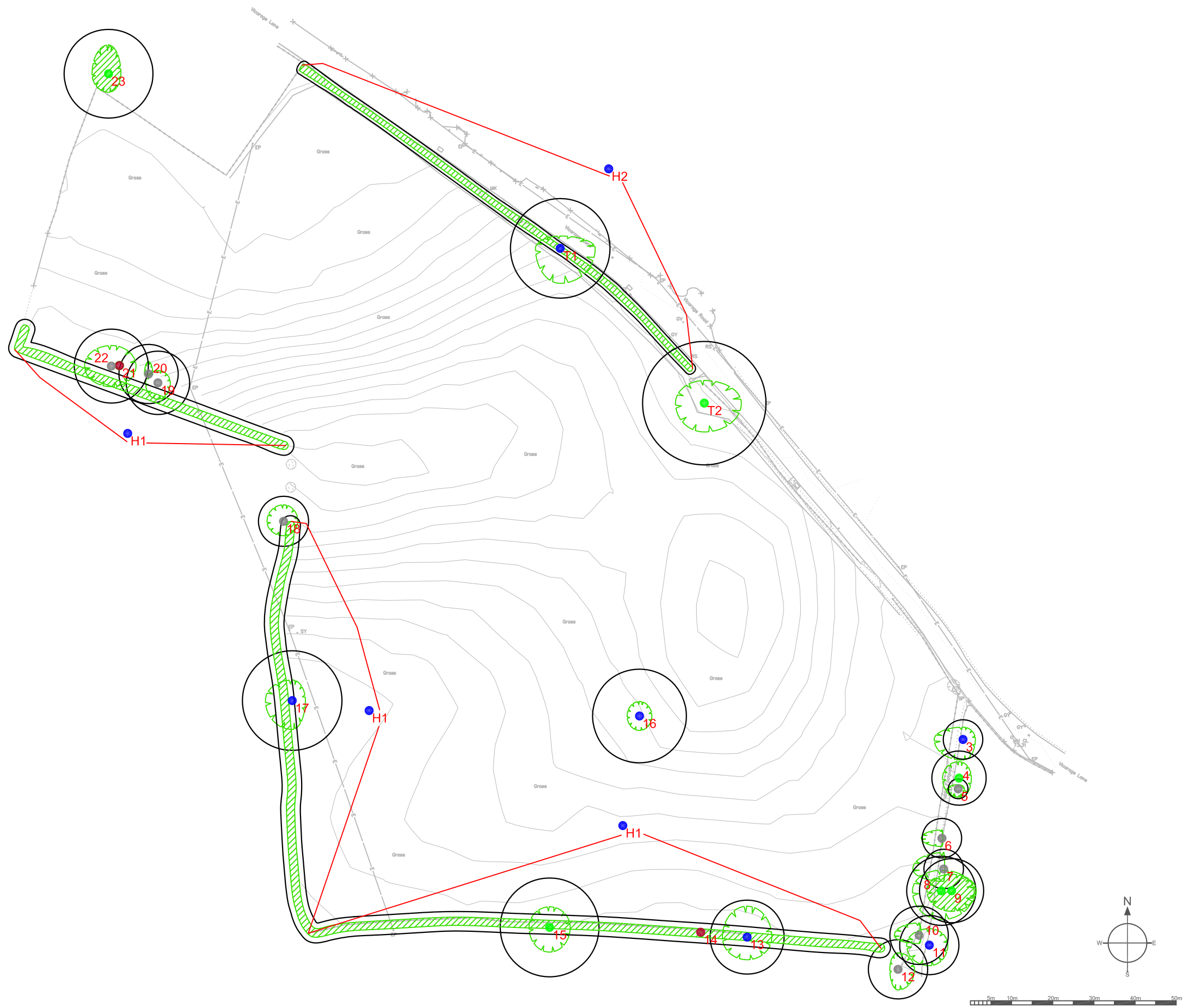
TREE NO. T - Tree G - Group H - Hedge W - Wood	SPECIES (COMMON NAME)	AGE	HEIGHT (m) + CROWN CLEARANCE/ DIRECTION OF GROWTH (N.S.E.W)	RADIAL CROWN SPREAD (m)				STEM/ MULTI-STEM* DIA.(mm)	VITALITY	COMMENTS	MANAGEMENT	CATEGORY & SUB-CATEGORY GRADING BS 5837	BS 5837 RADIUS (m) RPA (m²)
				N	S	E	W						
T21	Oak								MD	Dead pole		U	N/A
T22	Oak	M	9 3N	5	5	6	7	750	M	- Tree of no significant value - E.R.C. 10	Reduce crown back from boundary to provide suitable easement to turning head	C2	9 255m²
T23	Oak	FM	9 1.5N	7	4.5	3	4	≤900	G	- Outside north west site boundary - no access to survey - High biodiversity value - Appears to have been topped in past leaving thick lower crown form - E.R.C. 40	3rd party tree N/A	A2	10.8 366m²
H1	Hawthorn Holly Elder	M	4 0					≤200	G	- Mixed age unmanaged field boundary hedge of biodiversity value - E.R.C. 20	Reduce height to 1.5m & maintain as such	B2	2.5 18m²
H2	Hawthorn	M	1.5 0					≤90	G	- Good field boundary hedge - E.R.C. 20+	Remove section for proposed access and visibility splay	B2	1 4m²

Table 1 Cascade chart for tree quality assessment

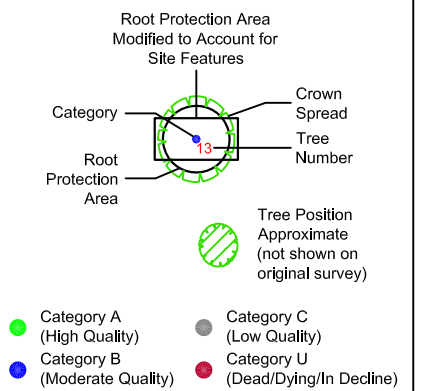
Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Appendix Two

Preliminary Tree Constraints Plan



Legend



Client: Gower Homes	
Project: Land off Vicarage Lane, Gresford	
Title: Preliminary Tree Constraints Plan	
Scale: 1:1000 @ A3	Date: October 2017
Drawn By: LI & AM	Revision:
Job Ref: 17/AIA/WXM/206	Drawing No: 01

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

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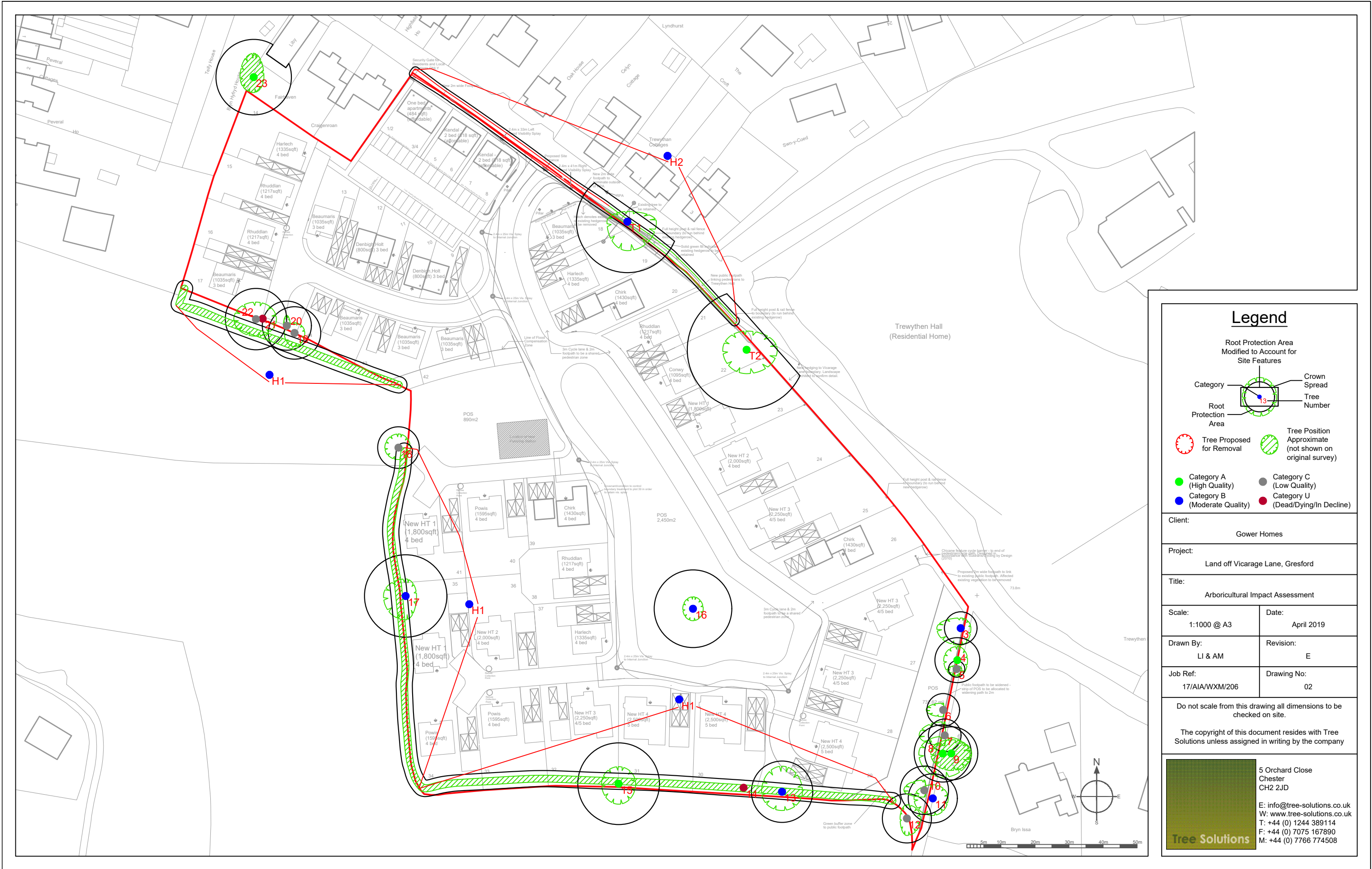


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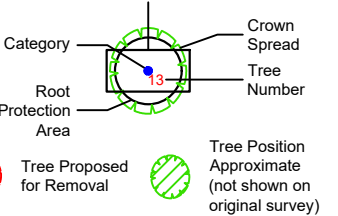
Appendix Three

Impact Assessment Plan



Legend

Root Protection Area
Modified to Account for
Site Features



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

Client: Gower Homes	
Project: Land off Vicarage Lane, Gresford	
Title: Arboricultural Impact Assessment	
Scale: 1:1000 @ A3	Date: April 2019
Drawn By: LI & AM	Revision: E
Job Ref: 17/AIA/WXM/206	Drawing No: 02

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Appendix Four

Tree Protection Plan



Tree Protective Fencing Specification



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 CONSENTS AND THE SUBJECTS OF A TREE PRESERVATION ORDER.
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY LEAD TO CRIMINAL PROSECUTION.
ANY BREACH OF THE PROTECTION AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY.

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 of surface vegetation and minor (<75mm high) surface irregularities of 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 'Geotextile 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' section shall be dictated by the final surface levels of the 'no-dig' section and vice-versa.

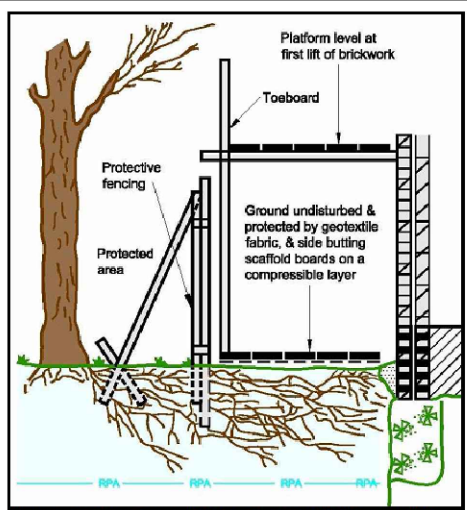
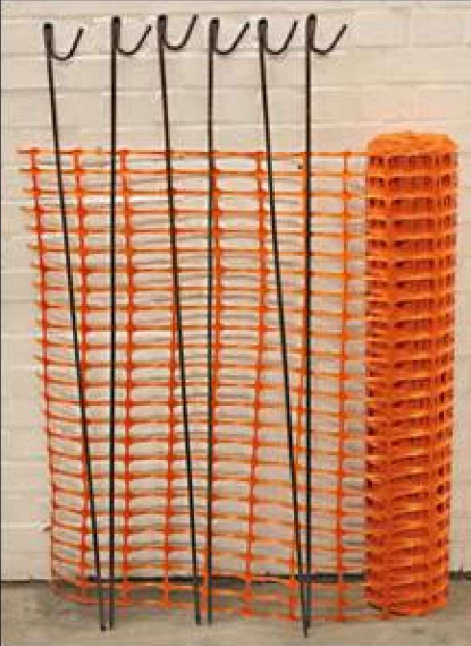
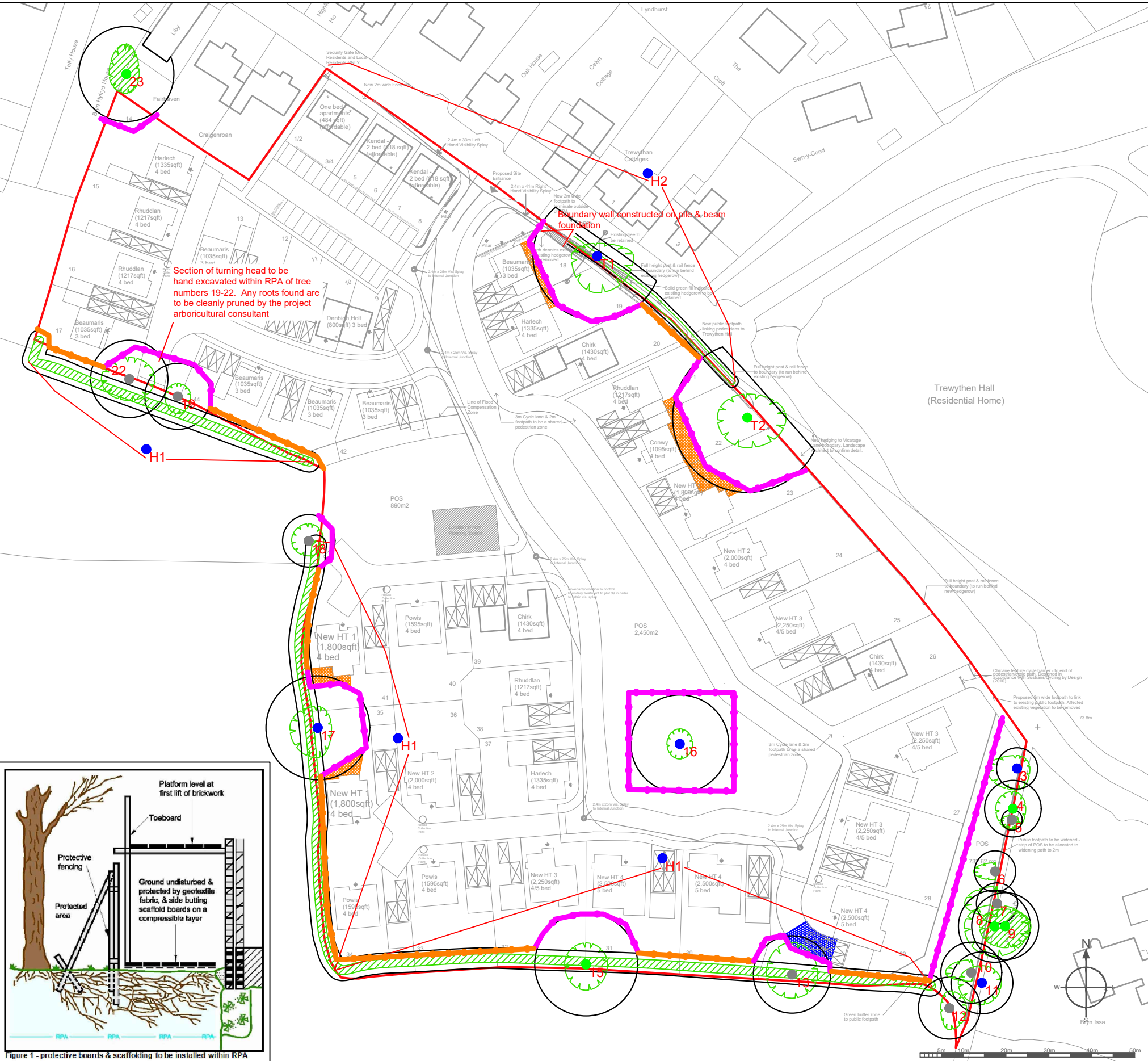


Figure 1 - protective boards & scaffolding to be installed within RPA



Legend

- Root Protection Area Modified to Account for Site Features
- Category
- Tree Position Approximate (not shown on original survey)
- Category A (High Quality)
- Category B (Moderate Quality)
- Category C (Low Quality)
- Category U (Dead/Dying/In Decline)
- 1000mm x 50m medium duty plastic temporary barrier mesh fencing mounted on 1.3m steel fencing pins driven in to the ground and secured with cable ties
- 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
- Ground Protection

Client:	
Gower Homes	
Project:	
Land off Vicarage Lane, Gresford	
Title:	
Tree Protection Plan	
Scale:	Date:
1:1000 @ A3	April 2019
Drawn By:	Revision:
LI & AM	C
Job Ref:	Drawing No:
17/AIA/WXM/206	03

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Tree Solutions

Appendix Five

Arboricultural Method Statement

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 tree protective fencing
3. Install ground protection boards
4. Main construction phase
5. Exaction of turning head within RPA of trees
6. Installation of boundary wall within RPA of T1
7. Installation of no-dig driveway
8. Removal of temporary fencing
9. Landscaping within RPA of trees
10. Arboricultural site supervision

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 Tree 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 'Tree Protection Specification' and in the location indicated on the Tree Protection 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. Install Ground Protection Boards

1. The ground protection measures must be capable of supporting the expected loads and evenly distribute the carried weight over the track width of any vehicles that will use the access route in order to avoiding rutting, compaction and damage to the soil.
2. The method of protecting the ground for tracked construction traffic movements within the RPA will involve the use of a high-density polyethylene track boards or bog mats laid across the RPA that extends beyond the protective fencing location butted together to form a continuous line as indicated on the Tree Protection Plan. The boards will be fixed in place by construction tie-rods to avoid any displacement details of which are to be approved for use by Tree Solutions and the LPA before installation commences.
3. Temporary ground protection materials shall be delivered and moved by low impact tracked machinery and installed by hand.
4. The ground beneath any protection boarding will be left undisturbed and will be protected with a porous geotextile fabric and side butting scaffold boards on a 100mm compressible layer such of sharp sand
5. Boards will remain in-situ until the construction of the building has been completed

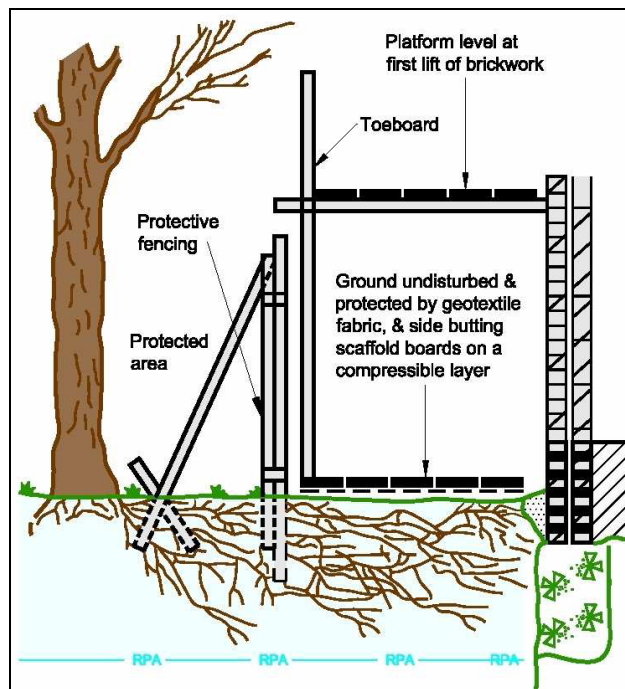


Plate 1 protective boards & scaffolding to be installed

4. 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.

Avoiding Damage to Stems and Branches

- Care shall be taken when planning site operations in proximity to trees to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious injury resulting in safe retention impossible

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

5. Exaction of Turning Head within RPA of Trees

The foundation for the road turning head will excavated by hand digging or by use of an 'Airsapade' within the RPA of tree numbers 19, 20 & 21. The use of mechanical excavation plant is prohibited.

The following steps will be adhered to in order to minimise damage:

1. After careful removal of the turf surface digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.
2. All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.
3. Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. Roots, whilst exposed, shall be wrapped in dry (winter) or wet (summer), clean Hessian sacking to prevent desiccation and to protect from rapid temperature changes prior to backfilling. Exposed roots shall be pruned back to a side branch, by use of sharp saw or secateurs by the project arboricultural consultant and not construction personnel.

6. Install Boundary Wall with RPA of T1

1. Prior to commencing operations within the RPA of tree number 1 (i.e. within the working area required for piling) the entire area is to be protected by covering with abutting scaffold boards laid on a compressible layer over a geotextile fabric. Gaps in this ground protection should be left where piles are to be installed.
2. If roots over 25mm are encountered the pile location should be moved slightly and a new trial hole dug by hand. Once the piles have been installed there should be no further excavation. The lowest point of the supporting beam is to be above the ground level between the plies.

7. Installation of 'No-Dig' Driveway

1. Upon completion of all construction work and removal of all plant and machinery from site, the no-dig driveway can be installed
2. The no-dig sections as indicated with a blue hatch on the Tree Protection Plan shall be constructed using a three-dimensional cellular confinement system in accordance with the project engineers and manufacturers recommendations.
3. Construction shall ideally be undertaken in dry weather when ground is driest and least prone to compaction
4. 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
5. All major protrusions such as rocks and demolition material shall be removed minimizing ground disturbance. All hollows will be filled with sharp sand
6. Permeable matting will then be laid, and the cellular confinement system laid on top and pegged in place.
7. 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 as a platform
8. Edging will be constructed with tanned boards attached to pegs driven into the ground. Pegs should be long enough to give adequate support during construction
9. Install a permeable wearing course, e.g. porous tarmac or block paving or porous tarmac placed on the aggregate. Paving slabs or brick paving should be dry-bedded on the sub-base and joints left unsealed

10. Under no circumstances is limestone aggregate to be used

8. 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.

7. Landscaping within RPA of Trees

1. There shall be **no rotovating** of ground within any area designated as a Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Fencing.
2. 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 the LPA.

8. ARBORICULTURAL SITE SUPERVISION

- 1 The erection of all tree protection measures outlined in this AMS and as indicated on the Tree Protection Plan will be inspected by the contract Arboricultural Consultant immediately after erection. Photographic evidence of the location and specification of all protective fencing will be forwarded to the LPA Tree Officer upon completion.

Useful Contacts

Arboricultural Consultant

Name: Alistair Henderson
 Tel: 01244 389114
 Mobile: 07766 774508
 Email: alistair@tree-solutions.co.uk

LPA Arboricultural Officer

Name: Jon Brewin
 Tel: 01978 298763
 Email: jon.brewin@wrexham.gov.uk

TREE PROTECTIVE FENCING

- 1 Before the commencement of construction works on site (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 2x2 timber posts concreted into the ground to provide a framework in accordance with BS 5837 – 2012 (photo below). Posts 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 daily; 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.

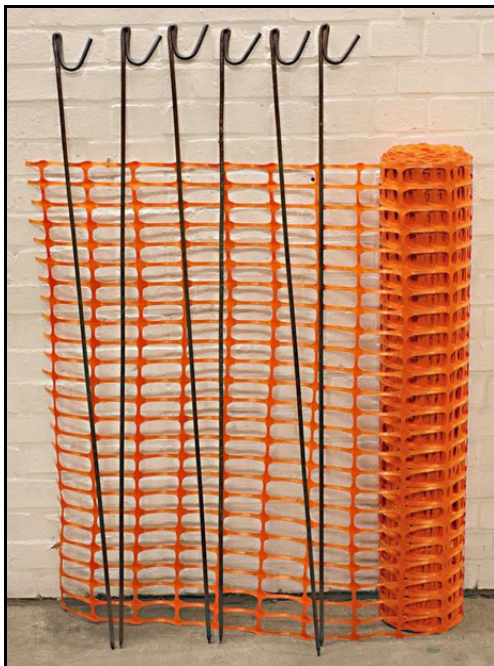
Protective Fencing Detail

1. **Magenta** - Trees



2. **Orange**

1000mm x 50m medium duty plastic temporary barrier mesh fencing mounted on 1.3m steel fencing pins driven in to the ground and secured with cable ties.



PLASNET - Plastic temporary barrier mesh fencing

Grade: **Medium duty** (160g/M² 8kgs per roll)

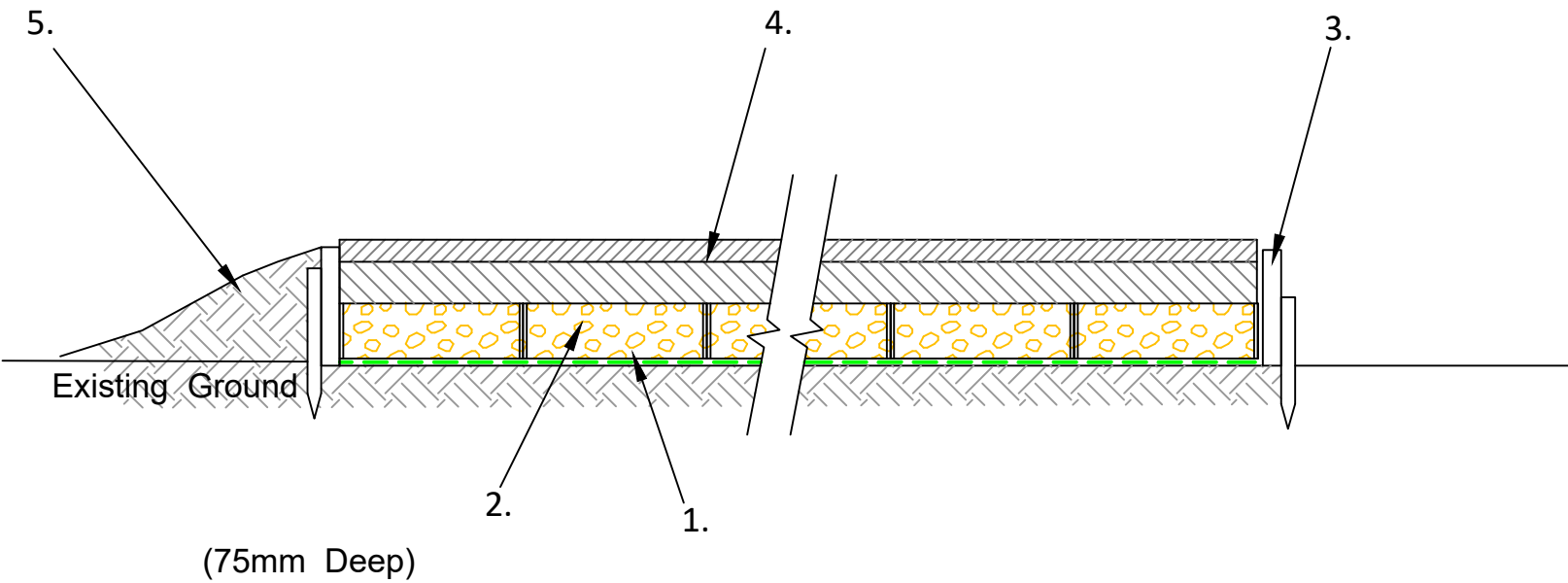
Roll size: **1000mm x 50M**

Appendix Six

Example No-Dig Driveway Specification

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. Pervious asphalt surface to engineers details
- 5. Soil graded to edging (if required)



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