Arboricultural Impact Assessment

in Relation to Proposed Erection of 10no. Over-55s Bungalows at

Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ

Prepared by:

Bowland Tree Consultancy Ltd

May 2018

Control sheet

Project No.:	BTC1475
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ
Client:	Reilly Developments
Agent for Client:	PWA Planning
Council:	Ribble Valley Borough Council
Survey Date:	22 November 2017
Surveyor:	Jennie Keighley PhD MSc MArborA
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DISCLAIMER

Survey Limitations: Unless otherwise stated all trees are surveyed from ground level using non-invasive techniques, in sufficient detail to gather data for and inform the design of the current project only. The disclosure of hidden crown and stem defects, in particular where they may be above a reachable height or where trees are ivy clad or located in areas of restrictive ground vegetation, cannot therefore be expected. Detailed tree safety appraisals are only carried out under specific written instructions. Comments upon evident tree safety relate to the condition of said tree at the time of the survey only. Unless otherwise stated all trees should be re-inspected annually in order to appraise their on-going mechanical integrity and physiological condition. It should, however, be recognised that tree condition is subject to change, for example due to the effects of disease, decay, high winds, development works, etc. Changes in land use or site conditions (e.g. development that increases access frequency) and the occurrence of severe weather incidents are also significant considerations with regard to tree structural integrity, and trees should therefore be re-assessed in the context of such changes and/or incidents and inspected at intervals relative to identified and varying site conditions and associated risks.

Where trees are located wholly or partially on neighbouring private third-party land then said land is not accessed and our inspection is therefore restricted to what can reasonably be seen from within the site. Stem diameters and other measurements of trees located on such land are estimated. Any subsequent comments and judgments made in respect of such trees are based on these restrictions and are our preliminary opinion only. Recommendations for works to neighbouring third-party trees are only made where a potential risk to persons and/or property has been identified during our survey or, if applicable, where permissible works are required to implement a proposed development. Where significant structural defects of third-party trees are identified and associated management works are considered essential to negate any risk of harm and/or damage then we will inform the relevant Council of the matter. Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule.

Where tree stem locations are not included on the plan(s) provided then they are plotted by the arboriculturist at the time of the survey using, where appropriate and/or practicable, a combination of measurement triangulation and GPS co-ordination. Where this is not possible then locations are estimated. Restrictions in these respects are detailed in the report.

This document is intended as a guide to identify key tree related constraints to site development only, and the potential influence of trees upon existing or proposed buildings or other structures resulting from the effects of their roots abstracting water from shrinkable load-bearing soils is not considered herein. The tree survey information in its current form should not therefore be considered sufficient to determine appropriate foundation depths for new buildings. Accordingly, an updated survey, with reference to the current NHBC Standards Chapter 4.2 - Building Near Trees, must therefore be prepared for the specific purpose of informing suitable foundation depths subsequent to planning approval being granted. The advice of a structural engineer must also be sought with regard to appropriate foundation depths for new buildings.

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APPENDICES

PLANS

1.0 INTRODUCTION

Terms of Reference

1.1 Bowland Tree Consultancy Ltd were instructed to:

a) Survey, as individuals or by group, all trees having reasonable potential to affect or to be adversely affected by the proposed development of the site under consideration;
b) Annotate the proposed site plan to produce a Tree Impact Plan, identifying tree retention categories, crown spreads, Root Protection Areas, trees to be removed, etc.;
c) Prepare a tabulated Tree Survey Schedule based on guidance specified BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations;
d) Evaluate the potential tree related impacts and design conflicts of the proposals, based on the supplied development proposal plan;
e) Advise on removal, retention and management options for the trees in the current context and in the context of the proposed development;
f) Advise on suitable retained tree protection measures required during development; and
g) Produce an Arboricultural Impact Assessment report outlining the main tree related issues and reasonably foreseeable tree impacts in relation to the proposals and indicating suitable mitigation provisions and retained tree protection measures.

Scope and Purpose of Report

1.2 By detailing foreseeable tree related issues this report is intended to assist the Local Planning Authority (LPA), in this case Ribble Valley Borough Council, in their review of the proposed development and, as such, should be supplied to them in support of the planning application to which it pertains. Essentially, the report provides an initial analysis of the impacts that the proposed development is projected to have on trees located both within the site and, where practicable, on land immediately adjacent to its boundaries. It also offers guidance on suitable retained tree management and mitigation for projected losses, along with advice on appropriate tree protection measures in the context of the proposed development in accordance with current guidance.

Site Visit, Data Collection and Tree Plans

1.3 Further to the instruction a tree survey was carried out on 22 November 2017, in accordance with the preceding disclaimer, and all tree data collected on site is set out in the attached tabulated Tree Survey Schedule (TSS) at Appendix One which, for ease of interpretation, should be read alongside the appended BS5837:2012 Table 1.

1.4 The survey identified eleven individual trees (prefixed ‘T’), seven groups of trees (prefixed ‘G’), two woodlands (prefixed ‘W’) and five hedges (prefixed ‘H’), which have been numbered accordingly on the appended Tree Impact Plan (TIP). The TIP, which details the existing site with an overlay of the proposed development, along with the readily definable tree constraints and projected impacts, is based on a topographical survey-based proposal plan, which was provided in electronic format by the project agent, PWA Planning. In turn, for the purpose of this report, it is presumed that the provided plan’s details are accurate.

1.5 The purpose of the TIP is to give an initial indication of the impacts that the proposed development is projected to have on trees, as well as to highlight areas where special construction and/or protection considerations may be necessary. It should subsequently be used by the LPA’s tree specialist to preliminarily assess if the proposed development can potentially be constructed in accordance with BS5837:2012 and, along with the information provided in this report, as a basis for the LPA to request further details regarding specific matters relating to trees at suitable stages in the planning process.

2.0 STATUTORY PROTECTION IN RESPECT OF TREES AND ASSOCIATED WILDLIFE

Tree Preservation Orders and Conservation Area Designations

2.1 The Town & Country Planning Act (1990) (the Act) and associated Regulations empower Local Planning Authorities (LPAs) to protect trees in the interests of amenity by making Tree Preservation Orders (TPOs). The Act also affords protection for trees of over 75 mm diameter that stand within the curtilage of a Conservation Area (CA). Subject to certain exemptions, an application must be made to the LPA in question to carry out works upon or to remove trees that are subject to a TPO, whilst six weeks' notice of intention must be given to carry out works upon or to remove trees within a CA that are not protected by a TPO.

2.2 According to Ribble Valley Borough Council's website, the site does not stand within a CA. However, the website does not provide details of specific TPOs, and it is therefore essential that the presence of any such statutory tree protection be checked directly with the council's planning department prior to scheduling or carrying out any tree works that are not directly related to, and subsequently authorised in accordance with, the implementation of a detailed (i.e. full) planning permission.

Protected Species

2.3 Nesting birds are afforded statutory protection under the Wildlife & Countryside Act (1981) (as amended) and their potential presence should therefore be considered when clipping hedges, removing climbing plants and pruning and removing trees. The breeding period for woodlands runs from March to August inclusive. Hedges provide valuable nesting sites for many birds and clipping should therefore be avoided during March to July. Trees, hedges and ivy should be inspected for nests prior to pruning or removal and any work likely to destroy or disturb active nests should be avoided until the young have fledged.

2.4 All bat species and their roosts are protected under Schedule 5 of the Wildlife & Countryside Act (1981) (as amended) and under Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). In this respect, it should be noted that it is possible that unidentified bat habitat features may be located high in tree crowns and all personnel carrying out tree works at the site should therefore be vigilant and mindful of the possibility that roosting bats may be present in trees with such features. If any bat roosts are identified, then it is essential that works are halted immediately and that a suitably qualified and experienced ecologist investigates and advises on appropriate actions prior to works continuing.

Felling Licences

2.5 Subject to certain exemptions the Forestry Act (1967) requires that a 'Felling Licence' be obtained to remove growing trees amounting to more than five cubic metres of timber in a calendar quarter. Felling Licences are administered by the Forestry Commission and contravention of the associated controls can incur substantial penalties. A felling licence is, however, not required for the felling of trees immediately required for the purpose of carrying out development authorised by a full planning permission granted under the Town and Country Planning Act 1990.

3.0 THE SITE AND THE SURROUNDINGS

3.1 The site under consideration is located in a residential area in the village of Barrow, Lancashire, approximately four kilometres south of the town on Clitheroe and within the administrational boundaries of Ribble Valley Borough Council. It is a rectangular plot of rough grassland, divided into two by a post and wire fence that runs north to south through

the middle of the field. It is bordered to the north by residential properties, to the east by a continuation of the field, which is not included in the red line development boundary, to the south by a young woodland, to the south-west by an ongoing new residential development, and to the west by a slight continuation of the field and a yard area containing a relatively large building that is evidently constructed from metal. There is currently no formal vehicular access to the site.

3.2 The topographical survey plan provided indicates that the site sits on a very slight south-west-facing slope, which rises by approximately four metres from the lowest point in its south-west corner to the highest point in the north-east corner.

4.0 THE TREE POPULATION

4.1 As noted previously, eleven individual trees, seven groups of trees, two woodlands and five hedges were surveyed for the purpose of this appraisal. They range from young to mature in age, with heights of up to 24 metres, maximum diametrical crown spreads of up to 28 metres, and stem diameters of up to approximately 1200 millimetres. Detailed tree dimensions and other pertinent information, such as structural defects and physiological deficiencies, are included in the Tree Survey Schedule (TSS) at Appendix One.

4.2 In respect of the survey it should be noted that tree quality is categorised within the existing context without taking any site development proposals into account. However, recommendations for works included in the TSS take both current site usage into consideration and the proposed site development where there are definable development related issues with regard to specific trees.

4.3 Under the UK's planning system trees are a material consideration in the planning and development process. Nonetheless, only trees of a suitable quality and value should be considered a material constraint to development. In this respect the TSS includes a column ('Cat. Grade') listing the trees' respective retention values, where they are rated either 'A', 'B', 'C' or 'U', as per BS5837:2012 Table 1 (Appendix One). 'A' category trees are those considered to be of 'high quality' and, accordingly, the most suitable for retention, whilst 'B' category trees are those considered to be of 'moderate quality', and 'C' category trees are those considered to be of 'low quality' with a correlated low retention value. In turn, 'U' category trees are those that are considered to be 'unsuitable for retention'.

4.4 As detailed in Table A, below, one tree and one woodland were categorised as high quality (i.e. 'A' category), four trees, two groups and one woodland were categorised as moderate quality (i.e. 'B' category), four trees, four groups and the five hedges were categorised as low quality (i.e. 'C' category), and two trees and one group were categorised as unsuitable for retention ('U' category).

Table A: BS5837-2012 Retention Categories of the Surveyed Trees & Groups

	Ret. Cats.	Tree/Group/Woodland/ Hedge Numbers	Totals
Those of a moderate or high quality that should be afforded appropriate consideration in the context of development	**'A'**	T2 W2	*1 Tree* *1 Woodland*
	'B'	T5, T6, T7, T8 G4, G7 W1	*4 Trees* *2 Groups* *1 Woodland*
Those of a low quality that should not be considered a material constraint to development	**'C'**	T1, T3, T4, T11 G2, G3, G5, G6 H1, H2, H3, H4, H5	*4 Trees* *4 Groups* *5 Hedges*
Those that should be removed for sound management reasons regardless of site proposals	**'U'**	T9, T10 G1	*2 Trees* *1 Group*
			= 11 Trees, 7 Groups, 2 Woodlands & 5 Hedges in Total

5.0 THE DEVELOPMENT PROPOSAL AND ITS PROJECTED ARBORICULTURAL IMPACTS

The Development Proposal

5.1 The supplied Proposed Site Layout plan (drawing no. 1218-PL03), as prepared by PWL Architecture, indicates that the planning application is for the construction of a ten-unit residential development comprising detached bungalows for the over-55s with associated outdoor amenity space and garages and/or off-street car parking (see TIP).

5.2 A vehicular access, with associated pedestrian footpaths, is proposed via the neighbouring new residential development to the south-west. In this respect it should be noted that the proposed plans provided show that a detached garage serving unit 15 of the neighbouring development, which was unbuilt at the time of the survey, is to be constructed in a position further east in order to facilitate the new access.

5.3 The proposal plans also detail five areas within the site that have been allocated for soft landscaping, with the inclusion of associated new tree planting.

Projected Arboricultural Losses Relating to the Proposal

5.4 As detailed in Table B, below, it is projected that construction of the development as proposed will require the removal of one tree from a low quality (i.e. 'C' category) group.

Table B: Arboricultural Impacts of Proposed Development & Other Tree Removal Proposals

	Ret. Cats.	Removals necessary to implement development	Removals recommended regardless of development	Total no. of tree removals
Those of a high quality that should be afforded appropriate consideration in the context of development	**'A'**	-	-	-
Those of a moderate quality that should be afforded appropriate consideration in the context of development	**'B'**	-	-	-
Those of a low quality that should be afforded appropriate consideration in the context of development	**'C'**	G3 (1no.)	-	*1 Tree from a Group*
Those that should be removed for sound management reasons regardless of plans	**'U'**	-	-	-
Totals		*1 Tree from a Group*	-	***= 1 Tree from a Group in Total***

Mitigation for Projected Tree Losses as Part of Site Landscaping

5.5 As shown on the Proposed Site Layout plan (drawing no. 1218-PL03), prepared by PWL Architecture, five areas within the site have been allocated for new tree planting as part of the development's landscaping scheme.

5.6 In turn, the provision of new trees within these areas is projected to more than adequately mitigate for the loss of the single low quality tree that is necessary to implement the development.

5.7 Accordingly, the provision of specific species, numbers, planting sizes, planting locations and details of post-planting management, in the form of a landscape plan, can be conditioned to a planning approval.

Special Materials and Working Methods for Proposed Construction within RPAs

5.8 As detailed on the TIP a proposed garage encroaches approximately 0.5% into the total calculated Root Protection Area (RPA) of moderate quality tree T6, which is located on neighbouring land. Nonetheless, in this respect it should be noted that section 7.5 of BS5837:2012 states that *"The insertion of specially engineered structures within RPAs may be justified if this enables the retention of a good quality tree that would otherwise be lost (usually categories A or B)",* and that *"Root damage can be minimised by using:*

- *piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600 mm; and*
- *beams, laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation."*

5.9 In respect of the proposals under consideration, it is therefore essential that the north-west corner of the building where the RPA encroachment occurs, be designed and constructed in accordance with these requirements. In turn, the provision of a specification drawing detailing an appropriate foundation design can be conditioned to a planning approval.

5.10 As also shown on the TIP several areas of proposed hard surfacing encroach 1.5% and 8% respectively into the RPAs of retained high quality tree T2 and a retained low quality tree in group G2. Whilst encroachments into less than 20% of the unsurfaced area of an RPA is acceptable under the BS5837:2012 guidance, we would note that Section 7.4 of BS5837: 2012 recommends that, where the construction of hard surfaces cannot be avoided within RPAs, then a 'no-dig' design, such as a three-dimensional cellular confinement system, should be used to avoid root loss and damage due to ground excavation and/or compaction. In this respect a manufacturer's brochure detailing the design and construction of a typical 'no-dig' hard surface is included at Appendix Three for reference purposes.

5.11 In turn, specific details regarding the construction of the hard surfaces, where they encroach within RPAs, should be discussed and established with a manufacturer of one of the products available on the marked and/or a specialist and experienced contractor.

5.12 Accordingly, in order to ensure adequate protection of retained trees, special materials and working methods for proposed construction within RPAs, including specially engineered foundations for buildings and 'no dig' hard surfaces, as aforementioned, should be included in a suitably detailed Arboricultural Method Statement and Tree Protection Plan, the provision of which and adherence to can be conditioned to a planning permission (see paragraphs 6.6 and 6.7 for further details regarding Arboricultural Method Statements and Tree Protection Plans).

6.0 RECOMMENDATIONS FOR SUCCESSFUL TREE RETENTION IN THE CONTEXT OF DEVELOPMENT

Root Protection Areas and Construction Exclusion Zones

6.1 Adequate protection of the Root Protection Areas (RPAs) of retained trees during construction is essential if their long-term viability is to be assured. RPAs, which are calculated through a method provided in BS5837:2012, are ground areas that should be protected by temporary protective fencing as Construction Exclusion Zones (CEZs) throughout the development process, thereby keeping the trees' root zones free from disturbance. Consequently, the RPA distances, as detailed in the TSS (see 6.2) and on the

TIP, give an idea of the on-site below-ground constraints in respect of tree roots and assist in planning for appropriate tree retention in relation to feasible development.

6.2 The TSS includes two columns listing RPAs of individually surveyed trees and, where applicable, the largest tree in any surveyed groups as overall areas in square metres and as radial distances. The radial RPAs are indicated as magenta coloured circles on the TIP.

6.3 With regard to CEZs the design, materials and construction of the fencing should be appropriate for the intensity and type of site construction works, should conform to at least section 6.2 of BS5837:2012, and should be secured by the imposition of a suitably worded planning condition. A default Temporary Protective Fencing Specification is included at Appendix Two.

Underground Utilities and Drainage

6.4 The installation of underground utilities in close proximity to trees can cause serious damage to their roots. As such, it is essential that utilities be routed outside RPAs unless there is no other available option. Where RPAs cannot be avoided then guidelines set out in the National Joint Utilities Group publication 'Volume 4: NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2) – Operatives Handbook' should be followed (e.g. trenches of a very limited width to be hand dug or the use of directional drilling).

6.5 A proposed service routing plan for the development under consideration, upon which to base an assessment of potential tree related impacts, has not been provided. However, the provision of a service plan, with all service runs routed outside retained tree RPAs, or where not possible, then with appropriate design and installation, can be conditioned to a planning approval.

Arboricultural Method Statement and Tree Protection Plan

6.6 Government guidance recommends that, where considered expedient by the LPA, an Arboricultural Method Statement (AMS) and a Tree Protection Plan (TPP) be prepared detailing special mitigation construction issues in relation to the development under consideration. Essentially, the AMS and TPP describe and detail the procedures, working methods and protective measures to be used in relation to retained trees in order to ensure that they are adequately protected during the construction process.

6.7 In order to ensure that any such special working methods are followed, and that the retained trees are adequately protected throughout the development process, the production of and adherence to an AMS and TPP can be conditioned to a planning approval.

7.0 OTHER RECOMMENDATIONS

Non-Development Related Tree Works and Recommendations

7.1 Any general management pruning works for retained trees that are stated to be non-development related, as detailed in the TSS, are recommended in accordance with prudent arboricultural management and should therefore be carried out regardless of any site development proposals and potential changes in land usage. All tree works should be carried out in accordance with BS3998:2010 - Tree Work – Recommendations.

Tree Work Related Consents

7.2 No tree pruning or removal works should commence on site until necessary consents have been obtained from the LPA as part of a planning approval or in respect of any statutory tree protection (e.g. TPOs).

Arboricultural Contractors

7.3 All tree works should be carried out by suitably qualified and experienced arboricultural contractors carrying appropriate public liability insurance cover and be implemented to the minimum current CE and UK industry standards and in accordance with industry codes of practice. Only certificated personnel should, in accordance with The Control of Pesticides Regulations, apply any pesticides.

Contractors and Subsequently Identified Tree Defects

7.4 Tree contractors should be made aware that, should any significant tree defects become apparent during operations that would not have been immediately obvious to the surveyor, then such defects should be notified immediately to the client and subsequently confirmed to the consultant within five working days.

New Tree Planting

7.5 All tree planting at the site should be carried out in accordance with BS8545:2014 Trees: from nursery to independence in the landscape – Recommendations, and in accordance with the guidance detailed in section 5.6 and Table A.1 of BS5837:2012.

Landscaping Within and Close to Retained Trees' RPAs

7.6 All proposed landscaping to be carried out within and close to retained trees' RPAs should be carried out in strict accordance with the guidance detailed in section 8 of BS5837:2012.

Retained Tree Management

7.7 Any tree risk management appraisals and subsequent recommendations made in this report were based on observations and site circumstances at the time of the survey. Trees are dynamic living organisms whose structure is constantly changing and even those evidently in good condition can succumb to damage and/or stress.

7.8 In this respect, it should be noted that, under the Occupiers' Liability Act (1957 & 1984), site occupants have a duty of care to take reasonable steps to prevent or minimise the risk of personal injury and/or damage to property from any tree located within the curtilage of the land they occupy. In turn, it is accepted that these steps should normally include commissioning a qualified and experienced arboriculturist to survey their trees in order to identify any risk of harm to persons or damage to property that they may present and, where unacceptable risks are identified, taking suitable remedial action to negate those risks.

8.0 SUMMARY AND CONCLUSIONS

8.1 Eleven individual trees, seven groups of trees, two woodlands and five hedges were surveyed in respect of a proposal to construct ten detached, over-55s bungalows at the site under consideration.

8.2 One tree and one woodland were categorised as high quality, four trees, two groups and one woodland were categorised as moderate quality, four trees, four groups and the five hedges were categorised as low quality, and two trees and one group were categorised as unsuitable for retention.

8.3 An appraisal of the documentation provided to date identified that construction of the development as proposed will require the removal of one tree from a low quality group.

8.4 However, new tree planting is proposed as part of the development's landscaping, which is projected to more than adequately mitigate for the loss of the single low quality tree.

8.5 In turn, the provision of new tree planting as a component of the development, in accordance with a landscape proposal plan, can be conditioned to a planning approval.

8.6 In addition to the above it is also concluded that, in order to ensure successful existing tree preservation over the long-term, it is essential that the retained trees are protected in strict accordance with current Government guidance and the recommendations included herein.

8.7 In this respect it was identified that construction of a proposed garage encroaches a short distance (0.5%) into the calculated RPA of a moderate quality tree located on neighbouring. Nonetheless, this encroachment is permissible under current government guidance providing that the building is designed and constructed using specially engineered foundations in strict accordance with section 7.5 of BS5837:2012. Accordingly, a specification drawing detailing an appropriate foundation design can be conditioned to a planning approval.

8.8 The appraisal also identified that several areas of proposed hard surfacing encroach permissible distances into the RPAs of a high quality tree and a low quality tree. Nonetheless, these encroachments are permissible under current government guidance providing that the hard surface is designed and constructed using 'no-dig' methods and materials in accordance with BS5837: 2012. Consequently, a specification drawing detailing an appropriate 'no-dig' cellular confinement system design can be conditioned to a planning approval.

8.9 Accordingly, in order to ensure adequate protection of retained trees, these factors, including the construction of 'no dig' hard surfaces and specially engineered foundations for buildings, as aforementioned, should be included in a suitably detailed Arboricultural Method Statement and Tree Protection Plan, the provision of which and adherence to can be conditioned to a planning permission.

REFERENCES

BS8545:2014 - Trees: From Nursery to Independence in the Landscape – Recommendations. BSI British Standards, London.
BS3998:2010 - Tree Work - Recommendations. BSI British Standards, London.
BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations. BSI British Standards, London.
National House Building Council (2017). NHBC Standards Chapter 4.2 - Building Near Trees. NHBC, Amersham.
National Joint Utilities Group (2007). Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook.

APPENDICES

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL			
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ		
Client:	Reilly Developments		

Surveyor:	Jennie Keighley PhD MSc MArborA
Survey Date:	22 November 2017
Job Ref:	BTC1475

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
T1	Common Horse Chestnut	8	1x140 2x50 (ms)#	N E S W	2.5 2.5 2 2.5	0.5-N 4	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Subordinate stem emerges west side of base.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	C1	11	1.88
T2	Common Alder	15	1160	N E S W	11 10 11 10	3-S 1	M	G	▪ Moderately heavy basal epicormics and several adventitious growths to a diameter of 100mm emerging from heights around 0.5m. ▪ Occasional partially occluded cavities throughout crown to a diameter of 100mm. ▪ Proposed hard surfaces encroach 1.5% into Root Protection Area (RPA).	▪ Prune to lift west side of crown to create a 2m ground clearance in order to install boundary treatment as proposed. ▪ Construct proposed hard surfaces, where within RPA, using 'no dig' methods and materials in accordance with s7.4 of BS5837: 2012. ▪ Protect RPA throughout development using Temporary Protective Fencing (specification appended) to form a Construction Exclusion Zone (CEZ).	20+	A3	609	13.92
T3	Common Oak	16.5	830	N E S W	9 12 9.5 7.5	4-N 1.25	M	M	▪ Significant stem lean east, with crown now largely weighted east due to large diameter branch failures on western side of crown. ▪ Multiple branch failures and long, dead pruning stubs to a diameter of 230mm throughout. ▪ Fruiting bodies of saprophytic fungi abundant on attached deadwood. ▪ Risk of stem or rootplate failure due to weighting issues.	▪ Located outside proposed development boundary and not projected to be impacted. ▪ Landowner is advised to have detailed risk assessment inspection carried out by professional arboriculturist.	10+	C1	312	9.96
T4	Common Ash	16	1200#	N E S W	9 12 9 9	4 4	M	M	▪ Traverses boundary lines. ▪ Historically pollarded. ▪ Long history of pruning works, with numerous unoccluded to fully occluded wounds. ▪ Frequent deadwood to a diameter of 150mm.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	651	14.4

Headings and Abbreviations:

No. Allocated sequential reference number - Tree ('T'), Group ('G'), Woodland ('W') or Hedge ('H') reference number - refer to plan and to numbered tags where applicable
Species: Common name
Height: In metres, to nearest half metre – where possible approximately 80% are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement listed is that of the highest tree
Stem Diam.: Stem diameter in millimetres, to nearest 10mm - measured and calculated as per Annex C of BS5837:2012. MS = multi-stemmed, TS = twin-stemmed
Branch Spread: Crown radius measured (or estimated where considered appropriate) from the four cardinal points (north, east, south and west) to give an accurate visual representation of the crown
Branch & Canopy Clearances: Existing height above ground level, in metres, of first significant branch and direction of growth (e.g. 2.5-N) and of canopy at lowest point – to inform on crown to height ratio, potential for shading, etc.
Life Stage: Estimated age class - Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature
PC: Physiological Condition - a measure of the tree'(s)' overall vitality, i.e. D = Dead, MD = Moribund, P = Poor, M = Moderate, G = Good
General Observations and Comments: Comments relating to the tree'(s)' overall condition and any other pertinent factors including structural defects, current and potential direct structural damage, physiological decline, poor form, etc.
Management Recommendations: Either Preliminary or In Consideration of the Proposal - In the case of Arboricultural Constraints Surveys the recommended management works only take exiting site and tree circumstances and conditions into account and not proposed developments. Arboricultural Impact Assessment and Method Statement related Surveys take the proposed development into consideration with recommendations made accordingly. More than one option may be given if considered appropriate
ERC: Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)
Cat. Grade: Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1
RPA m^2: Root Protection Area in m^2 - calculated area around the tree that must be appropriately protected throughout the development process in order avoid root damage
RPA Radius (m): Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection
 # (Estimated Dimensions): Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a "#" symbol

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL			
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ	**Survey Date:**	22 November 2017
Client:	Reilly Developments	**Job Ref:**	BTC1475

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
T5	Common Alder	12	300#	N E S W	5 5.5 5 5.5	3 3.5	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ No significant visible defects.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	41	3.6
T6	Common Oak	19	900#	N E S W	9.5 9.5 9 9.5	2.5-W 1.5	M	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Several partially occluded pruning wounds to a diameter of 300mm on southern side of crown. ▪ Proposed garage encroaches 0.5% into RPA.	▪ Construct proposed garage, where within RPA, using specially engineered foundations in accordance with s7.5 of BS5837: 2012. ▪ Protect remainder of RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	366	10.8
T7	Common Horse Chestnut	11	450#	N E S W	5 6 5 6	2-S 1.75	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Lower stem out of view behind close board timber board fence. ▪ No significant visible defects. ▪ Crown overhanging site by 4m with relatively low clearance.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	92	5.4
T8	Common Ash	13	450#	N E S W	5 6 5 6	3.5-SW 1.5	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Lower stem out of view behind close board timber board fence. ▪ No significant visible defects. ▪ Crown overhanging site by 4m with relatively low clearance.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	20+	B1	92	5.4
T9	Common Ash	7	100#	N E S W	0.5 2.5 2.5 2.5	1.5-S 1.25	Y	M	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Growing between wire mesh fence and close board timber fence. ▪ Limited potential for future growth due to conflict with boundary treatments.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	<10	U	5	1.2
T10	Common Ash	8	400#	N E S W	3 3 3 3	3 3	EM	P	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Topped at least two seasons ago at a height of 5m, with regrowth to a diameter of 30mm. ▪ Short projected life expectancy.	▪ Protect RPA throughout development using Temporary Protective Fencing to form a CEZ.	<10	U	72	4.8
T11	Weeping Willow	11	320	N E S W	4 5 4 3	1.5 0.5	EM	G	▪ Growing within group G6. ▪ No significant visible defects.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	46	3.84

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL		Surveyor:	Jennie Keighley PhD MSc MArborA	Page: 3 of 4
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ	Survey Date:	22 November 2017	
Client:	Reilly Developments	Job Ref:	BTC1475	

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m^2)	RPA Radius (m)
G1	3no. Beech, 2no. Hawthorn, 1no. Common Oak, 1no. Sycamore	≤ 8	≤ 140	N E S W	≤ 2.5 ≤ 2.5 ≤ 2.5 ≤ 2.5	1.25-N ≥ 0.5	Y-M	G	▪ Northernmost tree is on site side of fence, but rest of group is located on neighbouring land and therefore not inspected in detail. ▪ Growing very close to or in contact with post and rail boundary fence. ▪ Limited potential for future growth due to conflict with boundary treatment.	▪ Located outside proposed development boundary and not projected to be impacted.	<10	U	≤ 9	≤ 1.68
G2	6no. Hybrid Black Poplar	≤ 22	≤ 1030	N E S W	≤ 14 ≤ 14 ≤ 14 ≤ 14	2-NW ≥ 1.25	M	M/G	▪ Moderately spaced linear group growing at edge of wet field ditch. ▪ Interspersed with younger individuals, some of which are dying back, moribund or dead. ▪ Two trees removed from centre of group in past. ▪ Large pile of earth, resulting from neighbouring development site preparation, piled within southern side of RPAs of eastern trees. ▪ Proposed footpath and access road encroach 8% into RPA of one of retained trees.	▪ Remove 1no. tree, as indicated on Tree Impact Plan, in order to construct access as proposed. ▪ Construct footpath and road, where within RPA of retained tree, using 'no dig' methods and materials in accordance with s7.4 of BS5837: 2012. ▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	≤ 480	≤ 12.36
G3	Hybrid Black Poplar	≤ 24	≤ 1000#	N E S W	≤ 11 ≤ 15 ≤ 10 ≤ 8	3-E ≥ 6	M	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Start of another moderately spaced linear group of Poplars extending southwards, running perpendicular to group G2.	▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	≤ 452	≤ 12
G4	8no. Common Ash, 6no. Common Oak, 4no. Sycamore	≤ 18	≤ 450#	N E S W	≤ 7 ≤ 7 ≤ 7 ≤ 7	1-W ≥ 1	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Moderately spaced linear group evidently planted as a shelterbelt for the young woodland W1 beyond. ▪ Many of crowns overhanging site with low clearance.	▪ Prune to lift north sides of crowns to create a 4m ground clearance where overhanging proposed dwellings' outdoor amenity space. ▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	20+	B2	≤ 92	≤ 5.4
G5	2no. Common Hawthorn	≤ 5	≤ 3x100 (ms)#	N E S W	≤ 2 ≤ 2 ≤ 2 ≤ 2	1.75-N ≥ 1.75	M	G	▪ Growing between post and wire fence and close board timber fence at northern site boundary. ▪ Ownership unclear, expected to be located on neighbouring land. ▪ Very closely spaced pair.	▪ Protect RPAs throughout development using Temporary Protective Fencing to form a CEZ.	10+	C1	≤ 14	≤ 2.08
G6	2no. Leyland Cypress	≤ 7	≤ 200#	N E S W	≤ 2.5 ≤ 2.5 ≤ 2.5 ≤ 2 .5	0.5 ≥ 0.5	SM	G	▪ Very closely spaced pair. ▪ No significant visible defects.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C1	≤ 18	≤ 2.4

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT APPRAISAL				
Site:	Land off Clitheroe Road, Barrow, Lancashire, BB7 9AQ	**Surveyor:**	Jennie Keighley PhD MSc MArborA	
Client:	Reilly Developments	**Survey Date:**	22 November 2017	
		Job Ref:	BTC1475	

No.	Species	Height	Stem Diam.	Branch Spread	Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m²)	RPA Radius (m)
G7	2no. Silver Birch, Hazel, Common Oak, Common Alder	≤ 18	≤ 320#	N ≤ 4.5 E ≤ 4.5 S ≤ 4.5 W ≤ 4.5	0.5-S ≥ 1.5	Y-EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Moderately closely spaced linear group extending northwards. ▪ Two early-mature Silver Birches with several young trees of other species in between.	▪ Located outside proposed development boundary and not projected to be impacted.	20+	B2	≤ 46	≤ 3.84
W1	Birch, Oak, Ash, Hazel, Hawthorn, Wild Cherry, Scots Pine, Holly	≤ 12	≤ 180#	N ≤ 3 E ≤ 3 S ≤ 3 W ≤ 3	0 ≥ 0.5	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Young, planted, closely spaced mixed woodland. ▪ Occasional trees with protective tubes still in place.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	B3	≤ 15	≤ 2.16
W2	Common Beech, Common Oak, Elder, Holly, Hawthorn	≤ 20	≤ 280#	N ≤ 5 E ≤ 5 S ≤ 5 W ≤ 5	0 ≥ 0	EM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Edge of moderately to widely spaced woodland extending eastwards. ▪ Fronted by a recently laid and currently sparse Hawthorn hedge.	▪ Located outside proposed development boundary and not projected to be impacted.	40+	A3	≤ 35	≤ 3.36
H1	Common Beech	≤ 5	≤ 70#	≤ 3 wide	0.25 ≥ 0	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Evidently planted as a hedge, but not managed as such.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C2	N/A	≤ 0.84
H2	Common Beech	≤ 1.5	≤ 50#	≤ 1 wide	0 ≥ 0	Y	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Managed garden boundary hedge.	▪ Located outside proposed development boundary and not projected to be impacted.	10+	C2	N/A	≤ 0.6
H3	Leyland Cypress	≤ 3	≤ 100#	≤ 2 wide	0.25 ≥ 0.5	SM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Managed garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.2
H4	Leyland Cypress	≤ 8	≤ 150#	≤ 4 wide	0 ≥ 1.25	SM	G	▪ Located on neighbouring land and therefore not inspected in detail. ▪ Unmanaged garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.8
H5	Leyland Cypress	≤ 8	≤ 100#	≤ 3 wide	0.25 ≥ 0.25	SM	G	▪ Unmanaged garden boundary hedge.	▪ Protect throughout development using Temporary Protective Fencing to form a CEZ.	10+	C2	N/A	≤ 1.2

BS5837:2012 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 *Note: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see BS5837:2012 paragraph 4.5.7.*			Red
	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)	Green
Category B Those of moderate quality and value: those in such a condition as to make a significant contribution. A minimum of 20 years is suggested.	Trees that might be included in the high category, but are downgraded because of impaired condition. Examples include the presence of remediable defects including unsympathetic past management and minor storm damage	Trees present in numbers, usually as groups or woodlands, so they form distinct landscape features which attract a higher collective rating than they might as individuals. But which are not, individually, essential components of formal or semi-formal arboricultural features. For example, trees of moderate quality within an avenue that includes better, A category specimens. Or trees which are internal to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	Blue
Category C Those trees of low quality and value: currently in adequate condition to remain until new planting could be established - a minimum of 10 years is suggested - or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	Grey
	Note – Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation			

- TEMPORARY PROTECTIVE FENCING & GROUND PROTECTION SPECIFICATION -

Construction Exclusion Zones (CEZs), shall be enclosed by **Temporary Protective Fencing** and/or, where necessary, **Temporary Ground Protection Measures**. The fencing/ground protection Type(s), locations, and extents shall be agreed, in writing, with the Local Planning Authority (LPA). In turn, the **Temporary Protective Fencing** and/or **Temporary Ground Protection Measures** shall:

1. be constructed as in accordance with the Type 1, Type 2 or Type 3 'Temporary Protective Fencing Construction' sections and, where applicable the 'Temporary Ground Protection Measures' section, as detailed herein and agreed, in advance with the LPA;
2. be retained in place throughout the development process until completion of the project, and only removed following receipt of written permission from the LPA;
3. be sited in the area(s) defined by the Root Protection Areas on the associated Tree Impact Plan, or as the CEZs on the Tree Protection Plan;
4. be erected prior to any construction, demolition or excavation works and remain in place for the duration of the project;
5. preclude any delivery of site accommodation and/or materials and/or plant machinery;
6. preclude all construction related activity, with the sole exception of specified arboricultural works and any other works to be carried out under supervision that have been agreed by all parties;
7. preclude the storage of all development related materials and substances including fuels, oils, additives, cement and/or any other deleterious substance; and
8. be affixed with a 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1, below), at every 10.0 metre length of protective fencing.
9. Important: Any incursion into CEZs must be by prior arrangement, following consultation with the LPA.

Figure 1: CEZ Warning Sign

– TREE PROTECTION AREA –
KEEP OUT!

(TOWN & COUNTRY PLANNING ACT 1990)
THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR SUBJECTS OF A 'TREE PRESERVATION ORDER', THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:

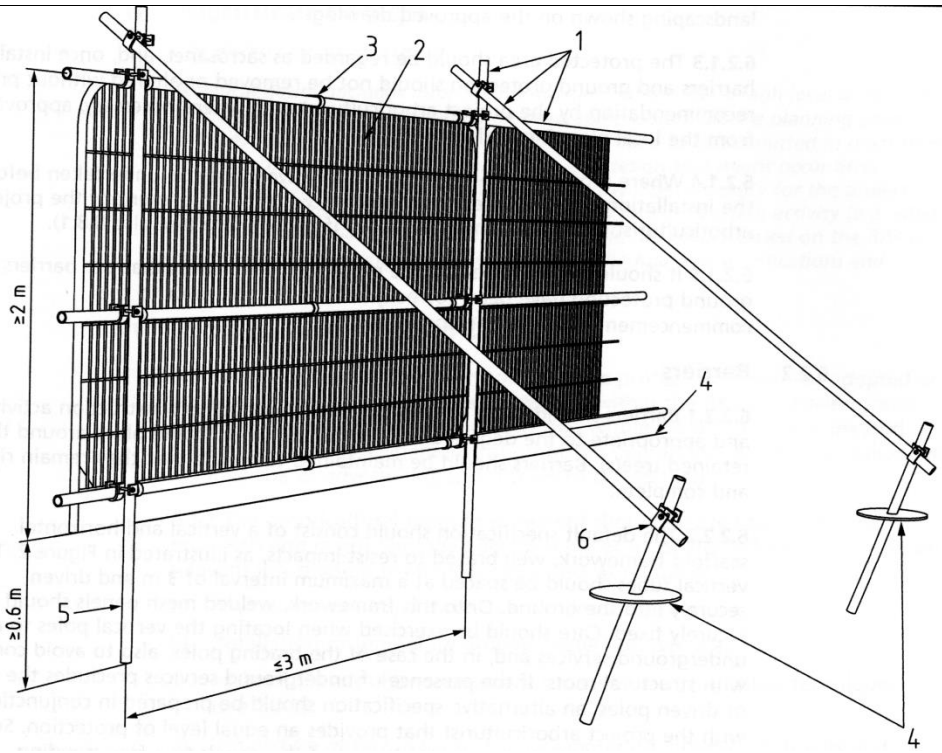
- THE PROTECTIVE FENCING MUST NOT BE MOVED
- NO PERSON SHALL ENTER THE CONSTRUCTION EXCLUSION ZONE
- NO MACHINE, PLANT OR VEHICLES SHALL ENTER THE EXCLUSION ZONE
- NO MATERIALS SHALL BE STORED IN THE EXCLUSION ZONE
- NO SPOIL SHALL BE DEPOSITED IN THE EXCLUSION ZONE
- NO EXCAVATION SHALL OCCUR IN THE EXCLUSION ZONE
- NO FIRES SHALL BE LIT IN THE EXCLUSION ZONE

ANY INCURSION INTO THE EXCLUSION ZONE MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Type 1 (i.e. 'Default') Temporary Protective Fencing Construction (see Figure 2, below)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall butt together and be securely fixed to a scaffold framework, as per points 3 to 5 of Figure 2, overleaf.
3. The scaffold framework shall comprise of upright poles of at least 3.0 metres in length driven no less than 0.6 metres into the ground at maximum 3.0 metre centres with horizontal and diagonal poles fixed to the uprights, as per points 4 to 5.
4. The two horizontal rail poles shall be attached to the uprights at heights of 0.6 and 1.8 metres with 3 no. clamps to each joint.
5. The diagonal scaffold pole struts be clamped to the top rail of the scaffold framework at a 45º angle and extend back into the CEZ and clamped to a 0.7 metre length of scaffold tube that shall be driven no less than 0.5m into the ground.
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

Figure 2: BS5837:2012 Default specification for protective barrier



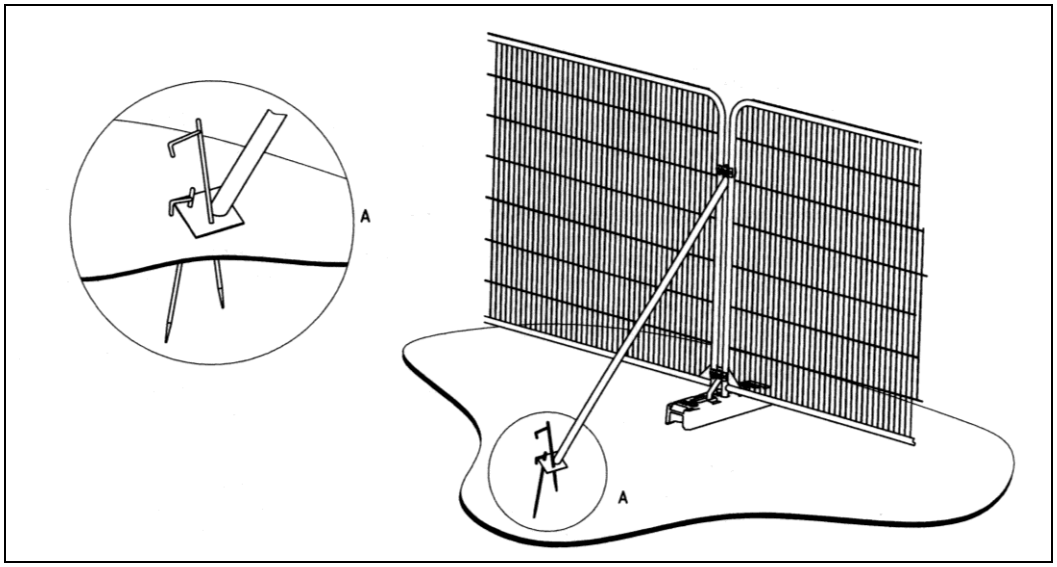
Key

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

Type 2 Temporary Protective Fencing Construction (see Figure 3(a), below)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45º angle and extend back into the CEZ and shall be attached to a base plate, which shall be secured to the ground with pins (Figure 3a).
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

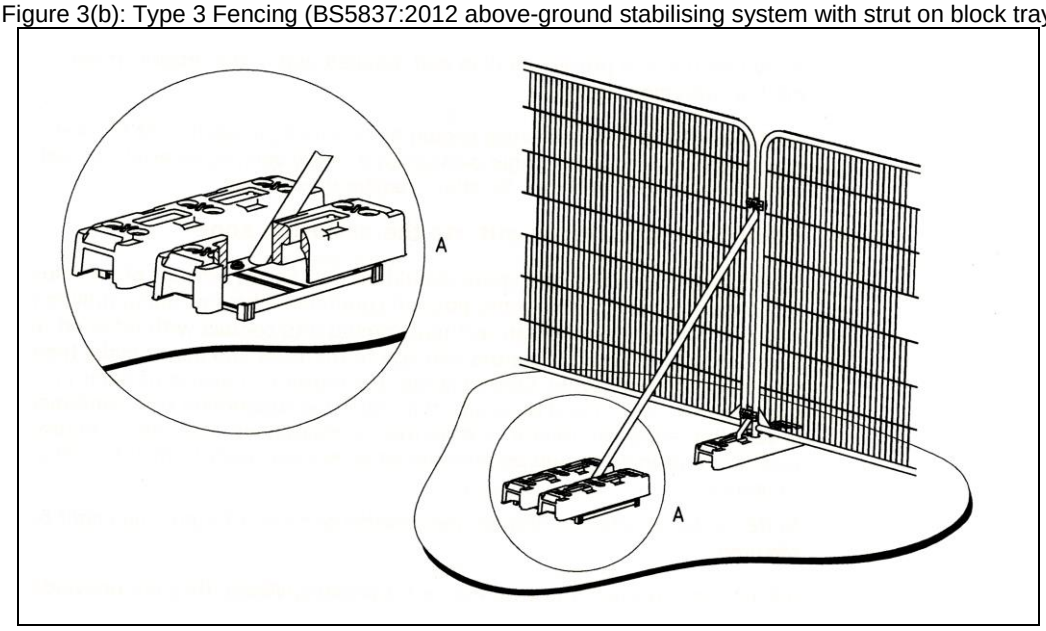
Figure 3(a): Type 2 Fencing (BS5837:2012 above-ground strut stabilising system with ground pins)



Type 3 Temporary Protective Fencing Construction (see Figure 3(b), overleaf)

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall stand on rubber or concrete feet.
3. The panels shall butt together, and be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence.
4. The distance between the fence couplers shall be at least 1.0 metre, and shall be uniform throughout the fence.
5. The panels shall be supported on the inner side by stabiliser struts, which shall be clamped to the scaffold framework at a 45º angle and extend back into the CEZ and shall be attached to a block tray base (Figure 3b).
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion of erection, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Protective Fencing.

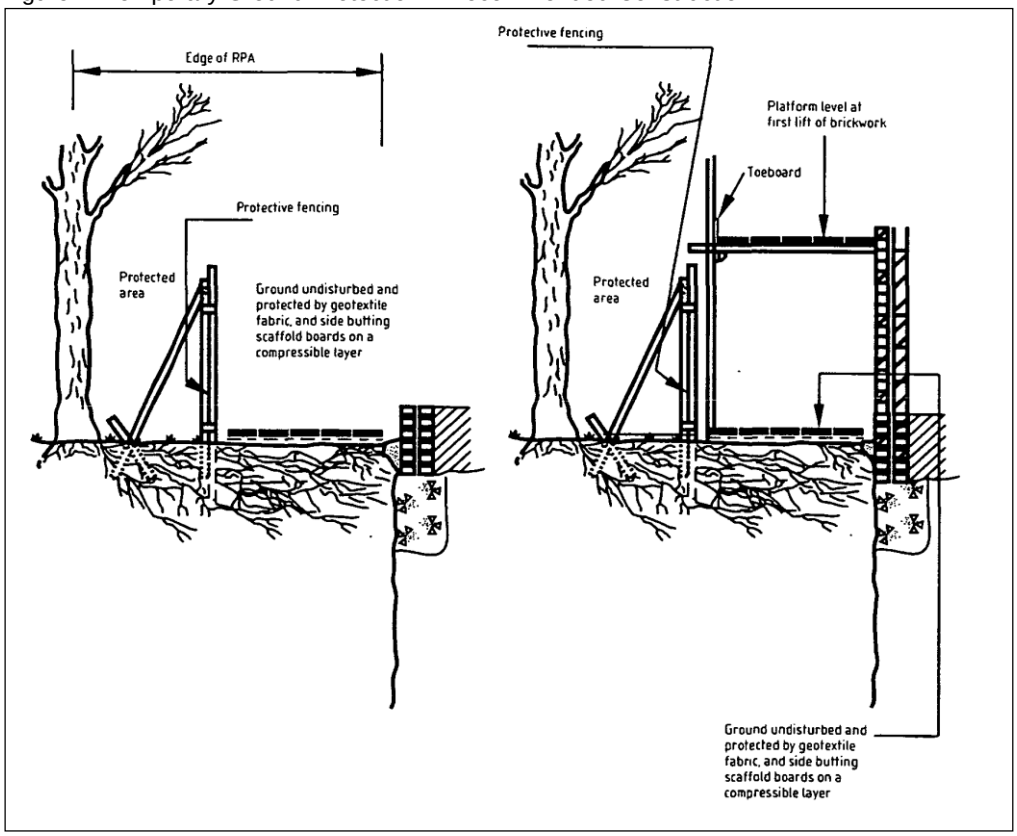
Figure 3(b): Type 3 Fencing (BS5837:2012 above-ground stabilising system with strut on block tray)



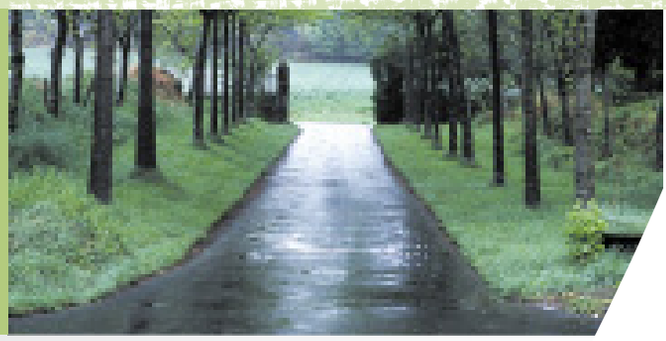
Temporary Ground Protection

1. Any necessary Temporary Ground Protection areas shall conform to Figure 4, below, unless otherwise agreed with the LPA.
2. The Ground Protection Area shall be left undisturbed and covered by a semi-permeable geotextile membrane which shall, in turn, be covered by a compressible layer consisting of a material such as woodchip.
3. Side-butting scaffold boards shall then be fitted to cover the Ground Protection Area.
4. On completion of installation, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Ground Protection.
5. The Temporary Ground Protection shall remain in place until completion of the project and only removed following receipt of written permission from the LPA.

Figure 4: Temporary Ground Protection – Recommended Construction



CellWeb TRP®



Tree Root Protection Guaranteed

Geosynthetics

www.geosyn.co.uk

CellWeb TRP® System

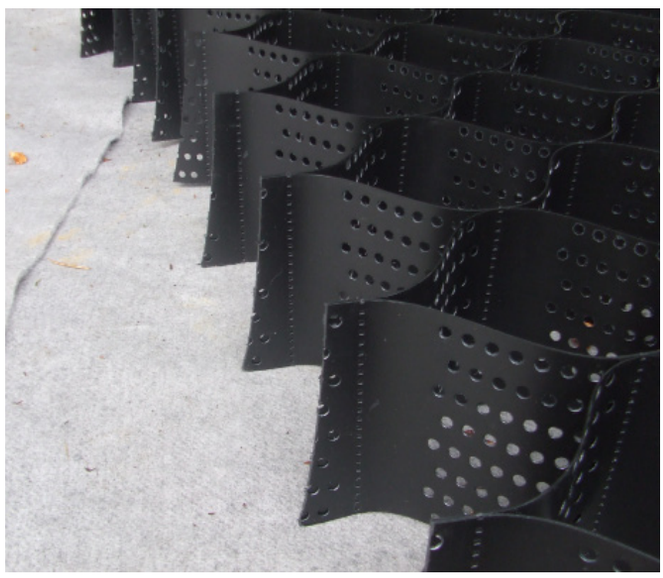
Tree Root Protection System



The Consquences Of Tree Root Damage During Construction

It is an offence to cut down, lop, uproot, top, wilfully damage or destroy a protected tree without authorisation. Trees can be protected under the Town and Country Planning Act 1990 and the Town and Country Planning (Trees) Regulations 1999. Trees are protected when they are the subject of Tree Preservation Orders (T.P.O) or within Conservation Areas, subject to certain exemptions. Retention and protection of trees on development sites is also secured through the use of planning conditions.

On a construction site all trees with a Tree Preservation Orders need to be managed in accordance with BS5837 2012 (Trees in relation to construction); failure to comply with these orders can be a costly affair as many parties have discovered.



Fishponds, Ketton

There are two offences which apply equally to trees protected by Tree Preservation Orders and those within Conservation Areas:

- Firstly, anyone who cuts down, uproots or wilfully destroys a tree, or who lops, tops or wilfully damages it in a way that is likely to destroy it is liable, if convicted in the Magistrates Court, to pay a fine of up to £20,000. If the person is committed for trial in the Crown Court, they are liable on conviction to an unlimited fine. The Courts have held that it is not necessary for a tree to be obliterated for it to be "destroyed" for the purposes of the legislation. It is sufficient for the tree to have been rendered useless as an amenity.
- Secondly, anyone who carries out works on a tree that are not likely to destroy it is liable, if convicted in the Magistrates Court, to a fine of up to £2,500. In addition to directly carrying out unauthorised works on protected trees, it is an offence to cause or permit such works.

Developers and building contractors are often completely unaware that 'compaction of soils within the Root Protection Area (RPA)' constitutes wilful damage to the tree. When vehicular or pedestrian access within the RPA is necessary, either for the construction operation or final site access, the effects of this activity must be addressed and the ground must be protected. When tracked or wheeled traffic movements are involved, the ground protection system should be designed by an engineer and take into account the loading involved.

Shelton Road, Shewsbury

The Solution:

Geosynthetics CellWeb TRP® System



The Solution According to BS 5837:2012

"Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems ....."

(BS 5837 2012 section 7.4.2 Note 1)

The CellWeb TRP® Solution

CellWeb TRP® is the market leader in the United Kingdom and Ireland for tree root protection. CellWeb TRP® cellular confinement system protects tree roots from the damaging effects of compaction and desiccation, while creating a stable, load bearing surface for vehicular traffic. CellWeb TRP® complies with BS 5837:2012 and APN 12. It provides a no-dig solution, is tried and tested having been used successfully since 1998. It is the only tree root protection system which has been independently tested and it is the only tree root protection system which is guaranteed for 20 years. See page 6 for the full terms and conditions of the guarantee.

Fishponds, Ketton

Field Trials

Geosynthetics Limited are the only company in the UK and Ireland to carry out live, completely independent field tests on the performance of a 3 dimensional cellular confinement system when used in a no-dig tree root protection system application. The results prove that CellWeb TRP® significantly reduces the compaction of sub-soils within the root growth limiting parameters established by K D Coder, 'Soil damage from compaction'. University of Georgia. July 2000. A copy of the report is available upon request.

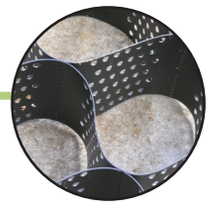
CellWeb TRP® Product Guarantee

Geosynthetics Limited prides itself on a providing a reliable, consistent service; including technical advice, on site support and installation guidance. Geosynthetics Limited provides a 20 year guarantee for the CellWeb TRP® tree root protection system. This guarantee gives the client, the tree officer and arboricultural consultant the confidence that the designed system will perform as intended without damaging the health of the tree.

See page 6 for the full terms and conditions of the guarantee.

CellWeb TRP® System

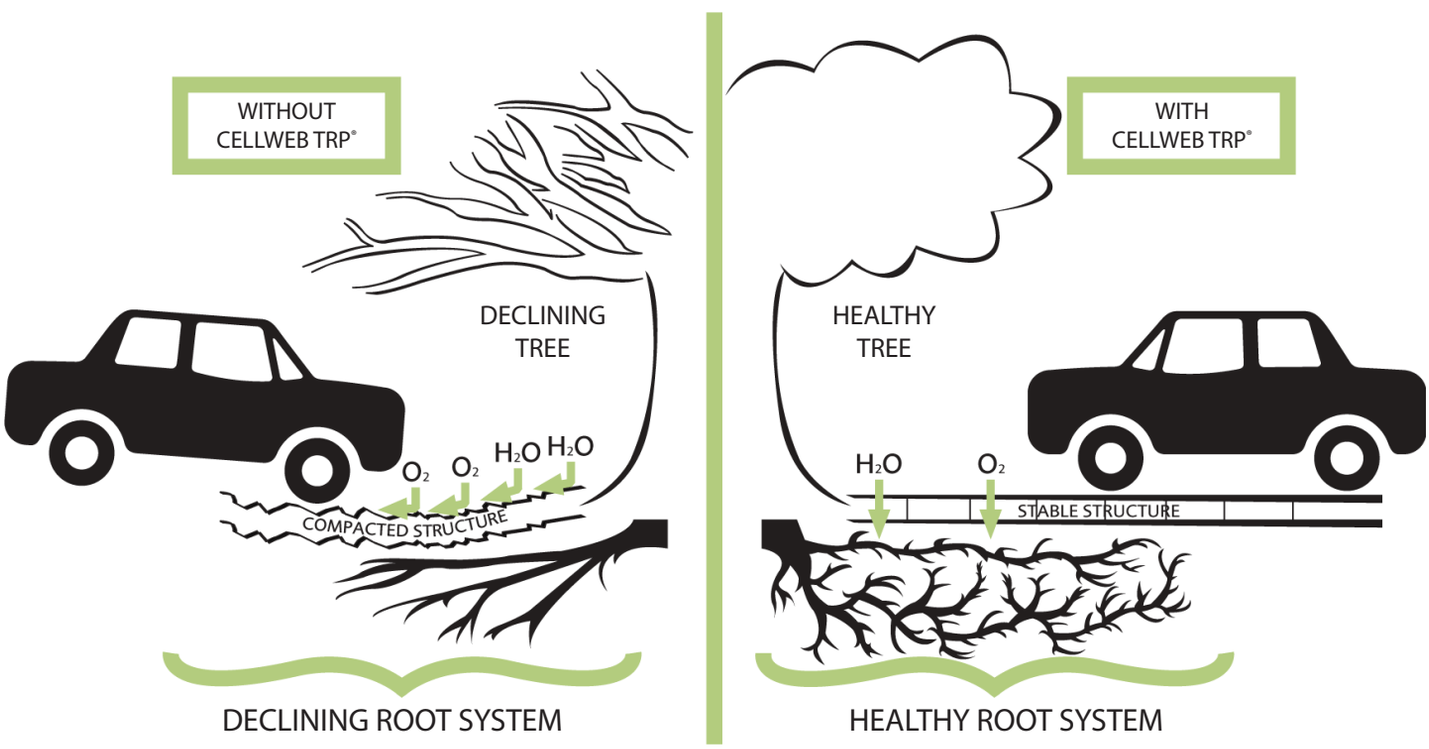
How the System Works



How CellWeb TRP® Works

CellWeb TRP® is a cellular confinement system that confines aggregate materials and makes them stronger, thus increasing the bearing capacity of the sub base materials. Research shows that CellWeb TRP® acts as a stiff raft to distribute wheel loads and reduce their magnitude at the base of the construction, thus maintaining the soil bulk density at levels that are suitable for tree root growth.

CellWeb TRP® is used around the world to provide cost effective hard surface construction over tree roots and is the system of choice for Tree Officers and Arboriculturists. For more information on this subject see CellWeb TRP® Fact Sheet No 1.



Water and Oxygen Transfer Through the CellWeb TRP® System

The CellWeb TRP® system is constructed using open aggregate infill and CellWeb TRP® has perforated cell walls. The pore spaces between the aggregate particles are greater than 0.1mm in diameter. This open structure is far more permeable than typical soils and allows the free movement of water and oxygen so that supplies to trees are maintained.

For more information on this subject see CellWeb TRP® Fact Sheet No 2.

CellWeb TRP® and Pollution

How CellWeb TRP® Deals With Catastrophic Oil Spills

How CellWeb TRP® Deals With Pollution

Where possible a permeable pavement system should always be constructed above the CellWeb TRP® system. The effective removal of pollution from runoff by permeable pavements is well known. Worldwide research has shown runoff that has passed through permeable pavements has low concentrations of pollutants.

Small spills of oil will be dealt with within the joints between the paving blocks and in the aggregate used within the system. However, large catastrophic spills are a different matter.

For more information on this subject see CellWeb TRP® Fact Sheet No 3.

Castle Gardens

Ambleside Lake District

Harcourt Aboretum

The Treetex® geotextile used in the CellWeb TRP® system has two functions. Treetex® separates the sub base aggregates from the soil beneath and it traps oil within its structure and allows it to degrade aerobically within the pavement construction. The structure, thickness and weight of Treetex® creates the perfect environment for this to happen. Most importantly tests prove that Treetex® will absorb 1.7 litres of oil per square metre, this is 4 times more effective than standard geotextiles.

Treetex® is an intrinsic part of the CellWeb TRP® system; and must be in conjunction with the CellWeb TRP® in order to guarantee the success of the system.

Please see page 6 for full details of the guarantee.

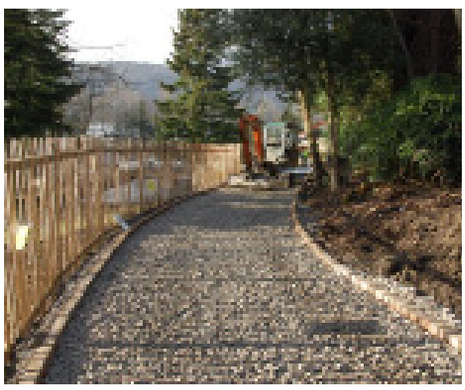
Geosynthetics CellWeb TRP® System:

A Proven No Dig Solution

Advice, Design and Product Selection

Geosynthetics Limited has been supplying the CellWeb TRP® system since 1998 and has vast experience in its application. No two contracts are the same and we understand the factors that need to be taken into account to specify the correct CellWeb TRP® product.

We provide a free consultation, design and advisory service to find the solution that is most cost effective and beneficial for your site. Our service includes product selection, engineering calculations, CAD drawings and full instructions to help you from project conception to completion.



Fallbarrow Park, Windermere: Prior to CellWeb TRP® Installation

Fallbarrow Park, Windermere: CellWeb TRP® Installation

Fallbarrow Park, Windermere: Completed CellWeb TRP® Installation

Final Surfacing

The benefits of the CellWeb TRP® system can only be maintained if a suitably porous final surface is selected. An ideal surfacing is the Golpla grass reinforcement and gravel retention system, a visually attractive surface that has the advantage of being fully porous. Alternatives include block paviors, porous asphalts and loose or bonded gravel.

Always Use CellWeb TRP®

The CellWeb TRP® system is the only research backed system of its kind in the UK with a 100% success rate. CellWeb TRP® has been specifically developed for the Tree Root Protection market. The system is supported by 15 years of data and thousands of installations making it the system of choice for the majority of Tree Officers and Arboriculturists in the UK.

CellWeb TRP® is uniquely identifiable. It is manufactured with a bright green panel on each side. When installed the green panels are laid adjacent, creating a green band across the construction.

Woodcock Hall, Yorkshire

Geosynthetics Limited

Fleming Road, Harrowbrook Industrial Estate
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Please call **01455 617 139**

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Visit our website www.geosyn.co.uk for further information.

Proposed footpath and road encroach 8% into RPA of retained tree in group G2. Construct using 'no dig' methods and materials in accordance with Section 7.4 of BS5837: 2012

Proposed garage encroaches 0.5% into RPA of tree T6. Construct using specially engineered foundations, in accordance with Section 7.5 of BS5837: 2012

Remove 1no. tree from group G2 in order to construct access road as proposed

Relocated garage to replace demolished

Garage in ongoing neighbouring development, which was not yet built at time of tree survey, proposed to be demolished to form access

Existing turning head removed

Proposed hard surfaces encroach 1.5% into RPA of tree T2. Construct using 'no dig' methods and materials, in accordance with Section 7.4 of BS5837: 2012

Crown lift western side of crown of tree T2 to a height of 2m in order to install boundary treatment as proposed

Important: The original version of this plan was produced in colour, which is essential to the plan's interpretation and usability. As such, a monochrome copy should not be relied upon

KEY

T = Individual Tree
G = Group of Trees
W = Woodland
H = Hedge

Please refer to associated Arboricultural Impact Assessment for specific details in respect of items below:

Tree Categorisations:

Those to be Considered for Retention:

Category 'A'
Tree/Group/Woodland/Hedge
Those of a High Quality with an Estimated Remaining Life Expectancy of at Least 40 Years

Category 'B'
Tree/Group/Woodland/Hedge
Those of a Moderate Quality with an Estimated Remaining Life Expectancy of at Least 20 Years

Category 'C'
Tree/Group/Woodland/Hedge
Those of Low Quality with an Estimated Remaining Life Expectancy of at Least 10 Years, or Young Trees

Those Unsuitable for Retention:

Category 'U'
Tree/Group/Woodland/Hedge
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

Note 1: The stem locations of individual tree T12, and trees in groups G1, G4 to G7, and woodlands W1 and W2, were not included on the topographical site plan provided and were subsequently plotted by the arboricultural surveyor at the time of the survey using GPS siting and measurement from existing site features. As such, the locations of these trees cannot be considered wholly accurate
Note 2: Trees with their identification numbers labelled in grey are recommended for removal in the context of the development

Root Protection Areas (RPAs):

RPAs
Area(s) of Ground Around Trees that Should be Protected Throughout Development Works with Protective Fencing to form a Construction Exclusion Zone - see Appended Specification

Project:
LAND OFF CLITHEROE ROAD
BARROW
LANCASHIRE
BB7 9AQ

Client:
REILLY DEVELOPMENTS

Title:
TREE IMPACT PLAN
in Relation to Proposed Erection of 10no. Over-55s Bungalows

Scale:	1:500@A2
Date:	May 2018
Drawn by:	JK
Checked by:	PH

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Ref: BTC1475-TIP Rev: