

BS 5837 Surveys

**Arboricultural Impact
Assessments**

**Arboricultural Method
Statements**

Site Supervision

Visual Tree Assessments

QTRA Assessments

Expert Witness Reports

**L.O.L.E.R Thorough
Equipment Inspections**

Mortgage Reports

TPO applications and advice



5. Walls on existing foundations

A free-standing wall on an existing foundation is unlikely to require any additional excavation and so its construction should have no adverse impact on RPAs if the appropriate protection is in place. However, replacing walls that retain the soil of RPAs normally requires some limited excavation back into the exposed soil face to provide a working space of at least 10—20cm behind the inside wall face. This should be done carefully and limited to no more than required to construct the new wall. Any roots found should be dealt with as set out in 1.7 above. Once the wall is completed, any voids behind it should be filled with good quality top soil and firmed into place but not over compacted. Specific difficulties with large roots that emerge during the course of the construction should be referred to the supervising officer.

Services: For the purposes of this guidance, services are considered as structures. Excavation to upgrade existing services or install new services in RPAs may damage retained trees and should only be chosen as a last resort. In the event that excavation emerges as the preferred option, the decision should be reviewed by the supervising officer before any work is carried out. If excavation is agreed, all digging should be done carefully and follow the guidance set out in 1.7 above.

6. SOFT LANDSCAPING IN RPAs

Upgrading existing soft landscaping or replacing existing surfacing/structures with new soft landscaping: For the purposes of this guidance, soft landscaping includes the re-profiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the installation of solid structures or compacted surfacing. Soft landscaping activity after construction can be extremely damaging to trees. No significant excavation or cultivation, especially by rotovators, should occur within RPAs. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting. Ideally, all areas close to tree trunks should be kept at the original ground level and have a mulched finish rather than grass to reduce the risk of mowing damage.

4. INSTALLATION OF NEW STRUCTURES IN RPAs

Basic principles: New structures in RPAs are potentially damaging to trees because they may disturb the soil and disrupt the existing exchange of water and gases in and out of it. Mature and over-mature trees are much more prone to suffer because of these changes than young and maturing trees. Adverse impact on trees can be reduced by minimizing the extent of these changes in RPAs. This can be done by constructing the main structures above ground level on piled supports and redirecting water to where it is needed. The detailed design and specification of such structures is an engineering issue that should be informed and guided by tree expertise.

Small sheds and bin stores: These light structures do not normally require substantial foundations and can have permeable bases. Ideally, their bases should be of a no-dig, load-spreading construction set directly on to the soil surface. They require a flat base and so an undulating site will need levelling to provide a suitable surface. Excavation of any high points by up to 5cm and filling depressions with permeable fill to provide a flat base will normally be acceptable provided no roots greater than 2.5cm in diameter need to be cut. If large roots are found, the preferred course of action would be to raise the base level of the structure by filling rather than cutting roots. However, if this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made. Above the base, there will often be a protective covering fixed onto a frame that can rise directly from the base or be fixed to supports either banged into the ground or set in carefully dug holes. Provided the supports are well spaced, i.e. greater than 1.5m apart, and of a relatively narrow diameter, i.e. not in excess of 15cm, it is unlikely they will cause any significant disturbance to RPAs.

Walls, gate piers, buildings and bridges on new foundations: Conventional strip foundations in RPAs for any significant structure may cause excessive root loss and are unlikely to be acceptable. However, disturbance can be significantly reduced by supporting the above ground part of the structures on small diameter piles and beams or cast floor slabs set above ground level. The design should be sufficiently flexible to allow the piles to be moved if significant roots are encountered in the preferred locations. Before the actual installation of the new structure starts, all RPAs that may be affected should be covered with temporary ground protection as set out in BS 5837. Gaps in the ground protection should be left where it is expected to install the piles or dig the holes for gate piers. Pile locations should be initially hand dug to a depth of 75cm to establish if there are any significant roots over 2.5cm in diameter that could be damaged. If significant roots are found, then the pile location must be moved slightly and a new exploratory hole dug. Once the piles have been installed, the lowest points of the supporting beams for the structure must be above the ground level between the piles and there should not be any further excavation. The beams between the piles can be pre-cast and imported to the site ready to fix or can be cast in position using shuttering for the sides and a biodegradable void-former for the base. Gate piers generally require larger holes and have less flexibility for relocation if large roots are found. Localized loss of roots may be unavoidable so each situation should be assessed on its own merits by an appropriate supervising officer once the careful excavations have been completed. Any roots found should be dealt with as set out in 1.7 above. When installing any of these structures, the ground protection must remain in place until the construction is completed and there is no risk of damage to RPAs.

specification are beyond the scope of this guidance and must be provided separately by the appropriate specialist.

Establishing the depth of excavation and surfacing gradient: The precise location and depth of roots within the soil is unpredictable and will only be known when careful digging starts on site. Ideally, all new surfacing in RPAs should be no-dig, i.e. requiring no excavation whatsoever, but this is rarely possible on undulating surfaces. New surfacing normally requires an evenly graded sub-base layer, which can be made up to any high points with granular, permeable fills such as crushed stone or sharp sand. This sub-base must not be compacted as would happen in conventional surface installation. Some limited excavation is usually necessary to achieve this and need not be damaging to trees if carried out carefully and large roots are not cut. Tree roots and grass roots rarely occupy the same soil volume at the top of the soil profile, so the removal of a turf layer up to 5cm is unlikely to be damaging to trees. It may be possible to dig to a greater depth depending on local conditions but this would need to be assessed by an arboriculturist if excavation beyond 5cm is anticipated. On undulating surfaces, finished gradients/levels must be planned with sufficient flexibility to allow on-site adjustment if excavation of any high points reveals large unexpected roots near the surface. If the roots are less than 2.5cm in diameter, it would normally be acceptable to cut them and the gradient formed with the preferred minimal excavation of up to 5cm. However, if roots over 2.5cm in diameter are exposed, cutting them may be too damaging and further excavation may not be possible. If that is the case, the surrounding levels must be adjusted to take account of these high points by filling with suitable material. If this is not practical and large roots have to be cut, the situation should be discussed with the supervising officer before a final decision is made.

Base and finishing layers: Once the sub-base has been formed, the load spreading construction is installed on top without compaction. In principle, the load spreading formation will normally be cellular and filled with crushed stone although the detail may vary with different products. Suitable surface finishes include washed gravel, permeable tarmac or block pavements set on a sand base. However, for lightly loaded surfacing of limited widths (<3m) such as pedestrian paths, pre-formed concrete slabs may be appropriate if the sub-base preparation is as set out above. In some situations, limited width floating concrete rafts constructed directly on to the soil surface may be acceptable but the design must not include any strip-dug supports.

Edge retention: Conventional kerb edge retention set in concrete filled excavated trenches is likely to result in damage to roots and should be avoided. Effective edge retention in RPAs must be custom designed to avoid any significant excavation into existing soil levels. For most surfaces, the use of pre-formed edging secured by metal pins or wooden pegs is normally an effective way of minimizing any adverse impact on trees from the retention structure.

Installing new surfacing on top of existing surfacing: In some instances, surfacing can be retained and used as a base for new surfacing. Normally, this will not result in significant excavation that could expose roots so special precautions are not necessary. However, if large roots already protrude above the proposed sub-base level, then the precautions and procedures set out above must be observed.

on the soil beneath and further protective measures are not normally necessary. However, once they are removed and the soil below is newly exposed, damage to roots becomes an issue and the following guidance must be observed:

No vehicular or repeated pedestrian access into RPAs unless on existing hard surfacing or custom designed ground protection.

Regular vehicular and pedestrian access routes must be protected from compaction with temporary ground protection as set out in BS 5837.

RPAs exposed by the work must be protected as set out in BS 5837 until there is no risk of damage from the development activity.

Removal: Removing existing surfacing/structures is a high-risk activity for any adjacent roots and the following guidance must be observed: Appendix 'J': Site guidance for working in root protection areas (RPAs)

Appropriate tools for manually removing debris may include a pneumatic breaker, crow bar, sledgehammer, pick, mattock, shovel, spade, trowel, fork dud wheelbarrow. Secateurs and a handsaw must also be available to deal with any exposed roots that have to be cut.

Machines with a long reach may be used if they can work from outside RPAs or from protected areas within RPAs. They must not encroach onto unprotected soil in RPAs.

Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction of soil. Alternatively, it can be lifted out by machines provided this does not disturb RPAs.

Great care must be taken throughout these operations not to damage roots as set out in 1.7 above.

If appropriate, leaving below ground structures in place should be considered ~ their removal may cause excessive root disturbance.

3. INSTALLATION OF NEW SURFACING IN RPAs

Basic principles: New surfacing is potentially damaging to trees because it may require changes to existing ground levels, result in localized soil structure degradation and / or disrupt the efficient exchange of water and gases in and out of the soil. Mature and over mature trees are much more prone to suffer because of these changes than younger and maturing trees. Adverse impact on trees can be reduced by minimizing the extent of these changes in RPAs. Generally, the most suitable surfacing will be relatively permeable to allow water and gas movement, load spreading to avoid localized compaction and require little or no excavation to limit direct damage. The actual specification of the surfacing is an engineering issue that needs to be considered in the context of the bearing capacity of the soil, the intended loading and the frequency of loading. The detail of product and

Preventing adverse impact to the RPA beyond the immediate work area: Any part of the RPA beyond the agreed work area must be isolated from the work operations by protective barriers or ground protection to at least the minimum standard described in BS 5837 for the duration of the work.
Appendix 'J': Site guidance for working in root protection areas (RPAs)

Excavation and dealing with roots: All excavation must be carried out carefully using spades, forks and trowels, taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air may be an appropriate alternative to hand digging, if available. All soil removal must be undertaken with care to minimize the disturbance of roots beyond the immediate area of excavation. Where possible, flexible clumps of smaller roots, including fibrous roots, should be retained if they can be displaced temporarily or permanently beyond the excavation without damage. If digging by hand, a fork should be used to loosen the soil and help locate any substantial roots. Once roots have been located, the trowel should be used to clear the soil away from them without damaging the bark. Exposed roots to be removed should be cut cleanly with a sharp saw or secateurs 10–20cm behind the final face of the excavation. Roots temporarily exposed must be protected from direct sunlight, drying out and extremes of temperature by appropriate covering. Roots greater than 2.5cm in diameter should be retained where possible. Roots 2.5–10cm in diameter should only be cut in exceptional circumstances. Roots greater than 10cm in diameter should only be cut after consultation with the appropriate supervisory officer.

Arboricultural supervision: Any work within RPAs requires a high care. Qualified arboricultural supervision is essential to minimize the risk of misunderstanding and misinterpretation. Site personnel must be properly briefed before any work starts. On-going work must be inspected regularly and, on completion, the work must be signed off by the arboriculturist to confirm compliance by the contractor. In the context of this guidance, an appropriate supervising officer would normally be an arboriculturist.

2. REMOVING SURFACING / STRUCTURES IN RPAs

Definitions of surfacing and structures: For the purposes of this guidance, the following broad definitions apply:

- **Surfacing:** Any hard surfacing used as a vehicular road, parking or pedestrian path including tarmac, solid stone, crushed stone, compacted aggregate, concrete and timber decking. This does not include compacted soil with no hard covering.
- **Structures:** Any man-made structure above or below ground including service pipes, walls, gate piers, buildings and foundations: Typically, this would include drainage structures, carports, bin stores and concrete slabs that support buildings.

Access: Roots frequently grow adjacent to and beneath existing surfacing/structures so great care is needed during access and demolition. Damage can occur through physical disturbance of roots and / or the compaction of soil around them from the weight of machinery or repeated pedestrian passage. This is not generally a problem whilst surfacing / structures are in place because they spread the load

APPENDIX 'I'

Site guidance for working in root protection areas (RPAs)

1. GENERAL GUIDANCE FOR WORKING IN RPAs

What is the purpose of this guidance? This guidance sets out the general principles that must be followed when working in RPAs. Where more detail is required, it will be supplemented by illustrative specifications in other appendices in this document. Before work starts on site, the purpose of this guidance is to demonstrate to the council that tree protection issues have been properly considered and to provide a written record of how they will be implemented. Once the site works start, this guidance is specifically for the site personnel to help them understand what has been agreed and explain what is required to fully meet their obligations to protect trees. All personnel working in RPAs must be properly briefed about their responsibilities towards important trees based on this guidance.

What are RPAs? RPAs are the areas surrounding important trees where disturbance must be minimised if they are to be successfully retained. All RPAs close to the construction area are illustrated on the tree protection plans accompanying this guidance. Damage to roots or degradation of the soil through compaction and/or excavation is likely to cause serious damage. Any work operations within RPAs must be carried out with great care if trees are to be successfully retained.

When should this guidance be followed? Anyone entering a RPA must follow this guidance if important trees are to remain unharmed. Anyone working in a RPA must take care to minimize excavation into existing soil levels and limit any fill or covering that may adversely affect soil permeability. There are two main scenarios where this guidance must be followed when entering and working within a RPA:

Removal of existing surfacing / structures and replacement with new surfacing, structures and / or landscaping.

Preparation and installation of new surfacing, structures and / or landscaping.

Broad definitions of surfacing, structures and landscaping are set out in the following sections.

Where does this guidance apply? This guidance should always be read in conjunction with the site plans illustrating the areas where specific precautions are necessary. Each area where precautions are required is annotated on the plans as identified on their keys. All plans are illustrative and intended to be interpreted in the Context of the site conditions when the work is started. All protective measures should be installed according to the prevailing site conditions and agreed as satisfactory by the appropriate supervising officer before any demolition or construction work starts.

What references is this guidance based on? This guidance is based on the assumption that the minimum general standards for development issues are those set out in BS5837; (2012) Trees in relation to design, demolition and construction - Recommendations and the National Joint Utilities Group (2007) Volume 4, Issue 1: Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. It is interpreted in the context of our experience of managing trees on development sites.

APPENDIX 'H'

Illustrative specification for ground surface protection measures and special surfacing within root protection areas



Laying of geotextile fabric with the cellular confinement system pinned in place



Appropriate aggregates are back filled filling all of the cells



Geotextile fabric laid over filled cells then covered with temporary / permanent wearing course as per construction specifications

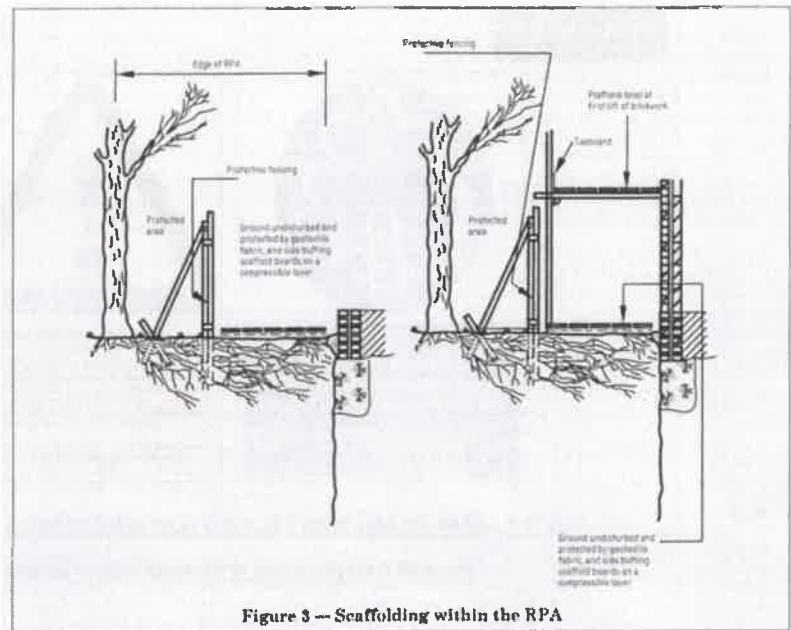
(Costs may be incurred for laminated version).



Site photos of protective fencing on site with warning / information sign fixed to the fencing



Illustrative specification for protective fencing located inside the Root Protection Zone:



Example of ground protection for pedestrian access under scaffolding prior to 'Heras' fencing being attached to the scaffold framework, this will prevent access to CEZ (grassed area)

Example of a warning / information sign to be fixed to the tree protection fencing

*A PDF copy of this sign or a laminated version can be supplied if requested

Figure 3 Examples of above-ground stabilizing systems

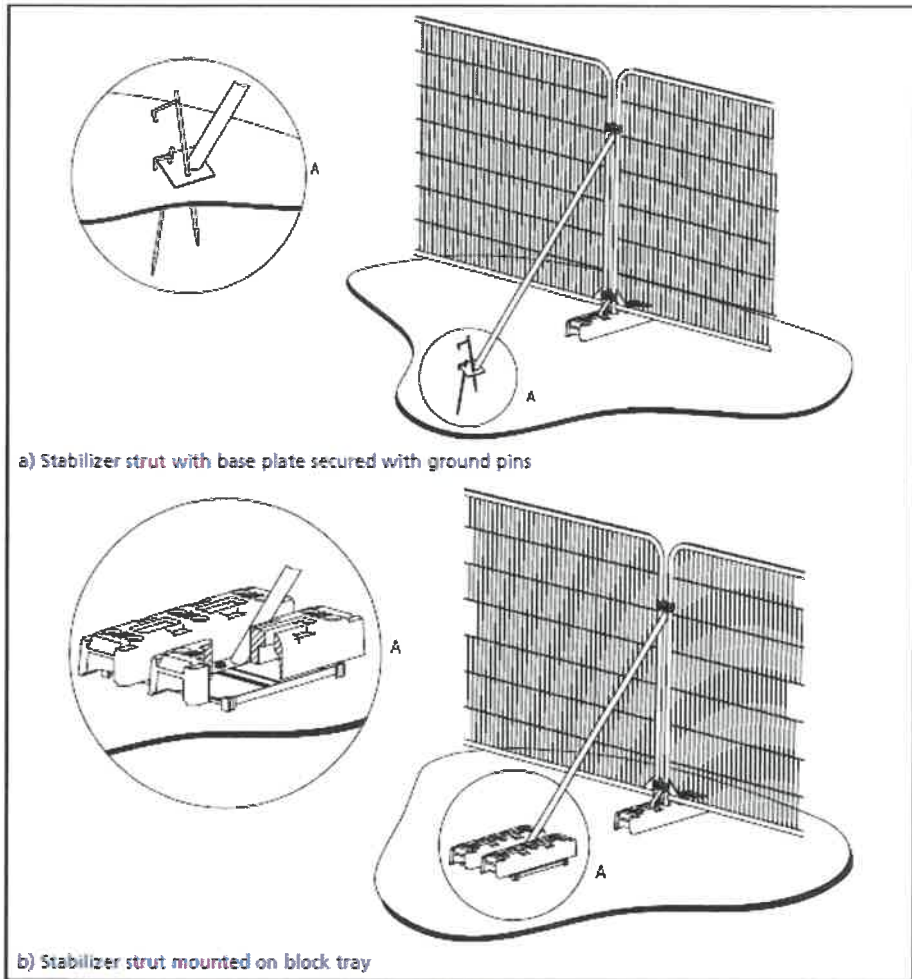


Illustration of specification for tree protective barrier without significantly penetrating the ground / surface, taken from BS 5837 2012



Example of protective fencing where it is not feasible / safe to drive scaffold poles into the ground

(Risk of striking underground cables / damaging surfacing etc.)

APPENDIX 'G'

Illustrative specifications for tree protection

1. Tree protective fencing.
2. Ground protection inside the Construction Exclusion Zone.
3. Construction Exclusion Zone Warning Signs.

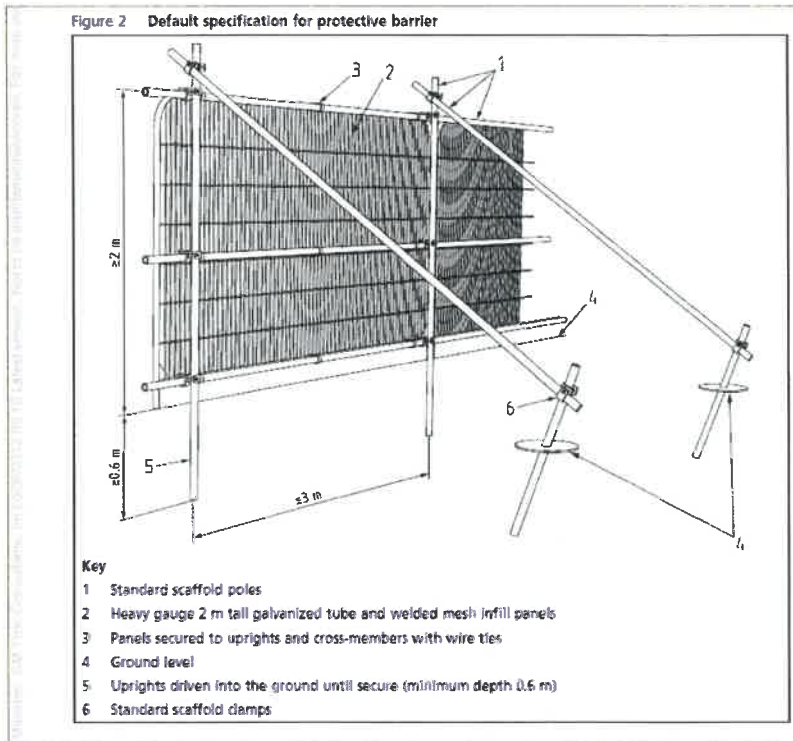


Illustration of default specification for tree protective barrier, taken from BS 5837 2012

Example of scaffold framework with 'Heras' fencing attached

(Photo taken from within the CEZ)



APPENDIX 'F'

Cascade chart showing tree retention categories exerted from: BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations

Cascade chart for tree quality assessment		Identification on plan
Criteria (including subcategories where appropriate)		
Trees unsuitable for retention (see Note)		
Category and definition 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	<ul style="list-style-type: none"> Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unstable 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	RED
Trees to be considered for retention		
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	1 Mainly arboricultural qualities 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)	3 Mainly cultural values, including conservation Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	2 Mainly landscape qualities Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features 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	GREEN
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	1 Mainly arboricultural qualities 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 Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	BLUE
		GRAY

GMITREE CONSULTANTS		Job Ref: 1184		Survey Date: 04 June 2018		Surveyor: Gary Marsden		Site Address: Clough Bank, Chatburn			Tel: 077 6166 7384 www.gmtreeconsultants.co.uk		BS:5837 (2012) TREE SURVEY DATA									
Stem diameter @ 1.5m rounded up to nearest 25mm	Calculated Root protection Area (radius in meters)	Calculated Root protection area (msq)	Type (Tree / Line / Group / Hedge)	Tree number	Species (common)	Number of stems	Stem diameter @ 1.5m (mm)	Height (m)	Height of canopy above G/L (m)	Height of first significant branch (m)	First significant branch direction (NSEW)	Crown Spread - NORTH (m)	Crown Spread - EAST (m)	Crown Spread - SOUTH (m)	Crown Spread - WEST (m)	Life Stage	Physiological Condition	Structural Condition	Comments on significant observations of the tree / Defects	Preliminary management recommendations to ensure SULE is at least 10 years	Remaining contribution <10 - 10+ 20+ 30+ 40+	Tree quality assessment category
1100	13.20	547.39	T	17	Beech	4	1100	22	2	5	East	8	8	8	8	Mature	Good	Good	- Tree under 3rd party ownership+ - Tight union+ - Multi stemmed at base	- Lift crown to 5m	20+	B1
850	10.20	326.85	T	18	Beech	2	860	22	1	5	North	7	5	3	5	Mature	Good	Good	- Tree under 3rd party ownership+ - Multi stemmed at base	- Lift crown to 5m	20+	B1
600	7.20	162.86	T	19	Pine	1	600	18	>5	7	West	5	5	5	5	Mature	Good	Good	- Tree not showing any significant defects+ - Tree under 3rd party ownership	- No work required at time of survey	20+	B1

GMITREE CONSULTANTS		Job Ref: 1184		Survey Date: 04 June 2018		Surveyor: Gary Marsden		Site Address: Clough Bank, Chatburn		Tel: 077 6166 7384 www.gmitreeconsultants.co.uk		BS:5837 (2012) TREE SURVEY DATA										
Stem diameter @ 1.5m rounded up to nearest 25mm	Calculated Root protection Area (radius in meters)	Calculated Root protection area (msq)	Type (Tree / Line / Group / Hedge)	Tree number	Species (common)	Number of stems	Stem diameter @ 1.5m (mm)	Height (m)	Height of canopy above G/L (m)	Height of first significant branch (m)	First significant branch direction (NSEW)	Crown Spread - NORTH (m)	Crown Spread - EAST (m)	Crown Spread - SOUTH (m)	Crown Spread - WEST (m)	Life Stage	Physiological Condition	Structural Condition	Comments on significant observations of the tree / Defects	Preliminary management recommendations to ensure SUILE is at least 10 years	Remaining contribution <10 - 10+ 20+ 30+ 40+	Tree quality assessment
750	9.00	254.47	T	9	Sycamore	1	745	18	4	6	North	4	3	2	6	Mature	Good	Good	- Tree not showing any significant defects+ - Dense ivy clad	- No work required at time of survey	20+	B1
1025	12.30	475.29	T	10	Sycamore	1	1020	22	4	5	South	5	8	10	8	Mature	Good	Good	- Tree not showing any significant defects+ - Ivy clad	- No work required at time of survey	20+	B1
750	9.00	254.47	T	11	Sycamore	1	750	18	4	6	South	6	6	6	6	Mature	Good	Good	- Tree not showing any significant defects+ - Dense ivy clad	- No work required at time of survey	20+	B1
500	6.00	113.10	T	12	Ash	4	500	10	3	6	South	4	4	4	4	Semi Mature	Poor	Fair	- Moderate deadwood 25-100mm dia+ - Canopy dieback	- Remove for sound arboricultural management reasons	<10	U
300	3.60	40.72	T	13	Elm	1	300	12	3	4	North	4	4	2	2	Semi Mature	Good	Fair	- Suppressed growth+ - Crown unbalanced	- Remove for sound arboricultural management reasons	10+	U
350	4.20	55.42	T	14	Ash	1	355	14	5	5	South	5	5	5	5	Semi Mature	Fair	Good	- Minor deadwood <25mm dia+ - Canopy dieback	- No work required at time of survey	10+	C1
225	2.70	22.90	T	15	Sycamore	1	220	10	2	3	West	3	2	3	4	Semi Mature	Good	Good	- Suppressed growth+ - Crown unbalanced	- No work required at time of survey	20+	C1
1000	12.00	452.39	T	16	Beech	1	1000	24	2	4	East	7	7	7	7	Mature	Good	Good	- Tree not showing any significant defects+ - Tree under 3rd party ownership+ - Low canopy	- Lift crown to 5m	20+	B1

GMITREE CONSULTANTS		Job Ref: 1184		Survey Date: 04 June 2018		Surveyor: Gary Marsden		Site Address: Clough Bank, Chatburn			Tel: 077 6166 7384 www.gmtreeconsultants.co.uk		BS:5837 (2012) TREE SURVEY DATA											
Stem diameter @ 1.5m rounded up to nearest 25mm	Calculated Root (radius in meters)	Calculated Root protection area (msq)	Type (Tree / Line / Group / Hedge)	Tree number	Species (common)	Survey Date:	Number of stems	Stem diameter @ 1.5m (mm)	Height (m)	Height of canopy above G/L (m)	Height of first significant branch (m)	First significant branch direction (NSEW)	Crown Spread - NORTH (m)	Crown Spread - EAST (m)	Crown Spread - SOUTH (m)	Crown Spread - WEST (m)	Life Stage	Physiological Condition	Structural Condition	Comments on significant observations of the tree / Defects	Preliminary management recommendations to ensure S.U.L.E is at least 10 years	Remaining contribution >10 - 10+ 20+ 30+ 40+	Tree quality assessment	
300	3.60	40.72	G	1	Ash		3	300	8	0	1	North	3	3	3	3	3	Young	Good	Good	Tree not showing any significant defects	Remove for development purposes	<10	U
350	4.20	55.42	T	2	Willow		3	346	6	0	1	South	3	3	3	3	3	Young	Good	Poor	Co-dominant fork+ Unstable rootplate+ Leaning tree	Remove for sound arboricultural management reasons	<10	U
250	3.00	28.27	T	3	Willow		8	250	8	1	2	South	3	3	3	3	3	Young	Good	Good	Tree not showing any significant defects	Remove for development purposes	<10	U
700	8.40	221.67	T	4	Ash		3	683	18	4	6	North	2	5	5	5	5	Mature	Good	Good	Tree under 3rd party ownership+ Minor deadwood <25mm dia+ Suppressed growth+ Crown unbalanced+ Low canopy+ Multi stemmed at base+ Dense ivy clad	No work required at time of survey	20+	B1
600	7.20	162.86	T	5	Sycamore		3	606	16	1	5	North	5	5	3	5	5	Mature	Good	Good	Tree under 3rd party ownership+ Minor deadwood <25mm dia+ Suppressed growth+ Multi stemmed at base+ Dense ivy clad	No work required at time of survey	20+	B1
400	4.80	72.38	T	6	Ash		1	400	20	4	5	North	4	4	4	4	4	Semi Mature	Poor	Poor	Tree under 3rd party ownership+ Moderate deadwood 25-100mm dia+ Canopy dieback	Remove for sound arboricultural management reasons	<10	U
1275	15.30	735.42	T	7	Beech		1	1270	24	3	5	South	7	7	7	7	7	Mature	Good	Fair	Minor deadwood <25mm dia+ Bark defect+ Stem defect	No work required at time of survey	20+	B1
950	11.40	408.28	T	8	Beech		1	940	24	2	5	North	6	6	6	6	6	Mature	Good	Good	Tree not showing any significant defects	No work required at time of survey	20+	B1

APPENDIX 'E'

Tree survey data inserted including the calculations for the root protection zones

- Initial tree survey data
- Root protection area calculations

Legend

tree number
tree name
key number
root position area (RPA) by red line
inductive crown based on measurements at central points
diameter at breast height (DBH) at 1.3m
British Standard category as defined in BS5837:2012
where the tree is not determined, the figure stated in the category in brackets
British Standard category as defined in BS5837:2012
where the tree is not determined, the figure stated in the category in brackets



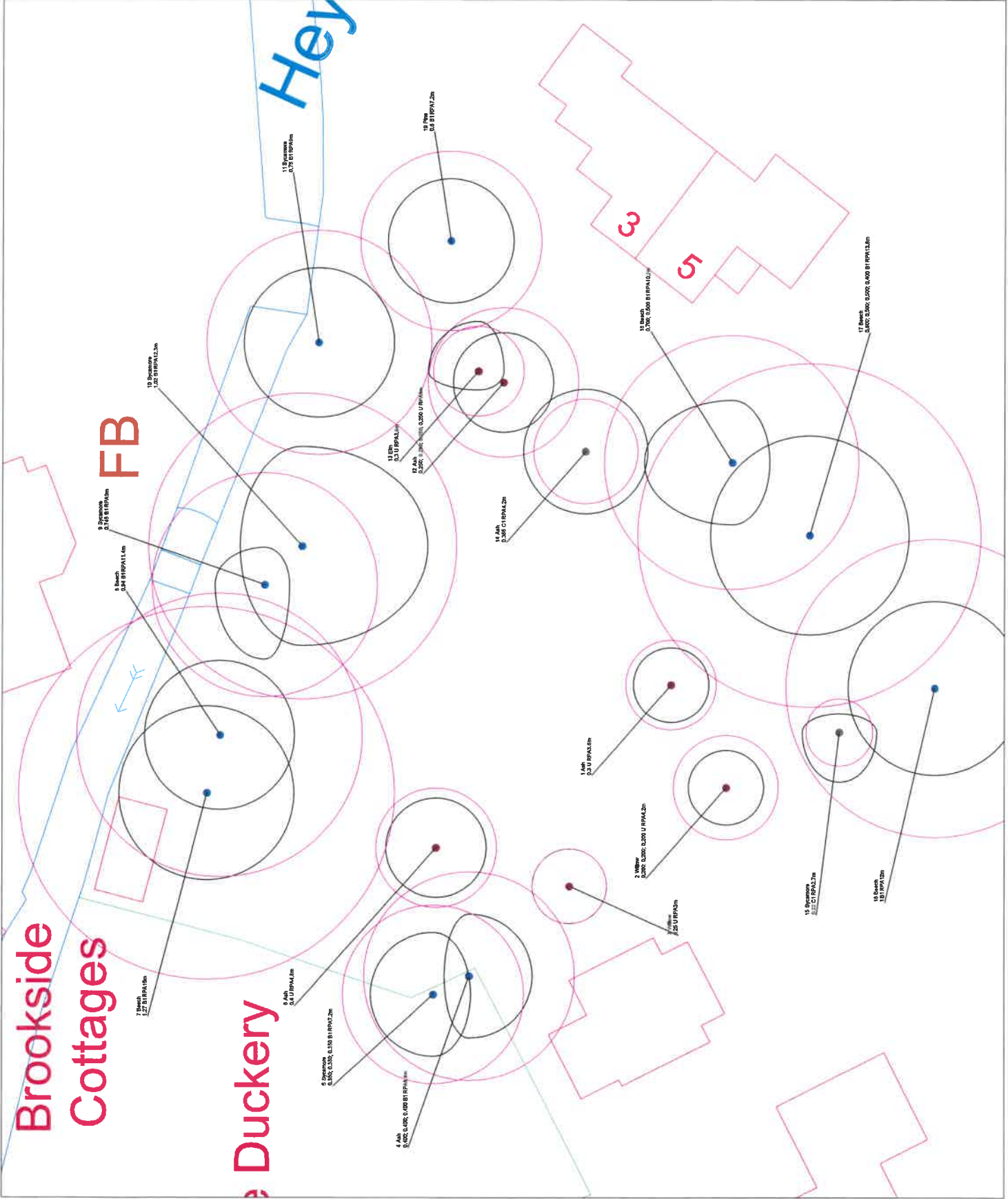
TREE CONSTRAINTS PLAN	
PROJECT:	Crough Bank, Chatham, Chatham BB7 4AT
JOB REF:	1184
FIGURE REF:	184/TCP/001
DRAWN BY:	Gary Maradin
SCALE:	1:200 @ A2
DATE OF DRAWING:	4th June 2018
REVISION NUMBER:	1

Drawing to be read in association with arboricultural impact appraisal and method statement. If in any doubt, details should be confirmed with project arboricultural consultant prior to commencement. Any work must be undertaken in accordance with the following instructions issued by the arboricultural consultant.

THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR. A MONOCHROME COPY SHOULD NOT BE RELIED UPON.

For planning purposes only unless otherwise indicated by surface. GM Tree Consultants does not guarantee the accuracy of the information contained within this drawing. No liability for any loss whatsoever can be accepted as a result of the use of this drawing or any other of the information contained herein. This drawing is the property of GM Tree Consultants and is not to be used for any other project, without the written consent of GM Tree Consultants. For more information, contact the arboricultural method statement or the survey schedule.

18, Parford Drive, Lower Darwen, Darwen, Lancashire, BB3 9PU
Tel: 01524 535354 Email: gmtree@gmtreeconsultants.co.uk



Brookside Cottages

Duckery

FB

5

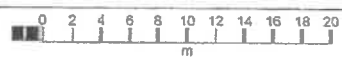
5

Hey

1.2m



PROPOSED SITE PLAN



Land off Clough Bank
 Chatburn
 Clitheroe
 BB7 4AW

OS Mastermap
 02 June 2011, ID: MDP-00075548
 www.mapdataportal.co.uk
 1:500 scale print at A4, Centre: 376900 E, 444028 N
 ©Crown Copyright. Licence no. 10001998



APPENDIX 'D'

Inserted site plans showing tree locations and all other relevant details

Inserted Tree Constraints Plan (TCP) showing all relevant tree information including:

- Tree location
- Trees species
- Tree classification

Inserted Tree Protection Plan (TPP) showing all relevant tree information including:

- Tree classification.
- Trees to be retained
- Trees to be removed - identified with a broken red line
- Protective fence positions therefore the Construction Exclusion Zones (CEZ)
- Ground protection positions therefore the Construction Exclusion Zones (CEZ)
- Root protection area outside the protective fencing where special precautions must be taken.

APPENDIX 'C'

Tree survey index

Tree Locations:	Tree Number:
This has been plotted using GPS to an accuracy of <1m and / or using permanent land features to measure accurate offsets with a laser distancing device.	Each surveyed feature is assigned a number prefixed by a 'T' for individual trees, 'G' or 'L' for groups / lines of trees and 'H' for hedgerows. It is used to locate the tree in the data survey and the relevant position on the plan.
Species:	DBH calculations
The species identification is based on visual observations and the common English name of what the tree appeared to be is listed first. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations.	The 3 first columns of figures calculate, the stem diameter rounded up to the nearest 25mm, the radius of the calculated RPA and the calculated overall area of the RPA all derived from the stem diameter @ 1.5m above ground level as per BS5837.
Number of stems:	Stem Diameter:
The number of main stems of each individual tree.	These figures relate to stem diameter in millimetres at 1.5m above ground level. This is measured using a girthing tape, unless access is restricted.
Height:	Height of first branch and direction:
Overall height of tree recorded in meters.	Existing height in metres of the first significant branch above ground level and the direction of growth in relation to the 4 cardinal points (NSEW).
Height of canopy above ground level:	Crown Spread:
Existing height in meters of the canopy above ground level.	This is measured in meters taken at the four cardinal points (NSEW) to derive a representation of the crown.
Life stages:	Physiological Condition:
Described as young, semi-mature, mature, over-mature / veteran.	Described as good, fair, poor, dead and notes as needed.
Preliminary management recommendations:	Structural Condition:
Practical arboricultural operations that are suggested and described as needed.	Described as good, fair, poor, dead and notes as needed.
Remaining Contribution:	Tree Retention Category Grading:
Estimated remaining contribution in years: e.g. <10, 10+, 20+, 30+, 40+. This is based upon Jeremy Barrels system of 'SULE' (Safe Useful Life Expectancy).	U or A to C category grading as referenced from BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations. (see Table 1 in appendix 'F')

APPENDIX 'B'

Site Location aerial photo taken from Google Maps showing site location 

<https://www.google.co.uk/maps/@53.8921412,-2.3539989,179m/data=!3m1!1e3>



APPENDIX 'A'

Brief details of qualifications and experience of Gary Marsden

Qualifications:

- National Certificate in Arboriculture
- Foundation Degree in Science - Arboriculture
- BTEC Higher National Diploma in Arboriculture
- Certified Expert Witness by Cardiff Law School / Bond Solon
- LANTRA Professional Tree Inspection Award

Practical experience:

After qualifying at NC level in arboriculture I gained full time employment with Blackburn with Darwen Borough Council as an Arborist / Climber (September 1998) where I gained a wide range of practical Arboricultural experience ranging from pruning, dismantling and planting.

In January 2004, I was promoted to Team Leader Arborist where I developed my skills in Arboriculture, leadership, organisation and prioritising workloads.

In August 2005, I was promoted to 'Arboricultural Officer' this job involves:

Health and Safety of all Arboricultural aspects

Inspection and scheduling of tree complaints

Tree surveys and report writing

Staff management

In July 2008, I set up my own tree consultancy company – GM Tree Consultants – which I am constantly developing and evolving.

Continuing professional development:

As a conscious effort to stay in touch with the progression in modern techniques and practices in the arboricultural industry, I attend seminars, receive regular arboricultural literature and maintain membership of professional bodies, examples of which are listed below:

- Arboricultural Association Professional Member since November 2006
- Professional Member of the Consulting Arborist Society since May 2009
- Quantified Tree Risk Assessment licensed user since October 2008
- Attendance of Arboricultural Association annual conferences
- Attendance of specialist short courses in relation to specific fields in arboriculture including: Tree Preservation Orders, Subsidence and mortgage reports, Planning legislation and Tree inspection methods and skills.
- Accredited as an Expert Witness by Cardiff University Law School / Bond Solon since December 2011

A detailed breakdown of qualifications and continued professional development training is available; please contact me directly for this information if requested.

planning condition, Referencing the report by name and relating conditions to specific subsections is an effective means of reducing confusion and facilitating enforcement in the event of problems during implementation. More specifically, the following issues should be directly referenced in the conditions for this site:

1. Pre-commencement meeting
2. Fencing
3. Ground protection
4. Services
5. Installation of new landscaping
6. Programming of tree protection
7. Arboricultural supervision

Each of the above matters must be supervised by an arboricultural consultant and the relevant conditions can only be discharged once that supervision has been confirmed in writing to the council, normally via email. This is intended to act as a summary quick-reference within the council file to help keep track of the progress of the supervision.

Gary Marsden FDS Arb M.Arbor.A

between the arboricultural consultant and the developer's team is an effective means of project managing the tree issues to maximize site efficiency within often difficult constraints.

63. Pre-commencement site visit

A pre-commencement meeting must be held on site before any of the site preparation or construction work begins. This must be attended by the site manager, the arboricultural consultant and a council representative. If a council representative is not present, the arboricultural consultant must inform the council in writing of the details of the meeting. All tree protection measures detailed in this document must be fully discussed so that all aspects of their implementation and sequencing are understood by all the parties. Any clarifications or modifications to the consented details must be recorded and circulated to all parties in writing. This meeting is where the details of the programme of tree protection will be agreed and finalised by all parties, which will then form the basis of any supervision arrangements between the arboricultural consultant and the developer.

64. Site supervision

Once the site is active, the arboricultural consultant must visit at an interval agreed at the pre-commencement site meeting. The supervision arrangement must be sufficiently flexible to allow the supervision of all sensitive works as they occur. The arboricultural consultant's initial role is to liaise with developer and council to ensure that appropriate protective measures are designed and in place before any works start on site. Once the site is working, that role will switch to monitoring compliance with arboricultural conditions and advising on any tree problems that arise or modifications that become necessary.

65. Site management

It is the developer's responsibility to ensure that the details of this arboricultural method statement and any agreed amendments are known and understood by all site personnel. Copies of the agreed documents must be kept on site at all times and the site manager must brief all personnel who could have an impact on trees on the specific tree protection requirements. This must be a part of the site induction procedures and written into appropriate site management documents.

How to use this report in the planning process

66. Limitations

It is common that the detail of logistical issues such as site storage and the build programme are not finalized until after consent is issued. As this report has been prepared in advance of consent, some of its content may need to be updated as more detailed information becomes available once the post-consent project management starts. Although this document will remain the primary legal reference in the event of any disputes, some of its content may be superseded by authorised post-consent amendments.

67. Suggestions for the effective use of this report

The Arboricultural method statement of this report, including the relevant appendices, is designed as an enforcement reference. It is constructed so the council can directly reference the detail in a

Specifications for new tree planting

55. Site preparation, supply and planting of trees

No new tree planting will be required on this site.

56. Maintenance

No maintenance will be required due to no new trees being planted on site.

57. Root barriers / deflectors

No root barriers will be required for this site.

58. Structured tree soil

No structured tree soil will be required as there are no trees to be planted on this site.

Programme of tree protection and supervision

59. Overview

Tree protection cannot be reliably implemented without arboricultural input. The nature and extent of that input varies according to the complexity of the issues and the resources available on site. An arboricultural consultant must be instructed to work within this framework to oversee the implementation of the protective measures and management proposals set out in this arboricultural method statement.

60. Supervision and the discharge of planning conditions

Arboricultural planning conditions cannot be reliably or effectively discharged without supervision by an arboricultural consultant. These supervisory actions must be confirmed by formal letters / emails circulated to all relevant parties, including the council. These permanent records of each site visit will accumulate to provide the proof of compliance and allow conditions to be discharged as the development progresses. The developer must instruct an arboricultural consultant to comply with the supervision requirements set out in this document before any work begins on site.

61. Phasing of arboricultural input

Trees can only be properly budgeted for and factored into the developing work programme if the overall project management takes full account of tree issues once consent is confirmed. An arboricultural consultant must be involved in the following phases of the project management:

62. Administrative preparation before work starts on site

It is normal for a development proposal to vary considerably from the expectations before consent as the detailed planning of implementation evolves. The early instruction of an arboricultural consultant ensures that tree issues are factored into the complexities of site management and can often help ease site pressures through creative approaches to tree protection. Pre-commencement discussions

51. Site Huts and Toilets

Off site and not impacting on any trees or protective measures.

52. Emergency Procedures

Should any problem or emergency that relates to any tree or its protection arise, work in that area is to cease and the area is to be secured against the risk of further damage or possible injury to any person or property.

Once the area is secured both the Consulting arborist and the LPAs tree officer are to be informed so that appropriate action may be taken to remedy the situation.

Water is readily available on site and will be used to flush spilt materials through the soil and avoid contamination to tree roots. At the time of any spillage the main contractor will contact an arboriculturist for advice.

53. Remedial Tree Works

Tree works will be undertaken prior to any demolition / construction on site and the erection of protective fencing or ground protection to form the CEZ. All tree works are to be carried out in accordance with British Standard 3998: 2010 Recommendations for Tree Work.

54. Responsibilities

It will be the responsibility of the main contractor to ensure that the planning conditions attached to planning consent are adhered to at all times and that a monitoring regime in regard to tree protection is adopted on site.

The main contractor will be responsible for contacting the Local Planning Authority at any time issues are raised related to the trees on site.

If at any time pruning works are required permission must be sought from the Local Planning Authority first and then carried out in accordance with BS 3998: 2010 British Standard Recommendations for Tree Work.

The main contractor will ensure the build sequence is appropriate to ensure that no damage occurs to the trees during the construction processes. Protective fences will remain in position until completion of ALL construction works on the site.

The fencing and signs must be maintained in position at all times and checked on a regular basis by an onsite person designated that responsibility.

Care must be exercised when using cranes or similar equipment near the canopies of trees. **Note:** No high-sided vehicles or cranes have access to the site therefore their movement on the site is not an issue.

No retained trees are to be used as anchorage for equipment used to remove stumps or other trees, nor for any other purpose.

41. Protection of soil in areas for proposed new planting

No new planting is proposed in areas that are currently undisturbed soil.

42. Access Details

There is no requirement for any special measures related to the retained trees as all access for construction vehicles will be to the south east of the existing building, outside of the CEZ.

Access to the site will be off Clough Bank, the height of all vehicles, particularly high sided vehicles and cranes must be controlled as to omit any damage to the trees upon entering and exiting the site. The designated arboricultural consultant must be contacted if this is seen to be an issue.

43. Site Gradients

No significant alterations of soil levels will take place within the CEZ of the protected trees.

44. Demolition

No demolition is required on this site.

45. Hard Surfaces

No hard surfacing is scheduled to be carried out in any CEZ.

46. Soft landscaping

No soft landscaping is scheduled to be carried out in any CEZ.

47. Use of Herbicides

IF any herbicide is used within the RPA of a retained tree, it shall be systemic, spot applied, and mixed according to manufacturer's recommendations.

48. On site Monitoring Regime

All operations will be monitored by the main contractor.

49. Use of subcontractors

The main contractor will be responsible for ensuring sub-contractors do not carry out any process or operation that is likely to adversely impact upon any tree on site.

50. Contractors Parking

Off site and not impacting on any trees or protective measures.

On this site, special precautions must be taken near trees as illustrated on the TPP and summarized below:

1. Pedestrian movements within a Construction Exclusion zone

Trees could be affected by pedestrian movement and associated site activities within the construction exclusion zone. With suitable temporary ground protection installed on site as per the specification illustrated in Appendix 'G', the risk of damaging the tree root system will be minimised.

Scaffolding boards, laid on a compression-resistant material such as tree mulch and a geotextile fabric is recommended.

2. Erection of scaffolding within a construction exclusion zone

Trees could be affected by the erection of scaffolding and associated site activities within the construction exclusion zone. With suitable temporary ground protection installed on site as per the specification illustrated in Appendix 'G', the risk of damaging the tree root system will be minimised.

Scaffolding boards, laid on a compression-resistant material such as tree mulch and a geotextile fabric is recommended with the scaffold poles placed on the scaffold boards to help distribute the load over a greater surface area.

Other tree related site works

39. Tree work recommendations

Tree work proposals based on my preliminary inspection are set out in the management recommendations column of the tree schedule in Appendix 'E'. The location of each tree is shown on Tree Protection Plan (TPP) and all trees to be removed are indicated with a red dashed crown outline.

40. Site storage, cement mixing and washing points

All site storage areas, cement mixing and washing points for equipment and vehicles must be outside CEZ unless otherwise agreed with the council.

Where there is a risk of polluted water runoff into CEZ, heavy-duty plastic sheeting and sandbags must be used to contain spillages and prevent contamination.

No storage or discharge of any materials likely to be injurious to the tree, i.e. oil bitumen, cement within 10m of a tree stem.

No fires are to be lit under or within 20m of a tree stem and will take into account fire size and wind direction so that, (where wind or radiated heat may be a problem) no flames come within 5m of any foliage or canopy of any retained tree.

No signs, cables or telephone wires or other services etc. are to be attached or fixed to trees

- Edge retention will be custom designed to avoid any significant excavation into existing soil levels either using pre-formed edging or wooden boards secured by metal pins or wooden pegs.
- Illustrative specifications for special surfacing are included as Appendix 'H' and installation methods should accord with guidance set out in Appendix 'I'.

37. Temporary ground protection (removed after construction)

Any RPAs outside protective barriers must be covered in ground protection where movement on site will occur either by people or vehicles, so that there is no risk of damage from construction activities.

Due to the nature of the site and the intended method of construction, temporary ground protection will need to be established. New temporary ground protection should be capable of supporting the construction traffic entering or using the site without being distorted or causing compaction of underlying soil and to be laid in accordance with BS5837:2012. Typically ground protection might comprise one of the following:

- Pedestrian movements – scaffold boards placed either on top of a driven scaffold frame to form a suspended walkway; or on top of a compression resistant layer of 100 mm depth of woodchip, laid onto a geotextile membrane;
- Plant (pedestrian operated up to 2 t gross weight) – proprietary, inter linked ground protection boards placed upon a compression resistant layer of 150 mm depth of woodchip, laid onto a geotextile membrane;
- Construction traffic (wheeled or tracked exceeding 2 t gross weight) – an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with the project arboricultural consultant, to accommodate the expected loading.

In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.

38. Precautions when working in RPAs / CEZ

Any work in RPAs must be done with care as set out in Appendix 'I' and with appropriate reference to the sections above.

If temporary access is required to a CEZ then access may only be gained after consultation with the Local Planning Authority and following placement of materials such as geo-textile fabrics that will spread the weight of any vehicular load and prevent compaction to the soil.

35. Protective Fencing

Illustrative guidance for fencing design based on BS 5837 recommendations is included as Appendix 'G'. The location of the fencing and the RPAs is illustrated on the TPP as set out on the plan key.

The precise location of the fencing must be agreed with the council on site before any development activity starts e.g. before any materials or machinery are brought on site, development or the stripping of soil commences.

The fence will have signs attached to it stating that this is a Construction Exclusion Zone and that **NO WORKS ARE PERMITTED WITHIN THE FENCE OR GROUND PROTECTION**. The protected fence may only be removed following completion of all construction works.

There are no new areas of planting to be protected during the construction phase.

No access to the site from any other part of the property, other than the main entrance that will be constructed along the south east boundary of the property will be permitted for construction traffic or delivery of supplies.

36. Permanent ground protection (left in-situ after construction)

Any RPAs outside protective barriers where construction will occur (for example a new road) must be covered in ground protection, so that there is no risk of damage from construction activities and movement over the tree roots once the development has finished.

Due to the nature of the site and the intended method of construction, permanent ground protection will need to be established by the use of a three dimensional cellular sub base product or another method designed by an engineer and passed by the local planning authority.

These proposals have been discussed and verbally agreed by the arboricultural officer.

This area will have signs attached to it stating that this is a Construction Exclusion Zone and that **NO WORKS ARE PERMITTED WITHIN THE FENCE OR BELOW THE GROUND PROTECTION**.

This product will be installed as identified on the Tree Protection Plan (TPP), prior to the commencement of any construction activity.

- The cellular confinement system will be placed on top of existing ground levels, (subject to limited clearance of 50mm to remove any spoil) before being filled with 40/20mm angular stone as per the manufacturers' specification.
- A geotextile fabric will then be placed in position before a temporary aggregate surface is deployed to act as a wearing course for the construction phase of the project.
- Once all construction activities are complete this temporary wearing course will be removed, to allow for the installation of a permeable final wearing course.

Arboricultural Method Statement: Introduction

32. Terms of reference

The arboricultural implications assessment identified the impact on trees and how that affects local character. The following sections are an arboricultural method statement setting out management and protection details that must be implemented to secure successful tree retention.

It is based on the assumption that the minimum general standards for development issues are those set out in:

- British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations.
- The National Joint Utilities Group (2007) Volume 4, Issue 1: Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees.
- British Standards Institution (2010) BS 3998 Recommendations for tree work

I have used my arboricultural expertise to interpret these references in the context of evolving good practice and the specific circumstances on this site.

33. Tree Protection Plan (TPP)

The Tree Protection Plan in Appendix 'D' is illustrative and based on the site visit and report. This plan can only be used for dealing with the tree issues and all scaled measurements must be checked against the original submission documents. The precise location of all protective measures must be confirmed at the pre-commencement meeting before any demolition, site preparation or construction activity starts. The TPP shows all existing trees on site with their corresponding colours indicating:

- Tree classification.
- Trees to be retained
- Trees to be removed - identified with a broken Red line
- Protective fence positions therefore the Construction Exclusion Zones (CEZ)
- Any root protection area outside the protective fencing where special precautions must be taken.

Tree protection on site

34. Construction Exclusion Zone

The Construction Exclusion Zone (CEZ) required by the current edition; BS5837; (2012) Trees in relation to design, demolition and construction - Recommendations; relates to the stem diameter of each tree when measured at a height of 1.5m from ground level, the values indicate the area of soil around the base of the tree to be retained undisturbed. The CEZs are to be afforded protection at all times and will be protected by fencing and /or ground protection This area should be protected with vertical barriers and considered sacrosanct. Signs should be erected on the fencing to indicate that the area is a Construction Exclusion Zone (CEZ). No works will be undertaken within any CEZ that causes compaction to the soil or severance of tree roots.

of the tree owners. The implications of non-cooperation require legal interpretation and are beyond the scope of this report. By common law, branches from trees on adjacent properties extending over boundaries can be pruned back to the boundary line without the permission of the owners. However, the material belongs to the tree owner and the same guidance on statutory controls applies as.

27. Implementation of works

All tree works should be carried out to BS 3998 Recommendations for Tree Work as modified by more recent research. It is advisable to select a contractor that has appropriate qualification and insurance to carry out the required works. Additional guidance can be obtained from the Arboricultural Association.

Arboricultural Association
The Malthouse,
Stroud Green,
Standish,
Stonehouse,
Gloucestershire
GL10 3DL, UK

Tel: +44 (0)1242 522152
Email: admin@trees.org.uk
Website: www.trees.org.uk/contractors.htm
Fax: +44 (0)1242 577766

28. Local Arboricultural Contractors

If requested I can provide a list of reputable arboricultural contractors that have carried out work on previous projects.

29. Safety

Tree works can be a hazardous profession, so it is important that all operatives have the necessary and relevant training, health and safety policy and valid forms of insurance.

30. Statutory wildlife obligations

The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000, provide statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.

31. Future considerations

Any remaining trees should be inspected on a regular basis by a qualified arboricultural consultant and should not exceed a 5 year interval.

loss during or post development. There are no such developments planned to take place adjacent or within the RPA of any retained trees.

22. Proximity of trees to structures

With the impact of trees on buildings, and vice versa, allowances for future growth have all been considered in the sighting of the new dwellings. Tree size, future growth, light / shading, leaf and fruit nuisance etc. have received due attention and are not considered to be a significant issue.

Leaf fall onto the roofs has been highlighted to the client and accept this issue, leaf guards in the gutters are recommended to minimise the risk of rainwater blockages.

23. Protection of retained trees

The successful retention of trees depends on the protection and the administrative procedures to ensure those protective measures remain in place whilst there is an unacceptable risk of damage. An effective means of doing this is through an arboricultural method statement that can be specifically referred to in a planning condition. An arboricultural method statement for this site is included in this report.

24. Mitigating tree loss / New planting

Some tree loss will take place as a result of the development of the site. As yet there are no proposed replacement trees to be planted. If required as part of planning conditions, there are areas on the site that can be planted with trees and possibly areas around the development perimeter. Any replacement trees would be selected and located allowing development into a mature tree without the conflict between tree, building or surrounding features.

Summary

25. Summary of the impact on local amenity

This proposal will result in the loss of low category trees. All the significant boundary tree cover located on the site will remain intact.

The construction activity and proposed changes may adversely affect further trees if appropriate protective measures are not taken. However, if adequate precautions to protect the retained trees are specified and implemented through the arboricultural method statement included in this report, the development proposal will have no adverse impact on the contribution of trees to local amenity or character.

Other Considerations

26. Trees outside the property boundaries:

Any trees that are located in adjacent properties are effectively out of the control of the client / land owner. It will not be possible to easily carry out any recommended works without the full co-operation

The new access driveway that is proposed will pass over the RPA of T16 / T17, this area will need to be constructed without the

18. Above ground constraints

There is no development encroachment into the canopy areas of the retained trees on site therefore no conflict with above ground constraints are foreseen with the planned proposal. There are low canopy branches on the more mature trees, as good practice it is recommended that all trees should be crown lifted to give a minimum of 3m clearance over footpaths, 5m over any road system. Protective fencing will still be required to protect the retained trees as per the tree protection plan (TPP).

19. Construction processes of the proposed development

Development processes that lead to soil compaction in tree rooting zones and physical damage to trees can adversely affect long-term tree health. This can lead to unnecessary tree loss if not controlled properly on site during the demolition of a building and then the construction phases that follow.

No access to the RPAs of any retained tree will be permitted before or during construction activity unless the RPA falls within an already existing hard standing road or protected with suitable ground protection measures. This will limit the risk of contractors or machinery causing damage to roots, trunks and low branches.

The processes of construction are highly unlikely to have a detrimental effect upon the health of the retained trees assuming recommendations made in this report are adhered to at all times by the contractors e.g. the positioning of a stout fence between the retained trees construction activities is placed prior to commencement of works and remains intact and in position throughout the duration of the construction activities.

20. Modifications proposed to accommodate trees

The siting of the dwellings dispenses with a need to modify building construction to accommodate retained trees. The retained trees are far enough away from the siting of the dwellings so as to permit light infiltration to the windows. This will negate the need for subsequent calls for tree pruning due to shading

21. Infrastructure requirements – highway visibility, lighting, CCTV, services etc.

The installation of services within the rooting zones of trees can have a large detrimental impact on the long-term survival of retained trees leading to their unnecessary loss or root failure in high winds.

No services are to be installed within any tree RPA.

The trees on site do not have any impact on highway visibility.

Undisclosed sighting of above ground services, CCTV cameras, electrical sub-stations, refuse stores, lighting and other infrastructure requirements can lead to unnecessary pruning of tree crowns or root

These trees are considered important for retention and have potential to contribute to amenity, so any adverse impacts on them should be minimised. I have reviewed the situation carefully and my experience is that these trees could be successfully retained without any adverse effects if appropriate protective measures are properly specified and controlled through a detailed arboricultural method statement.

13. Category C trees to be lost

Two category 'C' tree are to be removed these trees are not considered to have any potential for long term retention. As such they are considered to be unworthy of influencing any layout. I believe it is not important in the overall planning context and there loss should not influence the determination of this application.

14. Retained category C trees that may be adversely affected through RPA disturbance

There are no category 'C' trees located on or immediately adjacent to the site that may be adversely affected through RPA and canopy disturbance.

15. Category U trees

Any trees that have been given a category 'U' rating should be removed regardless of any development works being undertaken, the reason for removal will be due to structural or physiological defects or in line with good arboricultural management. Further notes are available in the survey schedule.

16. Effects of new buildings on amenity value on or near the site

The effect of the new construction on this site have been assessed and have been found not to have any significant effect on the amenity value of the remaining trees on site.

17. Below ground constraints

The zone of influence has been determined using the calculation outlined in Table 2, of section 5.2.2 of BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations. This calculation utilises the diameter of the trunk, at a height of 1.5m from the surrounding ground level; and calculates the root protection area (RPA) by multiplying the diameter by a value of 12; the result is then used to calculate the total area (m²) of the RPA. The calculations are illustrated in the tree survey data in Appendix 'E'.

No construction of foundations or the installations of services are to take place within any Root Protection Area (RPA) therefore no conflict with below ground constraints are foreseen with the planned dwellings.

Some of the RPA falls within areas that will need to be accessed by the contractors to facilitate the construction process, in these areas temporary ground protection will be needed to minimise any impact on the trees rooting systems. Protective fencing will still be required to protect the retained trees as per the tree protection plan (TPP).

Arboricultural Implications Assessment

10. Summary of the impact on trees

I have assessed the impact of the proposal on the trees / groups by the extent of disturbance in and around the RPAs and the current and future canopy height and spread. All the trees / groups that may be affected by the development proposal are listed in table 2.

Table 2: Summary of the trees / groups that may be affected by the development on this site if the current proposed plans are implemented.

Impact	Reason	Important trees		Unimportant trees	
		A	B	C	U
Trees / groups to be removed	Good arboricultural management regardless of development			n/a	G1, T2, T3, T6, T12, T13
	Building construction, new surfacing, and / or, proximity	n/a	n/a	T14, T15	
Tree / group that may be adversely affected through disturbance to RPAs or canopy due to removal of existing surfacing / structures / landscaping and or installation of new surfacing / structures / landscaping	Protect tree with protective fencing only	n/a	T4, T5, T7, T8, T9,	n/a	
	Protect tree with protective fencing and ground protection / engineering solutions within RPA	n/a	T10, T11, T16, T17, T18	n/a	
*note - Any trees / groups not mentioned above will be unaffected by this development proposal					

11. Category A and B trees to be removed

There are no category 'A' trees located on or immediately adjacent to the site that are to be removed.

There are no category 'B' trees located on or immediately adjacent to the site that are to be removed.

12. Category A and B trees that may be adversely affected through RPA disturbance

There are no category 'A' trees located on or immediately adjacent to the site that may be adversely affected through RPA and canopy disturbance.

There are 5 category 'B' trees may be adversely affected by the site activity.

5. Correspondence with local arboricultural / planning officer

There is no significant correspondence that needs documenting at the time of writing this report.

6. Purpose of this report

The primary purpose of this report is to show the local authority that all due considerations have been made in relation to retaining suitable trees within the site layout while taking into account any impact this may have on the retained trees on site. It will also serve as a management tool for the methods of protecting the retained trees while the development is undertaken.

Within this planning process, this report will be available for inspection by people other than tree experts so the information is presented to be helpful to those without a detailed knowledge of the subject.

7. Scope of this report

This report is only concerned with the prominent trees within or around the proximity of the site that could influence the development of this site. It takes no account of any trees outside this remit or any building structural issues. It includes a preliminary assessment based on the site visit and any documents provided, listed in section 4 above.

The survey is based upon information that was available at the time of the inspection. Further inspections are necessary over time to give a fuller picture of the health of trees.

8. Mapping

I have not been provided with a topographical survey of the site. A digital ordnance survey map has been purchased and I have plotted the trees by the combined / individual use of land features, manual measurements, laser measurements and GPS. It is estimated that the accuracy is within 1-2m.

Site plans showing all of the tree locations and any relevant details can be found in Appendix 'D'.

9. Technical references

This arboricultural report is based on the following primary technical references:

- British Standards Institution (2012) BS 5837: Trees in relation to design, demolition and construction - Recommendations
- National Joint Utilities Group (2007) Volume 4, Issue 2: Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees
- British Standards Institution (2010) BS 3998 Recommendations for tree work

Introduction

1. Qualifications and experience

I have based this report on my site observations and any provided information and I have come to conclusions in the light of my experience. I have experience and qualifications in arboriculture, and include a summary in Appendix 'A'.

2. Instruction

I am instructed by Chris Harrison (referred to as the 'client' from here on) to provide the following information to accompany the planning application:

- A schedule of the relevant trees to include basic data and a condition assessment as per section 4.4.2.5 of BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations.
- A tree constraints plan showing: Tree numbers, species, tree height, root protection areas, crown spreads and retention categories.
- An arboricultural impact assessment
- An arboricultural method statement
- Tree protection plan

3. Relevant background information

Prior to the site survey, my client advised me that:

- A summary of the intended development is to construct 2x residential properties within the site.
- A tree survey has been carried by myself and documented in report reference 1184. This was used by the client to influence the potential development at the site so that any impact from trees could be assessed and factored into the designs.

4. Documents and information provided

My client provided me with copies of the following documents or information:

- Their email of instruction outlining the situation.
- Their email commissioning this report and agreeing to the T&C and cost.
- Electronic map to plot tree locations in computer tree management software.
- Electronic topographical survey data.
- Proposed site layout drawing: Site plan (sketch of proposed layout on OS map)
- This is a planning submission to keep the application active as the original application is due to expire. It must be noted that the recommendations made in this report are based on the sketch plan. Prior to any construction work detailed drawings will be needed to accurately show the layout of boundary lines, driveways and landscaping proposals in relation to the trees. Some adjustments of the TPP may be needed within the RPAs.

Validation statement for council registration of this report

To allow the validation of planning applications, this report fulfils the recommended national list criteria for tree survey / arboriculture information. More specifically, it contains the following:

- A full tree survey compliant to the requirements of BS5837; (2012) Trees in relation to design, demolition and construction – Recommendations, undertaken by a qualified arboriculturist.
- A plan to a suitable scale with a north point and showing tree survey information, retention categorisation and root protection areas, and tree height.
- An assessment of the arboricultural implications of development detailing trees to be retained / removed and appropriate protection measures.
- An arboricultural method statement detailing the means of tree protection, implementation and phasing of works.

Summary

I have inspected all the relevant trees that could influence the development of this site and listed there details within this report, a root protection area and crown spread are indicated around each tree on the tree constraints and protection plan.

This proposal will result in the loss of low category trees. All the significant boundary tree cover located on the site will remain intact.

The construction activity and proposed changes may adversely affect further trees if appropriate protective measures are not taken. However, if adequate precautions to protect the retained trees are specified and implemented through the arboricultural method statement included in this report, the development proposal will have no adverse impact on the contribution of trees to local amenity or character.

Gary Marsden FDS Arb, M.Arbor.A

60.	Supervision and the discharge of planning conditions.....	20
61.	Phasing of arboricultural input.....	20
62.	Administrative preparation before work starts on site	20
63.	Pre-commencement site visit.....	21
64.	Site supervision	21
65.	Site management	21
	How to use this report in the planning process	21
66.	Limitations	21
67.	Suggestions for the effective use of this report	21
	APPENDIX 'A'	23
	Brief details of qualifications and experience of Gary Marsden	23
	APPENDIX 'B'	24
	Site Location aerial photo taken from Google Maps showing site location	24
	APPENDIX 'C'	25
	Tree survey index.....	25
	APPENDIX 'D'	26
	Inserted site plans showing tree locations and all other relevant details	26
	APPENDIX 'E'	27
	Tree survey data inserted including the calculations for the root protection zones.....	27
	APPENDIX 'F'	28
	Cascade chart showing tree retention categories exerted from: BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations	28
	APPENDIX 'G'	29
	Illustrative specifications for tree protection.....	29
	APPENDIX 'H'	33
	Illustrative specification for ground surface protection measures and special surfacing within root protection areas.....	33
	APPENDIX 'I'	34
	Site guidance for working in root protection areas (RPAs)	34
	Back Cover.....	40

29.	Safety	13
30.	Statutory wildlife obligations	13
31.	Future considerations	13
Arboricultural Method Statement: Introduction		14
32.	Terms of reference.....	14
33.	Tree Protection Plan (TPP)	14
Tree protection on site.....		14
34.	Construction Exclusion Zone	14
35.	Protective Fencing.....	15
36.	Permanent ground protection (left in-situ after construction)	15
37.	Temporary ground protection (removed after construction)	16
38.	Precautions when working in RPAs / CEZ.....	16
Other tree related site works		17
39.	Tree work recommendations	17
40.	Site storage, cement mixing and washing points	17
41.	Protection of soil in areas for proposed new planting	18
42.	Access Details.....	18
43.	Site Gradients.....	18
44.	Demolition	18
45.	Hard Surfaces	18
46.	Soft landscaping.....	18
47.	Use of Herbicides	18
48.	On site Monitoring Regime	18
49.	Use of subcontractors	18
50.	Contractors Parking.....	18
51.	Site Huts and Toilets	19
52.	Emergency Procedures	19
53.	Remedial Tree Works	19
54.	Responsibilities	19
Specifications for new tree planting		20
55.	Site preparation, supply and planting of trees	20
56.	Maintenance	20
57.	Root barriers / deflectors.....	20
58.	Structured tree soil	20
Programme of tree protection and supervision		20
59.	Overview	20

Table of Contents

Validation statement for council registration of this report	6
Summary	6
Introduction	7
1. Qualifications and experience	7
2. Instruction	7
3. Relevant background information	7
4. Documents and information provided	7
5. Correspondence with local arboricultural / planning officer	8
6. Purpose of this report	8
7. Scope of this report	8
8. Mapping	8
9. Technical references	8
Arboricultural Implications Assessment	9
10. Summary of the impact on trees	9
11. Category A and B trees to be removed	9
12. Category A and B trees that may be adversely affected through RPA disturbance	9
13. Category C trees to be lost	10
14. Retained category C trees that may be adversely affected through RPA disturbance	10
15. Category U trees	10
16. Effects of new buildings on amenity value on or near the site	10
17. Below ground constraints	10
18. Above ground constraints	11
19. Construction processes of the proposed development	11
20. Modifications proposed to accommodate trees	11
21. Infrastructure requirements – highway visibility, lighting, CCTV, services etc.	11
22. Proximity of trees to structures	12
23. Protection of retained trees	12
24. Mitigating tree loss / New planting	12
Summary	12
25. Summary of the impact on local amenity	12
Other Considerations	12
26. Trees outside the property boundaries:	12
27. Implementation of works	13
28. Local Arboricultural Contractors	13

The content and format of this report are for the exclusive use of the client. It may not be sold, lent, hired out or divulged to any third party not directly involved in this subject matter without our written consent.

I hope that this report provides all the necessary information, but should any further advice be needed please do not hesitate to contact me.

Any enquiries regarding this report should be addressed to:

GM Tree Consultants
 16, Farfield Drive,
 Lower Darwen,
 Darwen,
 Lancashire,
 England,
 BB3 0RJ.

Tel: 077 61 66 73 84
 Email: gary@gmtreeconsultants.co.uk
 Web: www.gmtreeconsultants.co.uk



Gary Marsden FDS Arb M.Arbor.A
 Professional Member - Arboricultural Association (AA)
 Professional Member - Consulting Arborist Society (CAS)



**BS 5837
Arboricultural Impact
Assessment
and
Arboricultural Method
Statement**

Location of property surveyed:

Clough Bank,
Chatburn,
Clitheroe
BB7 4AT

Arboricultural report for:

Chris Harrison

Date of site survey:

04/06/2018

Date of report:

05/06/2018

Job Ref: 1185

Gary Marsden
FDS Arb, M.Arbor.A.

Tel: 077 61 66 73 84

www.gmtreeconsultants.co.uk

gary@gmtreeconsultants.co.uk

