

**THE CHICHESTER DISTRICT COUNCIL (ACCESS TRACK OFF CROOKED LANE,
BIRDHAM) COMPULSORY PURCHASE ORDER 2023**

PROOF OF EVIDENCE OF SARAH POULTER

APPENDIX SP18:

**PAGE 20 OF DESIGN AND ACCESS STATEMENT FOR 2013
APPLICATION**

Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950

Access

Access to the site is via an existing lane between 'Copperfields' and Hedgecox' as shown on the location plan. This lane has been used as an access to the fields for many years and takes large agricultural vehicles now.

Although it is heavily tree lined, extensive surveys and investigations have shown that a full access road can be constructed within its boundaries. This is demonstrated by the Engineer's drawing 136.0099-2100 and -2101 showing the road layout and sections at various points.

Pre-planning advice was obtained from West Sussex County Council Highways Dept and they could see no problems with the provision of an access road to a suitable standard to service the development.

This road will be built as a shared surface for vehicles and pedestrians in line with recommendations in the Manual for Streets, and the traffic movement for 15 units would only cause very minor conflict with current traffic. Indeed WSCC advised that this construction would support a development of 30-40 dwellings and would still be below the 100 vehicle movements maximum for this type of shared surface.

This shared surface is continued within the housing site with the pavement in a contrasting material. The pavement is only proposed to one side of the road, in a similar manner to Crooked Lane, reflecting the rural location and low density of the scheme.

A stage 1 Safety Audit has been undertaken and is submitted with this application as requested by WSCC Highways - its findings have been incorporated within the design of the roadway and the Report signed off.

A large part of the Access Road will be of 'no-dig' construction to avoid damage to the roots of the trees and maintain a water supply to them. Most of the trees adjacent to the proposed access road have root levels that are well below the compacted service of the existing track and most of the new road levels are above this existing track so excavation is likely to be minimal apart from the removal of the topsoil. The existing bank will also be retained to protect the trees and their stability. The existing drainage to the lane will be improved, to avoid the ponding and flooding that occurs at the moment due to haphazard levels.

The construction of the road will also allow for the distribution of the Statutory Services to the site without harming the tree roots.

Full details of the construction, its methodology and tree / root protection will be provided prior to work commencing and will be done under the supervision of our Arboriculturalist and in accordance with the method statement agreed with the Council's Tree Officer.

A travel Plan has been submitted showing how the Housing association will engage with the Tenants to encourage 'Green Travel ' into their lifestyles.

There is a bus service 700m from the site and a regular bus service runs up to 4 times per hour at peak times.

Cycle storage is provided for each property within the garden shed located adjacent to each rear access gate.

The dwellings are Lifetime Homes compliant and are designed to be adapted for wheelchair access and living. The approach and access to all dwellings and internal circulation within all the properties will be fully compliant with Building Regulations Part M. Pathways to the front door are a minimum 1200 wide and door thresholds provide level access.

Emergency and utility vehicles have access and turning facilities in two locations.

Car parking

A total of 30 new car parking spaces are proposed.

2 car spaces are proposed per 2, 3 and 4 bed properties

1 car space is proposed per 1 bed property

2 visitor spaces are proposed for the development



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APPENDIX SP19:

**ARBORICULTURAL IMPACT AND METHOD STATEMENT FOR 2013
APPLICATION**

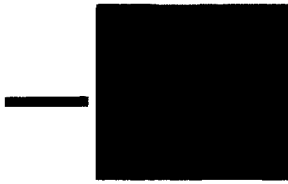
Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950



Technical Arboriculture

Arboricultural Impact Appraisal and Method Statement Crooked Lane, Birdham, West Sussex





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Arboricultural Impact Appraisal and Method Statement

Crooked Lane, Birdham, West Sussex

Prepared by

Kevin Cloud BSc Hons, Tech Cert Arbor A, F Arbor A

Report reference number: AIA/AMS-KC/DS/birdham/001Rev D

Report date: Sept 2013



Tree Preservation Order
ConsultingArboristSociety.com



Summary

The development proposal is to construct new dwellings on land at Crooked Lane Birdham.

The trees that could be affected by the development have been surveyed. The details of the tree survey and root protection area calculations are shown at appendix one of this report.

This survey and report updates the previous tree related information to incorporate recommendations contained in the latest version of *British Standard 5837:2012 Trees in relation to design, demolition and construction*. Information has previously been supplied to the client (by a different arboricultural consultant) on the constraints that trees impose upon the use of the site. The site layout has evolved, following consultation and taking full account of these constraints.

Mature trees on the site can be retained and protected. Proposed tree loss is restricted to poor grade trees (category U) recommended for removal on grounds of health and safety/risk management and limited retention value. The development proposals can accommodate the retention of these trees, should this be deemed a requirement of the local planning authority. However, I refer to comments in the tree survey schedule, the recommendations therein, and reiterate comments contained in paragraph 7 of this report. Some pruning to lesser trees, shrubs and boundary vegetation may be required to achieve adequate highway clearance, however I consider this to be minor and acceptable.

Some construction activity will be necessitated within the root protection areas of the retained trees. However, the use of appropriate engineering solutions to construct the access, together with design alterations to the access agreed with the highways engineers, will ensure that these areas will not be subjected to detrimental ground disturbance.

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 significant adverse impact on the contribution of trees to amenity or character in the wider setting.

Kevin Cloud BSc Hons, Tech Cert Arbor A, F Arbor A

Cardiff Law School certified Expert Witness

Director and Principal Arboricultural Consultant

Introduction

- 1 The client is seeking planning consent for development at Crooked Lane, Birdham, West Sussex.
- 2 My advice has been sought on the arboricultural issues relating to this project in order to satisfy the requirements of the local planning authority in respect of trees and development. Where applicable, methodologies, practices and recommendations, made or referred to by the project arboricultural consultant, follow relevant guidance contained in *British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations* [hereafter referred to as BS5827:2012].

Client's brief and scope of report

- 3 Instructions have come from Lloyd Exley, Technical coordinator, Drew Smith Group, Drew Smith House, Mill Court, The Sawmills, Durley, Southampton, Hampshire SO32 2EJ UK, who are acting on behalf of the Hyde Housing Association.
- 4 I have been instructed to assess the significant trees that could be affected by the development proposal and to prepare the following information to accompany the planning submission:
 - a schedule of relevant trees including basic data and a condition assessment based on the guidance criteria within BS5837:2012;
 - an appraisal of the impact of the proposal on trees and any resulting impact that the proposal will have on local amenity;
 - an arboricultural method statement setting out appropriate protective measures and management for trees to be retained.
- 5 This report provides an analysis of the implications of the development proposal on trees and local amenity. It also provides additional guidance on protective measures, appropriate tree management and any special engineering, or other such techniques or methods, required to minimise impact to trees.
- 6 The primary purpose of this report is for the local planning authority to review the tree related information in support of the planning submission and utilise it as the basis for issuing a planning consent, formulating tree related planning conditions or engaging in further discussions towards that end. Any use outside the planning application context is not intended or authorised.

- 7 Although this document is not meant to be a full and detailed report on tree health and safety, any significant visible structural defects or physiological conditions identified, together with preliminary tree works, are noted in the appropriate columns in the tree schedule. However, a full post development tree inspection is recommended to establish that the trees retained during construction present acceptable levels of risk once the development has been completed.
- 8 Any plans, tables, figures or attachments whether within this document, appendices or supplied as associated drawings are illustrative, and based on layout drawings, topographical surveys or other information provided. Therefore, all scaled measurements should be checked against the original design documents.
- 9 Any plans, tables, figures or attachments whether within this document, appendices or supplied as associated drawings should only be used for dealing with the tree protection issues and all other uses are prohibited, unless authorised by Technical Arboriculture Limited.

Document disclosure

- 10 The following text and plans have been provided in order to fulfil the client's brief:
- Existing site layout - Shaw Colegate Surveyors, August 2011
 - Proposed site layout - HNW Architects - Latest revision September 2013
 - Track Layout - Upton Mcgougan, September 2013

Location and brief site description

- 11 The site is located on land occupied by our client at Crooked Lane, Birdham, West Sussex.

Land survey

- 12 I have been provided with CAD based and paper site plans which I assume to be based upon an accurate land survey. This includes plots of tree locations and other topographical information relevant for the preparation of this report and appendices. All information in this report and appendices assumes accuracy of the land survey supplied and no responsibility for accuracy can be assumed or guaranteed by the author of this document.

Soil Assessment

- 13 A site specific soil assessment has been carried out by Ground and Water Limited in September 2011. This provides details of the soils present and may inform decisions relating to the root protection area (RPA), tree protection, new planting design and foundation design to take account of retained, removed and new trees.
- 14 In addition to the site soil assessment, I witnessed trial holes dug on the existing farm track, revealing heavily compacted soil and the track construction to be compacted building waste, rubble and hard core to a depth of 300 – 400mm. These observations have informed my opinion on the construction/upgrade of the track, to form the development site access, in proximity to retained trees.

Tree Survey – categorisation and assessment of tree stock

- 15 I conducted a tree survey on 31st May 2013. Where practicable, the survey was carried out in accordance with guidance contained at section 4.4 (tree survey) and 4.5 (tree categorization method) of BS5837:2012. The results of the survey may be viewed at appendix one.
- 16 A previous survey was carried out by tree:fabric in 2011. During my survey, access to trees was refused by local residents, restricted by vegetation and/or ground features or a combination of these. As a result I rely on the data gathered in the original survey in respect of observations of the stem/butt areas and the photographs relating to such observations contained in the original report (report reference TF/TS/850revA 08/09/11, appendix three - photographic record pages 22 – 27). Where I rely on such comments these are shown in blue text within the tree schedule.
- 17 Observations were made from ground level without detailed investigations. The survey involved a visual inspection of the trunk, together with the major branches and forks of the canopy. The examination was restricted to those views available within the survey site and the neighbouring area. Many of the trees are located on neighbouring land where no access was permitted to carry out tape measurements of stem diameters. For this reason all tree stem diameters should be considered estimated unless stated.
- 18 The position of the trees is shown on the submitted tree survey and protection plan drawing based on the site plan provided to us by our client or their representative.

British Standard colour coding and root protection area information has been added.
See appendix two.

- 19 The height measurements are approximations and have not been calculated using a clinometer. Where the canopy extends over an adjacent property, or where the understorey is very dense, the canopy spread has been estimated and stated as such with the tree schedule.
- 20 This report is based on the condition of the trees at the time of inspection. Trees are dynamic and their condition changes throughout their lives. No inspection has been made of the soil structure. No account has been taken of the effects of the tree/s or their removal directly or indirectly on any building/s or structure/s relating to the possibility of subsidence or heave. Regular inspections of the tree/s should be undertaken to monitor their health and determine appropriate management.
- 21 This report is to be used for the purposes for which it is prepared as specified in paragraphs three to nine of this document.
- 22 The trees identified in the tree survey are those upon which development of the land may have potential impact in line with guidance at paragraph 4.2.4 (b) of BS5837:2012.

Tree constraints

Above and below ground constraints

- 23 Following our tree survey, the data gathered was used to provide constraints information to our client and their appointed architect, based on the locations of retained trees. Crown extension of the trees and root growth has been taken into consideration with both the client and architect agreeing to alterations to the location, design and construction methods to lessen potential impact trees to be retained.

Defining and plotting root protection areas (RPAs)

- 24 The root protection areas (RPAs) have been calculated (see appendix one) in accordance with guidance contained at section 4.6 (root protection area) of BS5837:2012.
- 25 The RPAs have been plotted on the tree constraints plan, and on the tree survey and protection plan, in accordance with guidance contained in paragraph 4.6.2 of



BS5837:2012 (please refer to appendix two). RPAs are shown as a circle around each of the category A, B and C graded trees (BS5837:2012 paragraph 5.2.1.).

- 26 It should be noted that BS5837:2012 states (section 4.6.2) that “the RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution”.

Furthermore, “Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

- a) The morphology and disposition of the roots, when influenced by past or existing ground conditions (e.g. the presence of roads, structures and underground apparatus);
- b) Topography and drainage;
- c) The soil type and structure;
- d) The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management”.

Legal constraints

- 27 I have not been asked to ascertain the protection status of the trees. If the trees are subject to statutory protection any arboricultural work recommended by this report may only be carried out following the issue of formal planning consent, notwithstanding any restrictions placed by planning conditions contained therein. If tree work is to commence prior to the issue of consent we recommend that the client, or project arboricultural consultant, liaise with the local planning authority.
- 28 A licence from the Forestry Commission is normally required to fell growing trees (Forestry Act, 1967). However, an occupier may fell up to 5 cubic metres per calendar quarter without a licence provided that no more than 2 cubic metres are sold. A felling licence is not required if the work is undertaken in accordance with an approved planning permission or the trees are dead, dying or dangerous.



29 The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit trees. In addition European Protected Species legislation places a duty upon landowners to ensure that best practice is followed or an appropriate license issued prior to any work commencing which may affect bats, reptiles or dormice. These could impose constraints on the use and timing of access to the site in addition to any of the tree matters considered in this report. These issues are not the subject of this report. However our client is advised to seek ecological advice and this may be provided by Technical Arboriculture Limited.



Arboricultural Impact Assessment
Summary of impact on trees:

30 **Table 1: Summary of trees that may be affected by development.**

<p>RETAINED TREES</p> <p>Potential damage through disturbance to RPA</p>	<p>Demolition Some existing site features will require careful demolition to prevent damage to root protection areas and above ground parts of trees to be retained.</p>	<p>nil</p>		
	<p>Access and car parking Installation of some elements of parking bays and access will need to be carried out using suitable no dig solution to prevent tree root damage eg Geoweb cellular confinement system or similar.</p>	<p>T1/ G1 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13 G7</p>	<p>C2 U U U B2 C2 B2 U U C2 B2 C2 U</p>	
	<p>Foundation design Where elements of some buildings encroach into the plotted RPA of retained trees a suitable low impact foundation design will be required.</p>	<p>nil</p>		
	<p>Construction activity – working space requirements Areas of RPA requiring suitable ground protection or scaffolding precaution.</p>	<p>nil</p>		
	<p>Construction activity – encroachment into RPA Minor encroachment into plotted RPA to install site features</p>	<p>nil</p>		
	<p>Construction – low impact development Areas where small, low impact structures (eg bin or cycle store) are to be located within plotted RPA.</p>	<p>nil</p>		
	<p>RPA correction Area where pre-existing site conditions (eg levels, services, compaction, slope, etc) do not favour rooting. RPA adjusted to reflect arborist's professional opinion of prevailing root spread. Adjustment noted on tree survey and protection plan.</p>	<p>nil</p>		



<p>RETAINED TREES</p> <p>Pruning</p>	<p>Access pruning Minor crown lifting or pruning may required to facilitate and/or improve access to the development or to install site features.</p> <p>Ecological considerations Retention as veteran tree or habitat feature.</p> <p>Recommended pre development arboricultural work. Refer to tree survey schedule.</p>	<p>T1/2 G2 G3 G4 G5</p> <p>T18</p>	<p>C2 U U U C2</p> <p>B1</p>
<p>TREES TO BE REMOVED</p> <p>Actual tree loss</p>	<p>Trees not viable for retention or poor grade trees. Trees which should not be considered a constraint to development (category U or category C).</p> <p>Note: trees shown to be retained at request of local planning authority are category U or C. Please refer to management recommendations and paragraph 7 prior to bringing development into use.</p> <p>Trees lost to development footprint Built form</p> <p>Trees lost to development footprint Car park and access requirements.</p> <p>Trees lost to construction activity Demolition</p> <p>Trees lost to construction activity Working requirements.</p>	<p>T2</p> <p>nil</p> <p>T2</p> <p>nil</p> <p>nil</p>	<p>U</p> <p>C2</p> <p>U</p>
<p>TREES TO BE REMOVED</p> <p>Potential tree loss</p>	<p>None anticipated</p>		

Detailed impact appraisal

Trees to be retained and protected

- 30 Access and car parking – The plans provided show some sections of the car parking and access in close proximity to retained trees. Where I consider that this will have an unacceptable degree of impact to the root protection areas of these trees, a low impact solution to form these elements will be required e.g. Cellweb cellular confinement system (sample product specification at appendix). Such areas are indicated on the tree survey and protection plan. A performance specification for low impact surfacing is included within the arboricultural method statement. Refer to



operational guidance on installation of low impact surfacing contained within the arboricultural method statement supplied with this report.

It is noted that the proposed access is to be located on an existing access track to farm fields. I have assessed this track and reviewed trial pits dug by the client. The trial pits reveal heavily compacted soil and the track construction to be compacted building waste, rubble and hard core to a depth of 300 – 400mm.

For these reasons I am of the opinion that some excavations would be permissible within the RPAs of retained trees to install the access at current ground levels, however the access track foundation should still be constructed in these areas using a low impact solution. If this is carried out then I am of the opinion that conditions for rooting in the area of the proposed access will not be adversely affected and may, in fact, be improved.

- 31 The installation of the track will require the pruning of T1/G1 and some light trimming of boundary vegetation (G2-G5) in order to give adequate clearance to the proposed highway use of the access. The pruning to give highway clearance has been agreed by the local planning authority at the joint site meeting.
- 32 All other trees located within the development site will be located away from intense activity.
- 33 I have considered the situation carefully and it is my opinion that these trees may be successfully retained without any adverse effects provided that appropriate protective measures are specified.

Tree losses

- 34 A total of 6 trees and 5 groups are of such condition that it is recommended that they be removed on the grounds of sound arboricultural management for health and safety reasons (G2, G3, G4, G6, G7 and T2, T3, T4, T5, T9, T10). The trees were surveyed and categorised in accordance with guidance contained at section 4.4 (tree survey) and 4.5 (tree categorization method) of BS5837:2012. Accordingly the trees and groups are of such condition and status that they should not be considered a constraint to development. Details of these trees may be found at appendix one.

- 35 It has been agreed, during site meeting with the local planning authority, that actual tree loss be limited to the removal of T2. This is reflected on the tree survey and protection plan included as part of this arboricultural planning submission.
- 36 In light of the poor condition of the trees to be retained, a full risk assessment tree survey is recommended, and resulting remedial work programmed, prior to bringing the development into use.

Future Growth

- 37 The proximity of trees offers sufficient clearance to the proposed development. In general the trees on the site will compliment the development and aid its integration into the local area. No containment pruning is required or expected.

Shading, windows and orientation

- 38 The site location offers good opportunity for solar gain at various parts of the day. No issues from excessive shade or proximity of trees are envisaged.

Conclusion

- 39 I have considered the impact to trees and the effect of tree loss, pruning and other site operations on local tree cover, amenity and character.
- 40 Provided that the recommendations of this report are followed and that construction methods, as detailed within the arboricultural method statement, are followed when working near retained trees, I consider impact to be minimal and acceptable.

Arboricultural Method Statement

Terms of reference

- 41 This Arboricultural Method Statement has been compiled to aid the ongoing health and vitality of trees to be retained on the development site at Crooked Lane, Birdham, West Sussex. Implementation of the protection methods, and other details, within this report are integral to achieving this aim.
- 42 For details of trees to be retained and locations and types of protection, reference should be made to the latest revision of the tree survey and protection plan which should be displayed prominently on site for all staff to see.
- 43 Where applicable, the methodologies, practices and recommendations contained within this Arboricultural Method Statement follow relevant guidance contained in *British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations* [hereafter referred to as BS5827:2012].
- 44 The controlling authority is Chichester District Council, who should be consulted on any matters relating to existing trees at East Pallant House, 1 East Pallant, Chichester, West Sussex, PO19 1TY. Any questions relating to the content of this method statement or associated tree protection plan should be directed to Kevin Cloud at Technical Arboriculture Limited, 10 Albany Court, Bishops Waltham, Hampshire, SO32 1AZ, 01489 896655 or info@techarb.co.uk

Phasing and monitoring of development

- 45 BS5837:2012 states that “*wherever trees on or adjacent to a site have been identified within the tree protection plan for protective measures, there should be an auditable system of arboricultural site monitoring. This should extend to arboricultural supervision whenever construction and development activity is to take place within or adjacent to the RPA*”.
- 46 The following phasing is governed by operational constraints and may be subject to change or amendment. The project arborist must be notified of any proposed changes to this schedule:
- Phase one - Pre Development

- Pre commencement site meeting attended by the local planning authority arboricultural officer, project arboricultural consultant, client (or representative) and the construction site manager.
- Tree removals, pruning and remedial work.
- Tree protection measures installed.
- Site inspection by project arboricultural consultant

- Phase two – Development

- Phase 2 is subject to monthly site monitoring visits by project arboricultural consultant

NO ACCESS TO CONSTRUCTION TRAFFICE UNTIL COMPLETION OF ACCESS USING CELLULAR CONFINEMENT SYSTEM

- Low impact surfacing installed (subject to supervision by project arboricultural consultant)
 - Site accessible to construction traffic
 - Site compound/WC/materials
 - Groundworks and services
 - Development
 - Completion of development
- Phase three – Post development
 - Removal of protective fencing
 - Landscape operatives briefed by project arboricultural consultant
 - Hard and soft landscaping
 - Boundary treatments

47 Arboricultural monitoring involves a site visit and completion of a standard form which is signed by the site manager (or representative) and the project arboricultural consultant, and copied to both client and local planning authority tree officer.



- 48 The monitoring visit is held to ensure that the approved tree protection measures are continually adhered to. If remedial work or alterations are required to protective measures these can be agreed by all parties and actioned promptly.
- 49 Arboricultural supervision is to be carried out at all crucial stages of the development process to ensure that detailed tasks are carried out to the approved methodology. Such supervision shall occur during:
- Any demolition of existing buildings, surfaces or structures within or adjacent to the RPA
 - Hand excavations for boundary treatment posts
 - Any incursion into protection areas or exclusion zones for whatever reason
- 50 Supervision will require the project arboricultural consultant to be present throughout the task, to ensure all arboricultural objectives are met.
- 51 If the task is to take a long time period, the project arboricultural consultant may, at their discretion, reduce supervision to telephone contact between the site foreman and the project arboricultural consultant.
- 52 The local authority arboricultural officer will have free access to the site and pass any recommendations directly to the project arboricultural consultant.
- 53 Remedial tree works and any site clearance will be carried out prior to the erection of any tree protection fencing; however it may be expedient to mark out the extent of root protection areas and protective measures to aid any site clearance or pruning work.

Root Protection Areas (RPAs)

- 54 Based on tree survey data, root protection areas (RPAs) have been calculated and determined for every retained tree. The RPA is designed to protect a functional minimum of tree root mass in order to ensure that trees survive the construction process.
- 55 **Some trees on the site may be subject to statutory protection by tree preservation order or location within a conservation area. Damaging such trees is a criminal offence and contrary to any tree related planning condition imposed with planning consent. Breach of planning consent could lead to the**



issue of a stop notice; breach of statutory protection could result in heavy fines.

- 56 It is the responsibility of everyone engaged in the construction process to respect tree protection measures and observe necessary precautions within and adjacent to them. If in any doubt when working close to trees – consult the site foreman who will contact the project arboricultural consultant.

Restrictions within tree protection areas

- 57 Inside the area of protective fencing, the following shall apply:
- **No** mechanical excavation whatsoever
 - **No** excavation by any other means without arboricultural site supervision
 - **No** hand digging without a written method statement having first been approved by the project arboricultural consultant
 - **No** lowering of levels for any purpose (except removal of grass sward with hand tools)
 - **No** storage of plant, equipment or materials
 - **No** vehicular or plant access
 - **No** fire lighting
 - **No** handling, discharge or spillage of any chemical substance including cement washings
 - **No** action likely to cause localised water logging
- 58 In addition to the above, further precautions are necessary adjacent to trees:
- A 10 metre separation distance shall be observed between any tree and substances injurious to tree health, including fuels, oil and bitumen, cement (including cement washings), builders sand, concrete mixing and other noxious chemicals
 - No fire shall be lit such that flames come within five metres of tree foliage; this should be taken to mean a fire separation distance of 20 metres from any tree's canopy

Tree protection barriers

- 59 The tree survey and protection plan shows the alignment of tree protection barriers. Such barriers shall be installed prior to any of the following taking place:
- Plant and material delivery
 - Demolition
 - Soil stripping
 - Construction works
 - Utility installation
 - Landscaping
- 60 It is advised that, in order to ensure accuracy and avoid future fencing adjustments (which should be carried out under supervision), the barriers are set out by a surveyor with all node points being marked clearly on site for fencing contractor to work to. The tree survey and protection plan shows the root protection area radius in metres next to each retained tree after the words RPA (eg RPA6.2m). This is the minimum distance from the stem of each tree, within which the tree should be subject to protective measures and/or special engineering measures to ensure successful retention.
- 61 If, on completion of installation of protective measures, sections of the RPA are still exposed/uncovered or still open to construction access, immediate contact should be made with the project arboricultural consultant to ensure corrective measures are made.
- 62 Once erected, all barriers will be regarded as sacrosanct and will not be removed or altered without prior consultation with the project arboricultural consultant and/or approval of the local planning authority.
- 63 BS5837:2012 states that barriers should *“be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete”*.
- 64 In line with BS5837:2012 *“the default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in figure 2 [figure 2 BS5837:2012 is shown at appendix three of this report]. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground. Onto this framework, welded mesh panels should be securely fixed. Care should be*

exercised when locating vertical poles to avoid underground services and, in the case of bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared, in conjunction with the project arboricultural consultant that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free standing scaffold support framework”.

- 65 *“Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboricultural consultant and, where relevant, agreed by the local planning authority. For example, 2m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so they can only be removed from inside the fence. The distance between the couplers should be at least one metre and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (figure 3a [figure 3a BS5837:2012 is shown at appendix three of this report]. Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, the stabilizer struts should be mounted on a block tray (figure 3b) [figure 3b BS5837:2012 is shown at appendix three of this report].*
- 66 It may feasible to use temporary site office buildings as components of the tree protection barriers, provided these can be installed and removed without detrimental impact upon retained trees or their rooting environment.
- 67 Once the exclusion zone has been protected by barriers and/or ground protection, construction activity may commence. All weather notices should be attached to the barriers. A template of an appropriate notice is provided at appendix four of this report.

Ground protection

- 68 Where construction working space or temporary construction access is required, this should be facilitated by a set-back in the alignment of tree protection barriers as shown on the tree survey and protection plan.



- 69 RPAs must be covered with ground protection until there is no further risk of damage from demolition and/or construction activity.
- 70 Existing hard surfacing that is not proposed for re-use as part of the final site layout should be retained to act as temporary ground protection during construction, rather than removed during demolition.
- 71 Where the set-back would expose unmade ground to construction damage, new temporary ground protection should be installed.
- 72 New temporary ground protection should be capable of supporting the construction traffic entering the area onto which it is 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.
- 73 In all cases, the objective should be to avoid compaction, which can arise from a single passage of a vehicle.

Avoiding damage to trees

- 74 Care shall be taken when planning site operations in proximity to retained trees to ensure that wide or tall loads, or plant with booms, jibs and counterweights and static or mobile cranes can operate without coming into contact with retained trees. Such contact could result in serious injury which may make a tree's safe retention impossible.



- 75 Consequently, any transit or traverse of plant, in proximity of trees, shall be conducted under the supervision of a banksman to ensure that adequate clearance from trees is maintained at all times.
- 76 In some circumstances it may not be possible to achieve this without access facilitation pruning. Such pruning shall be kept to the utmost minimum required to facilitate development and shall be carried out in strict accordance with the guidance set out in the relevant section of this report entitled "Tree Surgery" (see below).
- 77 **Under no circumstances shall construction personnel undertake tree pruning operations.**

Tree Surgery

- 78 Tree work proposals based on preliminary inspection are set out in the tree schedule within the appendices.
- 79 All permitted or approved tree work must be carried out in accordance with British Standard 3998:2010 Tree work – Recommendations.
- 80 Work should be carried out by suitably qualified and experienced professional tree surgeons. For safety and insurance reasons under no circumstances should site personnel undertake any tree pruning operations.
- 81 The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit trees. In addition European Protected Species legislation places a duty upon landowners to ensure that best practice is followed or an appropriate license issued prior to any work commencing which may affect bats, reptiles or dormice. The statutory protection afforded will be adhered to. Failure to do so may lead to enforcement action and/or prosecution under the respective act. If further advice is required, particularly if bats are discovered during tree work, contact should be made immediately with the project arboricultural consultant.
- 82 The contractor shall seek consent from the project arboricultural consultant for the chosen tree surgeon to be used. Proof of experience, including knowledge and understanding of *Arboricultural Association Guidance Note one – Bats in the context of tree work operations* (as updated), and appropriate levels of insurance provision will be required, prior to approval to commence tree works. All work shall be undertaken

at the appropriate time and with the consent of the site agent who shall approve a programme of work.

- 83 The stumps of any trees removed from within the construction exclusion zone or RPAs of retained trees will be either cut flush to ground level and left in situ or ground out using a stump grinder. At no time shall tree roots be removed by winch or any other mechanical means.
- 84 All operations shall be carried out to avoid damage to the trees undergoing tree surgery or neighbouring trees which are to be retained. No trees to be retained shall be used for anchorage or winching purposes.
- 85 The tree surgeon shall report to the project arboricultural consultant, any defects or biological disorders which may compromise the health and future safety of the tree which are not noted on the tree survey schedule supplied to the tree surgeon at the time of commencement of tree works.
- 86 All arisings shall be removed from site, unless other provisions have been made for their disposal, and the site shall be left clean and tidy.

Soft landscaping within root protection areas

- 87 Ground preparation will be carried out sensitively to ensure root damage is mitigated as much as is practicable. At no time is any heavy plant to be used within the RPA. Removal of existing vegetation will be carried out by hand, turf may be removed using a mechanical turf stripper or by hand.
- 88 At no time shall a rotorvator be used within any RPA to prepare the soil. Any levelling will be done by hand with the use of hand tools.
- 89 Should the soil be compacted or have a poor structure which may hinder the development of any new planting, soil decompaction techniques may be used upon consultation with the project arboricultural consultant.
- 90 New plants will be planted individually to minimise root disturbance (eg 'no trench' planting).
- 91 No works will be carried out within any RPAs if the soil moisture is of a level likely to allow compaction to occur.

Hard surface removal within root protection areas

- 92 Tree protection measures will remain in place until work commences. When removed, all personnel to be working within the RPA are to be made aware of the extent and nature of the area.
- 93 The initial 'breaking up' of any surface may be carried out by low impact pneumatic tools (not breakers attached to diggers or JCBs, unless required due to the nature of the surface and if so, only when agreed with the supervising project arboricultural consultant), or by hand if possible.
- 94 Removal of the surface will occur in 2m strips working from undisturbed surface. This will enable any roots exposed to be covered with a good quality top soil to avoid desiccation and the ground to be 'made good' as the operation progresses, avoiding the need for excessive travel on exposed ground.
- 95 Where practicable subsequent removal of debris will be carried out by hand. Should mechanical means be required due to the size of the debris, then a small (1.5 ton) digger may be used providing that, when picking up debris, no tines/teeth from the bucket cause any damage to the underlying soil surface. Once left with manageable sized pieces, hand removal will be used. Where the digger is employed, it will only travel on the undisturbed hard surface (within RPA), clearing debris as it progresses out of the RPA.
- 96 No reduction in levels of the underlying soil surface will occur.
- 97 The underlying soil may be levelled by the addition of up to 100mm of good quality top soil to BS3882:1984. Hand tools only will be used for any levelling works; this work will not disturb the underlying soil.
- 98 Should any roots over 25mm diameter have grown above the final soil level and be a hindrance to the final installation, their removal will only be carried out under arboricultural supervision and with the approval of the local planning authority.
- 99 If the area around the retained trees is to be left following the removal of the existing hard surface, before a new hard surface is laid or soft landscaping implemented, then the line of protective fencing MUST be correctly re-established immediately the hard surface removal work has been completed.
- 100 If, for whatever reason there is a delay before the area is left exposed prior to awaiting a new surface, then a temporary surface must be implemented or the area fenced off.

Installation of underground services

- 101 Although every effort has been made to ensure the routeing of services does not encroach into RPAs, if installation within RPAs is required the project arboricultural consultant and local authority must be notified prior to any tree protection barrier removal and the following details adhered to.
- 102 Trenching for the installation of underground services severs any roots present and may change the local soil hydrology in a way that adversely affects the health of trees. For this reason, particular care will be taken in the routeing and methods of installing underground apparatus. Wherever possible, apparatus should be kept together in common ducts and tree and root sensitive methods of excavation used. At all times where services are to pass within the RPA, detailed plans showing the proposed routeing will be drawn up in conjunction with the project arboricultural consultant. Such plans will also show the levels and access space needed for installing the services.
- 103 Various trenchless solutions are available and selection and use will depend upon a variety of factors including soil type, underlying strata and type of apparatus to be installed. BS5837:2012 provides summary data on trenchless solutions for differing utility apparatus installation requirements. An extract of the summary is shown in the table on the following page. Technical Arboriculture Limited publishes the information as useful guidance to availability of the techniques stated and accepts no responsibility for the data. The type of technique employed shall be the decision of the client. In all cases entry and retrieval pits shall be sited outside the RPAs of retained trees.
- 104 For smaller operations the preferred method for trenching within RPAs is excavation using an 'air-spade' or similar. This tool utilises compressed air to remove soil from around tree roots causing minimal damage.
- 105 Reference can be made to *National Joint Utilities Group Volume 4* (formerly referred to as NJUG 10) for guidance, but any approach must be approved by the project arboricultural consultant and brought to the attention of the local authority tree officer.

Micro tunnelling	<20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/roadway under crossings.	Low cost projects due to relative expense.
Surface launched directional drilling	≈100	25 to 1200	150	Pressure pipes, cables including fibre optic.	Gravity-fall pipes e.g. drains and sewers. (see note B)
Pipe ramming	≈150	150 to 2000	70	Any large bore pipes and ducts.	Rocky and heavily obstructed soils.
Impact moling (see note C)	≈50 (see note D)	30 to 180 (see note E)			
<p>Key MSL = Maximum subterranean length</p> <p>Notes A – dependent on strata encountered B – Pit launched directional drilling can be used for gravity fall pipe up to 20m subterranean length. C – Impact moling (also known as thrust bore) generally requires soft, cohesive soils. D – Substantial inverse relationship between accuracy and distance E – Figures given relate to a single pass: up to 300mm bore achievable with multiple passes.</p>					

Installation of permanent hard surfacing within root protection areas using a cellular confinement system.

106 The following design criteria will need to be considered when installing new hard surfacing within the RPAs of retained trees:

In all situations:

- Maintain oxygen diffusion through new surface to rooting area (5-12% by volume)
- Maintain sufficient passage of water to the rooting area (12-40% by volume)
- Maintain existing ground levels to avoid root damage (severance and/or asphyxiation)
- Avoid compaction by maintaining a soil structure sufficient to sustain root growth (soil bulk density below 1.4g/cc).



- Tolerant of deformation by tree roots, ideally set back 500 mm from the stem/buttress to allow for future growth and movement.
- Account should be taken of finished levels in relation to adjacent structures.

Depending on end use of surfacing:

- If the new surface is likely to be subjected to de-icing salt application, an impermeable barrier should be incorporated to prevent contamination of the root area with any run off directed away from the RPAs of retained trees.
- Where a permeable surface is to be used for vehicle movements, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.
- Where there is a risk of waterlogging, the design should incorporate appropriate land drainage. Any such drainage within the RPA should be designed to avoid damage to tree roots and the soil structure.

The above criteria will provide the conditions for continued tree survival and growth.

- 107 Site analysis of the soil type and its structural characteristics will be required prior to determining the specific depth of products to be adopted. For example, footpaths normally require depths up to 100mm and 150-200mm depths are used for residential driveways, whilst greater depths may be required for the passage of the heavier vehicles such as construction traffic.
- 108 The use of a three dimensional cellular confinement system within is an acceptable approach which aims to fulfil the above design criteria. This system maintains the passage of oxygen and water to root systems; avoids root loss through severance or asphyxiation and minimises the potential for soil compaction. It is achieved by using geotextile membranes and the introduction of the three dimensional cellular confinement system (CCS). The CCS is laid directly onto the unchanged soil levels within the RPA of retained trees.
- 109 Retained trees must first be protected during all stages of the development, including demolition, by the erection of barriers as specified on the tree survey and protection plan. Installation of surfacing may require the repositioning of the tree protection



- fencing to a secondary location as agreed with the project arboricultural consultant or as shown on the tree survey and protection plan.
- 110 If ground levels are to be raised more than 150mm within the RPA this should be achieved by the use of a granular material which does not inhibit vertical gaseous diffusion e.g. no fines gravel, washed aggregate, structural soil (min 20% sand content) or cobbles.
- 111 Ideally surfacing should be installed between May and October when the ground is driest and least prone to compaction. The approved wearing course is to be laid over the CCS. Where surfacing covers in excess of 20% of the RPA, or is wider than 3m within the RPA, the new surface should be constructed in a manner to permit infiltration of moisture and gaseous diffusion (pervious). Where the wearing course is in excess of 20% of the RPA or wider than 3m, a specially engineered low impact surface will need to be designed to meet the above criteria.
- 112 The effect of the CCS produces a composite mattress, with high flexural stiffness and load support capabilities. The angular infill material engages with the CCS in such a manner as to prevent significant soil compaction and rutting.
- 113 The use of a non-woven geotextile beneath the cellular mattress acts as a separation/filtration layer. The CCS should be filled with no-fines stone in the 20-40mm range. This operation will be carried out avoiding the use of heavy machinery within the exposed RPA of retained trees. Once filled, the perforated cellular wall structure provides mechanical interlock for infill materials, increasing the sheer strength while allowing lateral and vertical draining and gaseous exchange.
- 114 The system will be used as a permanent base for a wearing course and/or a temporary site access for root protection. The minimum thickness available for CCS material is 75mm and is available up to 300mm thickness; the material required is dependent on the load bearing capacity of the final surface. A structural engineer should design all engineering solutions for surfaces.
- 115 A pre commencement site meeting with the appointed demolition and/or ground works contractor, site manager, project arboricultural consultant, tree officer and appointed engineering consultant, will agree the stages and specification for the installation of the surfacing. The project arboricultural consultant will supervise any works within the RPAs of retained trees.
- 116 Stages for installation of surfacing;

Stage 1: Erection of tree protection fencing (refer to tree survey and protection plan);

Stage 2: Remove existing vegetation by using a specific herbicide (as advised by a specialist) or manually remove with hand tools only. Shrubs, saplings or trees, agreed for removal and located within the RPAs of retained trees, are to be cut to or just below ground level, rather than grubbed or ground out which can damage roots of retained trees;

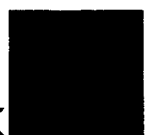
Stage 3: Remove existing hard surfaces. Machinery operating on existing surfaces or outside the RPAs and tree canopies could, under arboricultural supervision, be used to carefully remove existing wearing surfaces, however hand tools are preferable and should be used if possible. The sub base of existing surfaces or foundations should be left in situ where possible to avoid unnecessary root disturbance and provide a base for new surfacing (refer to relevant sections on removal of hard surfaces/demolition);

Stage 4: Install the non woven geotextile directly over soil grade level (levelled where necessary by the infill of no fines gravel, washed aggregate or structural soil) and fix in place;

Stage 5: Lay the CCS over the geotextile which is secured open under tension during the infill process with steel staples or wooden pegs;

Stage 6: Install curbs and edgings directly on top of existing soil grade level. For light structures a treated peg and board may be acceptable. For more substantial structures, railway sleepers, haunched concrete with road pins, drilled curb stones, gabions or cast in situ curbs will be appropriate;

Stage 7: Fill the CCS ensuring any plant or machinery work only on already filled areas. Typical infill consists of no fines angular granular material 20-40mm which will remain un-compacted;



Stage 8: install surfacing options:

Small block paving

- Lay a second layer of geotextile separation fabric over the infill CCS
- Lay a sharp sand bedding layer to recommended depth
- Place block pavers as per manufacturers' instructions

Washed gravel

- Lay a second layer of geotextile separation fabric over the infill CCS
- Place pea shingle/gravel to required depth

117 Further details, specifications and typical cross sections for CCS are contained in appendix seven of this report (courtesy of Geosynthetics).



Appendix one - Tree survey and classification in accordance with table one of BS5837

These tree survey notes have been guided by the recommendations of British Standard 5837:2012 and define the criteria for pre development tree surveys.

<p>Tree Number Tree numbers within the Tree Schedule relate to those marked on the Tree Constraints Plan and Tree Protection Plan drawings. Where specifically instructed small durable numbered metal tags have been applied to each tree surveyed.</p>	<p>compass (North, East, South, West) in order to achieve a representation of the crown shape which will be recorded on the accompanying tree protection plan. These provide a general guide to the outline of a tree / group crown but do not constitute tape measured dimensions. These would only be undertaken as part of a separately commissioned exercise where precise dimensions are critical to the project.</p>	<p>physiological condition is recorded as: Good / Fair / Poor / Dead Struct Cond An assessment of a tree / group's overall structural condition is recorded as: Good / Fair / Poor</p>
<p>Common Name Species of tree listed by common name</p>	<p>Cr Ci Height in metres of crown clearance above adjacent ground level. Where relevant to tree management the height of the first significant branch and direction of growth will be also be stated (e.g. 3S)</p>	<p>Rem Con Estimated remaining contribution in years (yrs) (<10, 10+, 20+, 40+)</p>
<p>Height Height assessments are estimated in metres. This will be adequate in most cases where accurate heights become a critical issue it will be necessary to return to site, as a separately commissioned exercise, to collect accurate measurements with the aid of optical instruments</p>	<p>Life stage An assessment of a tree / group's age class is made in terms of its site specific maturity as part of the surrounding landscape, taking into account its overall shape and form in that setting and is recorded thus: Y = Young / EM = Early mature / M = Mature / OM = Over-mature / V = Veteran</p>	<p>Est British Standard category grading (B or A to C) - see guidance extracted from BS5837:2012 on following page</p>
<p>Stem Dia Measurement of tree stem(s) in accordance with annex C of BS5837:2012. In the case of multiple stems the measurement quoted is that resulting from the appropriate calculation in line with annex C.</p>	<p>Phys Cond An assessment of a tree / group's overall</p>	<p>RPA Root protection area based on BS5837:2012 calculations and stated as Radius in metres (m) and Area in square metres (m²)</p>
<p>Branch Spread Radial crown spread assessments are estimated in metres from the centre of the trunk / group to each of the four primary points of the</p>	<p>Condition comments Date on the structural condition of the tree / group is provided, as appropriate, to give an indication of the visual appearance and any significant health and safety issues.</p>	<p>Management recommendations As per <i>British Standard 3998:2010 Tree Work - Recommendations</i></p>

Trees unsuitable for retention	
<p>Category U</p> <p>Those in such condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years</p>	<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 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 <p>Note: Category U trees can have existing or potential conservation value which it might be desirable to preserve.</p>
Trees to be considered for retention	
<p>Category A</p> <p>Trees of high quality with an estimated remaining life expectancy of at least 40 years.</p>	<p>Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features.</p> <p>Trees, groups or woodlands of significant conservation, historical, commemorative or other value (eg veteran trees or wood pasture).</p>
<p>Category B</p> <p>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.</p>	<p>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.</p> <p>Trees with material conservation or other cultural benefits.</p>
<p>Category C</p> <p>Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.</p>	<p>Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits.</p> <p>Trees with very limited conservation or other cultural benefits.</p>

Technical Arboriculture

Details shown in blue text relate to previous survey (please refer to paragraph 15 in main body of this report)

G2	Elm	6	0.17	3	Mature	Good	Good	<10	U	
Condition Comments Elm and buddlia. Management Recommendations Remove for sound arboricultural management reasons. To be retained at request of local planning authority										
G3	Elm	10	0.11	3	Mature	Good	Good	<10	U	
Condition Comments plus bramble and others. Elm likely to die of DED within 10 years. Management Recommendations Remove for sound arboricultural management reasons. To be retained at request of local planning authority										
G4	Elm	10	0.1	2	Mature	Good	Good	<10	U	
Condition Comments Remove for sound arboricultural management reasons. To be retained at request of local planning authority										
G5	Elm	6	0.17	1	Young	1	Good	10 to 20	C2	
Condition Comments hazel,elm. No special merit. Management Recommendations No work required at time of survey.										

G6	Hazel	6	0.1	1	1	Mature	1	Good	10 to 20	C2	
Condition Comments		Management Recommendations									
Hawthorn, hazel and dogwood.		Fell for development – access requirements.									
G7 (G10)	Ash	12	0.42	6N 5E 5S 4W	5	Mature	Poor	U	<10	5.1	81
Condition Comments		Management Recommendations									
Stems 300; 220; 200. Dead/dying. Major deadwood. Woodpecker holes.		Remove for sound arboricultural management reasons.									
G8 (G37)	Willow	6	0.07	1	1	Young	Good	Good	10 to 20	C2	
Condition Comments		Management Recommendations									
No special merit.		No work required at time of survey.									
G9 (G38)	Willow	6	0.2	1	1	Mature	Good	Good	10 to 20	C2	
Condition Comments		Management Recommendations									
		No work required at time of survey									
G10 (G39)	Willow	6	0.1	1	1	Mature	Good	Poor	10 to 20	C2	
Condition Comments		Management Recommendations									
		Coppice.									

T1/ G1	Hazel	8	0.27	6N 5E 4S 5W	1	Mature	Good	Fair	10 to 20	C2/U	3.3	30
Condition Comments												
Hazel coppice stool plus elm to E. On bank. Dense ivy. Ivy obscures. Elm likely to succumb to Dutch elm disease within 10 years.												
T2	Elm	10	0.25	4.5N 3E 4S 3W	2	Mature	Good	Good	<10	U	3	28
Condition Comments												
Stems 200, 150. Ivy clad. Dutch elm disease likely within 10yrs.												
T3	Ash	12	0.59	8N 7E 7S 4W	3	Mature	Good	Poor	<10	U	7.2	163
Condition Comments												
Stems 450;230;220;220. Located on raised bank with adjacent ditch to N side. Multi stemmed from 1m above ground level. Central stem removed forming decay pocket. Lower stem decay on NE side. Weak fork unions and extended laterals. Future potential for failure. Ivy clad. Climber. Previous pruning.												
T4	Ash	14	0.5	8N 5E 5S 5W	4	Mature	Good	Poor	<10	U	6	113
Condition Comments												
Stems 450; 220. Located on raised bank with adjacent ditch to N. Twin stemmed from stool of previously felled tree. Stool with internal decay forming hollow stem. Dense ivy cover.												
T5	Ash	14	0.28	4N 2E 4.5S 4.5W	4	Mature	Good	Good	<10	U	3.3	34
Condition Comments												
Stems 2 x 200. Located on raised bank with adjacent ditch to N. Stem from stool with x2 stems from 1.5m AGL. Suppressed and asymmetrical towards adjacent property due to T4. Poor quality. Ivy clad. Previous limb loss.												

T6 (T17)	oak	16	0.57	7N 7E 6S 7W	5	Mature	Good	Good	20-40	B2	RPA6.9	149.57
Condition Comments												
Stems 450; 350. Minor dead wood.												
T7 (T16)	Hawthorn	8	0.25	3N 3E 3S 3W	3	Mature	Good	Good	10 to 20	C2	RPA3	28.27
Condition Comments												
Ivy clad.												
T8 (T14)	oak	22	1.21	8N 6E 7S 8W	5	Mature	Good	Good	20-40	B2	RPA 14.7	679
Condition Comments												
Stems 720; 680; 710. Minor dead wood. Ivy clad.												
T9 (T8)	Ash	14	0.26	5N 2E 0.5S 3W	0	Mature	Poor	Poor	<10	U	3	28
Condition Comments												
Stems 240; 100. Declining. Dense ivy. Poor condition. Moderate dead wood.												
T10 (G9)	Ash	16	0.45	6N 4E 7S 6W	5	Mature	Fair	Poor	<10	U	5.4	92
Condition Comments												
Stems 300; 270; 200. Moderate dead wood. Ivy. Dieback												
T11 (T11)	oak	10	0.2	3N 3E 4S 2W	0	Mature	Good	Poor	10 to 20	C2	RPA2.4	18.1
Condition Comments												
Dense ivy. Poor form. Growing into crown of T12.												

T12 (T12)	oak	20	0.57	6N 5E 6S 7W	0	Mature	Good	Good	20-40	B2	RPA6.9	149.57
<p>Condition Comments Stems 450;350. Ivy. Epicormic growth. Dead wood. Bifurcates at 1m. Bifurcation obscured by epicormic growth. Preliminary grading.</p>												
T13	Willow	6	0.22	3N 4E 2S 3W	0	Mature	Good	Good	10 to 20	C2	RPA2.7	22.9
<p>Condition Comments No work required at time of survey</p>												
T14 (T18)	Ash	14	0.62	7N 6E 5S 5W	1	Mature	Good	Good	10 to 20	C2	RPA7.5	176.71
<p>Condition Comments Stems 500; 300; 220. Dense ivy and vegetation obscures. Minor dead wood.</p>												
T15 (T19)	Ash	16	0.44	5N 3.5E 5S 6W	3	Mature	Fair	Fair	10 to 20	C2	RPA5.4	91.61
<p>Condition Comments Stems 230;220;220;220. Base obscured by vegetation. dieback. dead wood. Ivy.</p>												
T16 (T20)	Willow	8	0.22	3N 3E 3S 5W	0	Mature	Good	Fair	10 to 20	C2	RPA2.7	22.9
<p>Condition Comments No special merit.</p>												

T17 (T21)	Ash	8	0.6	3N 3E 3S 3W	0.5	Mature	Good	Fair	20-40	C1	RPA7.2	162.86
Condition Comments Stems 450:400. Recently pollarded.												
Management Recommendations No work required at time of survey.												
T18 (T40)	oak	12	0.61	8N 7E 6S 7W	1	Mature	Good	Good	20-40	B3	RPA7.2	162.86
Condition Comments Stems 500:350. Dense ivy. Large burr at 1m. Limb descends into ditch to E.												
Management Recommendations Remove ivy.												



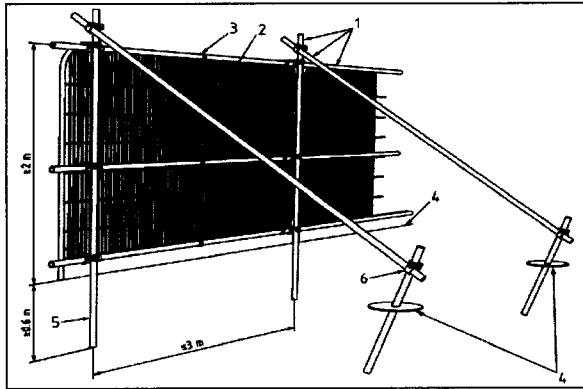
Appendix two - Tree survey and protection plan

PDF version – see separate PDF document supplied.



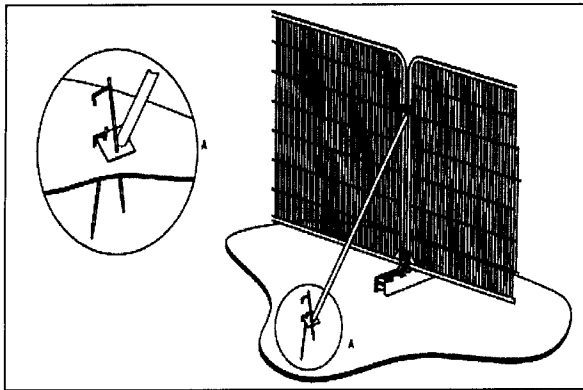
Appendix three – protective barriers

Default specification for protective barrier (from fig 2 BS5837:2012)



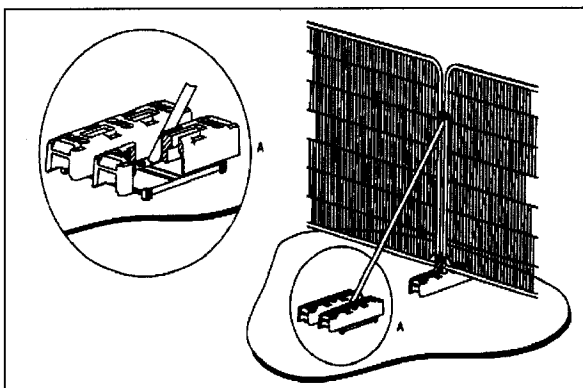
- 1 Standard scaffold poles.
- 2 Heavy gauge 2m tall galvanized tube and welded mesh infill panels.
- 3 Panels secured to uprights and cross members with wire ties.
- 4 Ground level.
- 5 Uprights driven into ground until secure (minimum depth 0.6m)
- 6 Standard scaffold clamps.

Examples of above-ground stabilization systems (from fig 3 BS5837:2012)



BS5837:2012 Figure 3a

Stabilizer strut with base plate secured with ground pins.



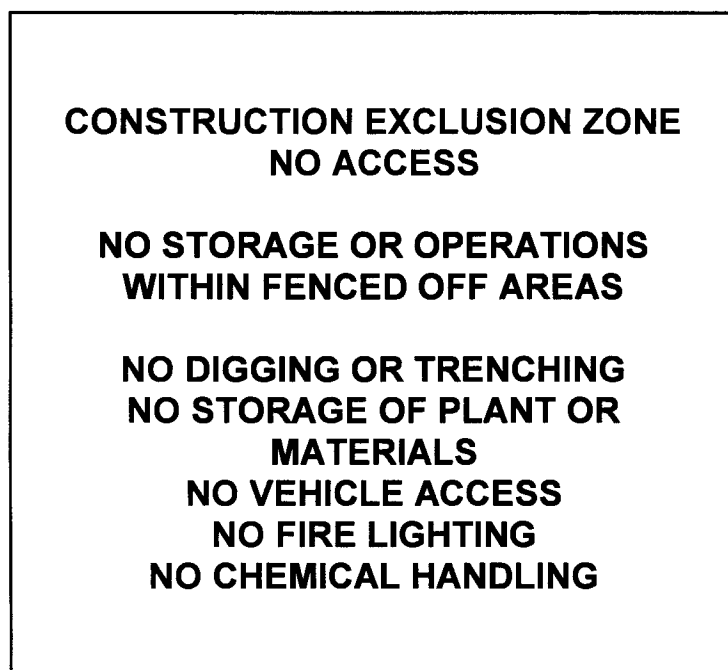
BS5837:2012 Figure 3b

Stabilizer strut mounted on block tray.

Failure to comply with these requirements could lead to enforcement action, including the issuing of a stop Notice, until the matter has been remedied. Where damage has occurred to legally protected trees, you may be liable for prosecution.

Appendix four - Site notices and additional information

Sites Notices on Fencing



Pre-printed laminated waterproof signs A3 in size should be fixed securely to fencing panels on each enclosure at 9 metre minimum intervals.

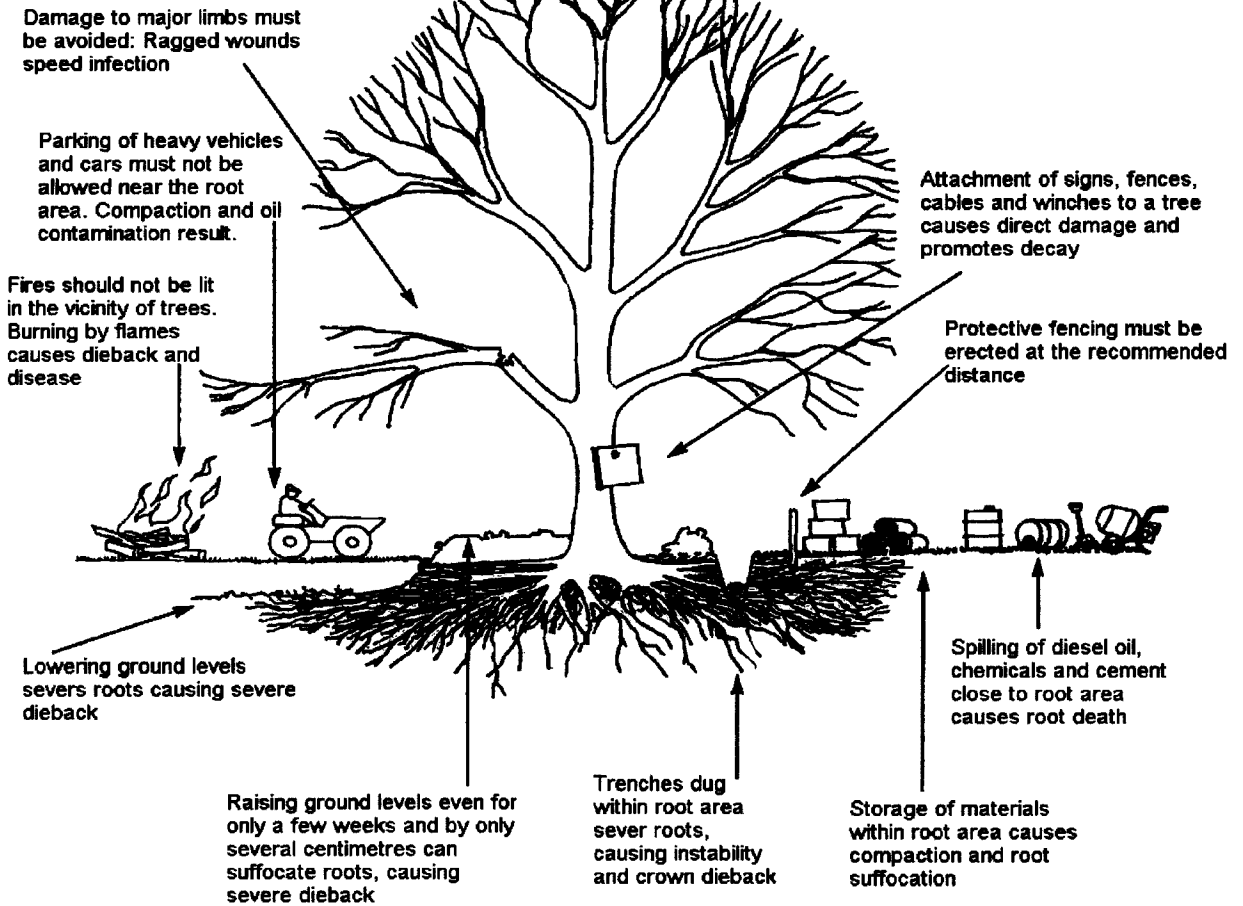
Construction and trees

Why is fencing erected around trees?

1. The major cause of damage to trees on construction sites is due to soil compaction.
2. Roots use the spaces between soil particles to obtain oxygen, water and nutrients.
3. Heavy plant and machinery compresses (compacts) the soil, squashing out the air spaces and preventing root function.
4. A compacted soil structure will stay compacted.
5. Consequently the tree suffers and will show signs of branch die-back.
6. Symptoms such as die-back may take several years to appear.
7. Soil compaction over roots can be prevented by maintaining a fenced exclusion zone over the tree roots.
8. The exclusion zone distance is calculated using British Standard 5837.
9. Protective fencing is installed at the calculated distance.
10. Protective fencing is a condition of planning approval, if it is removed or repositioned the construction firm is in breach of a condition and may be subjected to legal action.

Common causes of tree death

The use of properly positioned protective fencing can prevent tree deaths occurring.



Low impact surfacing – cellular confinement system



The 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™ offers an alternative to the traditional methods of constructing roadways and building foundations that involve excavation, which can result in tree root severance and soil compaction from the passage of vehicles. Such damage can severely influence tree health, and in extreme cases leads to death. CellWeb™ can be sensitively installed close to and under the canopies of trees without negative effects.

Trees are valuable landscape features and a vital environmental resource. Increasingly, contractors are being required to ensure the health and survival of trees during and beyond the construction period. Although this is enshrined in BS 5837: Trees in Relation to Construction: Recommendations (2005) and Tree Preservation Order legislation, it presents several issues when implementing construction projects near to trees:



- Destruction of soil structure and compaction due to the passage of heavy vehicles, restricting the flow of water and air to tree roots.



- Need for high-performance, cost-effective driveways and walkways in the vicinity of tree roots.



Potential loss of existing tree due to poor construction techniques.

The CellWeb™ system overcomes these issues and helps contractors to comply with tree health guidelines by creating a load-bearing base that is water-permeable, stable and durable.

With no need for excavation, the system is quick and easy to install, reducing construction time and saving costs and making it suitable for temporary and permanent solutions.



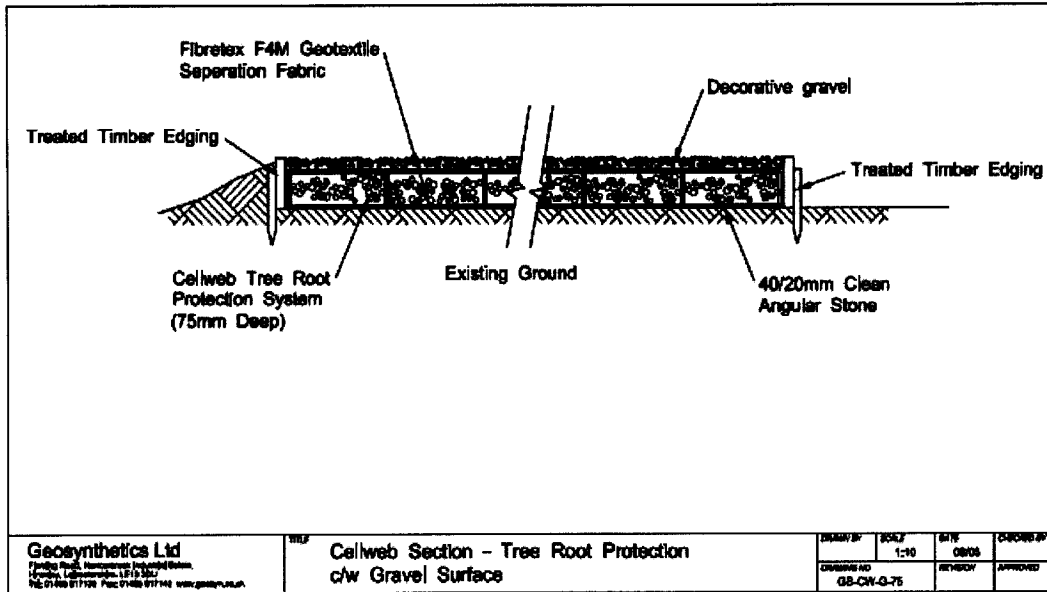
Glynebourne Wood.
Pedestrian path to recreational woodland built using a CellWeb™ foundation which was covered with DuoBlock and then filled with woodchip to create a porous surface.

Where a cellular confinement system is specified to protect the root protection area, this is available from:

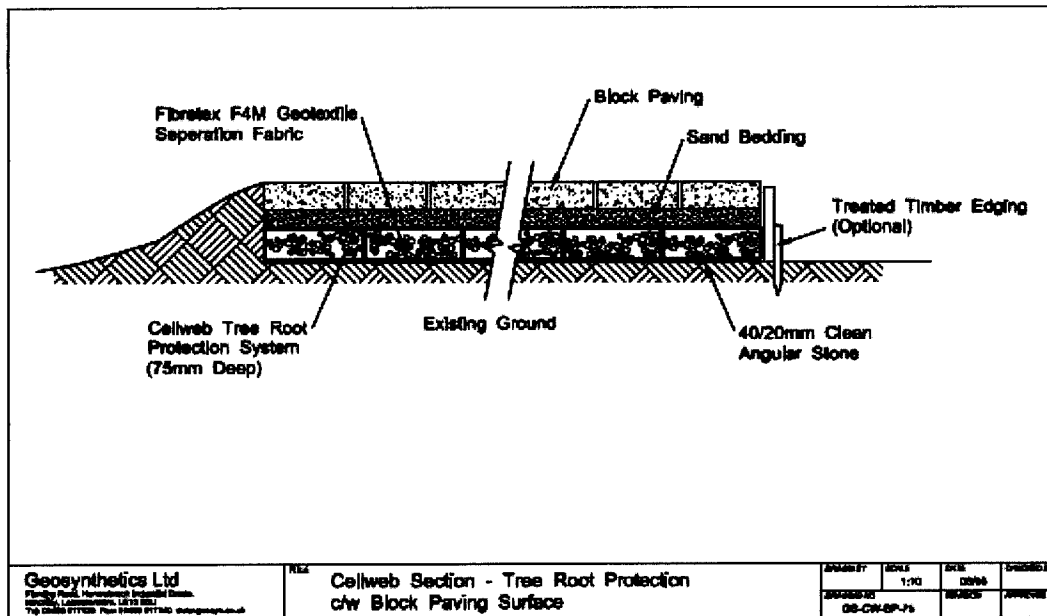
Geosynthetics Limited
Fleming Road
Harrowbrook Industrial Estate
Hinckley Leicestershire LE10 3DU
Tel: 01455 617139 Fax: 01455 617140
sales@geosyn.co.uk

Please note that alternate suppliers, materials and methods are available and that no endorsement of the above product is implied by providing the details shown.

Illustrative cross section of parking bay with decorative gravel wearing course



Illustrative cross section of parking bay with block wearing course



Note: Depth of Cellweb shown at 75mm. Actual final design depth dependent on end use of surface.

- Feasibility tree surveys
- Tree constraints reports and drawings
- Tree reports for planning
- Method statements to satisfy planning conditions
- Appeal statements and proofs
- Evidence at hearings and public enquiries
- Supervision and inspection of works
- Contract and project management
- Expert witness
- Tree risk assessment surveys
- TPO Review
- Local Government officer contracts
- Tree & woodland management programmes
- Protected species
- Habitat management plans



Technical Arboriculture

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Hampshire, SO32 1AZ

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**THE CHICHESTER DISTRICT COUNCIL (ACCESS TRACK OFF CROOKED LANE,
BIRDHAM) COMPULSORY PURCHASE ORDER 2023**

PROOF OF EVIDENCE OF SARAH POULTER

APPENDIX SP20:

**LETTER DATED 10 OCTOBER 2013 FROM ARBORICULTURAL
CONSULTANT**

Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950

Technical Arboriculture

Mr Phil Farminer
Drew Smith Group
Drew Smith House
Mill Court
The Sawmills
Durley
Hampshire
SO32 2EJ

Your reference Crooked Lane Birdham

Our reference Aia/ams-KC/DS/birdham/001 Rev D

10th October 2013

Dear Mr Farminer,

Location and potential impact of installation of services

Site Location: Crooked Lane Birdham West Sussex

Further to our telephone conversation of today, and the details supplied in your email of 9th October 2013, I herewith provide additional comment regarding installation of services, in proximity to retained trees, at the above site.

In making my comments I have been provided with the following information which was not available at the time of writing the arboricultural impact appraisal and method statement;

Annotated PDF file – water – drawing no. P113.

Annotated PDF file – electric – reference DXR156.

Annotated PDF file – gas main – drawn by Jamie Smith (no apparent reference)..

NJUG details – typical depths of services.

The drawings provided to me show the path of service runs to be located at the centre of the access track. This is considered the best routing for a number of reasons but, specifically with regard to retained trees, this offers a route furthest from individual stems and within the area of land made up as farm track.



General guidance on installation of utilities has been provided in the arboricultural method statement.

Trial excavations observed in the area of the track show there to be building waste, rubble and hard core to a depth of 300 – 400mm, points already noted in my arboricultural impact appraisal. Therefore I am of the opinion that excavations for utilities, following appropriate NJUG guidance (*National Joint Utilities Group Volume 4*) in relation to installation of services in proximity to trees, would not have an adverse effect on the retained trees.

I attach an extract of the guidance at the end of this document. This defines zones in relation to the tree crown in relation to the approach to installation of service runs. I have measured the distance of the centre of the track from a sample of retained trees and table the details below. Where multiple measurements are made I state the direction of measurement.

T1/HG1	3.22
T3	3.16
T4	2.8
T5	2.9
T6	3.16
T12	3.0
T8	5.3 N 8.5 NW 13.4 W

Notwithstanding the comments regarding the presence of rubble and building waste infill, it is recommended that work commences using an air spade or hand excavation, in accord with the NJUG guidance.

Should you have any further queries, or wish to discuss any details, please feel free to contact me on 01489 896655 or by email info@techarb.co.uk.

Yours sincerely,

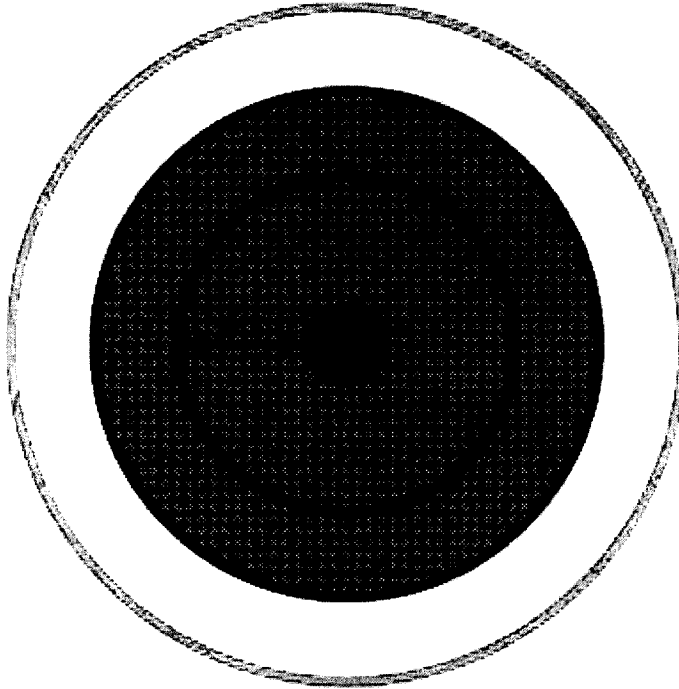


Kevin Cloud BSc (Hons), Tech Cert Arbor A, F Arbor A,
Cardiff Law School certified expert witness
Director and Principal Consultant



The National Joint Utilities Group

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2



TREE PROTECTION ZONE

Key to Diagram



Trunk of Tree



Spread of canopy or branches



PROHIBITED ZONE – 1m from trunk. Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



PRECAUTIONARY ZONE – 4 x tree circumference. Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



PERMITTED ZONE – outside of precautionary zone. Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.



PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

- Don't excavate within this zone.
- Don't use any form of mechanical plant within this zone
- Don't store materials, plant or equipment within this zone.
- Don't move plant or vehicles within this zone.
- Don't lean materials against, or chain plant to, the trunk.
- Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.
- Do protect any exposed roots uncovered within this zone with dry sacking.
- Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.
- Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

- Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.
- Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.
- Don't repeatedly move / use heavy mechanical plant except on hard standing.
- Don't store spoil or building material, including chemicals and fuels, within this zone.
- Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.
- Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.
- Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.
- Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

- Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.
- Do use caution if it is absolutely necessary to operate mechanical plant within this zone.
- Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.
- Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.
- Do notify the local authority tree officer or the tree's owner of any damage.



**THE CHICHESTER DISTRICT COUNCIL (ACCESS TRACK OFF CROOKED LANE,
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PROOF OF EVIDENCE OF SARAH POULTER

APPENDIX SP21:

SURFACE WATER DRAINAGE STRATEGY FOR 2013 APPLICATION

Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950

**15 NEW AFFORDABLE DWELLINGS -
FIELD NORTH WEST OF THE
SALTINGS CROOKED LANE
BIRDHAM WEST SUSSEX**

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SURFACE WATER DRAINAGE STRATEGY

The redevelopment of the site at land north of the Saltings falls within Flood Zone 1 of the National Planning Policy Framework (NPPF) – Development and Flood Risk framework; therefore according to Table 1 of the technical guidance to the NPPF all uses of land are appropriate for this site.

The site occupies an area of under 1 Ha, therefore according to the NPPF a formal flood risk assessment is not required to support the planning application, however a surface water drainage strategy has been proposed that aims to reduce the overall flood risk for the area through the introduction of sustainable drainage techniques.

The existing site is green field and is currently 100% permeable. A detailed site investigation report was carried out in august 2011 and as part of that study percolation tests were carried out. The results of the tests are scheduled below.

Falling Head Test Results					
Trial Hole/Depth of Borehole (m)	Test	Initial Water Level (m bgl)	Final Water Level (m bgl)	Time taken (mins)	Infiltration Rate (m/s)
TP1/3.00m bgl	1	0.58	0.79	240 mins	4.99x10 ⁻⁶ m/s
TP2/3.00m bgl	1	0.55	1.02	240 mins	8.39x10 ⁻⁶ m/s
TP3/3.00m bgl	1	0.65	1.04	240 mins	7.52x10 ⁻⁶ m/s

The current site is bounded by drainage ditches which have generally not been maintained over recent years.

The development of the site will result in an impermeable area of 850 m² in the form of buildings and 2300m² in the form of roads, footpaths and car parking.

Based on the results of the site investigation report, it is proposed that the houses will drain to traditional Trench soakaways which will be located a minimum of 5m away from any new or existing buildings. The house plan areas range from circa 50m² to 100m².

Preliminary soakaway calculations suggest that a soakaway of 3m x 2m x1.4m deep would drain a 70m² house, or equivalent paved area.

The access road will be drained using a permeable pavement, utilising shallow dig principles to protect the tree roots; this will also allow a natural drainage environment to be provided. The proposal includes the removal of approximately 300 - 400mm of impermeable compacted hardcore

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BIRDHAM WEST SUSSEX**


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which currently makes up the access road base. This will be replaced with Cellweb to spread loads over tree roots, with a permeable sub-base.

Since the ground conditions currently support infiltration, it is proposed that the new buildings and on site roads will be drained via new soakaways, subject to detailed design.

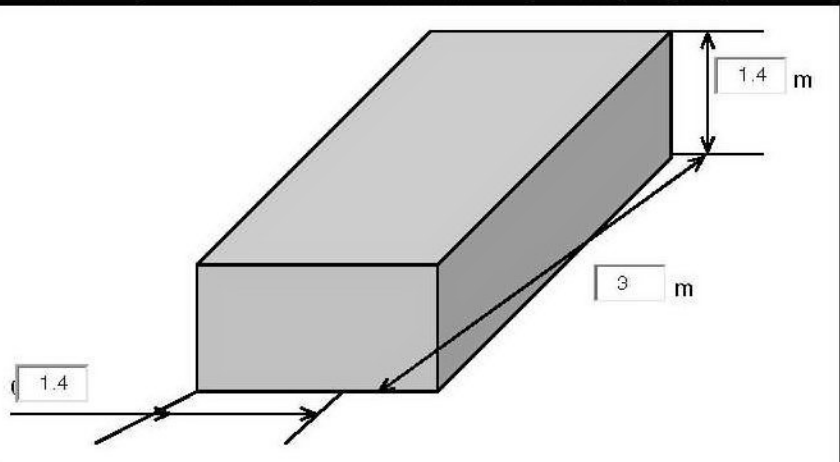
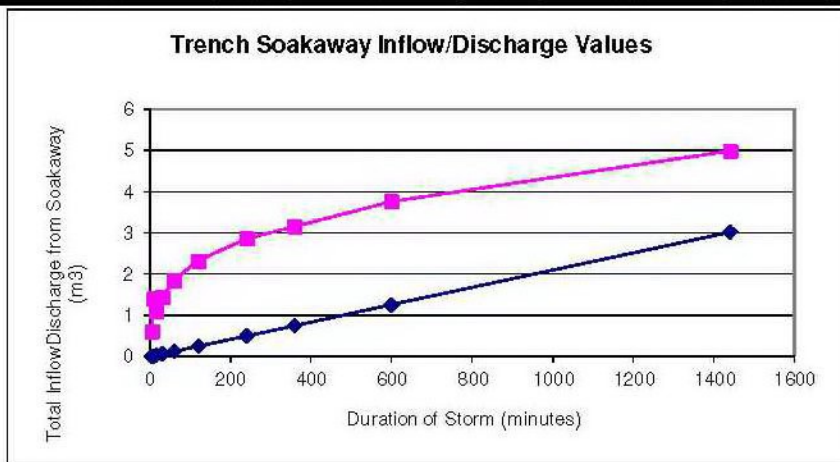
It can therefore be summarised that the development at land north of the Saltings is not at risk of flooding and will not increase flood risk elsewhere through the introduction source control measures. The proposals therefore meet the requirements of NPPF and the ICP for SUDS.



**Rob Wilson
Director**

Rectangular Soakaway design to BRE Digest 365

Upton McGougan Ltd Partnership House Moorside Road Winchester		Job no	136.0099	Date	25-Jul-13			Trench T1			
		job	Crooked Lane Birdham Preliminary Soakaway			Soakaway dimensions					
		Soakaway Properties									
Total Area drained=		75	m ²	Percentage of voids in fill=		30	%	Length= 3 m			
Soil infiltration rate=		4.99E-06	m ³ /s	Volume of trench=		8.4	m ³	Width= 2 m			
r=		0.3		Outflow Area (1/2 depth)=		7	m ²	Depth= 1.4 m			
				Trench Storage vol=		2.52	m ³				
Storm Duration minutes	Z1 mm	5 year Return mm	Z2 mm	10 year return mm	Inflow m ³	Discharge m ³	Storage Required m ³	Time taken	Soakaway Capacity	Storage 1/2 discharged within 24hrs?	
								for 1/2 vol Hours			
5	0.34	7	1.207	8.2	0.6	0.0	0.6	0.00000	Okay	Okay	
10	0.49	10	1.91	18.7	1.4	0.0	1.4	0.97729	Okay	Okay	
15	0.59	12	1.231	14.5	1.1	0.0	1.1	0.00000	Okay	Okay	
30	0.77	15	1.24	19.1	1.4	0.1	1.4	0.86941	Okay	Okay	
60	1	20	1.24	24.8	1.9	0.1	1.7	3.77145	Okay	Okay	
120	1.25	25	1.24	31.0	2.3	0.3	2.1	6.46932	Okay	Okay	
240	1.57	31	1.215	38.2	2.9	0.5	2.4	8.73658	Okay	Okay	
360	1.78	36	1.182	42.1	3.2	0.8	2.4	9.07344	Okay	Okay	
600	2.12	42	1.184	50.2	3.8	1.3	2.5	9.91376	Okay	Okay	
1440	2.84	57	1.17	66.5	5.0	3.0	2.0	5.61638	Okay	Okay	



**THE CHICHESTER DISTRICT COUNCIL (ACCESS TRACK OFF CROOKED LANE,
BIRDHAM) COMPULSORY PURCHASE ORDER 2023**

PROOF OF EVIDENCE OF SARAH POULTER

APPENDIX SP22:

EMAIL FROM RIDGE DATED 26 JULY 2024

Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950

Sarah Poulter

From: Chris Long <chrislong@ridge.co.uk>
Sent: 26 July 2024 10:11
To: John.Qualtrough
Cc: John Martin; Jake Wisniewski; Sarah Poulter
Subject: RE: Birdham public inquiry - attendance by Ridge [DJB_DMS-DJB-DMS.FID152212]
Attachments: Public Inquiry Tony Corkett Summary Speech FINAL.doc

This message originated from outside your organisation.

Hi John,

I have read through Tony Corkett's summary speech. It would be helpful to have his pack of information to check a few points.

Re an access of this nature in terms of width and shared use, I used a local example a few weeks ago at Itchenor to the west of Birdham.

There is an access into the Chichester Harbour Conservancy Car Park from The Street is a similar layout but it has grass verges on either side. It may be worth drawing the inspector's attention to this to show this approach is not unusual in the local area. The flows in and out of the car park would be substantially higher than the proposed residential development.



In terms of primary schools with accesses opposite, again not unusual across the UK. In Chichester, the Parklands Community Primary School on Durnford Close has a small residential estate opposite. Again, a good local example to quote to the inspector.

Kr

Chris Long
Partner
Ridge and Partners LLP
07392 316957
0117 244 2500
chrislong@ridge.co.uk



**THE CHICHESTER DISTRICT COUNCIL (ACCESS TRACK OFF CROOKED LANE,
BIRDHAM) COMPULSORY PURCHASE ORDER 2023**

PROOF OF EVIDENCE OF SARAH POULTER

APPENDIX SP23:

EXTRACTS FROM

**THE VALUE OF A SOCIAL TENANCY: UPDATING AND
DEVELOPING THE MODEL IN 2024 DATED MAY 2024**

BY SONNET ADVISORY & IMPACT CIC

Planning Inspectorate Reference: APP/PCU/CPOPF5540/3326950

Executive Summary

Social value

Throughout the report we talk about a range of social values in the context of economic value, preventative spending or additional value being brought to people and their communities by their housing situation being a social tenancy. As such, it should not be taken as referencing any specific or branded model for calculating social value as it is a term of widespread general use.

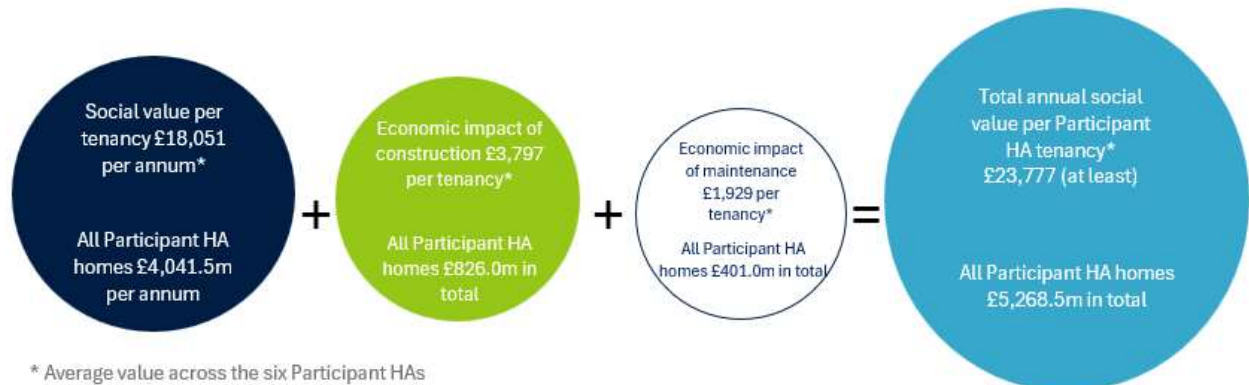
The new research shows that:

- Life has been tough for typical social tenants, but social housing has been a real safety net for many, not only in providing stability and support, but in giving them the opportunity to develop their own coping strategies, such as focusing on self-care and forming close relationships with neighbours.
- In contrast, literature and statistics have shown that those not living in social housing have found it particularly difficult, as they lack the benefits of living in a stable and affordable home, and don't benefit from the wider support that housing associations bring.
- Two significant new challenges have emerged since the 2018 study:
 - **In-work poverty:** whilst 'work should be a route out of poverty', uncertain employment, zero hours contracts and pay not keeping pace with inflation have countered that. All aspects of wellbeing have suffered.
 - **Digital exclusion:** for the least well-off, lack of access to digital communications where it is needed, and for some the ability to use it, is excluding people from access to support, public services, employment, money management, better priced goods and services, and much more. Social housing counters aspects of these problems, but much more needs to be done.
- A lack of social housing is likely to create skills shortages in key public and community service roles. Key services are at risk in some areas, because of a lack of key workers who are unable to afford to live where they work.
- More people are living in private rentals and temporary accommodation on a long term basis. This has huge negative impact on individual outcomes, including financial wellbeing, physical and mental health of both parents and their children, relationships and purpose, children's wellbeing, development and education, as well as Local Authority budgets.
- There is a real need for more supply for social housing to address these issues.

The Value of a Social Tenancy ("VoST") was published in 2018, with its valuation model updated annually. Based on in-depth research into the stories of social tenants at the Hyde Group, it compared three archetypal storylines for them, with the researched storylines for similar people not in social tenancies. It showed what aspects of social housing brought value, mapped the outcomes (changes) achieved once people became social tenants, and attached values to many of those outcomes from the perspectives of various stakeholders – public, private, and social.

In 2024, this research has been renewed and expanded, to now include a group of six housing associations with over 220,000 tenancies. The research re-examines those storylines and brings them up-to-date, post-COVID, and in the face of the cost-of-living

The profiles of social tenants have been updated to create three new archetypes: 'Thriving', 'Managing' and 'Struggling'. Their profiles have developed from the three from the 2018 study. With the changes in coping strategies and the benefit of stable housing, the 'Thriving' and 'Managing' groups have grown, whereas the 'Struggling' group are facing some very severe disadvantages. The value being delivered for each Social Tenancy has risen since the figures published for Hyde and MTVH, and others in 2022 (and 2018).



This is due to:

- the changed tenant stories, as a result of the new workshops and interviews
- the revision to the numbers of tenancies falling into each story
- the fall in outcomes for those not in social tenancies
- cost increases in temporary accommodation, problem debt, GP visits, etc.

This view does not reflect the benefit of improved digital inclusion as that would need more research.

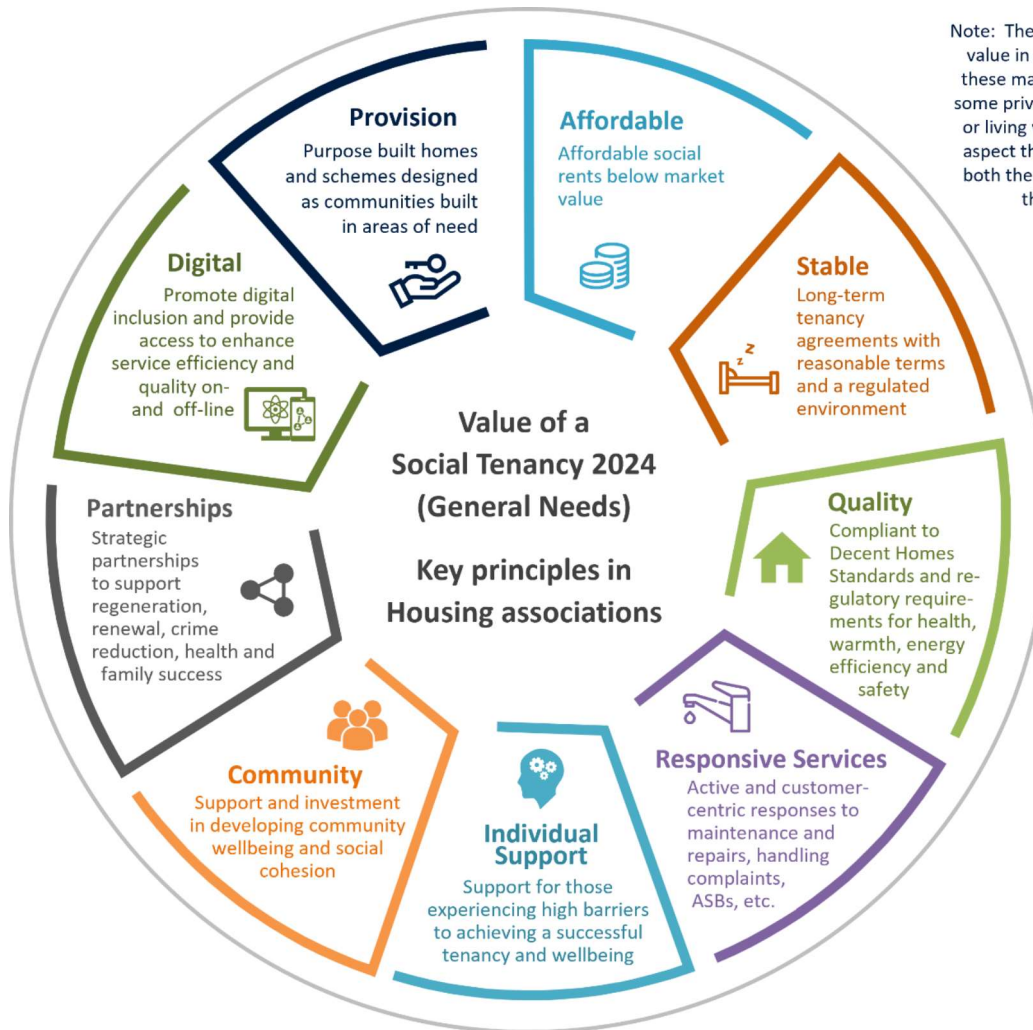
Based on the updated VoST model and what can be extrapolated from sampling six housing associations, the estimated total value being brought by the social housing sector of 4.2 million social properties (2.5 million owned by housing associations)¹ is at least £77.7 billion a year (or at least £46.3 billion for those properties owned by housing associations). This sits alongside the joint campaign by Shelter and the NHF that calls for the building of 90,000 social homes per year with a projected benefit of £32.6 billion in the first year with the economic impact of construction.²

¹ [Department for Levelling Up, Housing and Communities \(2024\). Social housing lettings in England, tenants: April 2022 to March 2023.](#) (all social housing)
[Department for Levelling Up, Housing and Communities \(2023\). English Housing Survey 2021 to 2022: social rented sector.](#) (housing association only)

² [Centre for Economics and Business Research \(2024\). The economic impact of building social housing: executive summary.](#)

Appendix F: VoST 2024 Theory of Change

Key principles in housing associations



Note: These are the factors that drive value in social tenancies. Some of these may be available to people in some private rented accommodation or living with friends and family, an aspect that is taken into account in both the outcomes framework and the evaluation itself.

Outcomes framework of a social tenancy

