LAND AT BURLEIGH LANE, CRAWLEY DOWN

ARBORICULTURAL IMPACT ASSESSMENT & METHOD STATEMENT

for

MERROW WOOD

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Revision:	
Ref:	PRI24810_aiaams

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1. Executive Summary

1.1. For the Arboricultural Method Statement see section 4.

1.2. The site is currently a yard bordered by existing housing developments to the north and west consisting of an open field to the western aspect of site, with a disused yard containing hard standing and various single-story structures within the centre and further open green space to the eastern aspect of site. The proposed development is a housing development of 48 units, with associated road infrastructure, play area and SUDs features.

1.3. This impact assessment is intended to evaluate the direct and indirect effects of the proposed design on the trees on site, and where necessary recommends mitigation.

1.4. The development proposals are in accordance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'. Adequate protection can be provided to ensure all retained trees are protected throughout development in the form of barriers and/or ground protection.

1.5. Given the number of trees on the site, the development proposals incorporate the majority of the better, more sustainable specimens.

1.6. All of the 'A' category trees are to be retained and protected throughout the development.

1.7. Two category 'B' trees and two category 'B' groups are to be removed as part of this development.

1.8. The majority of the trees proposed for removal are in the lower two categories, 'C' and 'U', and are not of a quality that should represent any constraint to development.

1.9. Where proposed new hard surfaces encroach into the RPA of trees highlighted for retention, sensitive surface construction will be required.

1.10. Number of trees to be removed as a direct result of the current design (see section 4 for details):

BS Category	Number of individual trees	Tree Groups
U	3	~
A	~	~
B	2	2
C	12	2

1.11. The Arboricultural Method Statement (AMS) has been compiled in conjunction with the Tree Protection Plan (TPP) for the purpose of feasibility and planning, as per Figure 1 of BS5837:2012. These detail any mitigation which will be necessary to ensure the protection of retained trees throughout the development.

2. Introduction

2.1. ACD Environmental was instructed in February 2025 to prepare the following Arboricultural Impact Assessment and Method Statement by Merrow Wood. Reference should be made to the appended Tree Protection Plan (PRI24810-03).

2.2. This Method Statement is to be made available to all operatives on site during the construction process, so that they understand the scope and importance of the measures set out for tree protection. Implementation of the protection methods and other details within this report are integral to ensuring protection for the retained trees.

2.3. For details of trees to be retained, and locations and types of special protection methods, reference should be made to the latest revision of Tree Protection Plan (ref: PRI24810-03), which should be displayed prominently on site for all staff to see.

2.4. To ensure accuracy and avoid future costly adjustments, the Tree Protection Fence must be set out by a surveyor/engineer with all node points being marked clearly on site for the fencing contractor to work to. The AutoCAD version of the Tree Protection Plan is available on request.

2.5. This report is based on the recommendations given in BS5837:2012 ‘Trees in relation to design, demolition and construction – Recommendations’.

2.6. The controlling authority is Mid Sussex District Council who can be contacted at:
Email: servicesupport@midsussex.gov.uk
Phone: 01444458166

2.7. According to a search on Mid Sussex District Councils online mapping service on the 24th of March 2025, there a no Tree Preservation Orders (TPO) on or affecting the site, nor is the site within a Conservation Area.

2.8. Any questions relating to the content of this report should be directed in the first instance to: ACD Environmental, Unit 7, Godalming Business Centre, Woolsack Way, Godalming, GU7 1XW, 01483 425714, quoting the site address and report reference number.

2.9. The following abbreviations have been used throughout this document:

- Root Protection Area – RPA.
- Construction Exclusion Zone – CEZ.
- Tree Protection Plan – TPP.
- Tree Protection Fencing – TPF.

3. Arboricultural Impact Assessment

3.1. The site is currently a yard bordered by existing housing developments to the north and west consisting of an open field to the western aspect of site, with a disused yard containing hard standing and various single-story structures within the centre and further open green space to the eastern aspect of site. The proposed development is a housing development of 48 units, with associated road infrastructure, play area and SUDs features.

3.2. This impact assessment is intended to evaluate the direct and indirect impacts on the trees on the site in relation to the proposed development. Any potential tree impacts are identified as per BS5837:2012 section 5.4, and details are given of proposed mitigation.

3.3. Any potentially damaging activities proposed in the vicinity of retained trees are identified, such that mitigation to significantly reduce or avoid this impact can be detailed in the Arboricultural Method Statement and Tree Protection Plan as recommended in BS5837:2012 section 5.4.2.

3.4. The development proposals are in accordance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'. Adequate protection can be provided to ensure all retained trees are protected throughout the development.

3.5. The tree survey for the site is at Appendix 2 of the Tree Report for the site ACD reference PRI24810ts.

3.6. This assessment is based upon the supplied layout drawing by Fluid Architects ref. FL24-2191-064.

3.7. Evaluation of impact of proposed tree losses

Table 1: Trees to be removed as a direct consequence of development

BS Category	Number of individual trees	Tree Groups
U	3	~
A	~	~
B	2	2
C	12	2

3.7.1. Those trees which are to be removed are shown with a red dashed canopy outline, and a dashed emblem around the trunk on the Tree Protection Plan ACD reference PRI24810-03.

3.7.2. T10, T12, G20, T32, G33, T34, T35, T36, T38, T46, T47, T48, T49, T50, G54, T55, G57, T58, T59, T61 & T66 are to be removed as a result of the development proposals.

3.7.3. The majority of the trees proposed for removal are in the lower two categories, 'C' and 'U', and are not of a quality that should represent any constraint to development.

3.7.4. The development would involve the removal of trees G54, T55, G57 and T58, which are B Category trees. However, these are all located in the interior of the site and, as such, their removal is not detrimental to the landscape. Further to this, all these trees comprise of a linear group, mostly consisting of Norway Spruce. Due to the proposals and the potential change in wind loading as such, these trees are considered unsuitable for retention within a residential environment"

3.7.5. The aforementioned 'B' category trees to be removed as a result of the layout design. It is acknowledged that the trees have value in their current location. Given the comprehensive redevelopment proposed, their retention is not feasible, and attempting to incorporate the trees into the design would be likely to result in an awkward layout design. It is judged to be acceptable to remove and provide replacement trees as illustrated on the layout.

3.7.6. In relation to the conception and design of development proposals, BS5837:2012 section 5.1.1 states: The constraints imposed by trees, both above and below ground should inform the site layout design, although it is recognised that the competing needs of development mean that trees are only one factor requiring consideration. Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal.

3.7.7. It is therefore deemed acceptable to remove the listed trees and, as part of the detailed landscape design for the scheme, include suitable and sustainable replacements as and where appropriate.

3.7.8. Replacement trees will be proposed through landscape design and will more than mitigate for their removal by providing robust long term tree cover in keeping with the proposal and surrounding properties.

3.8. Trees to be pruned

At this time the following tree surgery works are proposed.

Tree number	Species	Operation
G6	Various	Prune section as shown on the Tree Protection Plan.
G45	Various	Remove section as shown on the Tree Protection Plan, and grind resulting stumps.
G53	Various	Prune section as shown on the Tree Protection Plan.
G60	Austrian Pine	Remove all dead and cracked/split branches on western aspect of group.

3.9. Protection for retained trees

3.9.1. BS5837:2012 section 6.2.1. states: 'All trees that are being retained on site should be protected by barriers and/or ground protection (see 5.5) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone. A specification for protective fencing is given on the Tree Protection Plan. This consists of interlocking weld-mesh panels (e.g., Heras) well braced by attachment to scaffold pole uprights driven firmly into the ground. Should any alternative method of barrier construction be proposed the design should be approved by the local planning authority.'

3.9.2. A 0.5m off-set has been allowed for working room between visitor parking bay and T64, and a footpath connection adjacent to T67. This results in an incursion into the RPA of T64 of 2.5%, and an incursion of 2.2% for T67. This is unlikely to have any impact on either tree. However, in accordance with BS5837:2012 section 5.3.1 a), the area lost to encroachment is compensated for elsewhere by the tree protection fence.

3.10. Ground protection

3.10.1. Within the eastern sections for the RPAs of T3, T4 & T5, space is required to construct buildings. Potential damage cause by foot traffic and associated works can be mitigated by the use of ground protection as specified in BS5837:2012 section 6.2.3. To ensure the ongoing survival of the retained trees, this is detailed in the Arboricultural Method Statement and indicated on the Tree Protection Plan where required.

3.11. Demolition & Groundworks

3.11.1. To ensure damage does not occur to trees highlighted for retention, tree protection fencing must be erected prior to ANY plant machinery entering site whatsoever.

3.11.2. The existing structure northwest of T31, will require to be demolished in a sensitive manner. Tree Protection Fencing should be applied prior to the demolition works and only be removed in part prior to the demolition of this structure, ensuring adequate fencing is remains erected to protect the tree from the works.

3.12. New Hard Surfaces within RPAs

3.12.1. The construction of new permanent hard surfacing adjacent to plot 7 encroaches slightly into the RPA of T4. This encroachment is considered marginal (0.7% of the advised sq/m) and will not be to the detriment of the trees. Therefore, special construction measures or adjustment of the plans are NOT required, the area will however be excavated sensitively to achieve the desired working level.

3.12.2. The ground level adjacent to T29 is already made up of hard standing, however this is to be resurfaced with a more suitable finish associated with a residential development. Therefore, the existing surface is to be removed sensitively, with the existing levels underneath being utilised to protect any potential underlying roots. Prior to the application of the finished surface once the existing surface has been removed, the area will be protected by ground protection.

3.12.3. In order to minimise impact on the trees where the proposed footpath near the northern central section of the site encroaches into the RPAs of trees T39 & T40, sensitive surface construction will be required in the form of a no-dig surface. It is anticipated that using no dig surface means that installation of permanent hard surface in this area is unlikely to cause significant adverse impact on the trees to be retained.

3.12.4. As per the recommendation of BS5837:2012 section 7.4.2.3, the new permanent hard surfacing does not exceed 20% of any existing unsurfaced ground within the RPA.

3.12.5. To avoid root damage, a no-dig approach must be taken, limiting the impact on the trees:

3.12.6. The use of a three-dimensional cellular confinement system, such as 'Cellweb' 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 laying a Geotextile membrane directly onto unchanged soil levels, with a three-dimensional cellular confinement system ('Cellweb') laid on top filled with no fines granular fill, with a porous finishing surface. See specification on Tree Protection Plan (PRI24810-03).

3.12.7. Retained trees must first be protected during all stages of the development including demolition, by the erection of fencing as specified on the Tree Protection Plan (TPP). Installing the surface may require the re-positioning of the tree protection fencing to a secondary location in line with and associated method statement.

3.12.8. The area must be protected during all stages of the development including demolition, by ensuring the surface is installed, with a sacrificial tarmac surface (or trackway) if required, prior to any construction or demolition traffic entering the site.

3.12.9. The Arboricultural Method Statement describes installation of a typical no-dig surface. This follows the recommendations set out in Section 7.4 of British Standard 5837:2012. The author of this report is not an engineer and therefore detailed engineering design, and analysis must be carried out by a suitably qualified engineer. However, any design must be approved for use by the project arboriculturist.

3.12.10. Where the proposed roads encroach into the RPAs of T11, T14 & G60 sensitive excavations will be required to construct the road. This should be undertaken under direct supervision from the project arboriculturist.

3.13. Construction within RPAs

3.13.1. It is confirmed that there is no construction proposed within the RPAs of retained trees.

3.14. Services

3.14.1. It is fundamental to tree protection that infrastructure design is sensitively approached, as trenching close to trees may damage roots and affect tree health and stability. Details of services have not been provided at the time of writing. The Tree Protection Plan, showing the constraints posed by retained trees will be passed to the infrastructure engineers to inform their design, ensuring that all services avoid areas of potential conflict. As per BS5837:2012 Figure 1, once further details become available as part of the detailed/technical design for the site, the TPP and AMS will be revised to incorporate these details for services for inclusion in the Tender documentation.

3.15. Levels & Landscaping

3.15.1. Full details of all changes in ground levels on site remain to be finalised. Any alterations to levels close to trees may damage roots and affect tree health and stability. Unless no-dig methodology is proposed for installation of surfaces within RPAs the original levels in these areas must be noted, retained, and integrated into the engineering design of the site. Landscaping operations within the RPAs of retained trees must be carried out in a sensitive manner and be subject to a detailed method statement and arboricultural supervision.

3.16. Boundaries

3.16.1. All plot boundaries will need to be designed, positioned and installed to avoid damage to retained trees. When within RPAs, this will include hand excavation of all post holes, and the lining of any post holes with a non-porous membrane to stop leachates from the concrete damaging tree roots.

3.17. Supervision & Monitoring

3.17.1. The development process should be subject to arboricultural supervision and monitoring, especially areas where incursion into the RPA of retained trees is required. Therefore, a pre-commencement site meeting is advised. Supervision is recommended during the installation of all special details, such as no-dig surfaces and sensitive excavations. This should be detailed in the approved method statement and to provide comfort to the LPA, they are invited to include a planning condition to support this.

4. Arboricultural Method Statement

TO BE READ IN CONJUNCTION WITH THE APPENDED TREE PROTECTION PLAN REFERENCE: PRI24810-03

4.1. Phasing of operations for tree protection

4.1.1. Implementation of tree protection measures on the site must be carried out in the following order:

1) Tree removals and tree surgery.
2) Line of tree protection fence to be set out to node points by surveyor.
3) Accurate erection of tree protection fence and ground protection.
4) **Pre-commencement site meeting with project arboriculturist, Local Authority Tree Officer, site manager and groundworkers.**
5) Site accessible to construction/demolition traffic.
6) Demolition/site clearance.
7) Construction.
8) Removal of tree protection fencing.
9) Remedial tree surgery (if required).

4.1.2. The above phasing must not be changed without approval from the project arboriculturist and agreement with the Council.

4.2. Site supervision

4.2.1. The development process will be subject to arboricultural supervision where construction work inside the construction exclusion zone is required, and for the installation of any special detail (e.g., no-dig surface). Therefore, input and supervision from the project arboriculturist will be required at the following stages:

1) Tree removals and access facilitation pruning.
2) Accurate erection of tree protection measures.
3) Site meeting with project arboriculturist, Local Authority Tree Officer, site manager and groundworkers.
4) Installation of no-dig surfacing
5) Surface removal/excavation works within RPAs
6) Demolition/site clearance.

4.2.2. Arboricultural supervision is to be carried out at all crucial stages throughout the development process to ensure detailed tasks are carried out as per the approved methodology, and during any other, unplanned incursions into protection areas, for whatever reason.

4.2.3. This supervision will require the arboriculturist to be present throughout the task, to ensure all the arboricultural objectives are met.

4.2.4. If the task is to take a long period of time, provided the arboriculturist is satisfied, and after an initial ‘tool-box talk’, the supervision may be reduced to telephone contact between the site foreman/contractor and arboriculturist.

4.3. Restrictions within tree protection areas

4.3.1. Inside the exclusion area of the 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 arboriculturist.
- No lowering of levels for any purpose (except removal of grass sward using hand tools).
- No storage of plant or materials.
- No storage or handling of any chemical including cement washings.
- No vehicular access.
- No fire lighting.

4.3.2. In addition to the above, further precautions are necessary adjacent to trees:

- No substances injurious to tree health, including fuels, oil, bitumen, cement (including cement washings), builders sand, concrete mixing and other chemicals shall be stored or used within or directly adjacent to the protection area of retained trees.
- No fire shall be lit such that flames come within 5m of tree foliage.

4.4. Avoiding damage to stems and branches

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

4.4.2. 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 at all times maintained. In some circumstances, it may be impossible to achieve this without pruning works known as ‘access facilitation pruning’.

4.4.3. Access facilitation pruning shall be kept to the barest minimum necessary to facilitate development and shall be carried out in strict accordance with the guidance below (Tree Surgery). Under no circumstances shall construction personnel undertake any tree pruning operations.

4.5. Tree protection fencing

4.5.1. The Tree Protection Plan (see the latest revision of: PRI24810-03) shows the alignment of Tree Protection Fencing (TPF), which is to be installed prior to any of the following taking place:

- Demolition.
- Plant and material delivery.
- Soil stripping.
- Utility installation.
- Construction works.
- Landscaping.

4.5.2. Stages for installation of TPF:

1) Hand clearance of any vegetation to allow clear working access.
2) Setting out of fencing points.
3) Fencing erected.
4) Site accessible to demolition/construction traffic.

4.5.3. To ensure accuracy and avoid future costly adjustments, the Tree Protection Fence must be set out by a surveyor with all node points being marked clearly on site for the fencing contractor to work to.

4.5.4. Once erected, all TPF will be regarded as sacrosanct, and will not be removed or altered without prior recommendation by the project arboriculturist and approval of the local planning authority.

4.5.5. In certain areas of the site, temporary positioning of fencing will be required. These are only to be moved to the permanent position immediately prior to the commencement of the associated works e.g. installation of no-dig surfacing.

4.5.6. The typical TPF construction is suitable for areas of high intensity development, and shall comprise of interlocking weld-mesh panels, well braced to resist impacts by attachment to a scaffold framework that is set firmly into the ground. A detailed specification can be found on the TPP.

4.5.7. Should any alternative method of barrier construction be proposed, consultation with the project arboriculturist will be obtained to clarify the efficacy of the revised design prior to informing the local planning authority and obtaining their consent.

4.5.8. Once the exclusion zone has been protected by barriers and/or ground protection, construction work can commence.

4.5.9. All weather notices should be erected on the barriers (for example see figure below).

Figure 1: Tree Protection Sign (digital copies available for download at: www.acdenvironmental.co.uk)

4.6. Site storage, parking, welfare facilities

4.6.1. The site will require provision for; site storage, contractor parking, welfare facilities, temporary services/drainage, material drop of points, etc.

4.6.2. No details of these provisions are available at the time of writing of this report.

4.6.3. None of the above provisions will be sited within RPAs of retained trees without the input or the project arboriculturist and the consent of the Local Authority.

4.7. Ground protection

4.7.1. The specification for Ground Protection is shown on the Tree Protection Plan. Any alternative specification to be installed must be capable of supporting the expected loads and avoiding rutting, compaction and damage to the soil. As advised in BS5837:2012 section 6.2.3:

4.7.2. New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil. The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g., 100 mm depth of woodchip), laid onto a geotextile membrane:

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g., 150 mm depth of woodchip), laid onto a geotextile membrane:

c) for wheeled or tracked construction traffic 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 arboricultural advice, to accommodate the likely loading to which it will be subjected.

4.7.3. Stages for ground protection installation[1]:

<u>No plant machinery to be used in the area of ground protection for whatever reason</u>

1) Discuss procedure with project arboriculturist.
2) Dismantle primary TPF and re-erect in secondary location as shown on TPP.
3) Any shrubs, saplings or trees to be removed, are to be cut, or ground out to just below ground level rather than grubbed or winched out, which can damage roots of retained trees.
4) Lay woven geotextile over existing ground surface by hand.
5) Cover the area with compressible layer, woodchip for example, using hand tools only.
6) Cover compressible layer with side butting scaffold boards or plywood boards.
7) Confirm surface is acceptable for use with project arboriculturist.
8) Area ready for construction access.

4.7.4. To ensure accuracy and avoid future costly adjustments, the Ground Protection must be set out by a surveyor with all node points being marked clearly on site for the fencing contractor to work to.

4.7.5. There is to be no-excavation within ground protection area whatsoever. This includes installation of services and associated utilities.

[1]For protection from foot traffic only

4.8. Tree surgery and removal

4.8.1. Those trees which are to be removed are shown with a red dashed canopy outline, and a dashed emblem around the trunk on the Tree Protection Plan ACD reference PRI24810-03.

4.8.2. The following surgery works are to be carried out:

Tree number	Species	Operation
G6	Various	Prune section as shown on the Tree Protection Plan.
T10	Sycamore	Remove and grind resulting stump.
T12	Common Oak	Remove and grind resulting stump.
G20	Common Oak	Remove and grind resulting stumps.
T32	Ash	Remove and grind resulting stump.
G33	Willow	Remove and grind resulting stumps.
T36	Willow	Remove and grind resulting stump.
T38	Common Oak	Remove and grind resulting stump.
G45	Various	Remove section as shown on the Tree Protection Plan, and grind resulting stumps.
T46	Common Oak	Remove and grind resulting stump.
T47	Apple	Remove and grind resulting stump.
T48	Apple	Remove and grind resulting stump.
T49	Apple	Remove and grind resulting stump.
T50	Apple	Remove and grind resulting stump.
G53	Various	Prune section as shown on the Tree Protection Plan.
G54	Common Oak, Norway Spruce	Remove and grind resulting stumps.
T55	Norway Spruce	Remove and grind resulting stump.
G57	Norway Spruce	Remove and grind resulting stumps.
T58	Common Oak	Remove and grind resulting stump.
T59	Common Oak	Remove and grind resulting stump.
G60	Austrian Pine	Remove all dead and cracked/split branches on western aspect of group.
T61	Austrian Pine	Remove and grind resulting stump.
T66	Willow	Remove and grind resulting stump.

4.8.3. All trees to be removed are indicated on the Tree Protection Plan.

4.8.4. If any further tree surgery works are required, a proposed specification will be submitted to, and approved by the Local Planning Authority before any works are carried out.

4.8.5. All work will be carried out in accordance with BS 3998:2010 Recommendations for Tree Work, industry best practice and in line with any works already agreed with the Council.

4.8.6. The tree surgery contractor is responsible for carrying out any relevant health and safety risk assessment, and insurance, prior to any work being carried out.

4.8.7. The statutory protection afforded by the Wildlife and Countryside Act and Countryside and Rights of Way Act will be adhered to. If further advice is required, particularly if bats are discovered during tree work, it will be obtained from Natural England or other competent persons and recommendations adhered to.

4.8.8. The stumps of any trees removed from within the Construction Exclusion Zone or the RPAs of retained trees will be either; cut flush to ground level and left in situ or ground out using a stump grinder. They will not be winched out.

4.8.9. All operations shall be carefully carried out to avoid damage to the trees being treated or neighbouring trees. No trees to be retained shall be used for anchorage or winching purposes.

4.9. Soft landscaping within RPA

4.9.1. All landscaping and associated ground preparation within exclusion zones 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 any protected area. Removal of existing vegetation will be carried out by hand; turf may be removed using a mechanical turf stripper or by hand.

4.10. Turfing

4.10.1. Stages for turfing gardens and open spaces:

No plant machinery[2] to be used in the area for whatever reason

1) Remove TPF to allow access to area.
2) Do not reduce any high spots or excavate in any way.
3) Existing poor-quality turf may be removed with a turf stripper.
4) Use good quality topsoil to level any low-lying areas and hollows and provide a fine tilth to lay turf on. This imported soil must not result in a level increase of more than 100mm in any area.
5) Import turves by hand in wheelbarrow.
6) Lay turves.

4.11. Planting

4.11.1. 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 arboriculturist.

4.11.2. Stages for planting within tree protection areas:

No plant machinery to be used in the area for whatever reason

1) Remove TPF to allow access to area.
2) Remove existing vegetation by hand, turf may be removed using a mechanical turf stripper.
3) Do not reduce any high spots or excavate in any way.
4) Import good quality topsoil by hand (with wheelbarrow) into area.
5) Level to a depth of no more than 100mm with hand tools.
6) Dig individual planting pits for each plant by hand (including hedging which must not be trench planted).
7) Any mulch should also be imported and spread by hand.

4.11.3. No works will be carried out within any protected areas if the soil moisture is of a level likely to allow compaction to occur.

[2] Including rotovators

4.12. Demolition close to trees

4.12.1. All TPF to be installed as per approved Tree Protection Plan prior to any plant arriving on site.

4.12.2. Sensitive demolition will occur under supervision from the project arboriculturist.

4.12.3. Stages for demolition within tree protection areas:

No plant machinery to be sited on any exposed rooting area

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Dismantle any fencing to allow work to proceed.
3) Buildings to be folded in on themselves.
4) Removal debris by hand or with plant machinery not located on any exposed rooting area.
5) Floor to be broken up with had held breaker and pieces removed by hand. Slab floor can be lifted carefully by machinery if appropriate.
6) Underlying ground levels to be retained. No excavation to occur.
7) Any exposed roots and surrounding newly exposed areas to be covered with up to 100mm of topsoil, from elsewhere on site, or imported topsoil (to BS3882:1984). Soil may be placed in area by plant but must be spread by hand.
8) Tree protection fencing to be erected in final position as shown on plan.

4.12.4. No reduction in levels of the underlying soil surface will occur.

4.12.5. At no point are any heavy machinery permitted within the RPA.

4.12.6. Contamination of the soil by fuel and lubricant leaks must be avoided at all costs. If such a situation arises the project arboriculturist must be notified to assess the situation and prescribe remedial measures.

4.13. Hard surface removal

4.13.1. No hard surface removal within RPAs will occur without arboricultural supervision.

4.13.2. Stages for hard surface removal within tree protection areas:

No plant machinery to be sited on any exposed rooting area

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Dismantle fencing as required to access area.
3) Plant machinery to run only on existing hard surfaces with consent from arboriculturist.
4) Plant may be used to carefully peal up existing tarmac and concrete.
5) Other surfaces are to be removed by hand (paving etc.).
6) Where any subbase is not likely to contain roots, and only on approval from project arboriculturist, it may also be carefully removed.
7) Underlying ground levels to be retained. No excavation to occur.
8) Any exposed roots[3] and surrounding newly exposed areas to be covered with up to 100mm of topsoil, from elsewhere on site, or imported topsoil (to BS3882:1984). Soil may be placed in area by plant but must be spread by hand.
9) Tree protection fencing to be erected in final position as shown on plan.

4.13.3. 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.

4.13.4. 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.

[3]Should any roots over 25mm diameter, have grown above the final soil level and be a hindrance to any new surface installation, their removal will only be carried out under arboricultural supervision and with the approval of the LPA.

4.14. Installation of no-dig road surface

4.14.1. To ensure that tree roots, within the ground under this proposed surface, continue to survive during and after construction a cellular system such a CellWeb (Geosynthetics Ltd, 01455 617139, www.geosyn.co.uk) of 150mm depth is to be used[4].

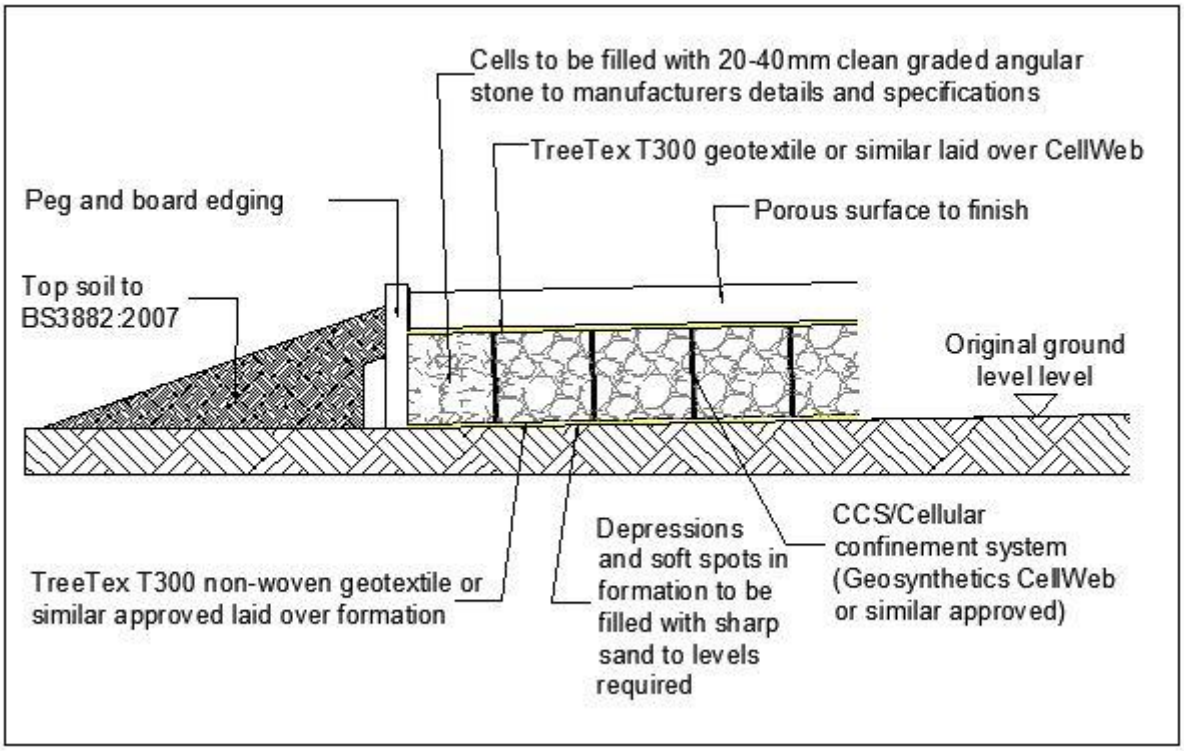

Figure 2: Cellular system profile

4.14.2. Stages for Installation of the cellular confinement surface:

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Dismantle TPF and re-erect in secondary location as shown on TPP.
3) Remove existing vegetation by using a specific herbicide (as advised by a specialist) or manual removal with hand tools only. Agreed removal of shrubs, saplings or trees, within the protected areas of retained trees are to be cut or ground out to just below ground level rather than grubbed or winched out, which can damage roots of retained trees.
4) Retain all original ground levels after vegetation removal. No excavation whatsoever.
5) Remove any existing hard surfaces (paving, tarmac etc.) Hand tools should be used if possible. If machinery is required for this operation, it must be used only on existing surfaces or outside the protection areas and tree canopies (approval from project arboriculturist must be sought before using machinery). 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 the new surface.
6) Install a non-woven Geotextile (such as Fibretex F4M) directly over soil grade level (levelled where necessary, by non-compacted washed sand) and fix in place.

[4]This approach describes installation of a typical no-dig surface. The author of this report is not an engineer and therefore detailed engineering design and analysis must be carried out before installation.

7) Lay the cellular system over the Geotextile, which is secured open under tension during the infill process with steel staples or wooden pegs.
8) Install kerbs 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 kerbstones, gabions or cast in situ kerbs will be appropriate.
9) Fill the cellular system ensuring any machinery works only on already filled areas. Typical infill consists of no-fines angular granular material 20-40mm, which will remain un-compacted.
10) Install porous wearing surface.

- Small Block Paving.
    - Lay a second layer of Geotextile separation fabric over the infill.
    - Lay a sharp sand-bedding layer to recommended depth.
    - Place block paviors as per manufacturer's instructions.
- Washed Gravel.
    - Place second layer of Geotextile separation fabric over the filled cellular confinement system.
    - Place pea shingle/ gravel to required depth.
- Porous Asphalt.

4.14.3. Any variation to the above specification must meet the following design criteria for low-invasive surfaces to provide the conditions for continued tree survival and growth:

- Maintain oxygen diffusion through new surface to rooting area (5-12% by volume[5]).
- Maintain sufficient passage of water to the rooting area (12-40% by volume[6]).
- 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[7]).

4.14.4. 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 a depth of 100mm and, 150mm to 200mm depths are used for residential driveways, while greater depths may be required for the passage of heavier traffic such as for construction access and delivery vehicles.

4.14.5. If ground levels are to be raised more than 150mm this should be achieved by the use of a granular material, which does not inhibit vertical gaseous diffusion. For example: no-fines gravel, washed aggregate, structural soil (min. 20% sand content) or cobbles.

[5] Tree Roots in the Built Environment 2006, Roberts Jackson Smith HSO
[6]Tree Root Growth Requirements, Dr Kim. D. Coder, University of Georgia. July 2000
[7] Arboriculture, Tree Management of Shade Trees and Vines 2004, Harris, Clarke, Matheny

4.14.6. Ideally, the surface 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 Cellular System. Where it 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 surface will need to be designed to meet the above criteria.

4.15. Resurfacing/repair of existing roads

4.15.1. Tree protection measures will remain in place until work commences and when removed all personnel to be working within the area are to be made aware of the extent and nature of the area.

4.15.2. All work within protected areas to be supervised at all times by project arboriculturist.

4.15.3. Stages for repair/replacement of existing hard surface within tree protection areas:

<u>No plant machinery to be sited on any exposed rooting area</u>

1) Contact project arboriculturist to hold pre-start site meeting and ‘toolbox’ talk before starting work.
2) Remove TPF to allow access to area.
3) Plant machinery to run only on existing tarmac surface.
4) Plant may be used to carefully peal up existing tarmac.
5) Other hard landscape features are to be removed by hand (paving etc.) or carefully lifted with plant.
6) Sub-base to be retained.
7) Sub-base to be enhanced if required.
8) New tarmac surface to be installed.

4.15.4. Should any roots over 25mm diameter be encountered during deconstruction of the old profile, their removal will only be carried out under arboricultural supervision and with the approval of the LPA.

4.15.5. Any new kerbing must be installed within the current hard construction profile.

4.15.6. No new excavation closer to the tree will be permitted.

4.16. No-dig footpath construction

4.16.1. To ensure that tree roots, within the ground under this proposed surface, continue to survive during and after construction a cellular system such a CellWeb (Geosynthetics Ltd, 01455 617139, www.geosyn.co.uk) of 75mm depth is to be used[8].

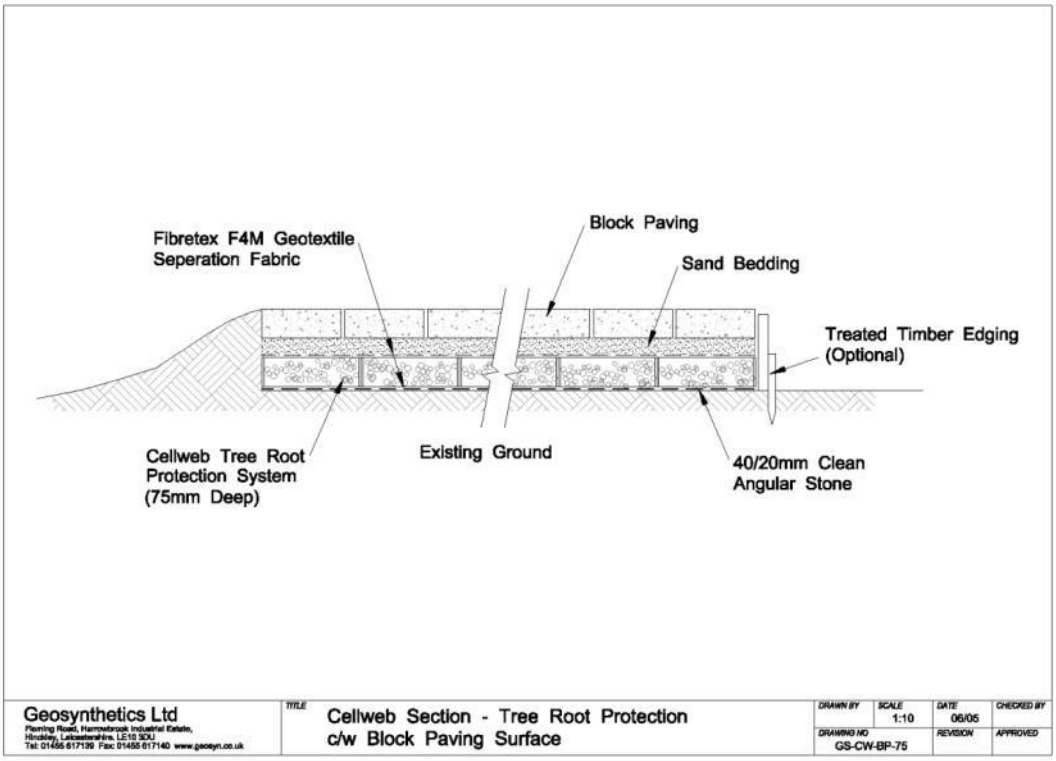

Figure 3 Cellular system profile

4.16.2. Stages for Installation of the cellular confinement surface:

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Dismantle TPF to allow access to work area.
3) Remove existing vegetation by using a specific herbicide (as advised by a specialist) or manual removal with hand tools only. Agreed removal of shrubs, saplings or trees, within the protected areas of retained trees are to be cut or ground out to just below ground level rather than grubbed or winched out, which can damage roots of retained trees.
4) Retain all original ground levels after vegetation removal. No excavation whatsoever.
5) Install a non-woven Geotextile (such as Fibretex F4M) directly over soil grade level (levelled where necessary, by non-compacted washed sand) and fix in place.
6) Lay the cellular system over the Geotextile, which is secured open under tension during the infill process with steel staples or wooden pegs.

[8]This approach describes installation of a typical no-dig surface. The author of this report is not an engineer and therefore detailed engineering design, and analysis must be carried out before installation.

7) Install kerbs 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 kerbstones, gabions or cast in situ kerbs will be appropriate.
8) Fill the cellular system ensuring any plant machinery stands only on already filled areas. Typical infill consists of no-fines angular granular material 20-40mm, which will remain un-compacted.
9) Install porous wearing surface.

4.17. Installation of proposed paving within RPA

4.17.1. The proposed paving is partly within the root protection area (RPA) for the trees located offsite adjacent to the northern boundary. Where within RPAs of these trees the following methodology will be adhered to:

4.17.2. All contractor personnel to be working within the area are to be made aware of the extent and nature of the tree protection areas as per Tree Protection Plan PRI24810-03.

4.17.3. Stages for installation of proposed paving within tree protection areas:

<u>No plant machinery to be sited on any exposed rooting area</u>

1) Remove Tree Protection Fence to allow access to area.
2) All works to be undertaken using hand tools only, with no plant or machinery to be used within RPAs.
3) Remove existing vegetation using hand tools only.
4) Level soil using landscaping rake, retaining original ground levels after vegetation removal, with no further excavation.
5) Install a non-woven Geotextile (such as Fibretex F4M) directly over soil grade level (levelled where necessary, by non-compacted washed sand) and fix in place.
6) Lay 100mm well graded grit sand (sharp sand).
7) Gently compact using manual roller, or edge of a 75mm section of e.g., scaffold board.
8) Lay stone slabs 2 – 5mm apart.
9) Fill joints with kiln dried fine sand.

4.18. Remediation for planting areas

4.18.1. Planting areas to be clearly defined prior to remedial works.

4.18.2. Area to be assessed for compaction and other damage.

4.18.3. Trial pit to be excavated to assess current soil quality.

4.18.4. If current soil quality is acceptable but compacted, then decompaction methods are to be employed. For example, rotovating to a depth equal to planting depth or tilling of soil with air excavation tool.

4.18.5. With poor quality soil in planting area, whole scale replacement of planting area soil is to be implemented. Provide as necessary to make up any removed topsoil and to complete the work. Soil grade should be Premium as advised by BS3882 and compacted under foot.

4.19. Soil remediation measures for compaction within RPAs

4.19.1. Stages for soil remediation for compaction within RPA. The following works must be undertaken by a suitably qualified and experienced soil remediation contractor:

1) Soil test to be undertaken to identify soil texture, nutrient content and pH. Based on the results, appropriate remediation measures to be undertaken.
2) Compaction test to be undertaken to identify soil compaction level.
3) Appropriate soil decompaction measures using a Terravent to reduce any compaction that may have occurred. To be used in a 1m matrix over the entire area previously covered by the fill.
4) Add layer of well composted mulch to a depth of 100-200mm over the RPA area.

4.19.2. Contamination of the soil by fuel and lubricant leaks must be avoided at all costs. If such a situation arises the project arboriculturist must be notified to assess the situation and prescribe remedial measures.

4.19.3. No plant machinery to be used in the area for whatever reason.

4.20. Installation of boundary fencing within protected areas

4.20.1. Stages for installing wooden fence posts:

No plant machinery to be used in the area for whatever reason

1) Contact project arboriculturist to hold pre-start site meeting and 'toolbox' talk before starting work.
2) Remove TPF to allow access to area.
3) Dig post holes using hand tools, avoiding damage to the protective bark covering larger roots. Roots smaller than 25mm diameter may be pruned back using either secateurs or a hand saw, leaving a clean cut.
4) Damage or severance of roots above 25mm diameter must be avoided. If roots of this size are discovered, the hole should be relocated. If there are a large number of such roots it may be necessary to relocate the hole by half a fence panels length and adjust the fence panels accordingly.
5) Line hole with non-porous lining, for example durable polythene bag.
6) Insert post and fill post hole with concrete to ground level.
7) Trim polythene to ground level.

4.21. Sensitive excavation within retained RPAs

4.21.1. All excavations within retained RPAs to be carried out using the following sensitive methodology:

1) Pre-start meeting between project arboriculturist and groundworkers.
2) Removal of Tree Protection Fencing where required to allow access to working area.
3) RPA radius of retained trees within proposed area of excavation to be measured and marked out with line-marker or pegs to inform areas of sensitive excavation.
4) Soil within marked out area to be excavated using hand-tools and/or air-spade.
5) Where suitable soil can be scraped away carefully under direct supervision of project arboriculturist using an excavator located outside of the RPA with toothless bucket attachment.
6) Upon discovery of any large rooting systems (diameter of over 25mm), remaining soil will be removed using either hand tools or with use of an air-spade.
7) Once area is excavated as required an assessment is to be made in regards to any significant roots discovered as to the feasibility of root retention and significance of potential impact to vitality and stability of retained trees from root pruning.
8) If root pruning is viable, then it shall be undertaken by the project arboriculturist as access facilitation pruning and documented for review by the Local Planning Authority.
9) If impact of root pruning is considered too significant then approval must be gained for further tree removal prior to continuation of works within the RPA of affected tree.
10) During any delay between exposure of roots and agreement of either removal or pruning works, exposed rooting structures must be covered with a damp material which is to be re-wetted as required to prevent dehydration of root-hairs.
11) Re-erection of Tree Protection Fencing following completion of works or between daily work intervals.

Will Wareing *ND Arb*
Arboriculturist

28 May 2025

Appendix 1: Tree Protection Plan
(PRI24810-03)

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