3, Tanners Hill, Hythe

Arboricultural Impact Assessment and Method Statement

A Report for Tolman Homes

April 2020

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3, Tanners Hill,

Hythe

Tree Survey

April 2020

Controlled Copy

01 of 02

01 Tolman Homes

02 Greenspace Ecological Solutions Ltd

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Report Number J20366_Arb_Rev_B

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CONTENTS

DRAWINGS

Tree Protection Plan J20366_P4_Arb_TPP_Rev_B

APPENDICES

APPENDIX A – Tree Survey Schedule

APPENDIX B – Section 4, Extracted from NJUG 4

APPENDIX C – Extract from the Cell Web Product Brochure

APPENDIX D – Programme of Site Monitoring

1 PROJECT OVERVIEW

Client: Tolman Homes

Site Address: 3, Tanners Hill, Hythe, CT21 5UE

Attending Surveyors: Neil Taylor

Survey Dates: 13th October 2016

Site Proposals: Demolition of existing buildings and construction of a new apartment building with access

Associated Planning Reference Number: Not Known

Source of Relevant Documents:

Document:	Source:
Site Location Plan:	Google Earth Pro
Site Plans:	Clague Architects

2 INTRODUCTION

2.1 Context

2.1.1 To inform a planning application, Greenspace Ecological Solutions has been commissioned by TG Designer Homes Ltd to undertake a tree survey of 3, Tanners Hill, Hythe ("The Site"), in accordance with British Standard (BS) 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations". The proposal involves the demolition of the existing buildings and the construction of an apartment building with associated car parking. Works that are likely to affect retained trees include the installation of hard surfaces and the movement of construction and demolition vehicles.

2.1.2 The aim of this report is to present the results of the survey, including a Tree Survey Schedule (TSS), an Arboricultural Implications Assessment (AIA), and an Arboricultural Method Statement (AMS). A Tree Protection Plan (TPP) has also been produced and accompanies this report as a separate drawing.

2.1.3 This report in no way constitutes a health and safety survey report. Where concerns for tree health and safety exist, the necessary and appropriate tree inspections should be carried out.

2.2 Site Location

2.2.1 The site is situated within Hythe, Kent, National Grid Reference TR 165349. The English Channel lies approximately 750m to the south. The geographical location of the site is depicted in Plate 1.

Plate 1. Location of 3, Tanners Hill, Hythe

2.3 Site Description

2.3.1 The site is suburban in nature and currently comprises a detached dwelling and garage set within a large garden. The site slopes dramatically from north to south and is bounded to the south by garages, to the west by residential dwellings, to the north by North Road and to the east by Tanners Hill, the other side of both are further residential dwellings.

2.3.2 There are no Tree Preservation Orders (TPOs) present on the site, however the site is within a conservation area.

3 SURVEY METHODOLOGY

3.1 The trees were inspected from ground level by consultant arboriculturist Neil Taylor on 13th October 2016 and measurements taken in accordance with the recommendations set out in the BS 5837:2012. Canopy spreads were measured and plotted to the four compass points. Where direct access was not possible measurements have been estimated. The surveyed trees are colour coded on the accompanying tree survey drawing according to their relevant BS category.

3.2 The tree data collected is used to enable the current canopy spread of the surveyed trees and the Root Protection Area (RPA) to be plotted on the accompanying TPP. The RPA is defined by the formula in paragraph 4.6 from the BS 5837:2012 and may be refined by taking into account current on-site constraints to root activity such as buildings, earthworks and hard paving. This forms part of the design process for the proposed development.

4 ASSESSMENT

4.1 Tree Character Groups

4.1.1 The detailed results of the tree survey are provided in the TSS, in Appendix 1. In summary, the trees on the site vary considerably in terms of condition and the amenity value that they provide to the wider landscape. The trees can be divided into three distinct character groups as follows:

1. The first character group includes the large, middle aged conifers found growing in a group on the eastern boundary of the site. It is likely that these trees were originally planted as a hedge but have been allowed to grow. These trees are in a reasonable condition and provide an important screen to the site.
2. The second character group includes the medium sized, middle aged trees found growing on the western boundary of the site. In the main, the trees in this character group are in a good condition and bring a sense of maturity to the site as well as providing an important screen.
3. The third character group includes the smaller sized young trees found growing across the site. The trees in this character group are generally in a good condition but due to their size, contribute little to the amenity of the local area and are easily replaced.

5 ARBORICULTURAL IMPLICATIONS ASSESSMENT (AIA)

5.1 Methodology

5.1.1 The AIA uses the information obtained in the tree survey to identify areas where the proposed construction may be at odds with accepted standards, in terms of a tree's requirements for space in which to maintain existing roots and shoots, and space for future growth.

5.1.2 The quality and relative importance of each tree is illustrated as a coloured polygon. The colour used relates to the BS categories as follows: A - green, B - blue, C - grey and R - red (see accompanying drawing reference J20366_P4_Arb_TPP_Rev_B). In general the design process will try to retain A and B category trees. Proposed construction will therefore normally be excluded from the RPA of A and B category trees. Red trees are discounted as they are recommended for removal.

5.1.3 Details of the trees surveyed are given in the TSS (Appendix 1). The juxtaposition of the proposed development in relation to existing tree locations are shown on the accompanying TPP drawing, reference J20366_P4_Arb_TPP_Rev_B.

5.1.4 The AIA considers existing site conditions and the effect that they may have on the development of the surveyed trees root systems. Hard structures such as building and paved roads and paths can influence the root activity of trees by reducing the availability of both moisture and nutrients.

5.2 Assessment

5.2.1 Refer to the accompanying TPP, drawing, reference J20366_P4_Arb_TPP_Rev_B, for the relationship between the proposed development and the trees on and adjacent to the site

- The following tree should be removed for arboricultural reasons:

  T7

- The following trees and hedge will be removed to enable the proposed development:

  T3 to enable the construction of an access drive

  T4 to enable the construction of a car park

  T5 to enable the construction of a car park

  T6 to enable the construction of a car park

  T14 to enable the construction of a car park

  T15 to enable the construction of a car park

T16	to enable the construction of a car park
G2	to enable the construction of a car park and to allow for replanting
H1	to enable the relocation of a retaining wall
Part of H2	to enable the construction of a refuse store

- The following trees and groups of trees will require pruning prior to the construction of the proposed development:

  T12 Reduce southeast facing laterals by 2 metres

  T13 Crown lift to clear 3 metres over site

  G1 Cut back overhanging branches to boundary to form hedge

- The following trees will be affected by the construction of a new hard surface within the RPA:

  T13 and T17

  The new surface will be porous and will be constructed in accordance with the 'no dig' principles outlined in APN12 and utilise a cellular confinement system such as Cell Web as a sub base. Refer to Section 6.3 below for details.

- The following tree will be affected by the resurfacing of the existing hard surface. The existing subbase is to remain in situ and will be utilised by the new hard surface. The wearing course is to be removed in accordance with the methodology described in Section 6.2 below:

  T1

- The following trees will be affected by the excavations to enable the construction of a retaining wall. Excavations will be carried out in accordance with the methodology described in Section 5.3 below:

  T12 and T13

6 ARBORICULTURAL METHOD STATEMENT (AMS)

6.1 Methodology

6.1.1 The AMS provides the means by which retained trees and hedges can be protected throughout the development.

6.1.2 The movement of demolition and construction machinery in close proximity to trees may cause compaction of the soil which affects the tree's ability to absorb moisture and nutrients. The RPAs of retained trees will be protected by a tree protection barrier as described in paragraph 6.5 below and shown on the accompanying TPP, drawing number J20366_P4_Arb_TPP_Rev_B.

6.2 Demolition within the RPA of Retained Trees

6.2.1 The existing hard surface is to remain in situ until the construction of the proposed development is complete. Where the existing wearing course is to be removed from within the RPA of T1, works will be carried out under the supervision of a suitably qualified arboriculturist. Any machinery used will be stood on the existing hard surface at all times and will retreat out of the RPA as the wearing course is removed. If an excavator is to be used, a toothless bucket will be used at all times.

6.3 Construction within the RPA of Retained Trees

6.3.1 Construction of the new hard surface within the RPA of T13 and T17 will be carried out before the demolition of the existing buildings so as to act as ground protection for the retained trees. The construction of the new hard surface will incorporate the 'no dig' principles set out in Arboricultural Advisory and Information Service guidance note APN12 and utilise a cellular confinement system, such as cell web, as a sub base. The new hard surface will be constructed on top of the existing ground level and no excavations will take place to level the ground. Guidance on the form of construction necessary to avoid root damage and loss is provided in the form of an extract of the Cell Web Product brochure for their cellular confinement system at Appendix B. The extent and nature of hard paved surfaces within the RPA of retained trees will determine the level of construction required. The installation of the hard surface should proceed in the following order:

- Kill ground vegetation and gather dead organic matter. Care must be taken to select a herbicide that will not affect tree roots.

- Remove major projections such as stumps and rocks. Stumps must be removed with a stump grinder so as to minimise ground disturbance.
- Fill major hollows with sharp sand.
- Lay geotextile membrane over the soil and pin into place
- Lay cellular confinement system (such as Cell Web) as specified by engineer and pin into place.
- Fill the cellular confinement system with a 'no fines' aggregate to engineer's specification. Work must be carried out progressively so that any machinery used only moves on the laid surface.
- Install haunched kerb on existing ground level or timber sleeper as specified by landscape architect or engineer.
- Lay geotextile membrane over filled cellular confinement system.
- Lay finished surface as specified by landscape architect or engineer. As the installed hard surface covers more than 20% of the RPA or is more than three meters in width, a porous surface will be required. Porous wearing courses include resin bonded grave, large aggregate asphalt, perforated concrete or pavers/slabs laid on a dried bed and dry grouted.

6.3.2 Where excavations are proposed within the RPA of T12 and T13, a trench will be excavated by hand along the edge of the proposed excavation area to the required depth under the supervision of an arboriculturist. Any roots encountered will be pruned in accordance with current best working practice. Once the required depth has been reached, the area can be levelled.

6.3.3 No materials or spoil is to be stored within the RPA of a retained tree unless on an existing hard surface.

6.3.4 In order to avoid damage to the retained trees the tree surgery and felling work identified in the accompanying tree survey schedule will be carried out prior to the occupation of the site by the building contractor. The work will be carried out in accordance with BS 3998:2010.

6.4 Services

6.4.1 The proposed locations of service runs are not known at this stage but are likely to be located outside the RPA of the trees on and adjacent to the site. Where it is not possible to achieve this, the section of service run which passes within the RPA of a tree will be hand dug in accordance with 'broken trenches' described in NJUG 4 Section 4, an extract of which can be

found in Appendix C. This will ensure that tree roots are not damaged during the installation of the service. All root pruning will be agreed beforehand with the named Arboriculturist in consultation with the local authority Arboricultural officer. All root pruning will be in accordance with current best working practice. All routes for overhead services will aim to avoid the trees. Where this is unavoidable any tree work will be agreed prior to commencement with the Council's Arboricultural Officer.

6.4.2 If the conditions are suitable on site and there is sufficient space, underground services may cross the RPA if a low impact method is used. Such low impact methods include: moleing, directional drilling and thrust boring. It is important that all entry and exit pits remain outside of the RPA and the services are installed at a sufficient depth (at least 600mm) so as to avoid the tree rooting system.

6.5 Tree Protection

6.5.1 All trees that are to be retained on the site will be protected by the use of a tree protection barrier erected in the location shown on the accompanying TPP, drawing number J20366_P4_Arb_TPP_Rev_B. The fence will consist of "Heras" type panels or similar braced at appropriate intervals and secured to keep in place. The tree protection barrier will be erected prior to the occupation of the site by the demolition contractor and will only be removed once the construction phase is complete.

6.6 Site Monitoring and Supervision

6.6.1 The process of reporting to the client and LPA/Tree Officer will be by emailing or faxing the checklist form at Appendix D. Site monitoring is to be at a frequency agreed and approved by the LPA. It will involve a site visit by the arboriculturist to ensure that the appropriate tree protection measures, as detailed in the approved drawings and method statements, are continually adhered to.

7 CONCLUSION

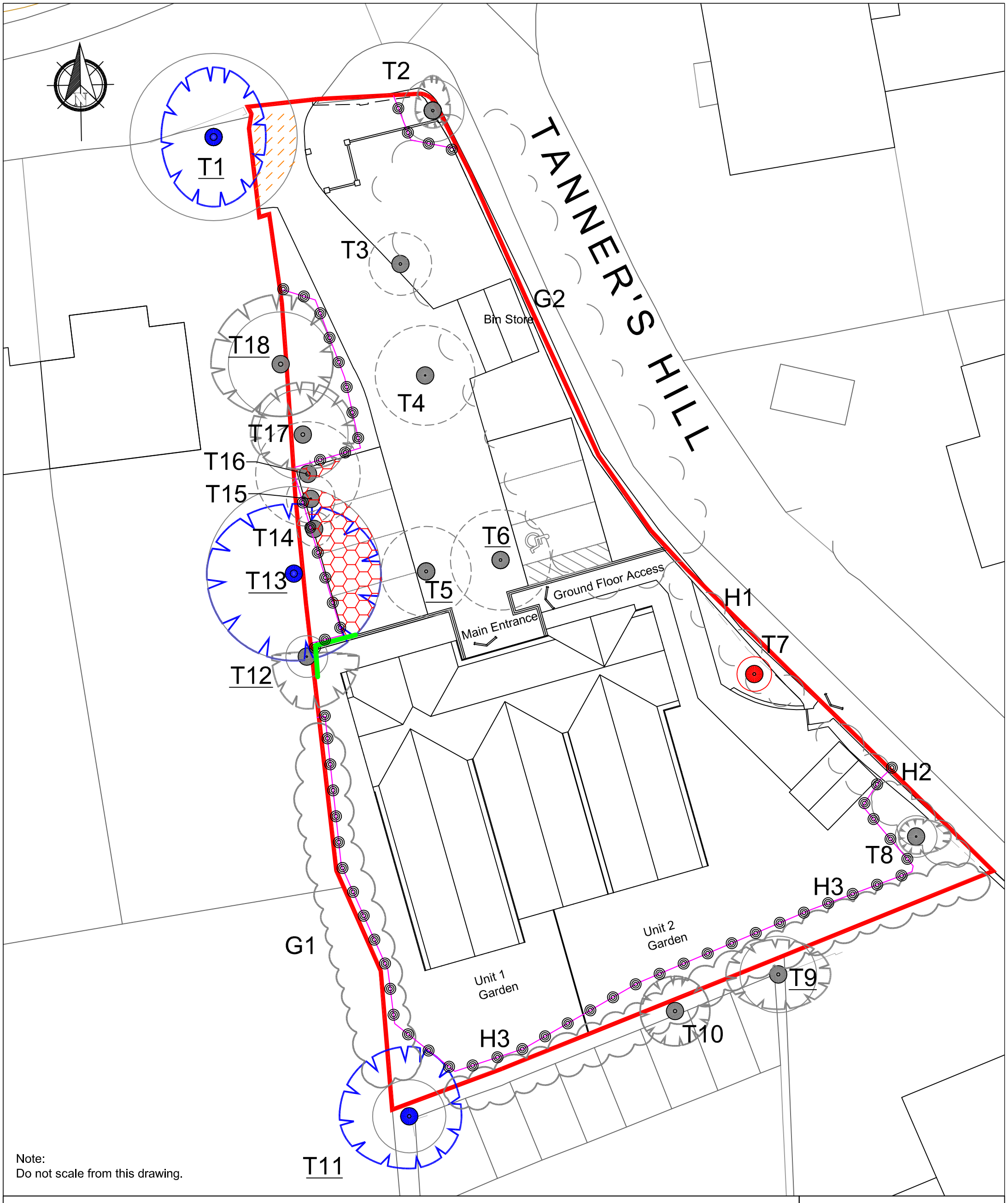
7.1 Greenspace Ecological Solutions was commissioned by Tolman Homes to carry out a tree survey at 3, Tanners Hill, Hythe. The results of the survey indicate that the trees within the survey area vary considerably in terms of quality and contribution to the amenity value within the local area.

7.2 A total of seven trees, one group of trees, one hedge and part of another hedge will be removed to enable the proposed development. The development of the site provides an opportunity to plant new trees as part of a landscape scheme which will increase the age range and species diversity of the trees in the local area. Furthermore, the new trees can be planted in a more prominent position adjacent to the eastern boundary of the site, increasing the benefit to the local area.

7.3 Through the specified tree protection measures, it will be possible to minimise the impact of the proposed development on the retained trees.

7.4 Overall, there are no known overriding arboricultural constraints which would prevent the proposed development from going ahead, subject to the protection measures and construction methodologies specified within this report being correctly implemented

DRAWINGS



Note:
Do not scale from this drawing.

Tree Categories

Root protection area (RPA)
Diameter of trunk
99
Tree number as recorded on Survey Schedule
Tree canopy
Coloured symbol indicating BS category as shown below

Underlined tree tags denote tree located by eye

- Category A tree — BS5837 2012
- Category B tree — BS5837 2012
- Category C tree — BS5837 2012
- Category U tree — BS5837 2012

Arboricultural Strategy

- Tree to be retained — Colour reference in accordance with the categories defined by BS:5837
- Tree to be removed — Colour reference in accordance with the categories defined by BS:5837
- G1/H1 — Tree group/hedge to be retained — Colour reference in accordance with the categories defined above
- G1/H1 — Tree group/hedge or part of tree group/hedge to be removed — Colour reference in accordance with the categories defined above
- Line along which Tree Protection Barrier should be installed. Refer to accompanying report for specification
- Area of supervised excavations. Refer to accompanying report for details
- Area of hard surface to be installed following a 'no dig' method of construction in accordance with APN12
- Area of existing hard surface to remain in situ and used as a sub base for the proposed re-surfacing

Drawing Reference : J20366_P4_Arb_TPP_B

Project Title
3, Tanners Hill, Hythe

Drawing Title
Tree Protection Plan

Date : 06-04-20 Checked : GN

Drawn : NT Approved : N/A

Status : Final Scale : 1:200@A3

GES Greenspace Ecological Solutions

APPENDICES

APPENDIX A – TREE SURVEY SCHEDULE

Project:	3 Tanners Hill, Hythe	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT	GES Greenspace Ecological Solutions
Ref:	J20336		Weather	Clear and Bright	
Date:	13.10.16		Tagged	No	
Client:	TG Designer Homes Ltd				

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T1	cherry (Prunus sp.)	5	400	4	3	4	3	1	2	M	Good - off site	Good	None	20-40	B2
T2	ash (Fraxinus excelsior)	4	150	2	1	1	1	1	2	Y	Good	Fair - decay at base	None	40+	C1
T3	field maple (Acer campestre)	4	150	3	1	2	3	1	1	Y	Good	Good	None	40+	C1
T4	apple (Malus sp.)	4	90	3	2	3	4	1	1	Y	Good	Good	None	40+	C1
T5	hawthorn (Crataegus monogyna)	6	170	2	3	3	3	1	2	MA	Good - ivy	Good	None	20-40	C1
T6	goat willow (Salix caprea)	5	156	3	3	3	3	2	0	Y	Good	Good	None	40+	C1
T7	cherry (Prunus sp.)	2	170	1	1	1	1	1	1	MA	Dead	Dead	Remove	0	U
T8	hawthorn (Crataegus monogyna)	4	100	1	2	1	1	1	1	Y	Good	Good	None	40+	C1
T9	elder (Sambucus nigra)	5	180	2	3	2	3	1	2	MA	Good	Good	None	20-40	C1
T10	holly (Ilex aquifolium)	6	197	2	2	2	2	2	1	MA	Good	Good	None	40+	C1

Project:	3 Tanners Hill, Hythe	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NAT	GES Greenspace Ecological Solutions
Ref:	J20336		Weather	Clear and Bright	
Date:	13.10.16		Tagged	No	
Client:	TG Designer Homes Ltd				

				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T11	bay laurel (Laurus nobilis)	7	206	4	3	3	4	3	1	MA	Good	Fair - triple stem	None	40+	B2
T12	common laburnam (Laburnam anagryoides)	4	100	0	3	3	2	1	2	Y	Good - off site	Good	None	40+	C1
T13	silver birch (Betula pendula)	8	420	4	5	5	5	1	2	M	Good - off site	Good	None	20-40	B2
T14	Lawson's cypress (Chamaecyparis lawsoniana)	4	100	1	1	1	1	2	2	Y	Good	Good	None	40+	C1
T15	Lawson's cypress (Chamaecyparis lawsoniana)	5	120	1	2	1	1	1	2	Y	Good	Good	None	40+	C1
T16	silver birch (Betula pendula)	10	250	1	3	2	3	1	2	MA	Good - ivy	Leggy. Stem obscured by ivy	sever ivy	20-40	C1
T17	silver birch (Betula pendula)	10	220	3	3	2	3	1	3	MA	Good - ivy	Leggy. Stem obscured by ivy	sever ivy	20-40	C1
T18	silver birch (Betula pendula)	8	250	4	3	3	4	1	2.5	MA	Good - ivy	Leggy. Stem obscured by ivy	sever ivy	20-40	C1
G1	elder, laurel, hazel	Up to 5	Varied							Y	Good - off site boundary group	Good	None	20-40	C1

Project:	3 Tanners Hill, Hythe							**BS 5837 2012 Trees in relation to design, demolition and construction-recommendations**			**Surveyed by**	NAT	GES Greenspace Ecological Solutions		
Ref:	J20336										**Weather**	Clear and Bright			
Date:	13.10.16										**Tagged**	No			
Client:	TG Designer Homes Ltd														
				Canopy Spread											
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
G2	Leyand cypress	Up to 12	Varied							MA	Fair - unmanaged Leyland cypress hedge. Branches beginning to deflect, some die back and coryneum canker present	Good	None	20-40	C1
H1	privet, holly	Up to 2	Varied							MA	Fair - intermitent boundary hedge	Good	None	20-40	C1
H2	privet, hawthorn	Up to 3	Varied							MA	Good - boundary hedge	Good	None	40+	C1
H3	privet	Up to 2	Varied							MA	Good - boundary hedge	Good	None	40+	C1

APPENDIX B - EXTRACT FROM THE CELL WEB PRODUCT BROCHURE

CellWeb

Tree Root Protection System

CellWeb Tree Root Protection System provides a flexible and permeable solution for protecting tree roots while creating a strong stable surface for traffic.

With increased urbanisation and more redevelopments of existing properties, the need to be mindful of the impact on the surrounding environment is more important than ever.

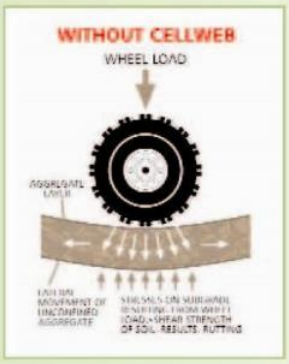
The demand for building site access, driveways and parking around existing trees can have a potentially fatal impact on the tree if carried out incorrectly. Tree preservation orders (TPO's) ensure that trees are not wilfully damaged. However the need for vehicle access over and around tree roots can still cause the following problems:

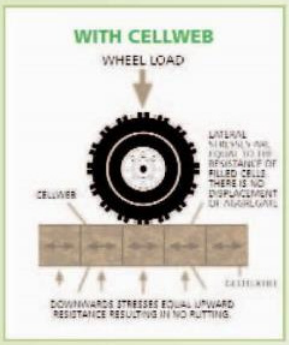
Problems:

- Compaction of subsoils (especially by construction traffic) causing oxygen and nutrient depletion
- Creating an impermeable surface that prevents water reaching the roots
- Changes in ground level and water table
- Damage caused during excavation
- Contamination of the subsoil

By using CellWeb Tree Root Protection System you can avoid these problems and ensure the tree's long-term future. BS 5837:1991 (revised 2005) and APN 1 provide information for the protection of trees during the construction process, and CellWeb is a well-established solution that conforms to these guidelines.

Product features

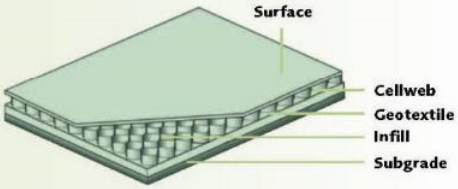




Cellweb's patented design with its unique cellular structure and perforated cell walls reduces the vertical load pressure on tree roots and prevents damage. With clean granular materials as infill, air and moisture can reach the roots to encourage healthy growth.

With no-dig solutions being the preferred option of most Arboricultural Consultants and Tree Officers, CellWeb is ideal as only the surface vegetation need be removed. As well as avoiding disruption to the roots this reduces installation time and saves money.

What's more CellWeb also cuts down the depth required for the sub base – in most cases by 50% for further cost savings. CellWeb also significantly reduces surface rutting, increasing the long-term performance of the finished surface.



Using CellWeb for tree root protection gives you these benefits:

- Reduced depth of excavation required
- Preventing the compaction of subsoils
- Preventing oxygen and nutrient depletion
- Environmentally sound
- Quick, easy and cost-effective installation
- Free technical support available

CellWeb gives you the cost-effectiveness you need at the same time as helping to preserve trees.

Geosynthetics Ltd is a leading dis

Please call
01455 617 139
or email sales@geosyn.co.uk
for further information.

Wide product range

Large stock holding

Next day delivery

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

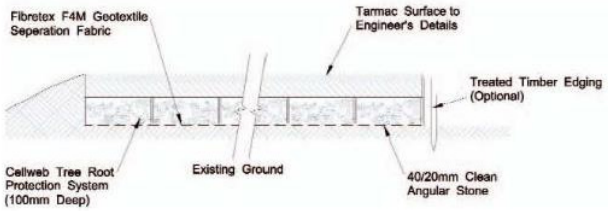
Final surfacing.

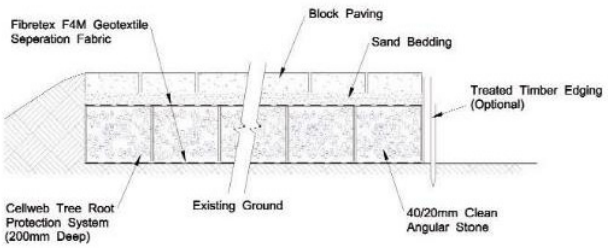
Final surfacing

The CellWeb Tree Root Protection is totally confined within the clean stone sub base, therefore you can choose whichever surface materials are most appropriate for your installation. Some materials are more suitable than others and serious consideration should be given to the porosity of the surface for continued healthy growth of the tree. An ideal surfacing are DuoBlocks: a grass reinforcement and gravel retention system. Geosynthetics can supply these systems for a visually attractive surface that also has the advantage of being fully porous.

Loose or bonded gravels can be used as an alternative hard landscaping and CellWeb can also be used with block paviors whose porous joints will permit moisture and air transfer to the roots. Where planning allows, porous asphalt is yet another possible surfacing treatment.

Call our sales office on 01455 617 139 for more information.





APPENDIX C – SECTION 4, EXTRACTED FROM NJUG 4

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 **Fine Roots**
Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 **Precautions**
The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

4.1.3 **Realignment**
Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless
Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug
The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.

- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 Additional Precautions near Trees

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

4.2 Above Ground

4.2.1 Damage by Pruning

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 2 - Prevention of Damage to Trees Above Ground

Causes of Damage	Type of Damage	Implications for the Tree	Precautions
Impact by vehicle or plant Physical attachment of signs or hoardings to the trunk Storage of materials at base of tree Rubbing by winch or pulling cables	Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk	Wounding with the potential for infection ultimately resulting in death of all or part of the tree. Structural failure of the tree	Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.
Impact by vehicle or plant Rubbing by overhead cables	Bark damage to branches, breakage and splitting of branches, abrasion to branches	Structural failure of the branch. Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.	Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes. All pruning should be carried out in accordance with BS3998 *(prune affected branches to give appropriate clearance from cables)*
Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.	Inappropriate pruning, unnecessary tree removal	Severely pruning tree to acquire line of sight signal for communications dish etc.	Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.
Lack of forethought in design and location of apparatus and services entries on new developments	Complete tree removal	The tree is removed unnecessarily	Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.
Use of herbicides	Poisoning of the tree via absorption through bark, leaves and shoots	Death of the whole tree, death of individual branches, damage to leaves and shoots	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.

APPENDIX D – PROGRAMME OF SITE MONITORING

3, Tanners Hill, Hythe Site Monitoring Form

To be completed by the named arboriculturist and emailed to the client and tree officer at the completion of each operation.

Arboriculturist……

Client……

Project Manager…….

Tree Officer…….

(The above to be filled in with names and contact numbers)

OPERATION	TIMING	DATE	COMMENTS
Pre-commencement meeting or contact with project/site manager.	Before any works or pre-works on site		
Spot check of specified pruning works	Before demolition begins		
Spot check of tree protection fencing	Before demolition begins		
Spot check of installation of 'no dig' hard surfaces	Before demolition begins		
Supervision of excavations within RPA of T12 and T13	Before groundworks to level the construction area		
Completion of development	Once all construction activity has been completed		