

Ref: LAS_492
Date: 01.12.2022

Site: The Moorings, Upper Warren Avenue, Reading, RG4 7EJ

Arboricultural Statement

1) Introduction

LandArb Solutions has been instructed to undertake a tree survey and prepare an Arboricultural Impact Statement to accompany a planning application for the demolition of an existing dwelling and construction of a replacement dwelling.

2) Tree survey and existing trees

LandArb Solutions visited the property/site on 14.09.22 to carry out a BS5837:2012 tree survey.

A copy of the tree survey and constraints plan and schedule are shown in Appendix 1. Site photos are shown in Appendix 2.

The tree survey schedule records information relating to existing trees on site in accordance with BS5837:2012. The tree survey and constraints plan show tree positions, canopy spread, quality category and root protection area (RPA constraints), plotted onto the site topographical survey (Topographical Survey, Mobile CAD Surveying Solutions, drawing 3420-01, Rev A dated 08.09.22).

Statutory Tree Protection and designations

A review of Reading Borough Councils TPO register for Upper Warren Avenue, does not list the dwelling Moorings as having any TPO trees at the property (accessed 14.09.22). However, before any tree work (if needed) is carried out, it is advisable to contact the Council to just confirm if any TPOs exist as it is uncertain as to how often the TPO register is updated.

Reading Borough Council online 'my maps', shows that the property is not in a Conservation Area.

3) Development proposals

Development proposals comprise the demolition of the existing dwelling and construction of a replacement.

A copy of the proposed site plan is shown in Appendix 3.

Arboricultural Impact Assessment

The proposed site plan has been overlaid with the tree survey to prepare a Tree Retention/Loss Plan (Appendix 4) and Tree Protection Plan (see Appendix 6). This has been used to inform this assessment in terms of the proposed site plan and relationship with trees.

4) Tree Retention/Loss

As shown in Appendix 4, the replacement dwelling itself will not require any tree loss.

Existing cypress garden shrubs at the site frontage will need to be removed to create a new site frontage, however these are not trees.

In the rear garden, a small fruit tree (see photoview 9 in Appendix 2) will need to be removed to create a rear patio area. This is a small garden fruit tree with no public visual amenity value. It is assessed as Category C, therefore should not be viewed as a constraint to development.

Construction of a new rear garden outbuilding will require the removal of several garden shrubs including a buddleia bush. However, none of these are trees.

At the property entrance off Upper Warren Avenue, existing shrubs either side of the access will need to be cleared to allow for construction of new boundary wall and electric gates.

Overall, proposals are considered to be acceptable from a tree retention/loss perspective because all existing trees, except for one small garden fruit tree, will be retained.

5) Impacts to retained trees

Tree works to retained trees

No major tree work to retained trees is required to enable proposed development. Some minor pruning is likely to be required as follows:

- Existing boundary vegetation (G8) is already managed/clipped along the driveway edge and west side of the existing dwelling. It is likely this management will continue.
- G13 is a clipped cypress hedge/group. The south side will need to be re-clipped to allow access to construct the new outbuilding.
- Off-site beech hedging in G22 on the eastern boundary overhangs the fence with a low canopy. This will likely need to be lifted/pruned back in accordance with common law rights as part of general maintenance rather than a requirement for new development.

Removal of existing structures

The existing dwelling and side buildings are to be demolished. However, all are located outside of any RPA.

A small timber shed is to be removed from within G13. The shed is of lightweight timber construction and its removal is unlikely to cause detrimental impacts to G13.

Construction of the new replacement dwelling

The location of the proposed replacement dwelling largely sits within the footprint of the dwelling to be demolished. It is shown to be located outside of all RPAs.

Construction of the new detached garage

It is proposed to construct a new detached garage in an area that is currently used for car parking. The location of the garage largely avoids RPAs but does encroach the outer RPAs of T4 and T5. The level of encroachment into the RPA of T4 is 5.3sqm (2.2% of total RPA) and for T5 is 4.5sqm (1.8% of total RPA). The level of encroachment is very minor and is unlikely to result in lasting detrimental impacts for these trees and it is noted that there is unconstrained rooting environment outside the default RPAs the trees can exploit.

Construction of rear garden outbuilding

The location of the proposed rear garden outbuilding avoids all RPAs.

Driveway surfacing and gates

The existing driveway comprises compacted gravel and areas currently used for parking comprise bare earth. It is proposed to resurface the driveway with new gravel. Although this will be in RPAs of existing trees, it must be noted that these areas are already used for parking and the existing driveway. In this context, proposals will not introduce a land use not already occurring.

However, to avoid root severance it would be important to re-gravel on top of the existing ground rather than excavating down to build up. Where the driveway comprises turf, it would be acceptable to remove the turf layer prior to laying gravel.

At the site frontage it is proposed to construct a new boundary wall with electronic gates as well as install tarmac to the driveway entrance.

The existing site entrance comprises compacted gravel which will be upgraded to permeable tarmac. As this is an existing site access, it would be reasonable to re-surface. However, as this would be within the RPAs of two large lime trees, the works would need to be carried out carefully with a shallow excavation to tie in with Upper Warren Avenue.

The new boundary wall and gate piers will be in default RPAs. The works will need to be carried out sensitively to avoid/reduce potential root damage. The gate piers can be positioned to avoid any major roots by excavating trial holes to determine optimal location. The brick walls could potentially cause root severance if a strip foundation is used. An

alternative would be to carefully excavate using hand digging or air spade and should any a major roots be discovered, lintel over any roots encountered.

Drainage and services

There are existing services at the property and it is proposed to re-use existing services.

6) Tree protection

A tree protection plan for the site demolition phase is shown in Appendix 5 and a tree protection plan for the construction phase shown in Appendix 6.

Protection measures on site will comprise a combination of fencing, ground protection and sensitive working methods.

Protection fencing and ground protection

With regard to construction and demolition, tree protection fencing would be required to contain the working area.

The alignment of fencing on the demolition and construction TPPs protects the majority of RPAs and tree stems from potential direct contact or RPA encroachment.

However, it would not be possible to fully fence off all RPAs, especially at the site access. The following areas will require fencing to be set back into RPAs:

- 1) It will be necessary to set fencing back into the RPA of a garden fruit tree in G19 to allow a patio to be constructed by the proposed outbuilding.
- 2) Fencing will need to be adjusted back to the edge of the existing gravel side access to the west of the existing building to allow space for construction of the new dwelling.
- 3) Fencing will need to be set to the edge of the existing site access but allow space for vehicular access for demolition and construction purposes.

Where RPAs would not benefit from temporary tree protection fencing, temporary ground protection would be needed, in areas as shown in green on the TPP Demolition and TPP Construction.

For pedestrian and vehicular passage ground protection in the form of Ground Guards or track mats set upon a 100-200mm layer of bark chippings would be suitable. Example shown in Appendix 7.

For heavier loading, ground protection would need to be in the form of a load bearing geocell such as (Cellweb or similar).

Areas where temporary ground protection would be needed is shown in green on the TPPs.

The existing driveway would likely require ground protection during demolition and construction, when ground guards would be recommended as its likely HGVs / dumper trucks would need to access the area for the removal of demolition waste and bring construction materials.

Sensitive working – driveway surfacing

With regard to the driveway re-surfacing, excavations should be avoided in RPAs, therefore the following methods should be employed:

- Turf layer and existing compacted gravel removed using hand tools where needed.
- A geotextile membrane should be installed on the existing ground and gravel installed on top.
- If a more stable base is required, a load bearing cellular confinement system, Cellweb TRP or similar (100mm as required by loading) is to be installed on the geotextile and filled using clean angular stone type 4/20. Installation works in this area should be carried out by hand.
- The above ground no dig cellular confinement (cellweb or similar) is then overtopped with gravel to form surface layer.
- Timber edging or brick/cobble sets can be used for edge support pinned in place and topsoil graded up to the edge.
- All works to the driveway are to be carried out using hand tools only.

An example of cellweb and installation guide is included in Appendix 8.

With regard to the installation of new tarmac at the site entrance, the following method should be followed:

- The existing ground closest to Upper Warren Avenue will need to be excavated to ensure the driveway ties in to the level of the road. This should be excavated using hand tools to the minimum depth required up to 200mm to form a sub base.
- However, it will be important to minimise the level of excavation into the site (towards the new electronic gates) because this areas in in the RPAs of two large lime. It will therefore be necessary to install the tarmac grading up from Upper Warren Avenue towards the electronic gates.
- Once the excavation at the entrance has been prepared, an impermeable membrane should be laid on the prepared ground prior to laying a subbase (clean angular stone) and surface using permeable tarmac.
- Works should be carried out using hand tools.
- Tarmac should leave at least 1m from either stem of the limes at the site frontage to allow future growth.

Electric gate post excavation

Where within default RPAs the following working method is to be followed with regard to installing the new gate posts:

- Post holes to be excavated using hand tools.
- If any roots under 25mm are discovered these are to be pruned back using a sharp cutting tool. If any roots over 25mm are discovered these must be retained and alternative post hole location chosen.
- Excavated post holes are to be lined with an impermeable membrane prior to any concrete pouring.

Electric gate cable installation

The following method should be used to excavate a shallow cable run from the new garage to the new electric gates following the edge of the driveway.

- Mark out the alignment of the cable run on the ground. Cable run to start from the new external garage and follow edge of the driveway.
- Excavate using handheld tools (hand digging or use of air-spade). The priority is to remove soil without damaging or severing any significant roots or damaging roots in the immediate area of excavation. Preference should be paid to using an air-spade to minimise damage to roots. However, if the ground is sufficiently compacted that air-spade excavation is not possible or not possible for another reason, excavation should be carried out using hand tools.
- Where digging by hand as opposed to air-spade, a fork should be used to loosen soil and help locate any significant roots. Loosened soil can then be lifted out using a spade.
- The electric cable for the access gate is to be inserted into a shallow excavation i.e. 200mm.
- During excavation, roots under 25mm are to be pruned back to the edge/face of the excavation using a sharp cutting tool such as saw or secateurs. If smaller roots under 25mm are sufficiently flexible and can be temporarily or permanently displaced, then the default should be to retain.
- Roots over 25mm or large fibrous mass are to be retained. Retained roots must not be served. Once roots have been located, a smaller tool such as a trowel should be used to clear soil away from the retained roots to avoid damaging its bark.
- Retained roots must not be exposed for long periods of time (over a few hours) without protection. Therefore any exposed retained roots are to be covered with damp hessian sacking or boards to prevent drying out and protect from direct sunlight until they can be recovered with soil/backfill.
- Excavated soil should be temporarily stored on heavy duty plywood boards or similar to prevent compaction to the ground beneath.
- Once excavation is complete and the electric cable installed, the excavation is to be backfilled and any roots protected with hessian sacking this will need to be removed prior to back filling.

New boundary wall at the site access

Where within default RPAs the following working method is to be followed with regard to installing the new boundary wall:

- Mark out the alignment of the new wall on the ground.
- Excavate using handheld tools (hand digging or use of air-spade). The priority is to remove soil without damaging or severing any significant roots or damaging roots in the immediate area of excavation. Preference should be paid to using an air-spade to minimise damage to roots. However, if the ground is sufficiently compacted that air-spade excavation is not possible or not possible for another reason, excavation should be carried out using hand tools.
- Where digging by hand as opposed to air-spade, a fork should be used to loosen soil and help locate any significant roots. Loosened soil can then be lifted out using a spade..

- If any roots under 25mm are discovered these are to be pruned back using a sharp cutting tool.
- If any roots over 25mm are discovered these must be retained and a lintel should be used to bridge over them.
- Where large roots are found and need to be retained, the foundation of the wall will need to avoid a strip foundation and will comprise a series of concrete piers with a lintels over retained roots.
- Posts holes for the wall piers/footings are to be lined with an impermeable membrane prior to any concrete pouring.

Timber post and rail fence to frontage

Where within default RPAs the following working method is to be followed with regard to installing the new fence posts:

- Post holes to be excavated using hand tools.
- If any roots under 25mm are discovered these are to be pruned back using a sharp cutting tool. If any roots over 25mm are discovered these must be retained and alternative post hole location chosen.
- Excavated post holes are to be lined with an impermeable membrane prior to any concrete pouring.

General rules for tree protection

Do not independently carry out any activity that is at odds with the site tree protection measures set out above.

Areas excluded by fencing form a construction exclusion zone and areas protected with ground protection also require certain works to be excluded. The following activities, would not be permitted in any area protected by fencing or ground protection (unless specificall delt with in this statement):

- No mixing of cement.
- No soil/turf stripping, raising/lowering of ground levels, deposit or excavation of soil or rubble.
- No storage of materials, waste materials, spoil, machinery fuel, chemicals or other materials of any other description.
- No parking/use of tracked or wheeled machinery.
- No lighting of fires or disposal of liquids.

Fires on site should be avoided. Where they are unavoidable, they must not be lit in a position where heat could damage foliage or branches. Fires must be a minimum of 20m from the trunk of any retained tree. No signs, cables, fixtures or fittings of any other description shall be attached to any part of a retained tree.

Summary

Overall with regard to proposal for the demolition of the existing dwelling and construction of a replacement dwelling the following is noted:

- Proposals would not require any significant tree loss (nor loss of any subject to a TPO, veteran, ancient, notable, champion or high quality).
- New built form is located away from retained trees and avoids any detrimental RPA encroachments that would lead to the loss of existing trees.
- Existing trees can be adequately protected using a combination of protection fencing, ground protection and sensitive working methodologies.

Appendix 1:
Tree Survey and Constraints Plan and Schedule

KEY - BS 5837 : 2012 Categories

- 

Tree Category A - High Quality
- 

A Category - Hedgerow, Group, Woodland
- 

Tree Category B - Moderate Quality
- 

B Category - Hedgerow, Group, Woodland
- 

Tree Category C - Low Quality
- 

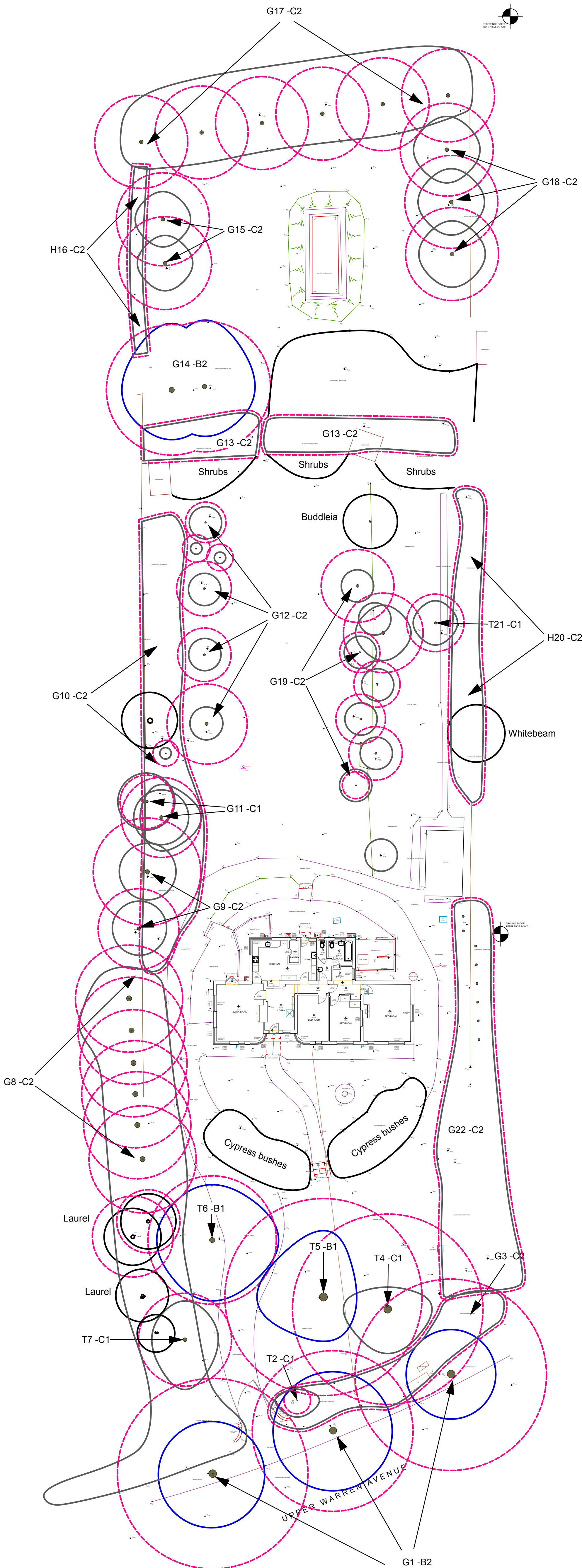
C Category - Hedgerow, Group, Woodland
- 

Tree Category U - Unsuitable for Retention
- 

Default Root Protection Area to BS:5837:2012
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Adjusted Root Protection Area to BS:5837:2012
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Shrub Mass / Offsite Tree



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Revision	Description	Date
-	First Issue	16/9/22

LANDARB SOLUTIONS

Project:
The Moorings, Caversham, Reading
Description:
Tree Survey and Constraints Plan

Status:
For Planning

Scale: 1:200 @A1	Drawn I Checked DP MP	Date: 16/09/2022
Job Number: LAS 492	Drawing Number: 01	Revision: -



Ref no.	Species	Ht. (m)				Category Grading	Crown Spread (m)								Life stage	ULE	Physiological Condition	Structural Condition	General Observations and Notes
			Stem dia. (mm)	RPA radius	RPA area		N	E	S	W	Ht. 1st Br. (m)	Est.	1st Br. Direction	Ht. Can. (m)					
G1	Lime	18.0	720	8.6	235	B2	As on plan				N/A	-	N/A	3.0	M	20+	Good	Fair	Three mature limes, part of avenue of limes along road frontage. Western lime multi-stem from 3m appears reduced in past, central lime has bark damage and exposed heartwood at main union north and south side, black staining on stem, union needs inspecting for decay. Eastern lime has dense crown, good shape.
	T2	Lime	3.0	100	1.2	5	C1	1.0	2.0	1.5	2.0	N/A	-	N/A	0.0	SM	10+	Fair	Poor
G3	Laurel, ivy, hawthorn	2.5	70	0.8	2	C2	As on plan				N/A	-	N/A	0.0	SM	10+	Fair	Poor	Ivy encroachment, hawthorn managed in past but now unkept,
T4	Deodar cedar	17.5	720	8.6	235	C1	2.0	4.0	4.0	4.0	N/A	-	N/A	0.5	M	20+	Fair	Poor	Tree has been topped, there is little needle coverage and branches on north side, moderate deadwood, poor form. Ivy on stem been cut.
T5	Deodar cedar	17.0	740	8.9	248	B1	6.0	3.0	4.0	6.0	N/A	-	N/A	3.0	M	20+	Fair	Fair	Topped in last, lower canopy lifted, moderate deadwood
T6	Walnut	12.0	480	5.8	104	B1	5.0	6.0	5.5	5.0	N/A	-	N/A	3.5	M	20+	Fair	Fair	Crown lifted in past, reasonably dense crown,
T7	Walnut	11.5	350	4.2	55	C1	3.5	3.0	4.5	3.0	N/A	-	N/A	3.5	EM	20+	Fair	Poor	Ivy on stem has been cut, canopy suppression north side
G8	Holly, laurel, cypress	10.0	300	3.6	41	C2	As on plan				N/A	-	N/A	0.0	EM	10+	Fair	Fair	Mixed boundary vegetation, cypress stems have been topped, side has been pruned in past. Cypress appear off site and others behind boundary fence with laurel shrubs in front.
G9	Ash	12.5	400	4.8	72	C2	As on plan				N/A	-	N/A	4.0	EM	10+	Fair	Poor	northern ash has no canopy east side, southern ash has thin crown and dieback and is in neighbouring property.
G10	Holly, cotoneaster yew, privet, ivy, hawthorn	4.0	100	1.2	5	C2	As on plan				N/A	-	N/A	0.0	EM	10+	Fair	Poor	Mixed garden shrubs, unmanaged, some dead with ivy smothering within. Northern section comprises several small Apple trees, limited crown cover, dense ivy smothering some trees and a pittosporum bush.
G11	Holly	9.0	300	3.6	41	C1	3.0	3.5	3.0	2.0	N/A	-	N/A	0.0	M	10+	Fair	Fair	Two holly stems, unable to access base, ivy stems and into crown, mixed garden shrubs around base.
G12	Apple	4.0	200	2.4	18	C2	2.0	2.0	2.0	2.0	N/A	-	N/A	1.0	M	10+	Fair	Poor	Line of garden fruit trees, small trees, pruned in the past, some deadwood,
G13	Cypress	9.0	300	3.6	41	C2	As on plan				N/A	-	N/A	0.0	M	10+	Fair	Fair	Line of topped cypress, managed on flanks
G14	Cedar	12.0	490	5.9	109	B2	6.0	4.5	4.5	4.5	N/A	-	N/A	1.0	M	20+	Fair	Fair	Two cedar, suppress each other, deadwood in lower crowns
G15	Apple	4.0	350	4.2	55	C2	2.5	2.5	2.5	2.5	N/A	-	N/A	0.5	M	10+	Fair	Fair	Two garden fruit trees, pruned in past. Mature to over mature
H16	Privet	2.0	80	1.0	3	C2	As on plan				N/A	-	N/A	0.0	EM	10+	Fair	Fair	Garden hedge, managed.
G17	Apple, cypress, holly, laurel, cotoneaster	9.0	350	4.2	55	C2	As on plan				N/A	-	N/A	0.0	M	10+	Fair	Fair	Two over mature apple trees with line of cypress and holly stems behind and understorey laurel and cotoneaster. Fruit trees pruned in the past, suppressed to north.
G18	Apple, pear	4.0	350	4.2	55	C2	3.0	3.0	3.0	3.0	N/A	-	N/A	0.0	M	10+	Good	Fair	Apple and two pear trees, small, garden fruit trees, mature to over mature, pruned in past.
G19	Pear, Apple, plum	4.0	300	3.6	41	C2	2.5	2.5	2.5	2.5	N/A	-	N/A	0.5	M	10+	Good	Fair	Garden fruit trees, small, mature to over mature, pruned in past.
H20	Beech	2.0	80	1.0	3	C2	0.0	0.5	0.0	0.5	N/A	-	N/A	0.0	EM	10+	Fair	Fair	Managed boundary hedge.
T21	Ash	7.5	220	2.6	22	C1	2.0	2.0	2.0	2.0	N/A	-	N/A	1.5	SM	10+	Fair	Fair	Small self set ash, dense ivy on stem, stump with ivy by its stem.
G22	Fig, cypress, beech, laurel, cotoneaster, yew, lilac	5.0	100	1.2	5	C2	As on plan				N/A	-	N/A	0.0	EM	10+	Fair	Poor	Mixed boundary vegetation, some inside fence whilst others in neighbouring property. Unkept appearance, failed cypress stem in site, low quality garden shrubs.

Appendix 2: Site Photos



Photoview 1: View north along driveway towards T4-T6.



Photoview 2: View looking west at G4 and off site goat willow.



Photoview 3: View west towards west side of existing property access.



Photoview 4: View looking north-east towards drive entrance.



Photoview 5: View looking south along east boundary of site adjacent to the existing dwelling.



Photoview 6: View east towards the garden fruit trees on east side of garden.



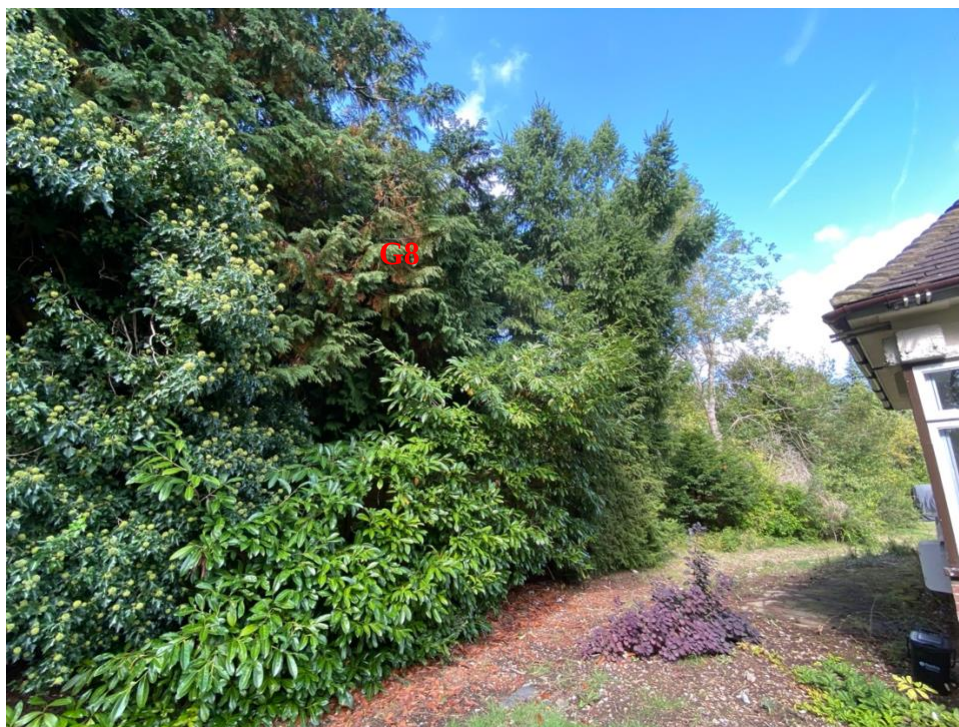
Photoview 7: View west towards fruit trees G9 and boundary vegetation G10 and G11.



Photoview 8: View north towards G13.

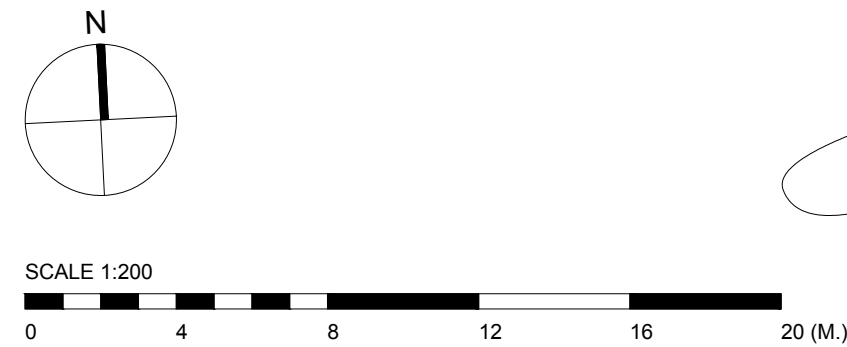


Photoview 9: View east towards the only small fruit tree to be removed.

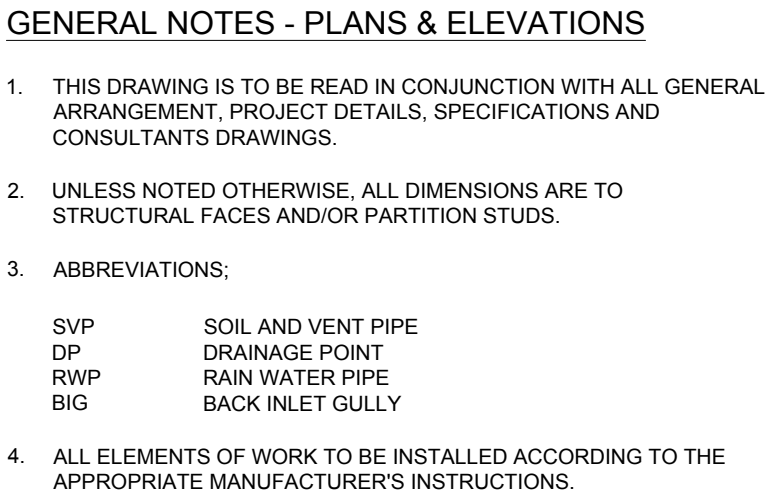


Photoview 8: View north along G8.

Appendix 3: Proposed Site Plan



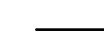
PROPOSED SITE PLAN

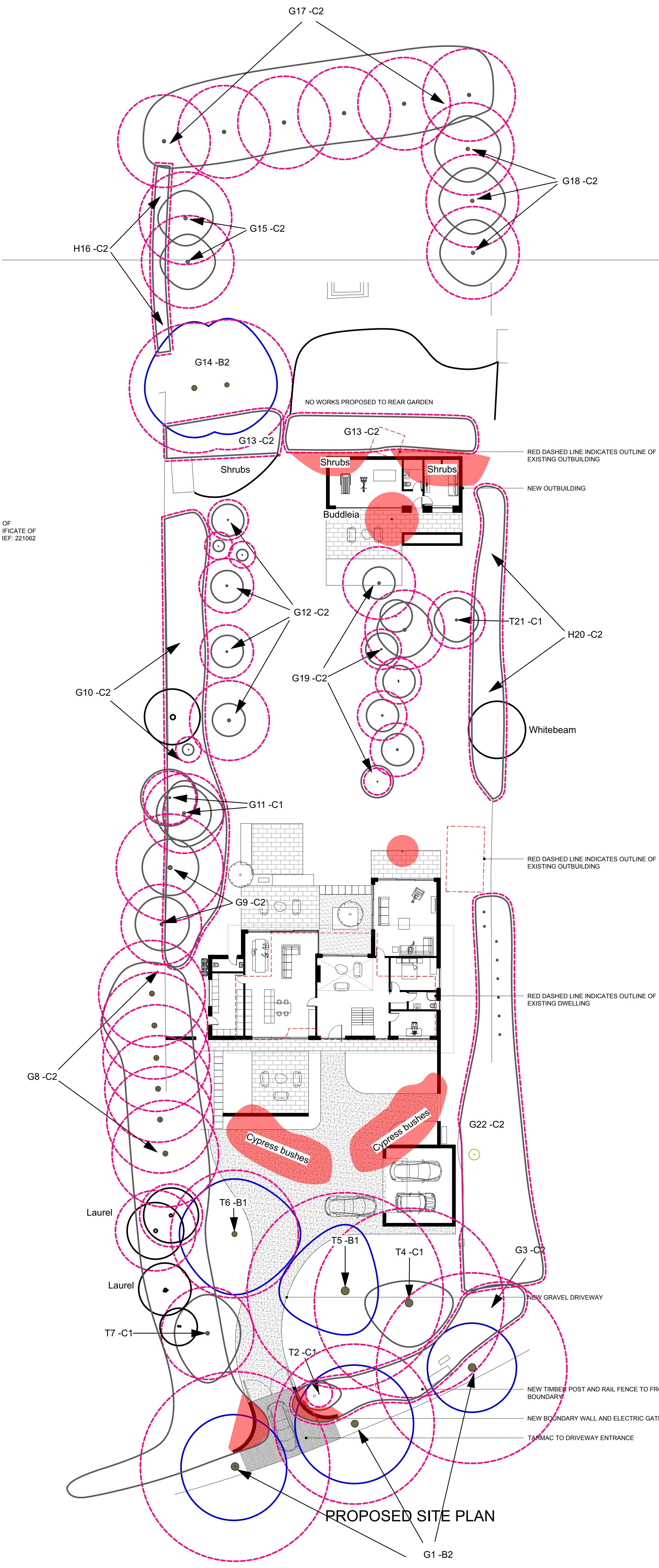


Project			
MOORINGS, UPPER WARREN AVE READING, RG4 7EJ			
Drawing Title			
EXISTING AND PROPOSED SITE PLAN			
Date	Scale	Drawn by	Check by
JULY 2022	1:200 @ A1	CA	KB
Project No.	Drawing No.	Revision	
22.107	PL.1212	A	

Appendix 4: Tree Retention/Loss Plan

KEY - BS 5837 : 2012 Categories

-  Tree Category A - High Quality
-  A Category - Hedgerow, Group, Woodland
-  Tree Category B - Moderate Quality
-  B Category - Hedgerow, Group, Woodland
-  Tree Category C - Low Quality
-  C Category - Hedgerow, Group, Woodland
-  Tree Category U - Unsuitable for Retention
-  Default Root Protection Area to BS:5837:2012
-  Adjusted Root Protection Area to BS:5837:2012
-  Shrub Mass / Offsite Tree
-  Survey Item to be Removed



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Revision	Description	Date
-	First issue	30/11/22

LANDARB SOLUTIONS

Project:
The Moorings, Caversham, Reading

Description:
Tree Retention and Loss Plan

Status:
For Planning

Scale: 1:200 @A1	Drawn I Checked DP MP	Date: 30/11/2022
Job Number: LAS 492	Drawing Number: 02	Revision: -

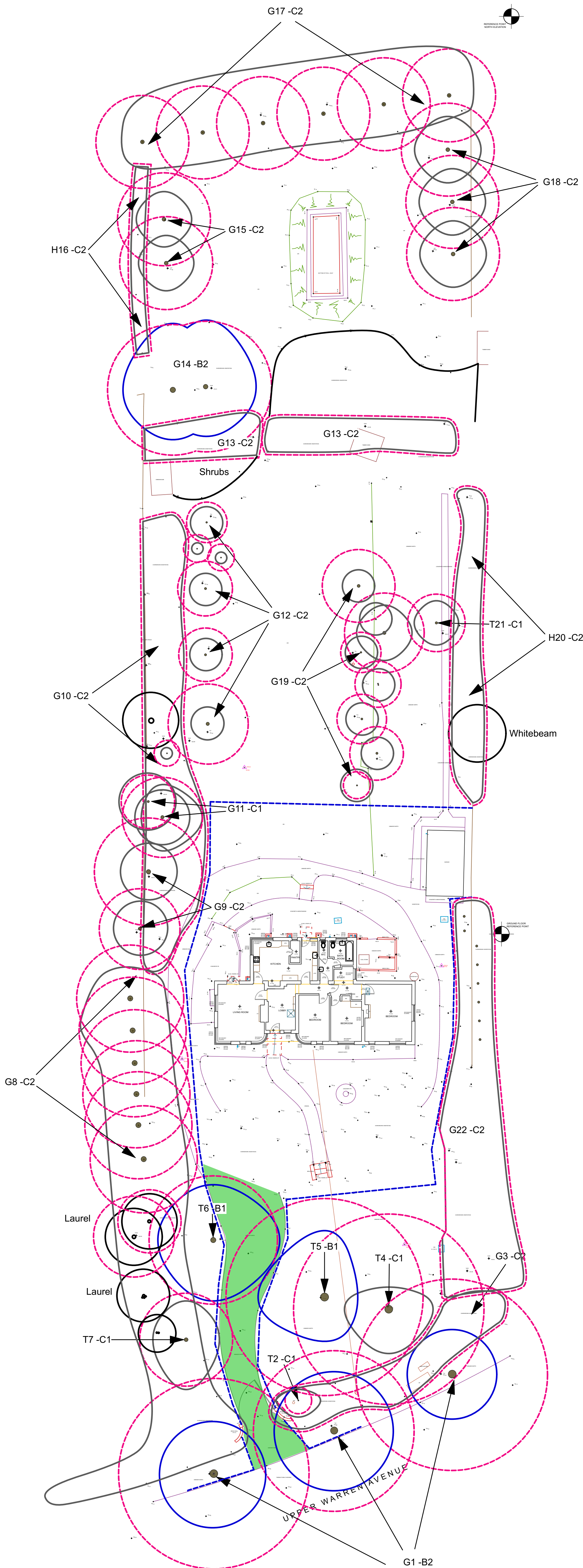
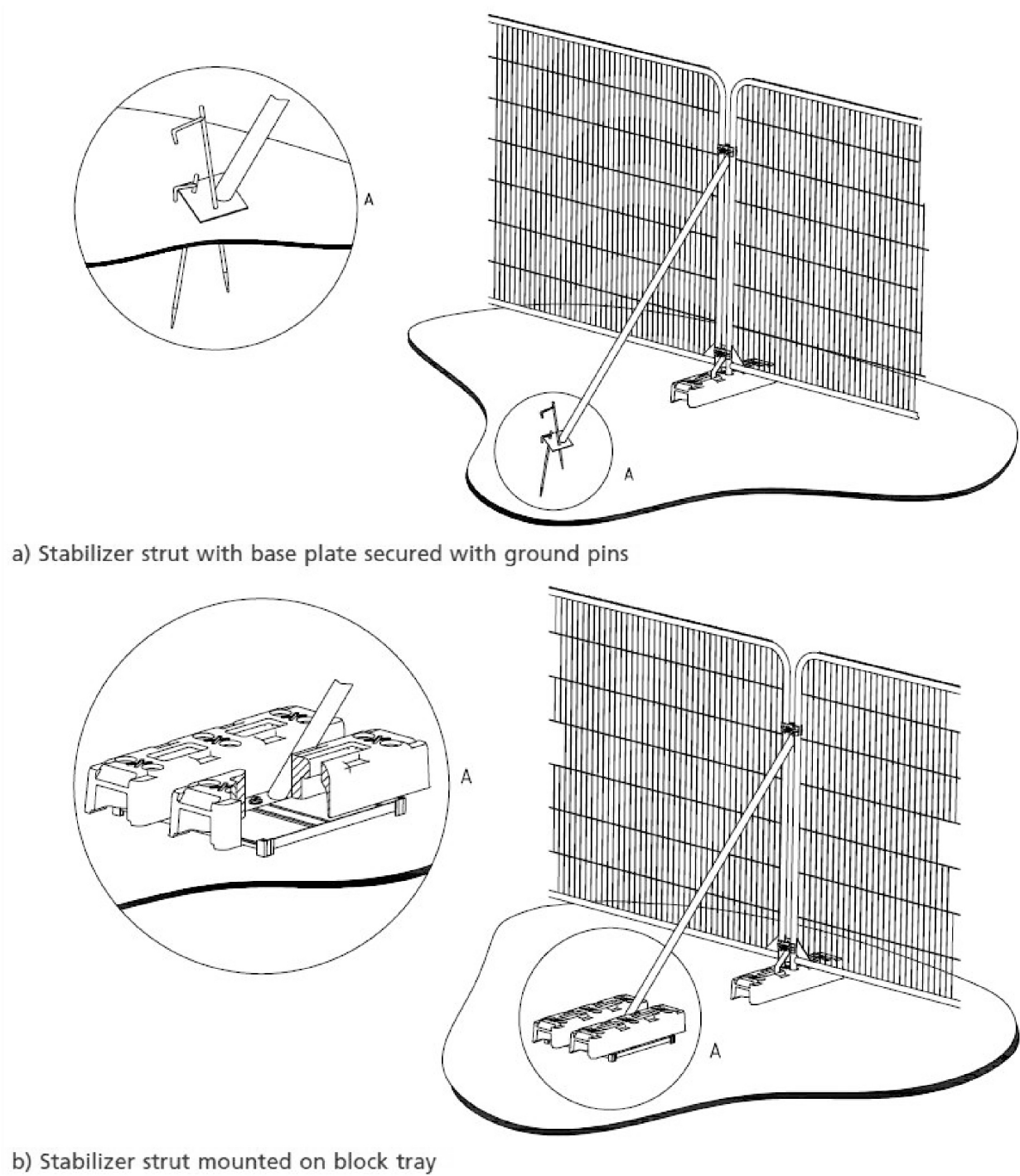


Appendix 5: Tree Protection Demolition

KEY - BS 5837 : 2012 Categories

- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- Default Root Protection Area to BS:5837:2012
- Adjusted Root Protection Area to BS:5837:2012
- Shrub Mass / Offsite Tree
- Tree Protection Barrier to BS:5837:2012 Primary Position
- Temporary Ground Protection to BS:5837:2012

BS:5837:2012 Figure 3 Examples of above-ground stabilizing systems



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Revision	Description	Date
-	First issue	22/9/22

LANDARB SOLUTIONS

Project:
The Moorings, Caversham, Reading
Description:
Tree Protection - Demolition

Status:
For Planning

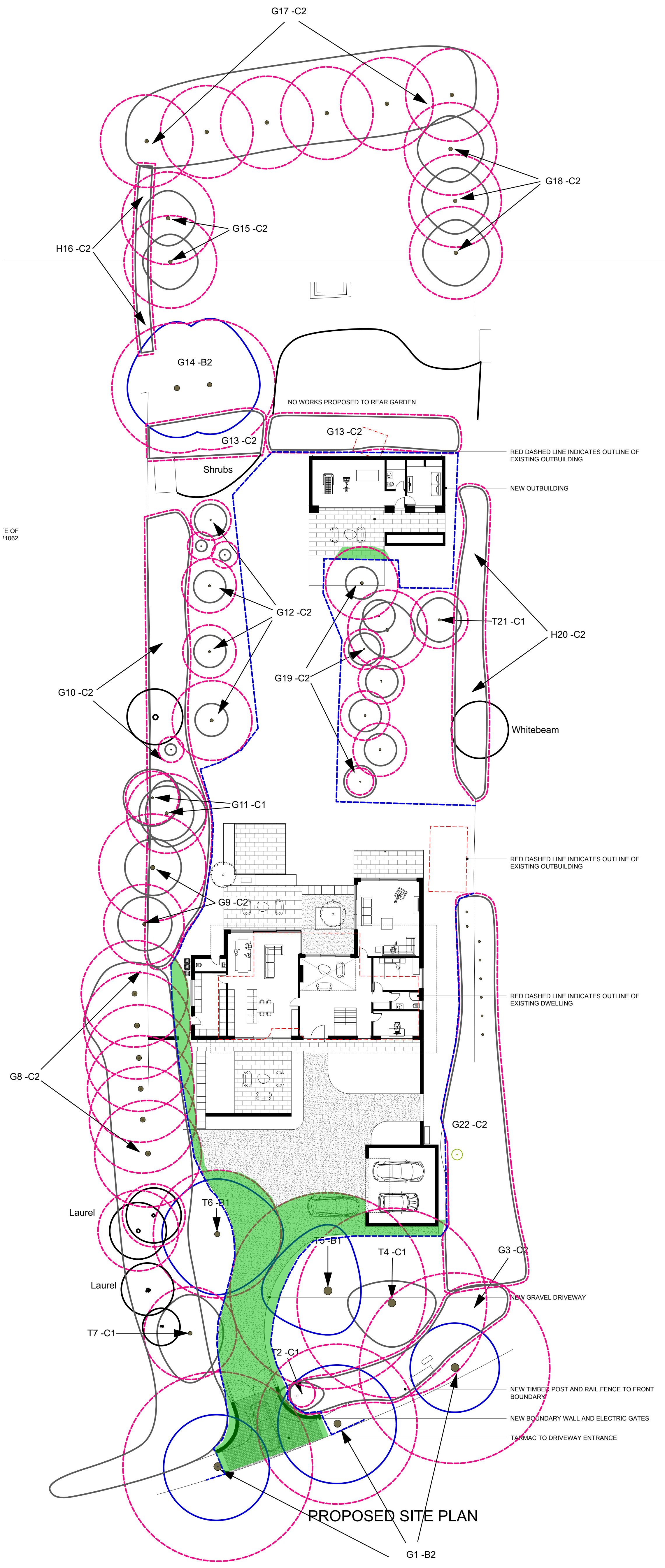
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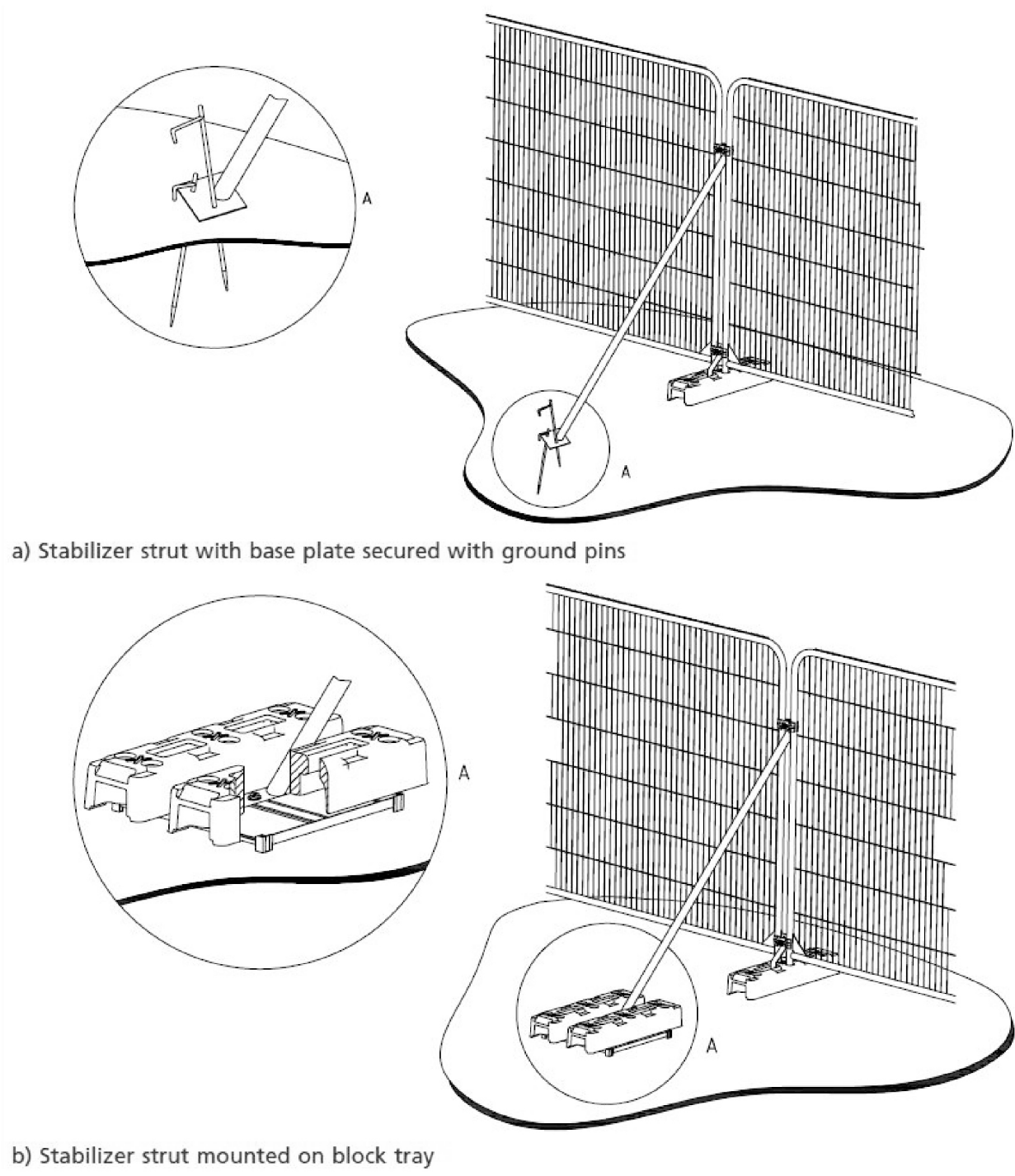
Appendix 6: Tree Protection Plan Construction

KEY - BS 5837 : 2012 Categories

- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- Default Root Protection Area to BS:5837:2012
- Adjusted Root Protection Area to BS:5837:2012
- Shrub Mass / Offsite Tree
- Tree Protection Barrier to BS:5837:2012 Primary Position
- Area of sensitive working/no dig/ground protection



BS:5837:2012 Figure 3 Examples of above-ground stabilizing systems



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Revision	Description	Date
-	First issue	30/11/22

LANDARB SOLUTIONS

Project:
The Moorings, Caversham, Reading

Description:
Tree Protection - Construction

Status:
For Planning

Scale:
1:200 @A1

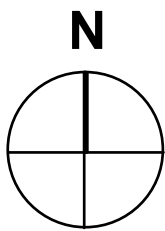
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LAS 492

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DP MP

Drawing Number:
04

Date:
30/11/2022

Revision:
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0 25m

Appendix 7: Ground Guard Example

TREE ROOT PROTECTION DURING CONSTRUCTION PROJECTS

The Department for Communities and Local Government's guide **"Tree Roots in the Built Environment"** states that **"ground protection should be installed before any materials or machinery is brought onto the site"** (Section 9.3.3.2) [Crown Copyright acknowledged]

It has been shown that **"the major contribution to soil compaction from vehicle movements comes from the first passes of vehicles over the ground"** (Section 4.2.3) Thus it is essential that ground protection is specified and installed from day one of construction projects.

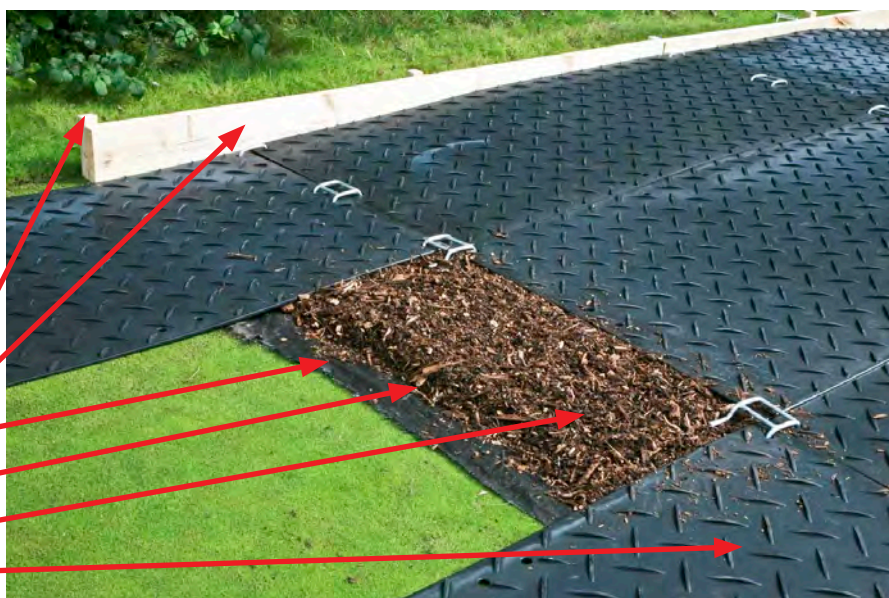
Failure to protect the ground from compaction will lead to reduced water and oxygen infiltration to the tree roots and can ultimately lead to the decline of the tree.

TREE ROOT PROTECTION METHOD

GroundGuards trackway mat systems are frequently used on construction sites to protect the ground from erosion and damage by construction vehicles. Where a temporary roadway must pass near to trees, the following extra precautions must be taken in order to provide cushioning for the ground under the tree canopy:

1. Edge rails of 200 x 50mm sawn timber should be installed where the trackway will pass under the tree canopy. These should be staked on either side of the trackway using 50 x 50 x 500mm timber stakes at 1.5m spacings.
2. A layer of geotextile membrane should be laid to cover at least the area under the tree canopy and preferably under the whole of the trackway.
3. A pad of trackway mats should be laid on top of the geotextile membrane, between the timber rails.
4. A 150mm deep layer of wood chipping should be laid over the mats
5. The trackway can then be laid so that it rises over the wood chippings as it passes under the tree canopy.

50x50x500 timber stakes
200x50 timber rails
Geotextile Membrane
Base layer of trackway mats
Wood chippings
Upper layer of trackway mats



Three trackway systems suitable for tree root protection are available for hire or sale:



MultiTrack

These mats quickly clip together and are suitable for medium weight construction traffic. Where they pass over tree roots, install a double layer of mats with 150mm of wood chippings between to cushion the ground.



MaxiTrack

This is a unique heavy duty matting system with overlapping flanges and bolt-together connection, for heavier traffic. Again, use a sandwiched layer of wood chippings where there are tree roots.



XtremeMats

For very heavy traffic, over extended periods, these rigid 4x2m mats spread the load to protect the ground. Double layering is not necessary, but 150mm of wood chippings should be used in areas with tree roots.

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Appendix 8: Cellweb Guide

Cellweb® TRP

Tree Root Protection

Cellweb® TRP is a 3D cellular confinement tree root protection system. The system provides a 'no dig' solution for the construction of new hard surfaces within root protection areas (RPAs). Cellweb® TRP has been designed and independently tested to comply with recommendations made in Arboricultural Practice Note 12 and BS 5837 2012 – Trees in relation to design, demolition and construction.



Cellweb® TRP Key Functions

Cellweb® is a 'no dig' solution which is constructed directly on the existing ground surface. This eliminates the requirement for excavation, preventing root severance.

Cellweb® is a completely porous system allowing continued water permeation and gas exchange between the rooting environment and atmosphere.

Cellweb® spreads point loads, minimising increases in soil compaction within the rooting environment. This maintains an open graded soil structure allowing continued root growth, water, gas and nutrient migration.

The Cellweb® TRP system comprises the following three components

Treetex™ Geotextile. Following minimal ground preparation the Treetex™ is laid onto the existing ground and top soil. This acts as a separation layer, separating the system above from the soil and rooting environment below. Treetex™ performs as a hydrocarbon pollution control measure in accordance with BS5837, holding 1.7lt of oil per square meter.

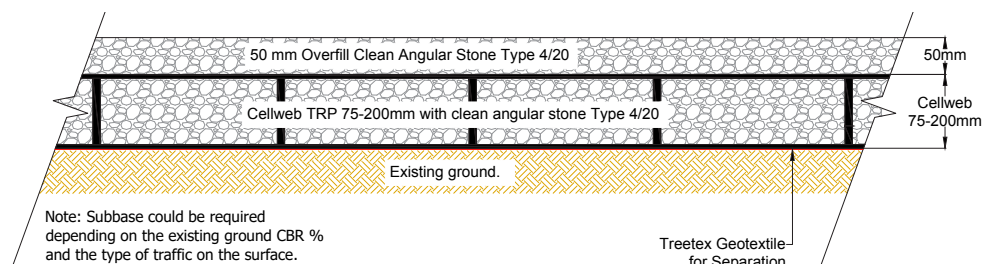
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

4-20mm Clean Angular Stone. The expanded Cellweb® is infilled with a 4-20mm clean angular stone. The confined angular stone locks together to produce a rigid stone mattress, while maintaining air pockets for continued water permeation and gas exchange. The low fines content of the stone prevents the Treetex™ layer from becoming blocked over time.

Which depth of Cellweb® TRP?

The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical and engineering support please contact Geosynthetics Ltd 01455 617139 or the full installation guide can be found on our website www.geosyn.co.uk.

Indicative Cellweb with overfill



Cellweb® TRP

The Contractors Guide



Complies with
BS:5837



No Dig
Solution



Adopted by
Councils



100%
Success Rate



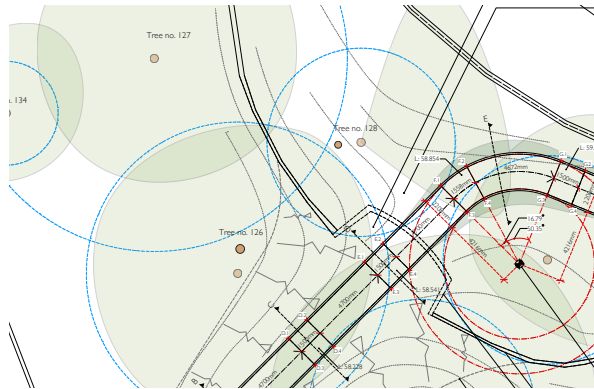
Cellweb®TRP
Guaranteed



Independently
Tested

What is Cellweb®TRP?

Cellweb®TRP is a cellular confinement system specifically designed for tree root protection. The system creates a stable load bearing surface for traffic or footfall whilst eliminating damage to roots through compaction and desiccation. The Cellweb®TRP system comprises of three specific elements; Cellweb® TRP, Treetex pollution control geotextile and an infill of clean angular stone. The system has been designed to combine the best possible products to create an unparalleled solution for tree root protection applications.



What is a Root Protection Area (RPA)?

The Root Protection Area is the minimum area around a tree which is deemed to contain sufficient roots and soil to maintain the trees viability. The RPA is calculated as 12 times the diameter of the tree trunk and 1.5m off the ground; for example a tree has a trunk that is 500mm in diameter and is measured 1.5m above the ground. This calculates that the RPA will have a radius of 6m ($500\text{mm} \times 12 = 6,000\text{mm}$). The RPA is a radius relative to the tree trunk, but the calculation is based on the trunk diameter. This is used to protect all of the retained trees within and around the development.

What is a Tree Preservation Order (TPO)?

Tree Preservation Orders are put in place by local planning authorities in England to protect specific trees and woodlands in the interest of amenity. Preservation orders prohibit; cutting down, topping, lopping, uprooting, wilful damage and wilful destruction of trees as per The Town And Country Planning (Tree Preservation, England) regulations 1990 and 2012. If found guilty of tree cutting offences in the UK, the court can fine up to £20,000. In serious circumstances, a person can face unlimited fines if found guilty by the Crown Court.

How Cellular Confinement Works?

By confining the infill material, 3D Cellular Confinement Systems work by altering the angle of load distribution, reducing the load on the soil and increasing its bearing capacity. This ultimately minimises soil compaction and maintains an open soil structure. This is crucial for continued water permeation and gas exchange in the rooting environment.

What makes Cellweb®TRP the best solution?

- Cellweb®TRP is the only established guaranteed tree root protection system on the market in the UK.
- It Complies with BS 5837: 2012, Trees in relation to design and demolition/construction recommendations.
- It is the only independently tested system, ensuring compliance with recommendations made in BS 5837: 2012.
- Cellweb®TRP has had a 100% success rate on thousands of projects.
- Our in house tree root protection team will provide technical support both over the phone and on site.
- Our in house qualified civil engineers will provide site specific technical recommendations.
- An extensive bank of case studies is available to download for free.
- We offer free educational tree root protection seminars across the UK.
- Cellweb®TRP has been adopted by a number of local authorities throughout the United Kingdom.



Cellweb® TRP

The Contractors Guide



Complies with
BS:5837



No Dig
Solution



Adopted by
Councils



100%
Success Rate



Cellweb®TRP
Guaranteed



Independently
Tested

What the Guarantee covers and how to get your project guaranteed?

The guarantee covers the replacement of the dead tree(s) up to the value of £10,000 per tree. In the unlikely event the Cellweb®TRP System fails, the guarantee will also cover the replacement of the system up to £50,000.

To obtain the guarantee you will need to provide a copy of the arb report. Geosynthetics Ltd will then send a complementary technical recommendation. A scoping agreement will then be signed to clarify what tree(s) are guaranteed.

For more information please contact the team on 01455 617 139.

Why is stone so important, how can I source it and how much will I need?

In conjunction with Cellweb®TRP we recommend using 4-20mm of clean angular stone. Having an angular stone allows the stone to bind together providing rigidity throughout the cells and also allows pore spaces for the diffusion of water and gasses. Having a clean stone will ensure that fines do not clog the Treetex layer.

If you would like more information on the stone specification, please contact the team on 01455 617 139 however this can be sourced from your local quarry.

What is Treetex and what does it do?

Treetex is a pollution control geotextile developed to work in harmony with the Cellweb®TRP System. The heavy duty needle punched geotextile fleece is manufactured from polypropylene. Treetex is ideal for use in a Tree Root Protection system as it is easily moulded to the shape of the aggregate and has been independently tested by Coventry University. The product has been proven to absorb 1.7 litres of oil per m² ensuring that the roots are not damaged by pollutants from the surface.

Do I need any specialist equipment for installation?

The system is very easy to install and simply requires a stapler, staples and pins to hold the panels down during installation. Please note on larger scale projects for speed of installation, a hydraulic stapler may be used.

What applications can Cellweb®TRP be used for?

Cellweb TRP is likely to be required in the following scenarios:

- For the construction of any new hard surface within the RPA of any retained tree on or bordering the site.
- For the construction of temporary ground protection where construction and foot traffic must pass through the RPA during construction. BS 5837 2012 – Trees in relation to design, demolition and construction recommendations states that: "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."
- Where the use of 'No Dig' construction has been specified by an arboricultural consultant within the tree protection plan.
- Where Cellweb TRP has been specified in the architects or engineers plans and drawings.



Cellweb® TRP

The Contractors Guide



Complies with
BS:5837



No Dig
Solution



Adopted by
Councils



100%
Success Rate



Cellweb®TRP
Guaranteed



Independently
Tested

Free technical support from Geosynthetics Ltd is available

Our tree root protection team can offer support and advice in the following areas.

- Installation
- Overcoming changes in levels and other site specific challenges
- The Cellweb infill material – ‘What stone and how much’
- Surfacing options for the Cellweb®TRP system
- Edging the Cellweb system
- Quantifying and pricing

All of the above services are free of charge and have been developed to ensure that you are provided with the required levels of tree root protection for your site. The advice and services have been given to ensure that you are able to provide an excellent service to your clients and do not fall foul to the tree protection law or planning conditions.

What is the delivery turn around time as standard?

Delivery turn around for the Cellweb®TRP system is 24-48 hours* dependent on location and volume purchased.

Which depth of Cellweb®TRP do I need?

Depth of Cellweb®TRP	Unit	Gross Vehicle Weight (GVW)	Application
200 mm	Kg	< 60,000	HGV & Unusual - Crane / piling rig
200 mm	Kg	< 50,000	Heavy Construction Traffic
150-200 mm	Kg	< 30,000	Standard Construction Traffic & Refuse vehicle
150 mm	Kg	< 16,000	Emergency Access & Tractors
100-150 mm	Kg	< 9,000	Delivery Vans
100-150 mm	Kg	< 6,000	Car Park: Cars & Light van
100mm	Kg	< 3,000	Domestic Traffic: Cars
75mm	Kg	< 1,000	Pedestrians (with cyclist) path

Can I use an alternative system?

Cellweb® TRP has a number of unique attributes and once this has been specified by architects and designers, please be aware that no other system can comply. For guidance on ascertaining if another system is suitable, please contact our team for assistance. A system failure can ultimately bring about the demise of the protected tree(s) and could lead to prosecution and unlimited fines.

Please be aware that if Geosynthetics Ltd have completed site specific calculations and provided a full technical recommendation, use of another product will void our engineered solution and the guarantee will no longer be applicable.

For further information and assistance with Cellweb Tree Root Protection, please contact Geosynthetics Ltd on 01455 617 139.

