



Invicta Arboriculture
Tree and Woodland Consultancy

**Arboricultural Implications Assessment and
Method Statement**

Huggens College
College Road
Northfleet
Kent
DA11 9DL

20th March 2024



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Executive Summary

1. **Brief:** Invicta Arboriculture has been appointed to provide arboricultural advice relating to the proposed development. This survey and report has been prepared in accordance with BS5837:2012 “Trees in relation to design, demolition and construction – Recommendations.
2. **Proposal:** Demolition of existing buildings and erection of retirement living apartments (Use Class C3), together with the extension of the existing chapel and the provision of associated communal facilities and external amenity space, lodge keeper’s and guest accommodation, back-of-house facilities, parking, bicycle/mobility scooter parking, and associated works including the creation of a secondary, emergency access from College Road.
3. **Survey:** The site was surveyed on 28th March 2023 following the guidance contained within BS5837:2012.
4. **Statutory designations:** The application site is not subject to any Tree Preservations Orders. The application site is not located within a Conservation Area.
5. **Arboricultural impact:** The arboricultural impact of the proposed scheme is considered to be low to moderate requiring the loss of twenty-six trees. The twenty-six trees to be removed are predominantly small ornamental specimens with low public visual amenity value.

In addition to the twenty-six trees being removed to enable the proposed development, a further five trees will be removed regardless of the development proposal due to their poor structural condition and are considered to pose an unacceptable risk to users of the site.

The loss of the trees will be mitigated with a comprehensive landscaping scheme proposed as part of the application.

Notwithstanding the proposed tree removals the tree line bounding the application site will be largely retained providing the benefit of screening to the proposed development.

BS5837:2012 compliant protective fencing will be erected around all retained trees.

BS5837:2012 compliant ground protection will be installed within the RPA’s of a number of trees to enable construction access.

BS5837:2012 compliant ground protection will be utilised in the form of ‘no-dig’ surfacing to enable the formation of footpaths within the RPA’s of a number of trees.

1 INTRODUCTION

1.1 **Brief:** I am instructed by the President and Trustees of Huggens College to provide a pre-development tree report in accordance with BS5837:2012 in respect of trees at Huggens College, College Road, Northfleet, Kent, DA11 9DL to accompany a planning application for the re-development of the site.

1.2 **Qualifications and experience:** I have based this report on my site observations and the information provided, and I have come to conclusions in the light of my experience as an arboriculturist.

I am a Professional member of the Consulting Arborist Society.

I am a Technician member of the Arboricultural Association.

1.3 **Documents and information provided:** I was provided with the following documents.

- A topographical plan of the site as existing.
- A proposed site layout plan.

1.4 **Report limitations:** This report is only concerned with the 128 trees and 2 tree/shrub groups as shown on the tree constraints plans at Appendix B. It takes no account of any other trees. It includes a detailed assessment based on the site visit and the documents provided, listed in 1.3 above.

This report has been prepared on the basis of the proposed development and should not be interpreted as a report on tree health and safety. Whilst all reasonable effort has been made to identify visible structural and physiological defects whilst undertaking the survey, trees and shrubs are living organisms; the health and stability of which can change rapidly; especially in the event of extreme weather conditions, therefore all recommendations given are valid for a period of twelve months from the date of this report.

1.5 **Collection of data:** The survey was carried out using the following inspection aids:

- Digital clinometer- To calculate the height of the trees
- Girthing tape- To measure stem diameter
- Leica Disto D1 laser measurer – To calculate canopy spreads

2 SITE VISIT AND OBSERVATIONS

- 2.1 **Site visit:** I carried an unaccompanied site visit on 28th March 2023. All of my observations were from ground level. The weather at the time of inspection was cold and raining but with good visibility.
- 2.2 **Brief site description:** The application site is located in the residential suburbs of Northfleet in north Kent and comprises a complex of retirement bungalows (Almshouses) along with a chapel and chaplains house all located around a central green open space. The topography of the application site is relatively flat. The site is not exposed.



- 2.3 **Identification and location of the trees:** 116 trees and a single shrub group are located predominantly around the boundaries of the application site, with a small group of trees located towards the centres of the green open space. 12 further trees and one tree group are recorded as off-site trees to the north and west of the application site on local authority owned land.

I have illustrated the approximate location of the trees on the tree constraints plans included at Appendix B. All of the relevant information and measurements on it are contained within this report and the provided documents.

- 2.4 **Collection of basic data:** I collected information on species, height, diameter, maturity and potential for contribution to amenity in a development context. I have recorded this information in the tree survey schedule included at Appendix A. I stress that my inspection was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level unless otherwise stated.

3 APPRAISAL

3.1 **Relevant references:** This inspection was undertaken in accordance with *B.S.5837:2012 Trees in relation to design, demolition and construction - Recommendations*. The trees were inspected using the Visual Tree Assessment method as documented by Mattheck and Breloer in '*The Body Language of trees*', ODPM Research for Amenity Trees number 4, 1994 or as modified by more recent research.

3.2 **British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations:** This report is set out according to the recommendations within B.S. 5837:2012 and contains the following information relating to the trees within and adjacent to the application site.

- Tree survey schedule (included at Appendix A)
- Tree Constraints Plan (included at Appendix B)
- Arboricultural impact assessment
- Arboricultural method statement
- Tree protection plans (included at Appendix C and D)

3.3 Table 1: Tree quality assessment

B.S. 5837:2012 Category	Survey Numbers	Total
U	T13, T14, T21, T22, T23, T26, T32, T35, T65, T81, T82, T118, T119, T120, T121, T122, T127	17
A	-----	0
B	T7, T8, T9, T10, T11, T12, T15, T16, T17, T18, T19, T25, T27, T29, T36, T38, T39, G40, T59, T74, T88, T89, T90, T91, T92, T100, T103, T104, T106, T108, T115, T116	32
C	All other trees and tree groups	81

3.4 The trees subject to this report are located predominantly around the boundaries of the application site. The trees are a mixture of broadleaved deciduous and coniferous varieties that vary in age class and condition with the more mature, better quality trees confined to the northern, eastern and southern boundaries. The vast majority of trees present display good overall form and vitality.

3.5 The trees that occupy the western boundary of the site are located within the rear gardens of numbers 8 to 19 and comprise a mixture of small ornamental evergreen and broadleaved species, none of which are considered to be particularly good examples of their respective species.

- 3.6 A group of maturing Silver Birch trees occupy the central area of the green open spaces around which the existing properties extend. The group of Silver Birch trees are considered to be good quality trees that contribute to the landscape character of the site as a group rather than individually.
- 3.7 Tree numbers G40 and T117 to T129 are all off-site trees located on local authority controlled land to the north and west. G40 comprises a group of seven mature Lombardy Poplar trees that are considered to be in good overall condition. T117 to T129 comprise a mixture of Lombardy Poplar, Sycamore and a single Goat Willow. The Lombardy Poplars that extend along the western boundary of the application site are considered to be poor specimens. Many of which have been previously pollarded at approximately ten metres above ground level with extensive decay now extending throughout most of the old pollard heads and in some cases down in to their main stems. Despite their root protection areas extending in to the application site, the presence of the Lombardy Polar trees along the western boundary should not pose any serious constraints on the development proposal whatever its design.

3.8 **Table 2: Trees to be removed**

B.S. 5837:2012 Category	Survey Numbers	Total
U	T21, T22, T23, T32, T65, T81, T82	7
A	-----	0
B	T90, T91	2
C	T1, T2, T43, T47, T50, T53, T54, T55, T57, T60, T61, T67, T69, T72, T75, T76, T77, T83, T87, T94, T99, T130	22

A total of twenty-six trees are to be removed from within the applications site to enable the proposed development. The vast majority of those to be removed are located along the western boundary of the application site and are considered to be small low value specimen trees, the loss of which is not considered detrimental to the landscape character of the site and will be mitigated against in the form of extensive new tree planting and landscaping.

A further five trees (T21, T22, T23, T32 and T65) will be removed regardless of the development proposal due to their poor structural condition and are considered to pose an unacceptable risk to users of the site.

4 TREE CONSTRAINTS PLAN

4.1 The tree constraints plan is primarily a design tool which shows the below ground constraints represented by the calculated root protection area and the above ground constraints represented by the current and ultimate heights of the trees and the potential effects of shade on any proposed development. The tree constraints plan is included at Appendix B.

4.2 Below ground constraints:

- The root protection area (RPA) is the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the trees viability and where the protection of the roots and soil structure is treated as a priority. The RPA is measured in m². The RPA is shown as a red circle on the tree constraints plan.
- The root protection area relates to the stem diameter of each tree when measured at a height of 1.5m from ground level. For single stem trees the RPA is calculated as an area equivalent to a circle with a radius of twelve times the stem diameter (or the mean diameter of the total number of stems in the case of multi-stemmed trees).
- Paragraph 4.6.2 of BS5837:2012 states that *'the RPA for each tree should initially be plotted as a circle centred on the base of the tree. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced'*. The majority of the trees subject to this report are considered to be open grown specimens and are considered to have symmetrical root systems and therefore their root protection areas are plotted as circles centred on the base of the tree.

Adjustments to the shape of the RPA's of T100, T106, T109, T110, T111, T112, T113, T114, T115 and T116 have been made due to the presence of walls, roads and buildings and as such their RPA's are shown as a polygon (square) with an equivalent area in accordance with the British Standard.

- The proposed development encroaches marginally in to the RPA's of T18 (Atlas Cedar) T107 (Ash) and T108 (Lime) and is quantified in table 3 below:

Table 3: RPA encroachments and separation distances:

Tree number	Total area of RPA M ²	Encroachment by area M ²	% Of encroachment in to RPA
T18	113.1	1.1	0.9
T107	55.4	3.4	6.1
T108	95.7	10.5	10.9

Separation distances of 5.6 meters, 3.1 metres and 7.7 metres will exist respectively between the proposed development and T18, T107 and T108.

Given the minimal encroachments in to the RPA's of T18, T107 and 108, a traditional strip foundation is considered acceptable in this instance.

New pedestrian footpaths will be formed across the site as part of the new development and will utilise a 'no-dig' methodology where they encroach in to the RPA's of a number of trees (T7, T44, T46, T59, T88, T89, T92, T107, T108, T109, T112, T113, T114, T115 and T119) and is discussed in more detail at section six of this report (tree protection plan).

Construction access will also be required within the RPA's of T18, T34, T39, T73, T107, T108, T109, T112, T113, T114, T115 and T119 and as such measures for ground protection within their respective RPA's is discussed in detail at section five of this report (Arboricultural method statement).

4.3 Above ground constraints:

- There are no significant above ground constraints.

5 ARBORICULTURAL IMPACT ASSESSMENT

- 5.1 **Arboricultural impact:** The arboricultural impact of the proposed scheme is considered to be low to moderate requiring the loss of twenty-six trees. The twenty-six trees to be removed are predominantly small ornamental specimens with low public visual amenity value.

In addition to the twenty-six trees being removed to enable the proposed development, a further five trees will be removed regardless of the development proposal due to their poor structural condition and are considered to pose an unacceptable risk to users of the site.

The loss of the trees will be mitigated with a comprehensive landscaping scheme proposed as part of the application.

BS5837:2012 compliant protective fencing will be erected around all retained trees.

BS5837:2012 compliant ground protection will be installed within the RPA's of a number of trees to enable construction access.

BS5837:2012 compliant ground protection will be utilised in the form of 'no-dig' surfacing to enable the formation of footpaths within the RPA's of a number of trees.

- 5.2 **Presence of TPOs or conservation area designations:** The application site is not subject any Tree Preservation Orders. The application site is not located within a Conservation Area.
- 5.3 **Effects of new buildings on amenity value on or near the site:** The effects of the proposed development are not envisaged to have any detrimental effect on the amenity value of the retained trees or surrounding landscape providing all advice given in this report is adhered to.
- 5.4 **Above and below ground constraints:** The above and below ground constraints are discussed in section four above and shown on the tree constraints plan at Appendix B.
- 5.5 **Construction processes of the proposed development or demolition needs:** The existing dwellings will be demolished. BS5837:2012 compliant protective fencing will be erected around all retained trees prior to the demolition contractors site occupation and is shown on the Tree Protection Plan – Demolition at Appendix C.

All existing boundary fences will need to be removed prior to the erection of the tree protection fencing. Fences will be removed by hand to avoid the need for mechanical incursion in to unprotected RPA's.

All plant and vehicles engaged in demolition operations will work outside of the RPA's of the retained trees.

Where trees stand in close proximity to structures to be removed, the demolition should be undertaken inwards within the footprint of the existing building (referred to as ‘top down, pull back’).

Where there is a significant build up of dust on the foliage of adjacent trees, it may be necessary hose down the tree in order to remove excessive accumulations.

- 5.6 **Modifications proposed to accommodate trees – Ground protection:** Construction access (erection of scaffolding, access for machinery etc.) will be required within the RPA’s of T18, T34, T39, T73, T107, T108, T109, T112, T113, T114, T115 and T119 and as such it will be necessary to install temporary ground protection within their RPA’s and is shown as purple ‘Honey’ hatching on the tree protection plan at Appendix C.

For pedestrian operated plant up to a gross weight of two tonne, proprietary inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150mm depth of woodchip) shall be deemed sufficient. I include a photograph below to demonstrate this system:



- 5.7 **Modifications proposed to accommodate development –tree pruning/felling:** A total of twenty-six predominantly low value trees will be removed to enable the proposed development and is discussed in detail at section three of this report. There are no requirements for any tree pruning.
- 5.8 **Infrastructure requirements – highway visibility, lighting, CCTV, services etc:** Services will be routed in to the new dwellings using existing feeds located outside of the RPA’s of the retained trees.

The installation of services within the rooting zones of trees can have a detrimental impact on the long-term survival of retained trees leading to their

unnecessary loss or root failure in high winds. The installation of services within RPA's should be avoided where possible. Where this is not possible it may be necessary to utilise a trenchless solution such as micro tunnelling, surface-launched directional drilling, impact moling or where the relative expense on low cost projects makes the use of such trenchless systems unviable, hand digging may be acceptable over short distances.

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

The trees subject to this report do not obscure highway visibility splays.

- 5.9 **End use of space:** The application is for the demolition of existing buildings and erection of retirement living apartments (Use Class C3), together with the extension of the existing chapel and the provision of associated communal facilities and external amenity space, lodge keeper's and guest accommodation, back-of-house facilities, parking, bicycle/mobility scooter parking, and associated works including the creation of a secondary, emergency access from College Road.
- 5.10 **Mitigating tree loss/ new planting:** Extensive landscaping to include new tree planting is proposed across the application site, the details of which however are outside the scope of this report.
- 5.11 **Veteran trees:** None of the trees are considered to be veterans.
- 5.12 **Impact of trees on buildings and vice versa and allowance for future growth:** The impact of the trees on the proposed development and vice versa and allowance for future growth has been considered.

Shading of the properties along the western boundary and their respective gardens should be anticipated throughout the later part of the day due to the number of trees present within and adjacent the application site along this elevation.

Leaf nuisance during the autumn and winter months could potentially cause blockages in rainwater goods and therefore a recommendation is made for the installation of proprietary gutter guards. Two types of suitable gutter guard are shown below:



6 ARBORICULTURAL METHOD STATEMENT AND TREE PROTECTION PLAN

Arboricultural Method Statement (AMS) includes a Tree Protection Plan (TPP) to identify:

- Protective fence positions therefore the Construction Exclusion Zones (CEZ) shown as a blue line on the TPP's at Appendix C and D.
- Measurements to identify fence positioning in relation to the centre of the tree are recorded in the tree survey schedule at Appendix A.
- No-dig construction of the pedestrian footpaths is shown as green 'Honey' hatching on the tree protection plan at appendix D.
- Ground protection for construction access is shown as purple 'Honey' hatching on the TPP at Appendix D.

1.0 Construction Exclusion Zone

- 1.1 The Construction Exclusion Zone (CEZ) as required by the current edition (2012) BS 5837 relates to the stem diameter of each retained tree when measured at a height of 1.5m from ground level or the mean diameter of the total number of stems in the case of multi-stemmed trees.

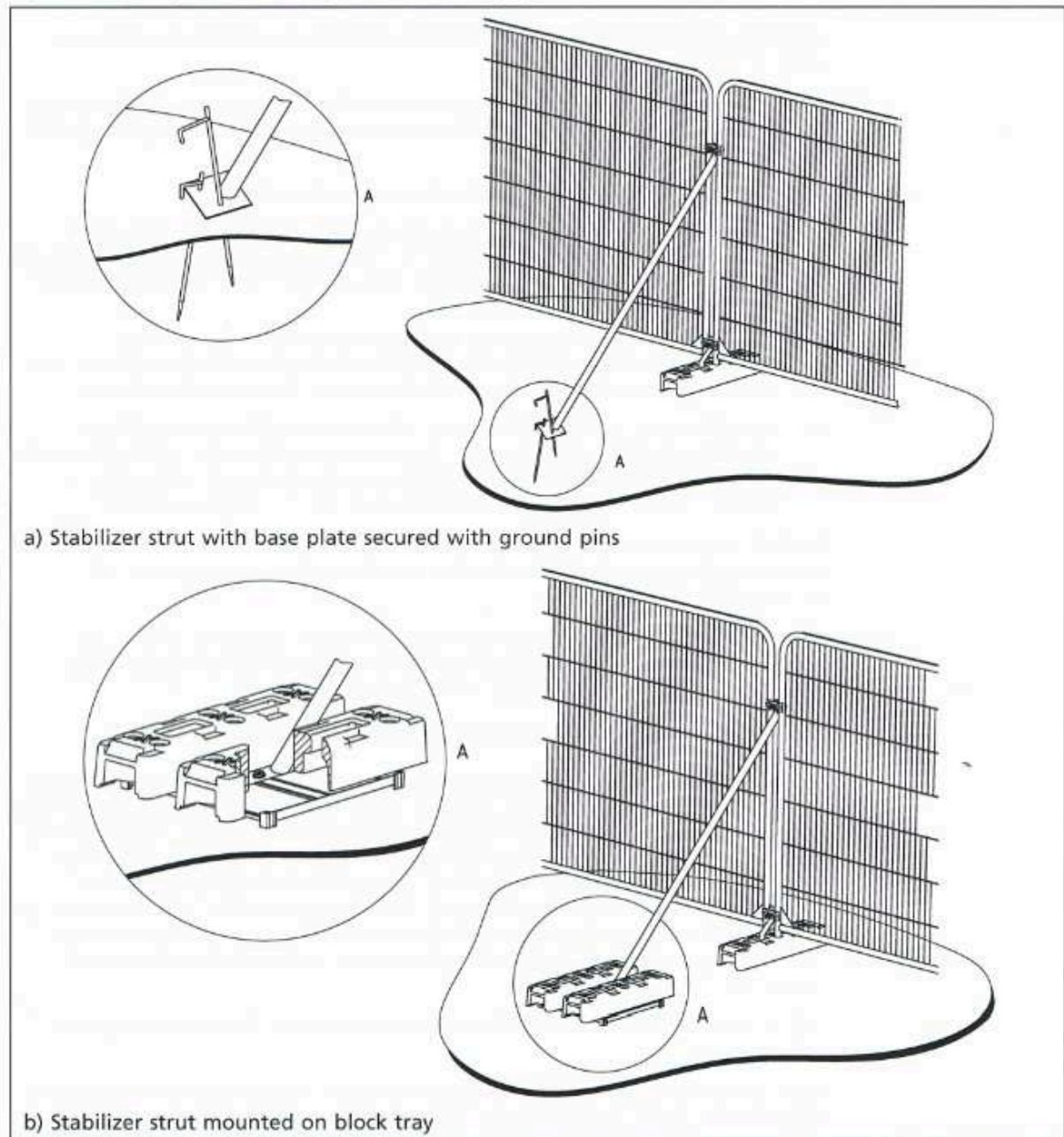
2.0 Protective Fencing

- 2.1 Protective fencing will be erected around all retained trees prior to the demolition contractors site occupation and commencement of site works e.g. before any materials or machinery are brought on site, development or the stripping of soil commences. The fencing will adjusted as necessary following the demolition work to enable the construction of the proposed development.

The fence should have signs attached to it stating that this is a Construction Exclusion Zone and that **NO WORKS are Permitted** within the fence. The protective fencing may only be removed following completion of all construction works.

- 2.2 The fencing is required to be sited in accordance with the Tree Protection Plan enclosed within this method statement at Appendix C. The fencing shall be constructed as per figure 3 - B.S.5837: 2012 and be fit for the purpose of excluding any construction activity.
- 2.3 An example of protective fencing: Figure 3 - B.S.5837: 2012, is shown below...

Figure 3 Examples of above-ground stabilizing systems



3.0 Precautions in respect of temporary works

3.1 There are no requirements in respect of temporary works.

4.0 Access Details

4.1 Construction traffic will access the site via College Road via the existing vehicular entrance and via a secondary access to be introduced further north along the eastern boundary.

5.0 Contractors car parking

5.1 Adequate parking provision is available on site away from all retained trees.

6.0 Site Huts and Toilets

6.1 Adequate space is available on-site and away from the retained trees for all site huts and portable toilets.

7.0 Storage Space

7.1 Adequate space is available on site and away from all retained trees for the storage of all plant, machinery and materials.

8.0 Additional Precautions

8.1 The installation of services near any tree will be undertaken in accordance with the National Joint Utilities Group Guidance Note 4 (NJUG 4): Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. A copy of this document can be provided on request.

8.2 No storage of materials or lighting of fires will take place within the CEZ. No mixing or storage of materials will take place up a slope where they may leak into a CEZ.

8.3 No fires should be lit within 20 metres of any tree stem and will take into account fire size and wind direction so that, no flames come within 5m of any foliage.

8.4 High-sided vehicles will have access to the site. Their movements around the site will be in no way detrimental to the health or stability of the retained trees.

8.5 No notice boards, cables or other services will be attached to any tree.

8.6 Materials that may contaminate the soil should not be discharged within 10m of any tree stem. When undertaking the mixing of materials it is essential that any slope of the ground is taken in to consideration so that it does not allow contaminants to run towards a tree root area.

9.0 Site Gradients

9.1 I am not currently aware of the need to alter site gradients.

10.0 Demolition

10.1 The existing dwellings will be demolished and is discussed in detail at section five of this report.

11.0 Hard Surfaces

11.1 Extensive, existing hard surfacing is present within the RPA's of T78, T80, T96 and T116 and will remain in situ.

- 11.2 The proposed pedestrian footpaths will be formed partially within the RPA's of T7, T44, T46, T59, T88, T89, T92, T107, T108, T109, T112, T113, T114, T115 and T119 and will be formed using a no-dig construction methodology in accordance with good arboricultural practice following guidelines detailed in the Arboricultural Associations Guidance Note 12: The use of Cellular Confinement Systems Near Trees.
- 11.3 The no-dig construction will comprise of a CellWeb three-dimensional cellular confinement system (100mm thickness proposed), overlaid on to Permatex 300 geotextile (or similar), secured in place with CellWeb staking pins. The mesh will be joined using a CellWeb stapler and staples and filled with 4/20mm clean angular stone to BS EN 13242 and 12620. The edges will be supported with suitable timber edging, which ideally should extend to a height greater than that of the 100mm CellWeb to enable the infilling with a suitable wearing course.

The levels of the footpath outside of the RPA's of the above listed trees will need to tie in (ramp up) to the no-dig area.

The no-dig construction shall utilise the following methodology:

Step one:

- Remove surface vegetation by hand.
- Remove any existing hard surfacing by hand digging methods only.
- Fill in any hollows in the exposed ground with sharp sand or 4/20mm clean angular stone. Do not grade off high spots.
- Install timber edge supports.
- Place the geotextile over the area to be protected ensuring overlaps of 300mm minimum.

Step two:

- Place the collapsed CellWeb panel on to the geotextile and pin through one end to secure it in place.
- Expand the panel to its full length and pin through to secure in place.
- Staple all additional panels together
- Panels can be cut to shape if required using a Stanley knife or similar sharp blade.

Step three:

- Fill the voids with 4/20mm clean angular stone.
- Allow for any settlement of the stone and top up as necessary.
- Lay top wearing course.
- Remove protective fencing.

Full details of the CellWeb product are included at Appendix D of this report.

12.0 Soft landscaping

- 12.1 Soft landscaping details are outside the scope of this report.

13.0 Use of Herbicides

13.1 I am not aware of the need to use herbicides on the site.

14.0 On site Monitoring Regime

14.1 All operations will be monitored by the main contractor.

15.0 Use of subcontractors

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

16.0 Contingency Plan

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

17.0 Remedial Tree Works

17.1 There are no requirements for any remedial tree works.

18.0 Responsibilities

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

18.2 The main contractor will be responsible for contacting the project arboriculturist or Local Planning Authority (Gravesham Borough Council) at any time issues are raised in relation to the trees adjacent to the site.

7 RECOMMENDATIONS

- 7.1 **Implementation of works:** All tree works should be carried out in accordance with the 2010 revision of BS 3998 *Recommendations for Tree Work*, or as modified by more recent research. It is advisable to select a contractor from the local authority list and preferably one approved by the Arboricultural Association. Their Register of Contractors is available free from The Malthouse, Stroud Green, Standish, Stonehouse, Gloucestershire GL10 3DL; Telephone 01242 577766; Website. <http://www.trees.org.uk/find-a-professional/Directory-of-Tree-Surgeons>.
- 7.2 **Statutory wildlife obligations:** The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 provides statutory protection to birds, bats and other species that inhabit trees. All tree work operations are covered by these provisions and advice from an ecologist must be obtained before undertaking any works that might constitute an offence.
- 7.3 **Future considerations:** The remaining trees should be inspected on a regular basis by a qualified arboriculturist.

8 BIBLIOGRAPHY

- 8.1 Claus Mattheck and Helge Breloer, *The Body Language of Trees*. Office of the Deputy Prime Minister, Research for Amenity Trees No 4, 1994.

David Lonsdale, *Principles of Tree Hazard Assessment and Management*. Department for Transport, Local Government and the Regions, 1999.

British Standard 3998:2010 *Recommendations for tree work*

British Standard 5837:2012 *Trees in relation to design, demolition and construction-Recommendations*.

Mr David Sephton Tech Cert (Arbor. A)

Appendix A:

Tree Schedule and Explanatory Notes

- **Number:** Number of tree as shown on site plan.
- **Species:** Tree name is given using its commonly known English name.
- **Hgt:** Height is estimated using a clinometer and given to the nearest metre.
- **St Dia:** Stem Diameter. Estimated stem diameter, measured 1.5 metres above ground level and given in millimetres.
- **N-S-E-W:** Crown Spread, calculated using a Leica Disto D1 laser measurer and given in metres.
- **Cr Cl:** Crown Clearance above ground level of first branch or branches, given in metres.
- **AC:** Age Class. young (Y), semi mature (SM), mature (M), over mature (OM), veteran(V).
- **PC:** Physiological Condition. Good (G), fair (F), poor (P), dead (D).
- **SC:** Structural Condition. Good (G), fair (F), poor (P).
- **Recommendations:** Preliminary management recommendations/ general comments.
- **ERCY:** Estimated remaining contribution in years (0-10, 10-20, 20-40, 40+).
- **Cat:** Retention Category. See table 2 below.
- **RPA Radius:** Root Protection Area Radius, given in meters.

Table 2: Retention Category's (as per cascade chart, Table 1, B.S. 5837:2012)

U	Those trees in such a condition that they cannot be realistically be retained as living trees in the context of the current land use for longer than ten years. Shaded Red on site plan.
A	High quality and value (40yrs +) 1: Mainly arboricultural values, 2: Mainly landscape values, 3: Mainly cultural values i.e. conservation. Shaded Green on site plan.
B	Moderate quality and value (20yrs +) 1: Mainly arboricultural values, 2: Mainly landscape values, 3: Mainly cultural values i.e. conservation. Shaded Blue on site plan.
C	Low quality and value (10yrs +) 1: Mainly arboricultural values, 2: Mainly landscape values, 3: Mainly cultural values i.e. conservation. Although category C trees would not be retained where they would pose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation. Shaded Grey on site plan.

Appendix A:

B.S. 5837:2012- Tree Survey Schedule for Huggens College, College Road, Northfleet, Kent, DA11 9DL.

Number	Species	HGT	St Dia	N-S-E-W	CC	Age	PC	SC	Comments/ Recommendations	E.R.C.Y	Cat	RPA Radius	RPA M ²
1	Sycamore	11	350	4-4-5-3	1.5	S/M	G	G	Remove to enable proposed development	10+	C1	4.2	55.4
2	Sycamore	11	250	4-2-2-3	2.5	S/M	G	G	Remove to enable proposed development	10+	C1	3.0	28.3
3	Cherry	7	220	5-3-3-3	1.5	S/M	G	G	None - Retain	10+	C1	2.6	21.9
4	Laburnum	5	150	4-2-0-2	0	M	G	G	None - Retain	10+	C1	1.8	10.2
5	Laburnum	5	250	4-3-2-3	0	M	G	G	None - Retain	10+	C1	3.0	28.3
G6	Laburnum/ Holly/ Cotoneaster/ Forthysia/ Portuguese Laurel/ Sycamore shrub mass	6	75	N/A	0	M	G	G	None - Retain	10+	C2	0.9	2.5
7	Horse Chestnut	16	770	6-6-8-4	2	M	G	G	None - Retain - Renew cable bracing	20+	B1	9.2	268.2
8	Horse Chestnut	16	630	7-4-4-4	3	M	G	G	None - Retain	20+	B1	7.6	179.6
9	Horse Chestnut	16	480	5-5-1-7	3	M	G	G	None - Retain	20+	B1	5.8	104.2
10	Horse Chestnut	15	430	5-4-2-3	3	M	G	G	None - Retain	20+	B1	5.2	83.6
11	Horse Chestnut	12	390	4-4-1-3	4	M	G	G	None - Retain	20+	B1	4.7	68.8
12	Horse Chestnut	11	490	5-5-5-3	3	M	G	G	None - Retain	20+	B1	5.9	108.6
13	Sycamore	7	250	3-3-3-3	0	Y	F	F	None - Retain - Multi-stem of coppice origin	0-10	U	3.0	28.3
14	Horse Chestnut	6	280	4-4-3-2	0	S/M	F	F	None - Retain - Regenerating former windblown tree	0-10	U	3.4	35.5
15	Horse Chestnut	12	510	4-5-4-4	2	M	G	G	None - Retain	20+	B1	6.1	117.7
16	Horse Chestnut	9	510	6-5-6-4	2	M	G	G	None - Retain	20+	B1	6.1	117.7
17	Horse Chestnut	9	470	5-3-4-2	3	M	G	G	None - Retain	20+	B1	5.6	99.9
18	Atlas Cedar	14	500	5-6-6-3	2	M	G	G	Retain - Remove snapped, hung up branch at five metres above ground level east side	20+	B1	6.0	113.1
19	Atlas Cedar	14	510	7-4-4-3	2	M	G	G	None - Retain	20+	B1	6.1	117.7
20	Monterey Cypress	8	150	2-3-4-2	2	M	G	G	No access to tree	10+	C1	1.8	10.2

21	Lombardy Poplar	19	730	3-3-3-3	2	M	F	P	Remove regardless of development proposal due to poor structural condition	0-10	U	8.8	241.1
22	Lombardy Poplar	19	370	1-1-0-2	3	M	F	P	Remove regardless of development proposal due to poor structural condition	0-10	U	4.4	61.9
23	Lombardy Poplar	18	330	1-1-2-0	5	M	F	P	Remove regardless of development proposal due to poor structural condition	0-10	U	4.0	49.3
24	Scots Pine	9	280	3-3-4-5	3	M	G	G	None - Retain	10+	C1	3.4	35.5
25	Monterey Cypress	14	520	3-4-3-4	1.5	M	G	G	None - Retain	20+	B1	6.2	122.3
26	Norway Maple	14	470	5-3-5-5	2	M	F	P	None - Retain - Die back evident throughout central and northern canopy	0-10	U	5.6	99.9
27	Norway Maple	14	530	6-6-7-5	2	M	G	G	None - Retain	20+	B1	6.4	127.1
28	Cupressus spp	7	150	2-3-2-2	0	S/M	G	G	None - Retain	10+	C1	1.8	10.2
29	Norway Maple	16	500	3-7-7-7	3	M	G	G	None - Retain	20+	B1	6.0	113.1
30	Cupressus spp	10	150	1-2-2-2	2	S/M	G	G	None - Retain	10+	C1	1.8	10.2
31	Cupressus spp	8	140	1-1-2-2	0	S/M	G	G	None - Retain	10+	C1	1.7	8.9
32	Sorbus spp	5	150	2-1-1-1	1.2	S/M	P	P	Remove regardless of development proposal due to poor structural condition	0-10	U	1.8	10.2
33	Norway Maple	12	320	3-6-5-5	1.5	M	G	G	None - Retain	10+	C1	3.8	46.3
34	Horse Chestnut	10	390	4-4-5-4	2	M	F	G	None - Retain - Bleeding cankers evident around base of tree	10+	C1	4.7	68.8
35	Cupressus spp	4	80	1-1-4-1	0	S/M	F	P	None - Retain - Former windblown tree	0-10	U	1.0	2.9
36	Lime	9	210	2-2-2-2	2	S/M	G	G	None - Retain	20+	B1	2.5	20.0
37	Lime	7	150	1-2-3-1	0	S/M	G	G	None - Retain	10+	C1	1.8	10.2
38	Lime	14	310	4-2-4-2	2	S/M	G	G	None - Retain	20+	B1	3.7	43.5
39	Norway Maple	9	340	3-4-3-5	1.5	S/M	G	G	None - Retain	20+	B1	4.1	52.3
G40	Lombardy Poplar x7	23	600	3-3-3-3	2	M	G	G	Off-site trees to north	20+	B2	7.2	162.9
41	Lawson Cypress	10	300	2-2-2-2	0	M	G	G	None - Retain	10+	C1	3.6	40.7
42	Lawson Cypress	8	210	1-2-2-2	2	M	G	G	None - Retain	10+	C1	2.5	20.0
43	Purple Plum	7	210	2-3-3-2	1.5	M	G	G	Remove to enable proposed development	10+	C1	2.5	20.0
44	Leyland Cypress	8	110	3-1-4-2	1	S/M	G	G	None - Retain	10+	C1	1.3	5.5

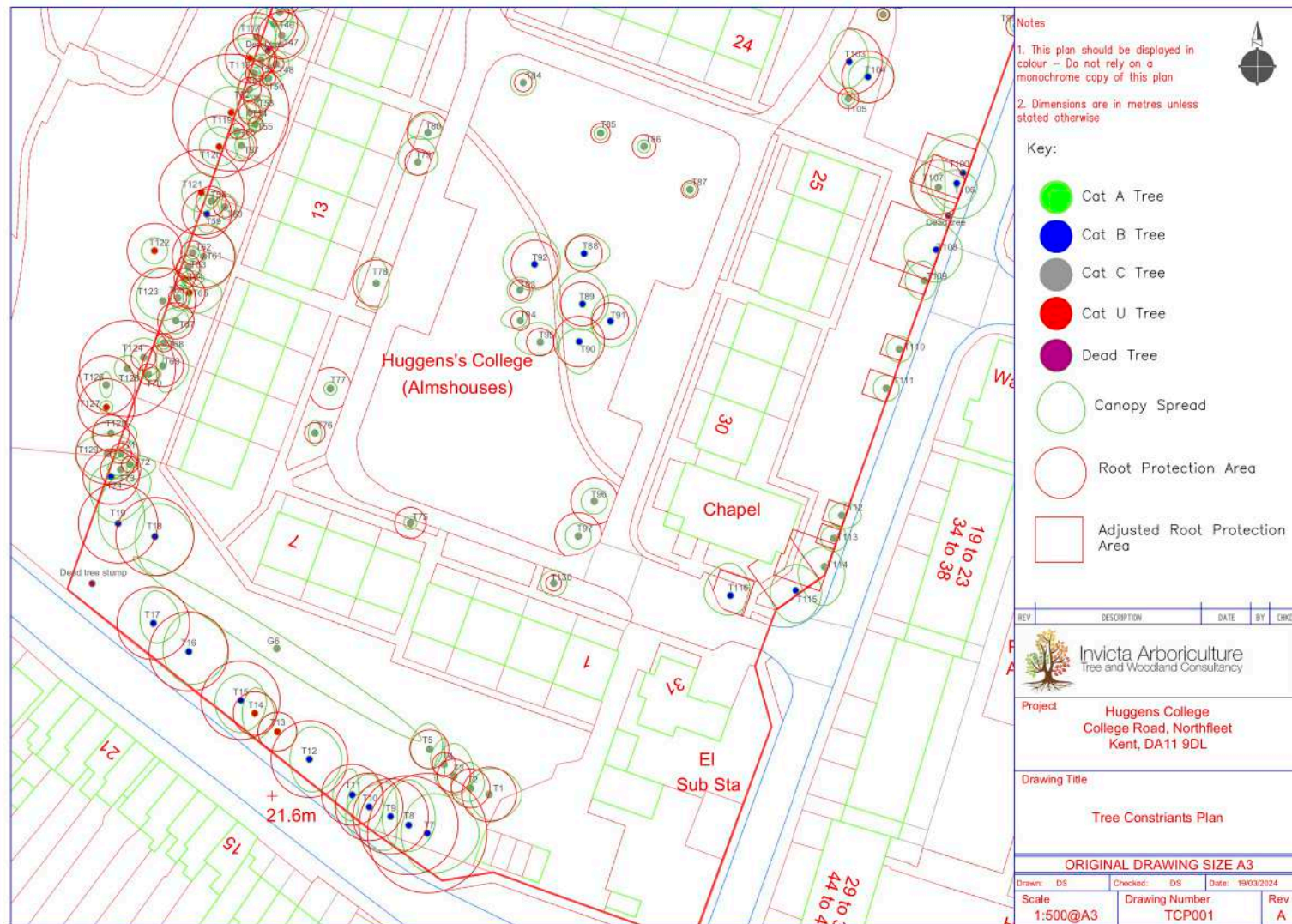
45	Leyland Cypress	8	120	2-2-2-2	1	S/M	G	G	None - Retain	10+	C1	1.4	6.5
46	Leyland Cypress	13	300	3-3-3-3	1	M	G	G	None - Retain	10+	C1	3.6	40.7
47	Cherry	6	300	2-4-4-1	1.5	M	G	G	Remove to enable proposed development	10+	C1	3.6	40.7
48	Laburnum	5	100	2-2-2-1	1	Y	G	G	None - Retain	10+	C1	1.2	4.5
49	Cupressus spp	10	200	1-1-1-1	3	M	G	G	None - Retain	10+	C1	2.4	18.1
50	Laburnum	6	90	1-1-1-1	1.5	Y	G	G	Remove to enable proposed development	10+	C1	1.1	3.7
51	Yew	4	120	1-1-2-1	0	Y	G	G	None - Retain	10+	C1	1.4	6.5
52	Laburnum	5	150	3-2-3-2	0	S/M	G	G	None - Retain	10+	C1	1.8	10.2
53	Cherry	4	180	0-2-2-2	1.5	S/M	G	G	Remove to enable proposed development	10+	C1	2.2	14.7
54	Leyland Cypress	7	140	2-2-2-0	0	S/M	G	G	Remove to enable proposed development	10+	C1	1.7	8.9
55	Yew	3	100	1-1-1-1	1	S/M	G	G	Remove to enable proposed development	10+	C1	1.2	4.5
56	Laburnum	4	100	2-1-3-0	1	S/M	G	F	None - Retain - Tied to fence	10+	C1	1.2	4.5
57	Leyland Cypress	8	200	2-2-2-1	0	M	G	G	Remove to enable proposed development	10+	C1	2.4	18.1
58	Abies spp	9	190	1-1-1-1	2.5	M	G	G	None - Retain	10+	C1	2.3	16.3
59	Monterey Cypress	14	320	3-3-2-2	3	M	G	G	None - Retain	20+	B1	3.8	46.3
60	Rowan	6	140	2-2-2-0	1.5	M	G	G	Remove to enable proposed development	10+	C1	1.7	8.9
61	Acacia	14	400	5-5-5-3	3	M	G	F	Remove to enable proposed development	10+	C1	4.8	72.4
62	Monterey Cypress	8	150	1-1-1-1	1.5	S/M	G	G	None - Retain	10+	C1	1.8	10.2
63	Monterey Cypress	8	150	1-2-2-2	1.5	S/M	G	G	None - Retain	10+	C1	1.8	10.2
64	Cupressus spp	4	130	1-1-3-0	2	S/M	G	G	None - Retain	10+	C1	1.6	7.6
65	Gleditsia spp	12	200	2-3-5-1	6	M	F	F	Remove regardless of development proposal - Decay evident at base of tree on eastern side	0-10	U	2.4	18.1
66	Monterey Cypress	7	120	2-2-2-1	1.5	S/M	G	G	None - Retain	10+	C1	1.4	6.5
67	Lawson Cypress	8	230	2-2-2-2	2	M	G	G	Remove to enable proposed development	10+	C1	2.8	23.9
68	Lawson Cypress	6	120	1-1-1-1	2.5	S/M	G	G	None - Retain	10+	C1	1.4	6.5
69	Laburnum	8	270	4-4-4-1	1.2	M	G	F	Remove to enable proposed development	10+	C1	3.2	33.0

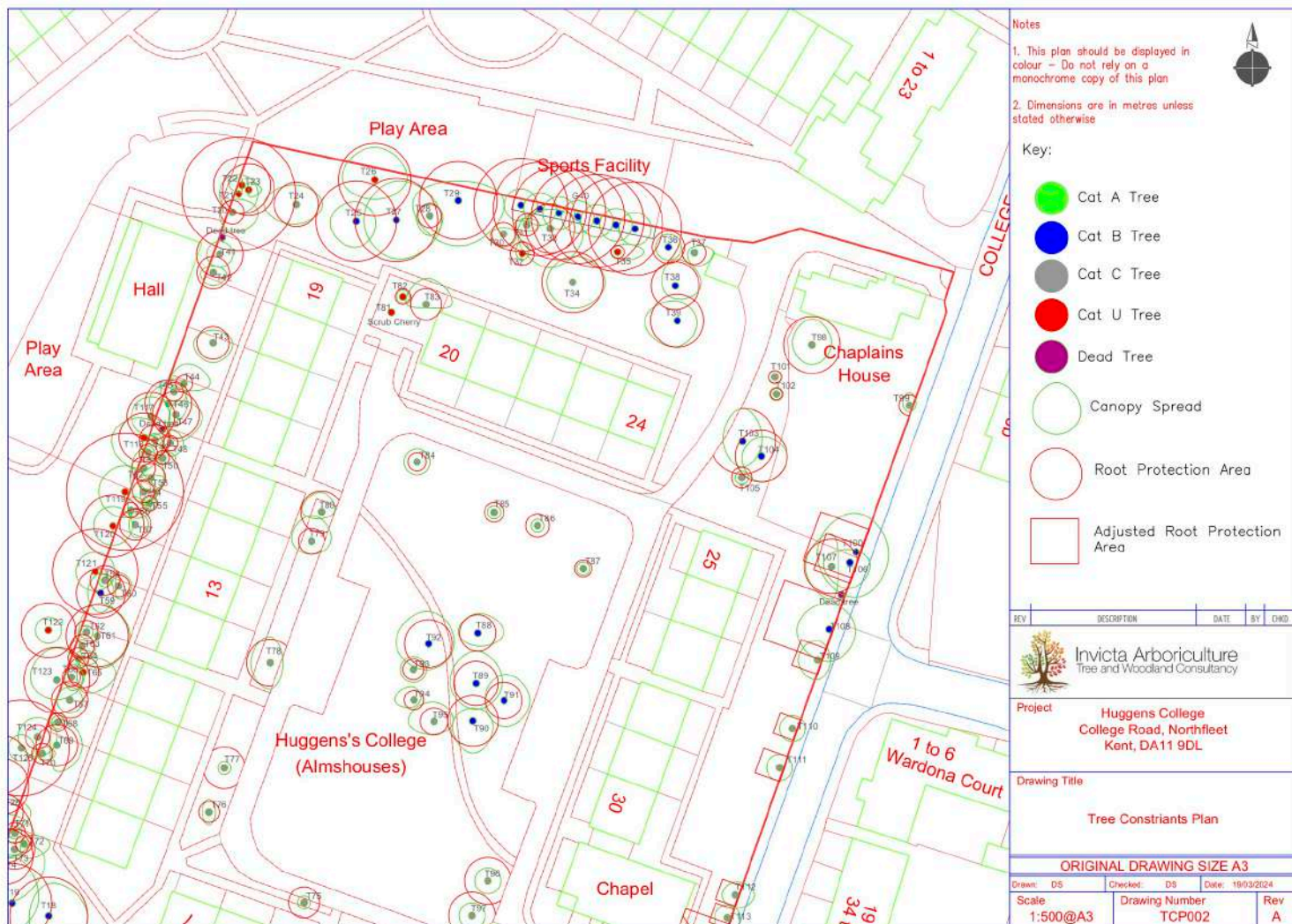
70	Monterey Cypress	10	140	1-1-2-1	1	S/M	G	G	None - Retain	10+	C1	1.7	8.9
71	Lawson Cypress	12	140	1-1-1-1	0	M	G	G	None - Retain	10+	C1	1.7	8.9
72	Acer spp	8	110	1-2-4-0	1.2	S/M	G	G	Remove to enable proposed development	10+	C1	1.3	5.5
73	Lawson Cypress	12	260	2-1-2-2	1.5	M	G	G	None - Retain	10+	C1	3.1	30.6
74	Gleditsia spp	14	360	2-7-6-3	2	M	G	G	None - Retain	20+	B1	4.3	58.6
75	Cherry	4	200	1-1-1-1	1	M	G	G	Remove to enable proposed development	10+	C1	2.4	18.1
76	Cherry	2	140	2-2-1-1	1.5	M	G	G	Remove to enable proposed development	10+	C1	1.7	8.9
77	Cornus spp	2	270	1-1-1-1	0	M	G	G	Remove to enable proposed development	10+	C1	3.2	33.0
78	Malus spp	5	300	4-4-2-3	1.5	M	G	G	None - Retain	10+	C1	3.6	40.7
79	Cherry	4	170	4-2-3-3	1	M	G	G	None - Retain	10+	C1	2.0	13.1
80	Cherry	4	270	3-1-2-3	1	M	G	G	None - Retain	10+	C1	3.2	33.0
81	Cherry stump	3	N/A	N/A	N/A	M	F	P	Remove to enable proposed development	0-10	U	0.0	0.0
82	Malus spp	2	100	1-1-1-1	0	Y	G	G	Remove to enable proposed development	0-10	U	1.2	4.5
83	Malus spp	5	200	4-0-4-3	0	S/M	G	G	Remove to enable proposed development	10+	C1	2.4	18.1
84	Malus spp	3	120	2-2-2-2	0.75	S/M	G	G	None - Retain	10+	C1	1.4	6.5
85	Cherry	2.5	125	1-1-1-1	0	Y	G	G	None - Retain	10+	C1	1.5	7.1
86	Cherry	2.5	150	1-1-1-1	0	Y	G	G	None - Retain	10+	C1	1.8	10.2
87	Malus spp	2	110	1-1-1-1	0.75	Y	G	G	Remove to enable proposed development	10+	C1	1.3	5.5
88	Silver Birch	9	240	3-2-4-3	2	M	G	G	None - Retain	20+	B2	2.9	26.1
89	Silver Birch	9	290	5-4-4-4	1	M	G	G	None - Retain	20+	B2	3.5	38.0
90	Silver Birch	9	330	2-5-3-3	1.5	M	G	G	Remove to enable proposed development	20+	B2	4.0	49.3
91	Silver Birch	8	240	4-4-4-3	2	M	G	G	Remove to enable proposed development	20+	B2	2.9	26.1
92	Silver Birch	9	310	5-4-4-5	1.5	M	G	G	None - Retain	20+	B2	3.7	43.5
93	Silver Birch	6	140	2-2-2-2	2	M	G	G	None - Retain	10+	C2	1.7	8.9
94	Silver Birch	5	130	2-1-1-3	2	M	G	G	Remove to enable proposed development	10+	C1	1.6	7.6

95	Silver Birch	7	180	3-2-3-4	1.5	M	G	G	None - Retain	10+	C1	2.2	14.7
96	Tamarisk spp	3	300	2-2-2-2	0	M	G	G	None - Retain	10+	C1	3.6	40.7
97	Tamarisk spp	3	300	2-2-2-2	0	M	G	G	None - Retain	10+	C1	3.6	40.7
98	Purple Plum	8	370	4-3-3-3	2	M	G	G	None - Retain	10+	C1	4.4	61.9
99	Laburnum	5	140	2-1-1-1	0.5	S/M	G	G	Remove to enable proposed development	10+	C1	1.7	8.9
100	Tree of Heaven	15	380	6-7-5-6	4	M	G	G	None - Retain	20+	B1	4.6	65.3
101	Pear	3	80	1-1-1-1	1	Y	G	G	None - Retain	10+	C1	1.0	2.9
102	Cherry	3	75	1-1-1-1	0	Y	G	G	None - Retain	10+	C1	0.9	2.5
103	Norway Maple	11	430	5-4-3-3	1.5	M	G	G	None - Retain	20+	B1	5.2	83.6
104	Norway Maple	10	340	3-4-4-3	2	M	G	G	None - Retain	20+	B1	4.1	52.3
105	Malus spp	2	140	1-1-1-1	0.5	S/M	G	G	None - Retain	10+	C1	1.7	8.9
106	Ash	12	290	2-4-3-4	3	M	G	G	None - Retain - No signs of Ash die-back	20+	B1	3.5	38.0
107	Ash	9	350	5-5-1-4	1	S/M	G	G	None - Retain - No signs of Ash die-back	10+	C1	4.2	55.4
108	Lime	11	460	4-5-4-5	2	M	G	G	None - Retain	20+	B1	5.5	95.7
109	Lime	6	200	3-3-2-3	2	S/M	G	G	None - Retain	10+	C1	2.4	18.1
110	Lime	6	160	2-2-2-2	1.5	Y	G	G	None - Retain	10+	C1	1.9	11.6
111	Lime	6	190	2-2-2-2	1.5	Y	G	G	None - Retain	10+	C1	2.3	16.3
112	Lime	7	160	2-2-3-2	1.5	Y	G	G	None - Retain	10+	C1	1.9	11.6
113	Holly	7	150	2-2-2-2	1	S/M	G	G	None - Retain	10+	C1	1.8	10.2
114	Lime	11	360	3-6-3-4	1.5	M	G	G	None - Retain	10+	C1	4.3	58.6
115	Scots Pine	12	380	4-5-4-4	4	M	G	G	None - Retain	20+	B1	4.6	65.3
116	Ginkgo biloba	12	270	5-3-3-4	2.5	M	G	G	None - Retain	20+	B1	3.2	33.0
117	Lombardy Poplar	12	310	3-3-3-3	3	M	F	P	Off-site tree to west	10+	C1	3.7	43.5
118	Lombardy Poplar	12	320	3-5-3-5	3	M	P	P	Off-site tree to west - Extensive decay throughout base of tree on eastern side	0-10	U	3.8	46.3
119	Lombardy Poplar	10	750	4-4-4-4	4	M	F	P	Off-site tree to west - Extensive decay throughout old pollard heads	0-10	U	9.0	254.5
120	Lombardy Poplar	12	400	3-3-3-3	5	M	F	P	Off-site tree to west - Extensive decay throughout old pollard heads	0-10	U	4.8	72.4
121	Lombardy Poplar	10	550	3-3-3-3	7	M	F	P	Off-site tree to west - Extensive decay throughout old pollard heads	0-10	U	6.6	136.8

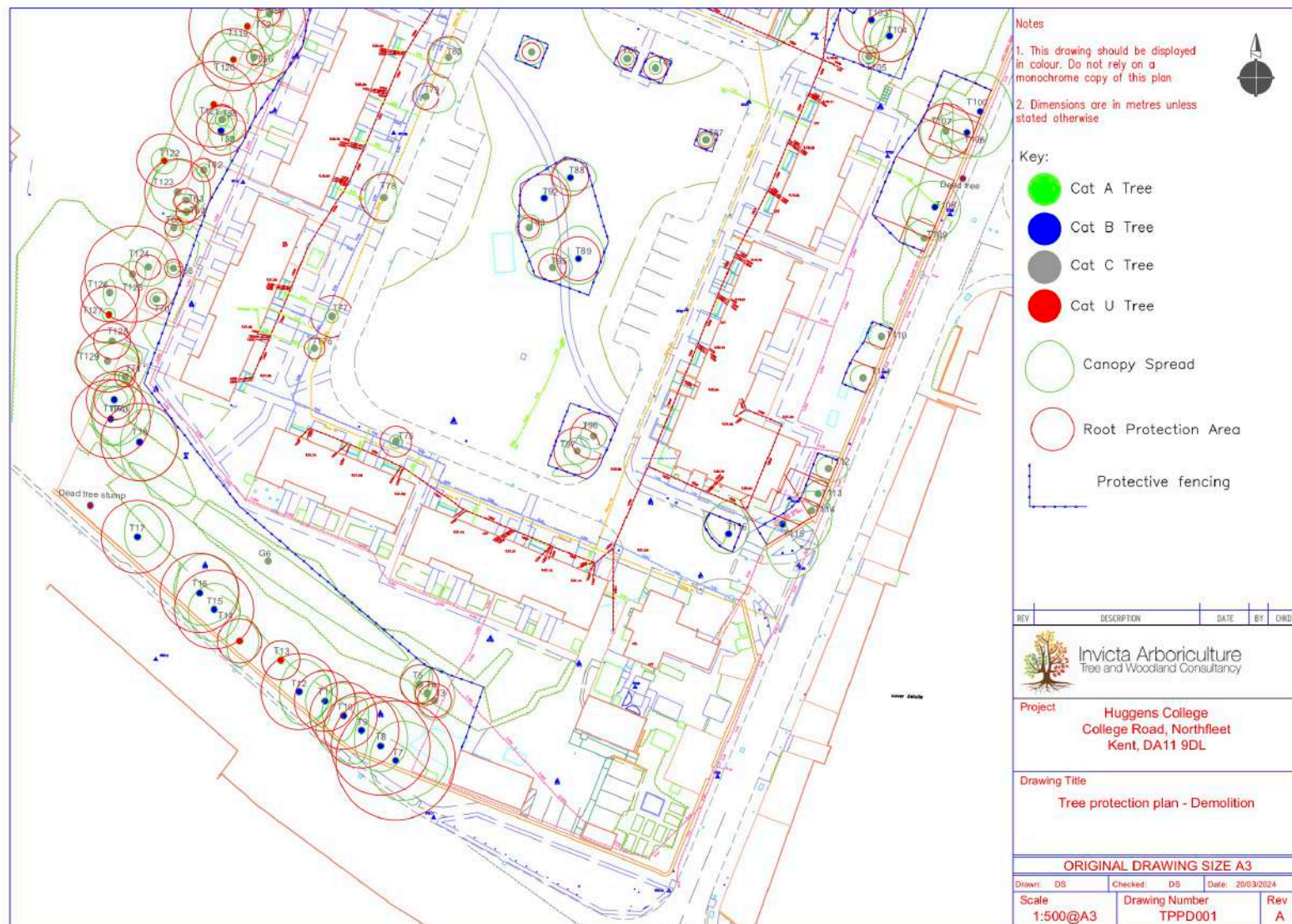
122	Lombardy Poplar	14	350	2-2-2-2	6	M	F	F	Off-site tree to west - Dense Ivy growth to eight metres above ground level prevents a through inspection	0-10	U	4.2	55.4
123	Sycamore	13	430	5-3-4-4	2	M	G	G	Off-site tree to west	10+	C1	5.2	83.6
124	Goat Willow	8	160	3-3-3-3	1	M	G	F	Off-site tree to west	10+	C1	1.9	11.6
125	Lombardy Poplar	14	620	2-2-2-2	4	M	G	F	Off-site tree to west	10+	C1	7.4	173.9
126	Lombardy Poplar	14	380	2-2-1-1	4	M	G	G	Off-site tree to west	10+	C1	4.6	65.3
127	Lombardy Poplar	10	370	1-1-1-1	3	M	F	P	Off-site tree to west - Extensive decay throughout old pollard heads	0-10	U	4.4	61.9
128	Sycamore	12	240	2-3-4-3	3	S/M	G	G	Off-site tree to west	10+	C1	2.9	26.1
129	Sycamore	13	400	3-4-5-5	2	M	G	G	Off-site tree to west	10+	C1	4.8	72.4
130	Cherry	3	100	2-2-2-2	1	Y	G	G	Remove to enable proposed development	10+	C1	1.2	4.5

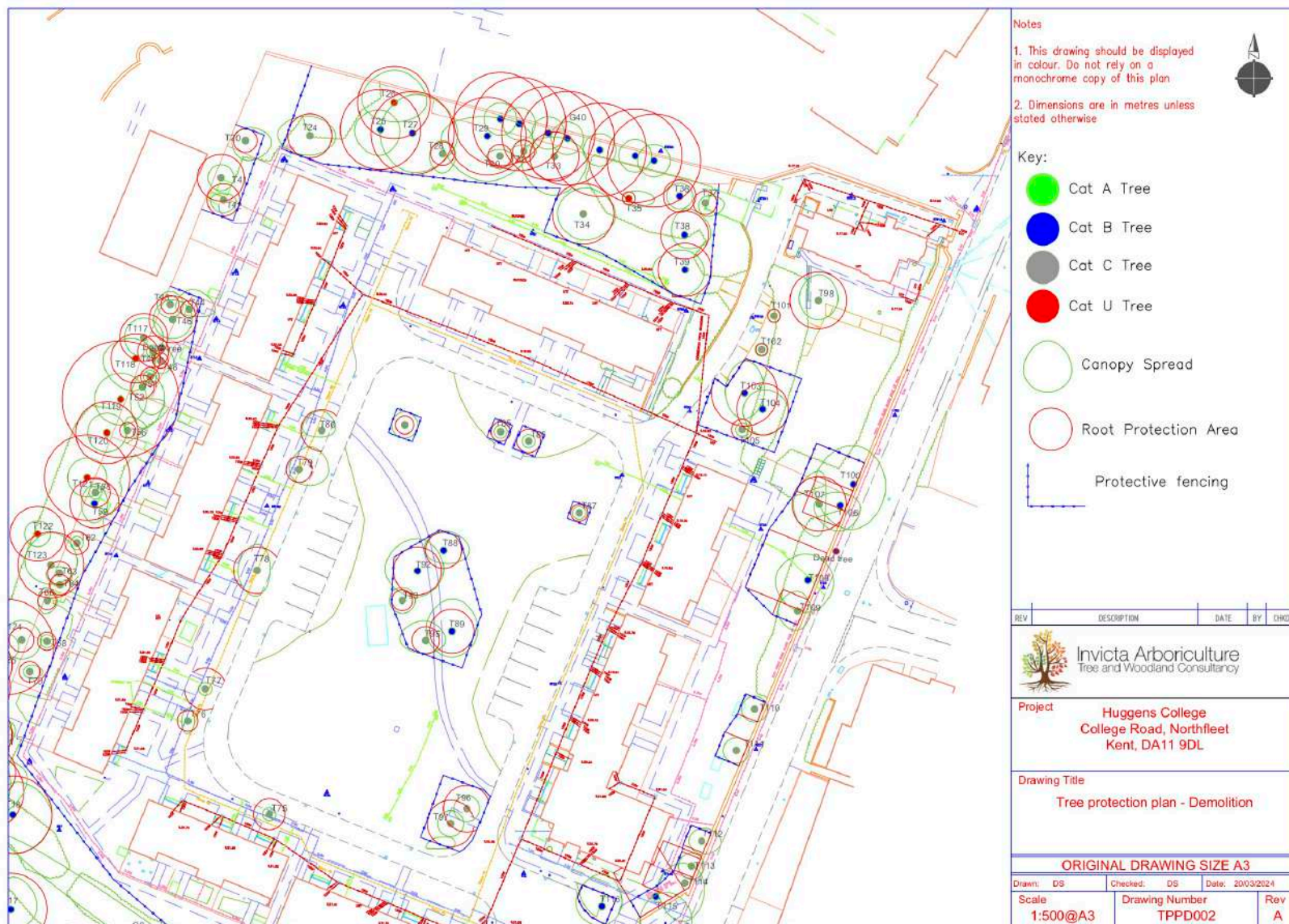
Appendix B: Tree Constraints Plans.



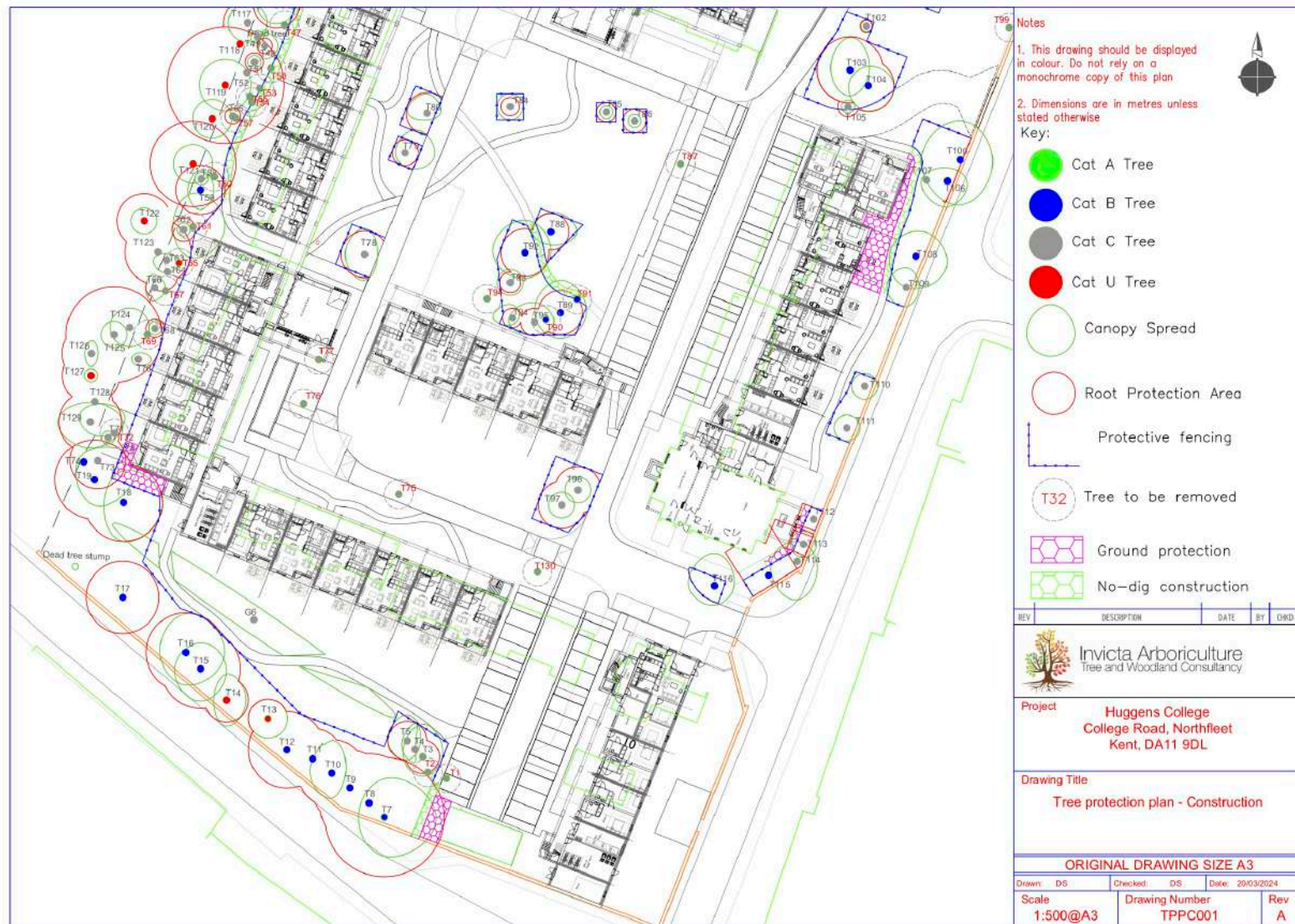


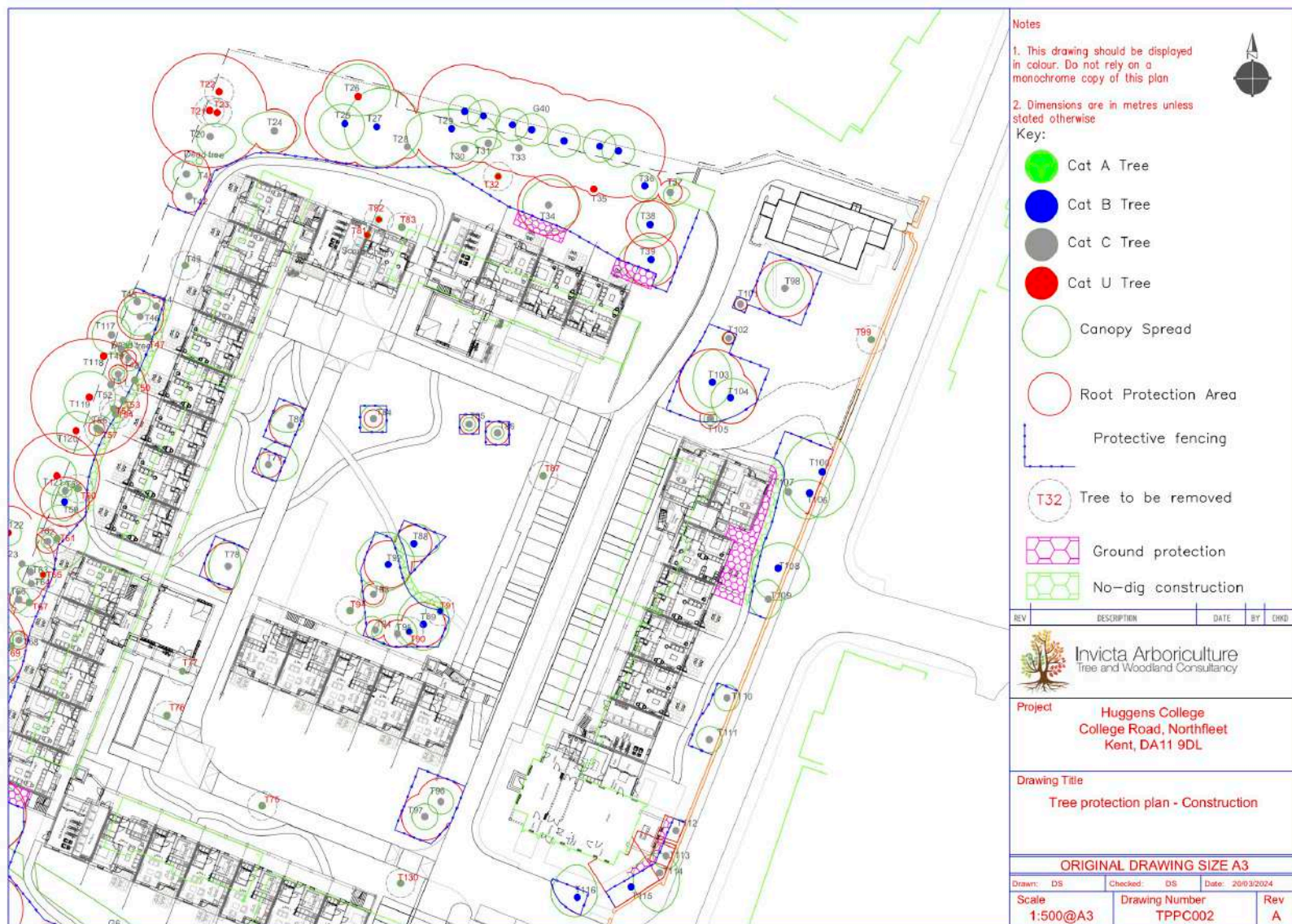
Appendix C: Tree Protection Plans - Demolition.



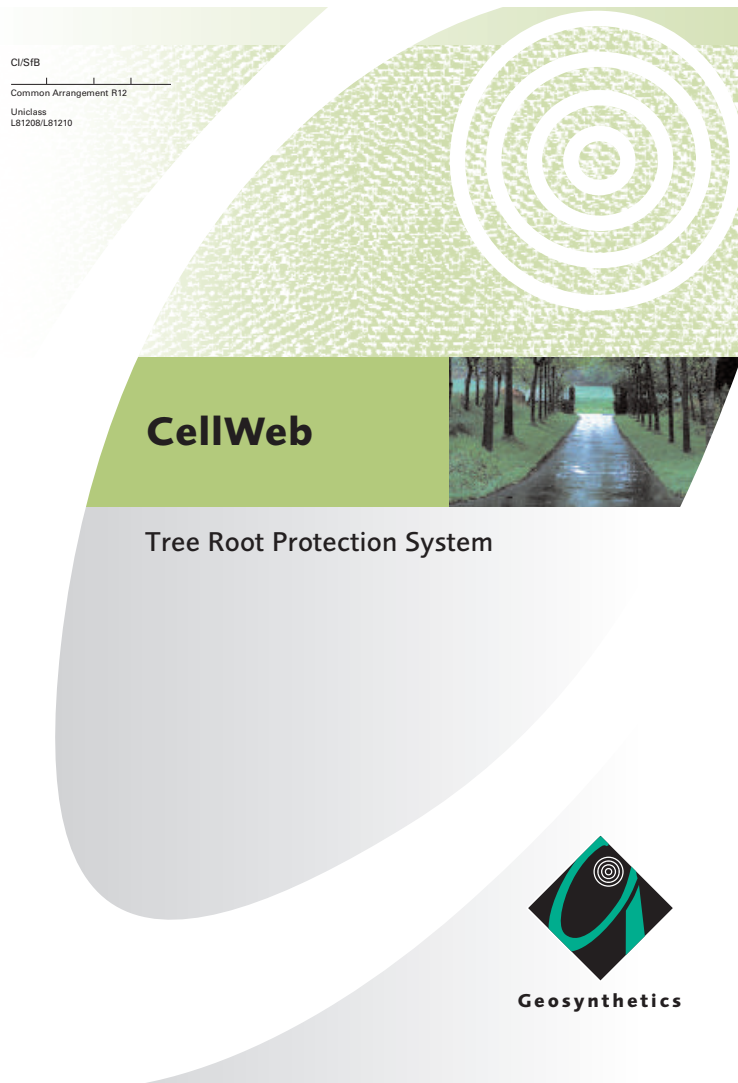


Appendix D: Tree Protection Plans – Construction.





Appendix E: CellWeb Product Information.



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:

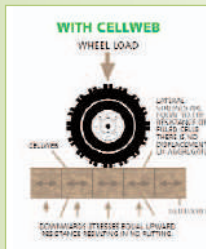
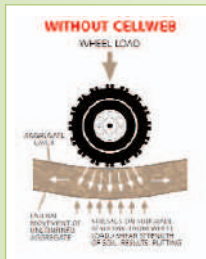


Problems:

- 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.

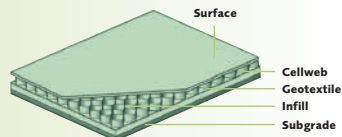
Product features



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.

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Access road for the National Lake District Parks Authority.
Site before construction pictured above.



CellWeb during installation.



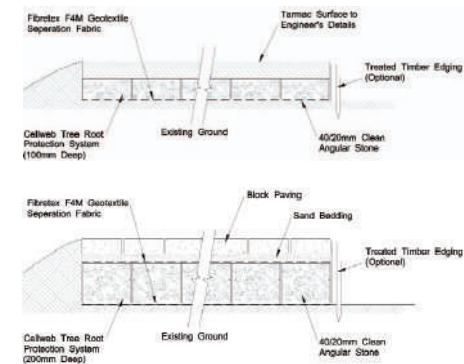
Final surfacing.

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.

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Quality assurance

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Cellweb™ is manufactured in accordance with an ISO 9001 Quality Management System with perforated walls, and a comprehensive range of cell diameters and depths. The perforated system improves the frictional interlock of infill material giving greater stability and facilitating lateral drainage.



Advice and product selection

Geosynthetics Limited has been supplying the CellWeb Tree Root Protection System for many years and as a result have acquired a vast amount of experience and knowledge. No two contracts are the same, and we understand the factors that need to be taken into account to specify the right CellWeb product for the right situation.

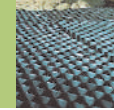
We provide a FREE consultation, design and advisory service to give you the reassurance that your project will be cost-effective and beneficial to existing trees. The service includes product selection, CAD drawings and full installation instructions and will help you from conception stage all the way through to completion.

Call our sales office on 01455 617 139 for specification details and project specific design assistance.

Geosynthetics Ltd is committed to offering the best solutions for soil stabilisation, erosion control, drainage and environmental protection problems.

Well trained staff are always available to discuss which materials are best suited to any particular application.

Technical specification



Product Specifications

Properties	Standard Cell	Large cell
Material	Virgin HDPE	Virgin HDPE
Wall thickness	1.25mm	1.25mm
Seam welding	Ultrasonic to 100% of seam length	Ultrasonic to 100% of seam length
Cell depth	75, 100, 150, 200 and 300mm	75, 100, 150, 200 and 300mm
Width of expanded panel	2.56m	2.56m
Length of expanded panel	8.1m	13.72m
Cell diameter (expanded)	259 x 224mm	508 x 475mm

This brochure is produced to give an example of the products we supply and how, subject to your own testing, our products may be used. Nothing in this brochure shall be construed so as to make any ascertain or give any warranty as to the fitness for purpose of any of our products in respect of any specific job. You should satisfy yourself through your own testing as to the suitability of our products for any specific purpose and rely solely on such testing and/or the advice of any professional(s) you commission. While we ensure as far as is possible that all information given in this brochure is accurate at the time of print, information and examples given in this brochure are by way of illustration only and nothing contained in this or any other promotional literature produced by us shall in any way constitute an offer or contract with you or shall be relied upon by you as a statement or representation of fact.

Please call - 01455 617 139

or email sales@geosyn.co.uk for more technical advice and further information.

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Geosynthetics