Rootcause
Arboriculture

3 Church Street,
Waltham Abbey,
Essex, EN9 1DX

BS 5837:2012 Tree Survey & Arboricultural Impact of Proposed New Pedestrian Route

Address: Landmark Arts Centre
Teddington

Site Surveyed by Peter Holloway

Report prepared by
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Date 22nd February 2021

Report Prepared for The Landmark Arts Centre

Table of Contents

1. Introduction

1.1 I am instructed by Mr Thomas Hayler on behalf of the Landmark Arts Centre. My brief is:

- To carry out a Tree Survey in accordance with the British Standard 5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' April 2012.

- To Produce an **Arboricultural Implications Assessment (AIA)** for the proposal to construct a new pedestrian access.

2. Documents

2.1 I was provided with the following documents:

i. Plan of Proposed Pedestrian Access, P001, 10.07.18
ii. Hand annotated Location Plan St Albans Church Teddington, Site Layout, 1283/026, June 1990.
iii. Tree Work Quotation by Treecare, Surrey, dated 20th March 2018 with a London Borough Richmond Upon Thames OS extract with some tree locations annotated.

3. Background

3.1 This report includes:
i. Standard BS5837 Methodology (Appendix 1)
ii. Tree Survey Data (Appendix 2)
iii. Proposed Site Plan with Tree Constraints (Appendix 3)

3.2 The trees were surveyed from ground level using a visual tree assessment method. No detailed tree examinations were undertaken during the survey.

3.3 I looked at the site on Monday 1st February 2021 and surveyed the trees nearest the proposed footpath.

3.4 The site is within a conservation area and some of the trees are included in Tree Preservation Orders

3.5 The Wildlife and Countryside Act 1981(as amended), the Conservation (natural habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000 provide protection for many species of animal that live in trees. I did not see any protected species and there are no plans to prune or remove any of the trees or shrubs at present.

3.6 The Geology at this postcode (as indicated at http://mapapps.bgs.ac.uk/geologyofbritain/home.html) is a bedrock of London Clay with a superficial layer of Kempton Park Gravel Member. Kempton Park Gravel consists of sand and gravel, locally with lenses of silt, clay, or peat. The average thickness is 6m. The web page shows four boreholes at this site. One borehole nearby recorded 0.3m of ash at the surface, 1m of clayey sand and gravel and then nearly 2m of sandy gravel with clay at deeper levels, one showed 20cm of topsoil, 1.2m of rubble, 3.4m of sandy gravel and then clay, another borehole had 1.2m of topsoil, 1.2m of sandy clay and gravel, 0.5m of clayey sand, 1.2m of sandy gravel then clay, the last showed 20cm of topsoil, 1 metre of brick and topsoil, 2.5m of sandy gravel and then clay. Soils and surface geology with clay can be affected by compaction which affects the porosity of the soil to air and water which can affect tree root growth and therefore tree health.

4. Tree Survey

4.1 The methodology for the tree survey is described in Appendix 1.

4.2 I recorded seven trees near to the proposed pathway. The tree details are included in Appendix 2 and plotted on the proposed site plan in Appendix 3.

4.3 I did not observe any significant defects that require remedial tree work for tree safety reasons. The Cedar (T3) has a number of common minor defects but the tendency for this species to occasionally lose branches means it may be prudent to carry out an aerial inspection and carry out remedial surgery removing weakly attached, dead or broken branches. The Tree surgeons should bear in mind that cedar branches are often interlocked resting on each other. Removing dead or damaged supporting branches can increase the mass of branches supported on remaining branches.

4.4 The dead Pine T2 should be tested annually for stability by attaching a suitable rope to the top and applying sufficient load to ensure that it is stable, with adequate precautions taken to ensure it cannot fall on anybody during the test.

5. Arboricultural Impact Appraisal

5.1 BS5837 says that construction within RPAs is only recommended where there is '*an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s). If operations within the RPA are proposed, the project arboriculturist should:*

a) demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA.

b) propose a series of mitigation measures to improve the soil environment that is used by the tree for growth'.

5.2 When digging within the RPA of trees, BS5837 recommends that roots of 25mm diameter or greater need to be retained but smaller roots can be cut to the edge of the trench. This is because smaller roots are readily regenerated. In trenches roots can usually regrow in the soil profile of a refilled trench. If there is a new foundation or structure, they do not have soil to grow back into but in the case of a shallow footpath roots will grow in the soil below it, particularly on sand or gravel.

5.3 The soil and underlying geology in the tree root zone is likely to be sandy or gravelly and so roots are likely to be growing at deeper levels than they might in finer grained soils.

5.4 The proposed pedestrian path consists of 75mm Cellweb, with 100mm paving substrate above. The Surface is 50mm above existing ground level and so the excavation is 125mm deep. Most of the path is constructed above the existing roadway (west of T3) and the path here will be constructed within and on top of the existing road surface and sub-base. The only part of the pathway that could affect roots is on the South east side of T1 where it crosses the exiting soft landscape.

5.6 I have not adjusted the RPAs of these trees because the deeper geology is sand and gravel, the only obstruction to rooting is the access roadway and this does not appear to be built to the same standard as the public highway.

5.7 The pathway where it affects the existing soft ground southeast of T1 will affect 10m^2 (25%) of the RPA of T1 and 4m^2(1%) of T3.

5.8 T3 will not be affected by the work but there will need to be precautions to protect the ground beneath the tree from compaction or contamination during the work.

5.9 The proportion of the RPA of T1 affected by the pathway is large (25%) but the depth of excavation is minimal (125mm), and the surface and sub-base are permeable to air and moisture. With suitable precautions to protect significant roots, and to prevent compaction or contamination of the soil, the tree will not be adversely affected. The ground around the tree could be improved by removing the existing gravel, de-compacting the soil around the tree with a fork and providing some humus rich dressing before the gravel is restored. If the kerb edge could be raised and a single knee rail fence installed during the tree would be protected better from vehicles and pedestrians in future and the soil would be retained more securely. Shrubs would not be appropriate because of vehicle sight lines.

6. Mitigation

6.1 The proposal will require a tree protection methodology. The Local Planning Authority may make that a condition of any planning permission.

6.2 I believe the proposal can be completed without any significant harm to retained trees.

6.3 Dead standing trees are important for wildlife, especially insects and so I am not suggesting that the standing dead stem (T2) is removed unless it proves to be unstable when tested. There is an opportunity for additional mitigation by planting a new tree near to T2, as a replacement for the existing dead standing stem.

7. Appendix 1 Standard Methodology

A.1 Survey

A1.1 All my observations were from ground level without detailed investigations and I measured tree stem diameters where possible and estimated height and crown spread by pacing and using a clinometer. I do not normally have access to trees outside the boundaries and so my observations and comments on these trees are based on the visual assessment made from within the site or the surrounding public highway.

A.1.2 I surveyed all trees objectively without reference to any design proposals supplied or suggested by the client. The trees were located using the topographical survey supplied. If the topographical plan did not include all relevant trees, they would be added in their approximate positions.

A.1.3 As suggested in the BS 5837:2012 all single stem trees with a stem diameter of less than 75 mm at 1.5 m above ground level are usually excluded from the survey as they are not deemed to be of significant size to be included. Multi stemmed trees were measured in accordance with the standard.

A.1.4 Trees and shrubs are living organisms whose health and condition can change rapidly, for this reason the BS 5837 grades, along with any conclusions or tree management recommendations can only remain valid for a period of 12 months.

A.1.5 Where possible trees were assessed as individual specimens, however, where there were trees that formed distinctive groups of the same species within the landscape they can be assessed and graded as groups.

A.1.6 Trees on or adjacent to development sites are a material consideration that may have a significant impact on the future development and use of the site.

A.2 Use of survey data.

A.2.1 The British Standard 5837:2012 provides guidance on the principles to be applied to achieve a satisfactory juxtaposition of trees with structures.

A.2.2 The tree survey with minimum requirements of BS5837 is enclosed in the appendices of this report.

A.2.3 The British Standard 5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' provides guidance and specifies measures to be adopted in order to avoid or minimise damage to trees retained on or in proximity to construction sites. One of the key recommendations is that a Root Protection Area (RPA) should be established around each retained tree. The RPA is calculated as an area equivalent to a circle with a radius 12 times the stem diameter measured at 1.5 metres above ground level for a single stem tree. In order to prevent disturbance or contamination of the RPA they are usually enclosed by robust fencing.

A.2.4 Circular Root Protection Areas (RPAs) can be adjusted by an arboriculturist by taking into account obstructions for root growth, including building foundations, retaining walls, metalled roads, topography, soil type and tolerance of individual trees.

A.2.5 The British Standard recommends that trees within categories A-C (where A is highest quality) are a material consideration in the development process. Category U trees are trees that will not be expected to exist for long enough to justify their consideration in the planning process. The tree categories are used with the number 1, 2, or 3, which is shown in Table 1. These signify whether the justification for the category was made based on mainly arboricultural values, mainly landscape values or mainly cultural/conservation values respectively. The tree categories are shown on the tree constraints plan by colour coding. Category A trees are green, category B trees are blue, category C are grey and category U are dark red.

A.2.6 It is important to recognise that tree roots are particularly vulnerable during any adjacent construction operations. Tree roots grow where conditions are most favourable, this tends to be near the soil surface, for this reason the majority of tree roots grow in the upper 600mm of the soil. This means that operations during construction such as shallow excavations, soil compaction by heavy plant or machinery or contamination by substances such as cement, diesel or other chemicals, even water in excess, can be damaging to the root system.

A.2.7 The presence of surrounding walls, roads and retaining walls can affect the root distribution of trees within and around the site. Normally when a Root Protection Area is adjusted its shape is changed but the total area is maintained.

A.2.8 Approved tree work should be carried out in accordance with BS 3998:2010 by suitably qualified and experienced professional tree surgeons. Under no circumstances shall site personnel undertake any tree pruning operations. All tree works should also take into consideration The Wildlife and Countryside Act 1981(as amended), the Conservation (natural habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000 protected species of flora and fauna.

A.2.9 If the site is within a conservation area then the local authority will need to be notified of your intention to prune the tree which they can prevent by making a Tree reservation Order. Some forms of tree work are exempt from this requirement and tree works directly required to accommodate a development that has planning permission would be exempt. However, to avoid error I would always recommend notifying the local authority to avoid costly mistakes.

A.2.10 If individual trees are protected by Tree Preservation Orders then written consent is required for tree pruning or tree removal except for a few exemptions and also if the work is directly required to accommodate a development which has planning permission. As above, I would always recommend applying for consent rather than assuming that works are exempt from requiring consent.

8. Appendix 2 Table 1 'Tree data'

Tree Table

Key to Tree Table

Tree number: The number used in the table 1 corresponds to numbers on the plans.

Species: The Common and Botanical names of each tree.

Height and **branch spread** are estimated and listed in metres.

Stem diameter is usually measured at 1.5m above ground level (a.g.l.). It is listed in the table in mm.

Height of crown above ground level (a.g.l.):
This gives an indication of whether the crown extends to the ground or has low hanging branches. The height of the lowest branch and its direction will also be recorded.

Age class: This refers to the age of the individual tree relating to the average life expectancy of each species in a similar environment.

Physiological condition:
The general state of health of the tree, good (G), fair (F), poor (P) or dead (D).

Structural condition:
A description of any defects/habits/any previous management of note.

Remaining contribution in years:
This has been estimated by taking the age of the tree away from an estimate of the total number of years the tree may live for in current site conditions, it has listed in bands as recommended in BS5837:2012.

Retention category:
Each tree is placed in a category using the guidance in BS 5837:2012.

Table 1	Landmark Arts Centre															4th May 2018	
Tree No.	Species		Height (m)	Stem Diameter (mm)	No. of Stems	Crown constraints			North (m)	South (m)	East (m)	West (m)	Age class	Observations		Root		Remaining contribution years	Tree Category
	Common	Botanical				Crown height m	Lowest branch m	Direction lowest branch						Summary of Physiological condition	Structural Condition & General comments	Radius (m)	Area (m2)		
1	Oak Common	Quercus robur	14	290	1	5	4	CB	4	5	3.5	5	Semi Mature	Fair	Bud density below average. Pruning wound. Bartk damage.	3.5	38	20-40	B1
2	Pine	Pinus sp.	6	620	1	NA	NA	NA	NA	NA	NA	NA	Mature	Dead	Standing deadwood	NA	NA	0	U
3	Cedar Deodar	Cedrus deodara	23	930	1	6	7	SW	10.5	9	9	9	Mature	Good	Tree has been crown reduced in the past but impercievable to a lay person. Typical Cedar crown with dog-legged branches minor tear out wounds and some dead wood	11.2	391	40+	A1
4	Sycamore	Acer pseudoplatanus	13	340	1	5	5	SW	4.5	7	3	5	Semi Mature	Fair	Bifurcates at 2m high. Doglegged stem	4.1	52	20-40	C1
5	Sycamore	Acer pseudoplatanus	13	280	1	3	4	W	4.5	5	1	5	Semi Mature	Fair	Ivy clad stem. Buds Sparser than T4.	3.4	35	20-40	C1
6	Apple	Malus sp.	4	60	1	1	1	CB	1	2.5	2	2	Young	Fair	Basal shoots. Low crown over car park space. Suppressed a little.	0.7	2	20-40	C1
7	Silver Birch	Betula pendula	13	200	1	1.5	2	W	3	3	2	2.5	Semi Mature	Good	Tar spotting on stem. Surface roots in shrub bed.	2.4	18	20-40	B1

9. Appendix 3 Proposed Plan with Tree Constraints

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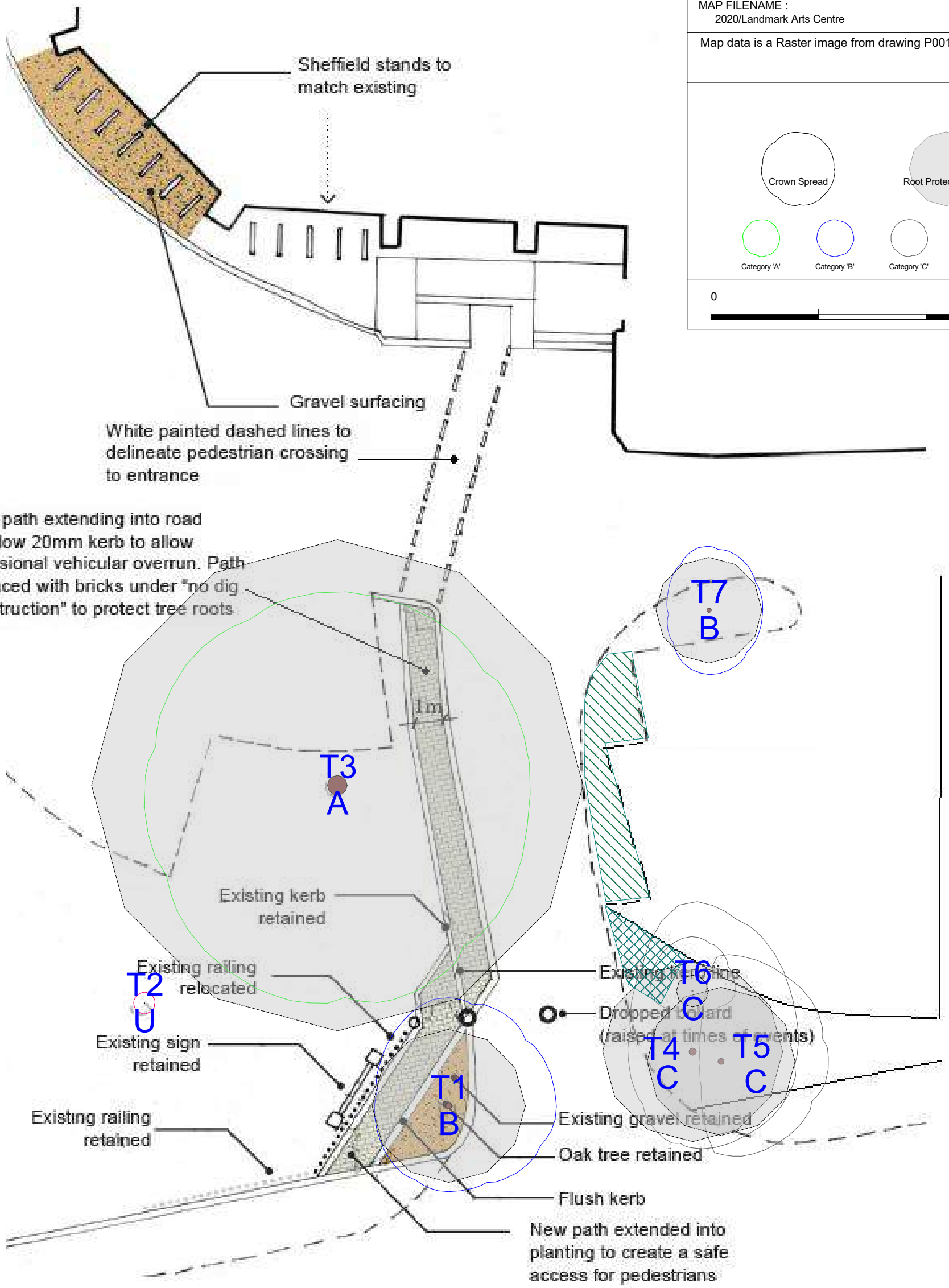
Landmark Arts Centre
Proposed Plan & Tree Constraints

SCALE : 1 : 200 @ A3

DATE : 22/02/2021

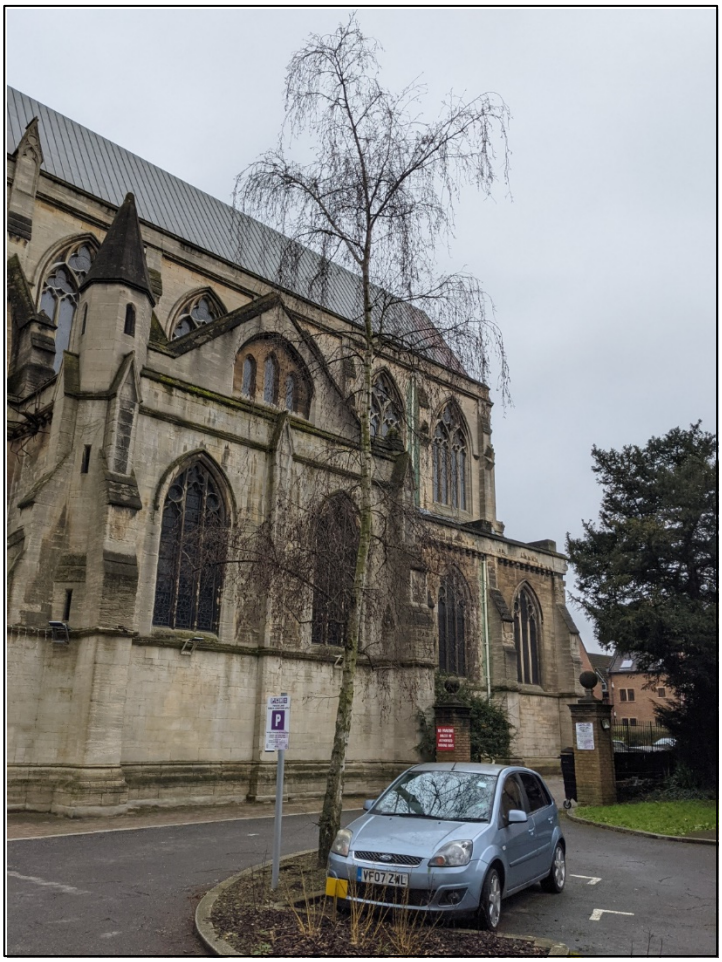
MAP FILENAME : 2020/Landmark Arts Centre

Map data is a Raster image from drawing P001 dated 10/07/2018



10. Appendix 5 Site Photographs


No Sign Boards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