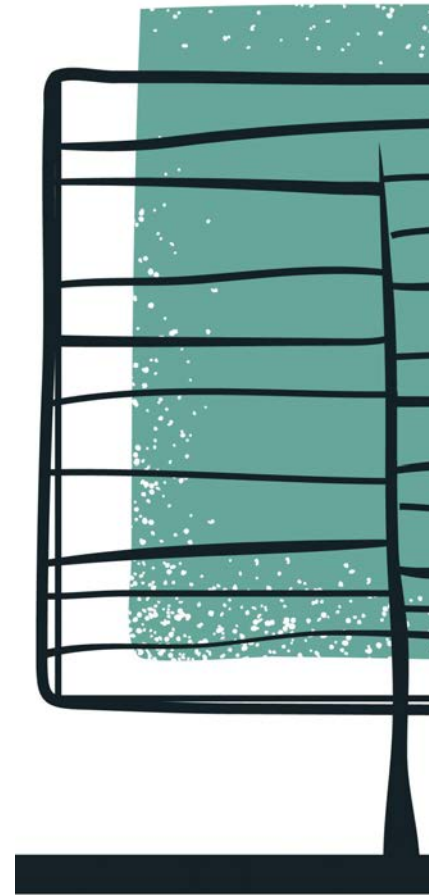




**Report No:** LTM0385.AIA.01

**Date:** 06/12/2021

**Project:** Advanced Proteins Facility, Bones Lane, Cheddleton, Leek, ST13 7BT

# **BS 5837:2012 Arboricultural Impact Assessment**

### **Inspection Record.**

| Date of Inspection | Surveyor                      |
|--------------------|-------------------------------|
| 02/12/2021         | Matthew Lally. FdSc MA ArborA |
|                    |                               |

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| Revision | Date       | Prepared by | Status   |
|----------|------------|-------------|----------|
| Final    | 06/12/2021 | M. Lally    | Complete |
|          |            |             |          |
|          |            |             |          |

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## Executive Summary

The proposed development site is a disused agricultural field located adjacent to the Advanced Proteins Industrial Site. The internal parts of the site are flat with a small, mounded area towards the north of the site. The majority of the trees are located on the site boundaries and two woodland sections have been identified to the southeast of the site but are located outside of the redline boundary for this site.

Trees present that could be potentially affected by the development are as follows:

| Category A | Category B                         | Category C          | Category U |
|------------|------------------------------------|---------------------|------------|
| 0          | 8 Trees<br>7 Groups<br>2 Woodlands | 5 Trees<br>2 Groups | 1 Tree     |

It is proposed to construct a new factory building in the centre of this site alongside a new biofilter and attenuation pond to the south of the site. Associated hardstanding areas such as car parking and access roads are also proposed.

To facilitate this development the following works will be required:

|                             | Tree Category. Trees Requiring Works |                      |            |            |
|-----------------------------|--------------------------------------|----------------------|------------|------------|
| Tree Work Type              | Category A                           | Category B           | Category C | Category U |
| Tree Removal                | 0                                    | 1 section of a group | 1 Group    | 1 Tree     |
| Cellular Confinement System | 0                                    | 1 Tree               | 0          | 0          |
| Supervised root pruning     | 0                                    | 3 Trees<br>1 Group   | 0          | 0          |
| Tree Pruning                | 0                                    | 1 Tree               | 0          | 0          |

It is felt that the losses proposed to facilitate this development could be easily mitigated with a robust planting plan and the mitigation measures outlined in this report will prevent future losses resulting from the construction process.

## 1.0 Introduction

- 1.0.1 The author of this report is Matthew Lally (MAborA) FdSc. Matthew is a professional member of the Arboricultural Association, The Consulting Arborist Society and an Associate member of the Institute of Chartered Foresters and is therefore required to uphold ethical standards laid out by these institutions.
- 1.0.2 This Arboricultural Impact Assessment has been commissioned by Michael Sylvester of Earth & Marine Environmental Consultants Limited and is prepared in relation to the proposed development at Bones Lane, Cheddleton, ST13 7BT.

An outline of the site boundary can be found in figure 1.



**Figure 1.** Assessment Boundary Plan

- 1.0.3 The tree survey & assessment of existing trees has been guided by the recommendations within British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'. The recommendations set out a structured assessment methodology to assist in determining which trees would be deemed either as being suitable or unsuitable for retention.
- 1.0.4 British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations' includes guidance for considering the relationship between existing trees and how to integrate their needs into a successful development. A harmonious and sustainable relationship between any retained trees and new structure and/or hard surfaces is at the heart of the guidance.

- 1.0.5 The survey was carried out Thursday 2<sup>nd</sup> December 2021 by means of inspection from ground level by an experienced and qualified arboriculturalist. The inspection can be restricted in cases where trees were Ivy clad or surrounded by dense vegetation.
- 1.0.6 Due to the size and nature of the site, it was decided that the survey methodology would include broadly grouping trees that share very similar characteristics. This method is in line with point 4.2.4 of BS 5837:2012 that states 'Trees forming groups should be identified and considered as groups where the arboriculturist determines that this is appropriate. It may be appropriate to assess the quality and value of trees as a whole, rather than individuals.'
- 1.0.7 British Standard 5837:2012 recommends the assessment of trees is made as objectively as possible, but the findings will always remain the opinions of the surveyor. The tree categorisation method identifies the quality and value of the existing tree stock, allowing informed decisions to be made concerning development design layout.
- 1.0.8 Table 1 provides a summary of the documents that have been made available by the client:

*Table 1 – Documents made available by client.*

| Document Type      | Reference No.                              | Author       | Date       |
|--------------------|--------------------------------------------|--------------|------------|
| Existing site plan | CT-204-PD-1-02 - Existing Site Layout.dwg  | N McCullough | 10/08/2021 |
| Proposed site plan | CT-204-PD-1-03B - Proposed Site Layout.dwg | N McCullough | 10/08/2021 |

- 1.0.9 The supplied drawing did include some tree positions; however, some trees were not located on the plan and others appeared to be inaccurate. Additions and corrections have been made by eye and any dimensions regarding tree positions and protective fencing must be checked on site.
- 1.0.10 Weather conditions during the survey were dry and still.
- 1.0.11 Assessing the potential influence of trees upon load bearing soils, beneath existing and proposed structures resulting from water abstraction by trees or rehydration of shrinkable soils was not included in the contract brief and is therefore not considered in the report. The consultant cannot be held responsible for damage arising from such action.
- 1.0.12 Potentially hazardous trees are highlighted, and appropriate recommendations are made. However, this report is not a substitute for a full tree risk assessment or management plan which are specifically designed to minimise risk and liability associated with responsibility for trees.

## **2.0 Planning Policy**

### **2.1 National Planning Policy Framework (NPPF)**

2.1.1 When determining planning applications, Local Planning Authority's (LPA) should apply the following principles:

- If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternate site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused unless there are wholly exceptional reasons, and a suitable compensation strategy exists.
- Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity (paragraph 175).

2.1.2. The trees proposed for removal within this report is neither considered aged or veteran and therefore the principles for refusal within the NPPF would not be considered applicable.

### **2.2 Local Planning Policy**

#### **Staffordshire Moorlands District Council Core Strategy Development**

##### **Plan Document**

##### **Policy DC1 – Design Considerations**

All development shall be well designed and reinforce local distinctiveness by positively contributing to and complementing the special character and heritage of the area in line with the Council's Design SPD. In particular, new development should: ....

- be designed to respect the site and its surroundings and promote a positive sense of place and identity through its scale, density, layout, siting, landscaping, character and appearance;

- create, where appropriate, attractive, functional, accessible and safe public and private environments which incorporate public spaces, green infrastructure including making provision for networks of multi-functional new and existing green space (both public and private) in accordance with policy C3, landscaping, public art, 'designing out crime' initiatives and the principles of active design;....

- protect the amenity of the area, including residential amenity, in terms of satisfactory daylight, sunlight, outlook, privacy and soft landscaping;

- promote the maintenance, enhancement, restoration and re-creation of

biodiversity and geological heritage, where appropriate, in accordance with policy NE1;....

#### Policy DC3 – Landscape and Settlement Setting

The Council will protect and, where possible, enhance local landscape and the setting of settlements in the Staffordshire Moorlands by:

1. Resisting development which would harm or be detrimental to the character of the local and wider landscape or the setting of a settlement and important views into and out of the settlement as identified in the Landscape and Settlement Character Assessment;
2. Supporting development which respects and enhances local landscape character and which reinforces and enhances the setting of the settlement as identified in the Landscape and Settlement Character Assessment;

#### Policy NE1 – Biodiversity and Geological Resources

The biodiversity and geological resources of the District and neighbouring areas will be conserved and enhanced by positive management and strict control of development by:....

3. Conserving and enhancing regional and locally designated sites. The Council will not permit any development proposal which would directly or indirectly result in significant harm to geological and biodiversity conservation interests including ancient woodland, unless it can be demonstrated that:

- there is no appropriate alternative site available; and
- all statutory and regulatory requirements relating to any such proposal have been satisfied; and
- appropriate conservation and mitigation measures are provided; or if it is demonstrated that this is not possible
- the need for, and benefit of, the development is demonstrated to clearly outweigh the need to safeguard the intrinsic nature conservation value of the site and compensatory measures are implemented....

5. Ensuring development where appropriate produces a net gain in biodiversity, and ensuring that any unavoidable impacts are appropriately mitigated for.

6. Ensuring development promotes the appropriate maintenance, enhancement, restoration and/or re-creation of biodiversity through its proposed nature, scale, location and design. The Staffordshire Moorlands Biodiversity Opportunity Map, in conjunction with the Staffordshire Biodiversity Action Plan, will be used to guide biodiversity enhancement measures to be included in development proposals as

appropriate to the nature and scale of development proposed and other environmental interest....

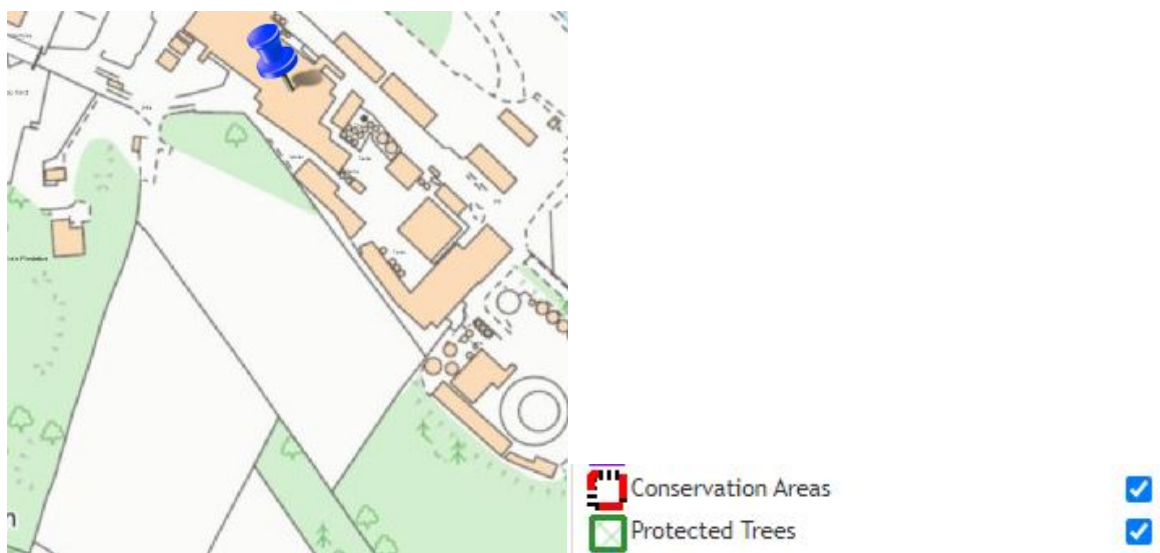
### 3.0 Legislation

#### Statutory Considerations

3.0.1 A Tree Preservation Order (TPO) is an order made by a local planning authority to protect specific trees, groups of trees or woodlands in the interests of amenity. A TPO prohibits the:

- cutting down
- topping
- lopping
- uprooting
- willful damage
- willful destruction, of trees without the local planning authority's written consent. If consent is given, it can be subject to conditions which have to be followed. In the Secretary of State's view, cutting roots is also a prohibited activity and requires the authority's consent. Anyone found guilty of such an offence is liable and in serious cases, may result in prosecution and incur an unlimited fine.

3.0.2 No direct consultation with the Local Planning Authority has taken place, however, it is understood having used the online search facility on the website for the Local Planning Authority, Staffordshire Moorlands District Council that there are no Tree Preservation Orders and Conservation Areas that would apply to any trees present on, or in close proximity to the assessment site and therefore no statutory constraints would apply to the development in respect of trees (See below map). Before any tree works are undertaken confirmation of the online information should be sought from the Local Authority.



**Figure 2.** Screenshot of Staffordshire Moorlands District Council interactive map showing the locations of TPO's and Conservation areas in relation to the site.

### **3.0.3 Felling Licence**

- 3.0.4 Tree felling is also restricted under the Forestry Act 1967. Under this act, there is an exemption from the need for a felling licence for “Felling trees immediately required for the purpose of carrying out development authorised by planning permission (granted under the Town and Country Planning Act 1990) ...”
- 3.0.5 If full planning permission is granted, then any trees which require felling to implement the approved plans are exempt from this statutory protection. Outline planning permission does not provide an exemption to the regulations that control tree felling in the Forestry Act 1967.

## **4.0 Survey Methodology**

- 4.0.1 The trees were surveyed in accordance with Chapter 4 of BS5837:2012. The tree metrics have been recorded in the tree schedule in appendix one. Where groups of trees and woodland groups have been recorded, average height, average crown spread and average diameter at breast height (DBH) are reported. Where access to the base of any trees was limited then measurements were estimated.
- 4.0.2 Trees have been assessed as individual trees (T), groups of trees (G), hedgerows (H) or woodland Groups (W) where it has been determined appropriate.
- The term group has been applied where trees form cohesive arboricultural features either aerodynamically, visually or culturally.
  - For the purposes of this assessment, a hedgerow is described as any boundary line of trees or shrubs less than 5m wide at the base and are managed or have been managed under a regular pruning regime.
  - For the purposes of this assessment, woodland is described as a habitat where ‘trees are the dominant plant form. The individual tree canopies generally overlap and interlink, often forming a more or less continuous canopy’.
- 4.0.3 All the trees were assessed using: a grading A to C (retention) and U (removal); condition and age class as defined in appendix two.
- 4.0.4 Where appropriate, canopy spread for each tree was recorded at four cardinal points in order to reproduce an accurate representation of the crown shape of the tree on the tree plan in appendix four.
- 4.0.5 The survey included all trees within the proposal area and trees near to the proposal.

## **Veteran and Ancient Trees**

- 4.0.6 Veteran trees and Ancient Woodland are important components of the landscape, their importance can be for a number of reasons including that of their ecological, social, cultural and historic value.

4.0.7 Veteran Trees and Ancient Woodlands are material considerations within the planning process and their importance is specifically recognised within the National Planning Policy Framework (NPPF) 2019

4.0.8 Ancient Tree Guide No4 Published by the Woodland Trust and the Ancient Tree Forum states that:

*'An ancient tree is one that has passed beyond maturity and is old, or aged, in comparison with other trees of the same species. Its canopy may be small. It will probably have a very wide trunk relative to other trees of the same species and it is very likely that it will be hollow'*

AND

*'Veteran is a term describing a tree with habitat features such as wounds or decay. The terms ancient and veteran have been used interchangeably in the past, however, it is important to know what the differences between them [are]. A veteran tree is a survivor that has developed some of the features found on an ancient tree, not necessarily as a consequence of time, but of its life or environment. Ancient veterans are ancient trees, not all veterans are old enough to be ancient. A veteran may be a young tree with a relatively small girth in contrast to an ancient tree but bearing the 'scars' of age such as decay in the trunk, branches or roots, fungal fruiting bodies, or dead wood. These veteran features will still provide wildlife habitat'*

4.0.9 Different methodologies are available for the defining of Veteran & Ancient trees in the field. Lally Tree Management use RAVEN (Recognition of Ancient, Veteran and Notable Trees) allowing quick and easy assessments to be made, whilst trying to ensure these valuable assets to our environment do not go un-noticed.

4.0.10 **No Veteran Trees or Ancient Trees were identified on this site.**

## **5.0 Development Proposals**

5.0.1 Overlaying the development plans & their associated infrastructure over the existing site plans has highlighted a number of areas where trees are in conflict with the proposal. This plan has been made available in appendix four and given the title 'Arboricultural Implications Plan'

5.0.2 In order to fully assess the impact of the proposals an Impact Table has been created detailing each tree, which shows the proximity of the associated works to the tree.

5.0.3 The aforementioned data and plans are analysed to determine whether the development will have a detrimental impact on the health of each tree. Once this has been determined, remedial measures can be detailed to reduce the impact the proposals will have on the treescape.

5.0.4 Impact Table: -

| Tree No. | Root Protection Area identified (m <sup>2</sup> ) in Table 2 of BS 5837:2012 | Distance to Proposed Hard Standing (m) | Distance to Proposed Development (m) | Can the Tree/s be Successfully Retained | Retention Category |
|----------|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------|-----------------------------------------|--------------------|
| T1       | 297                                                                          | 24.5                                   | 38.0                                 | Yes                                     | <b>C1</b>          |
| T2       | 122                                                                          | 3.5                                    | 16.8                                 | Yes, as outlined in section 7.3.        | <b>B1</b>          |
| T3       | 248                                                                          | 9.2                                    | 21.6                                 | Yes                                     | <b>B1</b>          |
| T4       | 312                                                                          | 4.6                                    | 30.0                                 | Yes, as outlined in section 7.4.        | <b>B1</b>          |
| G5#      | 41                                                                           | 8.8                                    | 35.0                                 | Yes                                     | <b>B2</b>          |
| T6#      | 157                                                                          | 19.5                                   | 40.0                                 | Yes                                     | <b>B1</b>          |
| G7#      | 65                                                                           | 23.0                                   | 37.0                                 | Yes                                     | <b>B1</b>          |
| G8#a     | 43                                                                           | 23.0                                   | 35.0                                 | Yes                                     | <b>B2</b>          |
| G8#b     | 31                                                                           | 21.6                                   | 33.5                                 | Yes                                     | <b>B2</b>          |
| G8#c     | 20                                                                           | 22.0                                   | 33.5                                 | Yes                                     | <b>B2</b>          |
| G8#d     | 55                                                                           | 21.6                                   | 33.0                                 | Yes                                     | <b>B2</b>          |
| G8#e     | 16                                                                           | 21.5                                   | 33.0                                 | Yes                                     | <b>B2</b>          |
| T9#      | 72                                                                           | 21.0                                   | 35.2                                 | Yes                                     | <b>B1</b>          |
| T10#     | 9                                                                            | 21.0                                   | 35.2                                 | Yes                                     | <b>C1</b>          |
| G11#     | 41                                                                           | 12.0                                   | 22.0                                 | Yes                                     | <b>C2</b>          |
| T12#     | 26                                                                           | 12.6                                   | 21.4                                 | Yes                                     | <b>C1</b>          |
| T13#     | 41                                                                           | 14.4                                   | 24.4                                 | Yes                                     | <b>C1</b>          |
| T14#     | 18                                                                           | 14.5                                   | 26.0                                 | Yes                                     | <b>C1</b>          |
| W15#     | 28                                                                           | 17.5                                   | 3.5                                  | Yes                                     | <b>B2</b>          |
| W15a#    | 55                                                                           | 17.0                                   | 10.2                                 | Yes                                     | <b>B2</b>          |
| T16#     | 65                                                                           | 21.8                                   | 3.2                                  | Yes, as outlined in section 7.2.        | <b>B1</b>          |
| T17#     | 55                                                                           | 33.5                                   | 3.2                                  | Yes, as outlined in section 7.2.        | <b>B1</b>          |
| W18#     | 18                                                                           | 41.0                                   | 4.4                                  | Yes                                     | <b>B2</b>          |
| G19#     | 46                                                                           | 36.0                                   | 1.5                                  | Yes, as outlined in section 7.2         | <b>B2</b>          |
| G20#     | 41                                                                           | 35.5                                   | 4.5                                  | Yes                                     | <b>B2</b>          |
| T21#     | 92                                                                           | 31.0                                   | 4.0                                  | Yes, as outlined in section 7.3 & 7.5   | <b>B1</b>          |
| T22#     | 41                                                                           | -                                      | -                                    | No                                      | <b>U</b>           |
| G23#     | 55                                                                           | 27.0                                   | 13.5                                 | 1 x section to be removed.              | <b>B2</b>          |

| Tree No. | Root Protection Area identified (m <sup>2</sup> ) in Table 2 of BS 5837:2012 | Distance to Proposed Hard Standing (m) | Distance to Proposed Development (m) | Can the Tree/s be Successfully Retained | Retention Category |
|----------|------------------------------------------------------------------------------|----------------------------------------|--------------------------------------|-----------------------------------------|--------------------|
|          |                                                                              |                                        |                                      | Remaining trees can be retained         |                    |
| G24#     | 55                                                                           | 2.0                                    | 37.0                                 | Yes                                     | <b>B2</b>          |
| G25#     | 5                                                                            | -                                      | -                                    | No                                      | <b>C2</b>          |

## 6.0 Impact Assessment

6.1 To assess the implications of the Impact Table each tree can be categorised in the following way: -

|                   | Trees to be Retained                                                                       |                                 | Trees to be Removed |                    |
|-------------------|--------------------------------------------------------------------------------------------|---------------------------------|---------------------|--------------------|
|                   | With No Impact                                                                             | With detailed construction      | Due to Condition    | Due to Development |
| <b>Category A</b> | -                                                                                          | -                               | -                   | -                  |
| <b>Category B</b> | T3, G5#, T6#, G7#, G8a#, G8#b, G8#c, G8#d, G8#e, T9#, W15#, W15a#, W18#, G20#, G23#, G24#, | T2, T4, T16#, T17#, G19#, T21#, | -                   | G23# 1 x section,  |
| <b>Category C</b> | T1, T10#, G11#, T12#, T13#, T14#,                                                          | -                               | -                   | G25#,              |
| <b>Category U</b> | -                                                                                          | -                               | -                   | T22#,              |
| <b>TOTAL</b>      | 22                                                                                         | 6                               | 0                   | 3                  |

## 7.0 Mitigation Proposals

### 7.1 Compensatory Planting

7.1.1 Due to the loss of the trees identified in section 6.1 it is proposed that along with the general soft landscaping for the development, more substantial supplementary tree planting will support the application.

7.1.2 This will have a number of benefits for the development and the character of the area. These being: -

- Give a greater diversity of age class on the site, increasing sustainability.
- Give a greater diversity of species and therefore wildlife habitat.

7.1.3 The trees proposed are listed in the schedule below: -

| Tree Species            | Tree Size      |
|-------------------------|----------------|
| <i>Acer campestre</i>   | 12-14 cm girth |
| <i>Betula pendula</i>   | 12-14 cm girth |
| <i>Pinus sylvestris</i> | 12-14 cm girth |
| <i>Quercus robur</i>    | 12-14 cm girth |
| <i>Sorbus aucuparia</i> | 12-14 cm girth |
| <i>Corylus avellana</i> | -              |
| <i>Prunus spinosa</i>   | -              |

7.1.4 The extent of mitigation planting required will need to be confirmed in agreement with the Local Planning Authority once the development proposal is finalised. Requirements usually involve replacement of trees on a two for one basis. This is based on tree sizes of 12-14cm girth.

## 7.2 Root Pruning.

7.2.1 The proposed construction of the Biofilter Unit & the Attenuation Pond encroaches into the RPA T16#, T17#, G19# & T21# by less than 4%, It is felt that due to the small incursion into the RPA and the large areas of space available to the trees for rooting that the minor root pruning required for this development will not adversely affect the safe useful life expectancy of these trees if the following points are adhered to.

- Excavation must be carried out using hand tools to avoid direct damage to the bark of the roots. It may be possible in some instances to use specialised equipment such as high air pressure machinery to excavate the soil with minimal disturbance to roots.
- Exposed roots will be wrapped in moist, clean Hessian to prevent the roots from drying out in hot or dry weather. The hessian must be removed before backfilling.
- Roots less than 25mm diameter may be pruned back, preferably to a growing point. A sharp cutting tool such as bypass secateurs or a handsaw should be used to leave the smallest wound possible. Roots greater than 25mm in diameter should be retained wherever possible but due to the limited incursion into the RPA of the trees larger roots can be pruned.
- Root pruning should be carried out under the supervision of the Arboricultural Consultant.
- Backfilling of any excavation must be carried out by hand to avoid direct root damage or compaction, where possible. Builder sand must not be used in the backfill material.

### 7.3 Uplift & Re-Laying of Existing Hardstanding areas adjacent to T2

- 7.3.1 The uplift & re-laying of the existing hardstanding could have implications for T2 and may adversely affect the Safe Useful Life Expectancy of this tree.
- 7.3.2 It is felt that during the uplift & re-laying of the existing hardstanding within the RPA of any retained trees that if any excavation within the RPA of these trees is limited to the existing hard standing layer and work is undertaken with hand tools only, then their Safe Useful Life Expectancy will not be adversely affected.

### 7.4 Construction of hardstanding within RPA

- 7.4.1 As shown above, the Impact Table raises concern of the proximity of the proposed hardstanding adjacent to T4 and the effect the proposals would have on the Safe Useful Life Expectancy of this tree.
- 7.4.2 Section 7.5.3 of BS 5837:2012 advises that where new hardstanding is to be formed within the RPA it should not exceed 20% of any existing unsurfaced ground. The table below details the amount of encroachment within the RPA.

| Tree No | Total Area m2 of RPA | Total m2 of Structure within the RPA | Percentage of Hardstanding within the RPA |
|---------|----------------------|--------------------------------------|-------------------------------------------|
| T4      | 312                  | 36                                   | 11.53                                     |

- 7.4.3 As you can see from the table above the proposed structure does not exceed 20% of the RPA.
- 7.4.4 If ground levels remain the same, the detrimental effects the hardstanding would have on this tree would be: -
- Compaction, resulting in oxygen depletion, caused from creating the access way.
  - The loss of a permeable surface.
- 7.4.5 It is now possible with the use of a cellular confinement system to be able to create hardstanding surfaces very close to trees without having a detrimental effect.
- 7.4.6 A cellular confinement system provides a load transfer mattress which prevents direct loads on tree roots and reduces the bearing pressure on subsoil's by stabilising aggregate surfaces against rutting under wheel loads.
- 7.4.7 A proposed methodology and cross-sectional diagram for the construction of the access way can be found in appendix five of this report. Should this be used for the construction of the hardstanding in the area effecting T4 then the proposals should not have a detrimental effect on safe useful life expectancy of this tree.

**7.5 Crown Reduction T21# on north-western side of crown.**

- 7.5.1 To aid with the construction of the Biofilter, T21# will require pruning on the north-western side of the crown by up to 2.5m
- 7.5.2 It is felt that if all pruning works are undertaken in line with BS 3998: 2010 then the safe useful life expectancy of this tree will not be adversely affected.

## 8.0 Caveats and Limitations

- 8.1 The report is for the sole use of the client and its reproduction or use by anyone else is forbidden unless written consent is given by the author.
- 8.2 This is an arboricultural report and as such no reliance should be given to comments relating to buildings, engineering, soils ecological or archaeological data. If either is commented upon within the report further professional advice should be sought.
- 8.3 This is not a Tree Risk Assessment. As such this report should not be taken to mean or imply that any of the inspected trees should be considered safe. A Tree Risk Assessment can be provided but would be subject to additional survey requirement and further fees.
- 8.4 Trees are growing dynamic structures. Whilst reasonable effort has been made to identify defects within the trees inspected, no guarantee can be given as to the absolute safety or otherwise of any individual tree. No tree is ever absolutely safe due to the unpredictable laws and forces of nature. As a result of this, natural failure of intact trees will occur; extreme climatic conditions can cause damage to even apparently healthy trees.
- 8.5 For the purposes of this survey all dimensions of trees and their associated parts are based on estimation unless otherwise stated.
- 8.6 Trees are living organisms whose health, condition and structure can change quickly and without warning. Therefore, the contents of this report are valid for a period of one year from the date of this survey.

# Appendix One

## Tree Survey Data



# BS5837:2012 TREE SCHEDULE



DATE OF SURVEY: 02/12/2021

JOB REFERENCE: LTM0385.AIA.01

SITE ADDRESS: Advanced Proteins Facility

| Tree No. | Species                   | Stem Dia (mm) | RPA (m <sup>2</sup> ) | RPA Radius (m) | Height (m) | Age Class | Crown Spread (m) |     |     |     | Crown Clearance (m) | Condition | Comments                                                                                                                                                   | Recommendations                                 | Remaining Contribution | BS5837 Retention Category |
|----------|---------------------------|---------------|-----------------------|----------------|------------|-----------|------------------|-----|-----|-----|---------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|------------------------|---------------------------|
|          |                           |               |                       |                |            |           | N                | E   | S   | W   |                     |           |                                                                                                                                                            |                                                 |                        |                           |
| T1       | Oak                       | 810           | 297                   | 9.72           | 16         | M         | 6                | 6   | 6   | 6   | 4N                  | C         | In decline. Significant deadwood present. Basal cavity.                                                                                                    | Remove deadwood. Monitor stability and vitality | 10+                    | C1                        |
| T2       | Larch                     | 520           | 122                   | 6.24           | 14         | EM        | 5                | 5   | 4   | 6   | 1W                  | A         | Codominant form. Good vitality. Snapped branch in crown. Acceptable condition.                                                                             | No action                                       | 40+                    | B1                        |
| T3       | Oak                       | 740           | 248                   | 8.88           | 15         | M         | 5                | 5   | 5   | 5   | 6N                  | A         | Good vitality. Multiple large pruning wounds on main stem showing some signs of occluding.                                                                 | No action                                       | 60+                    | B1                        |
| T4       | Oak                       | 830           | 312                   | 9.96           | 15         | M         | 7                | 10  | 9   | 8   | 4E                  | B         | Good form. Reduced vitality. Deadwood present.                                                                                                             | No action                                       | 40+                    | B1                        |
| G5#      | Birch. Oak. Maple. Spruce | 300           | 41                    | 3.6            | 10         | SM        | 3                | 3   | 3   | 3   | 3N                  | A         | A mixed group located outside red line boundary. Good vitality and form. No significant risk features observed. Averaged measurements. Estimated location. | No action                                       | 40+                    | B2                        |
| T6#      | Oak                       | 590           | 157                   | 7.08           | 14         | EM        | 3                | 7   | 4   | 3   | 2E                  | A         | Codominant form. Good vitality. Deadwood present. Outside red line boundary.                                                                               | No action                                       | 40+                    | B1                        |
| G7#      | Holly x 2                 | 380           | 65                    | 4.56           | 10         | M         | 4                | 3   | 4   | 4   | 0N                  | A         | A group of 2 x Holly located adjacent to stone boundary wall. Estimated measurements. Good vitality.                                                       | No action                                       | 40+                    | B1                        |
| G8#a     | Birch                     | 310           | 43                    | 3.72           | 12         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 3N                  | A         | A linear boundary group. Some trees multi stemmed. Good vitality. No significant risk features observed.                                                   | No action                                       | 20+                    | B2                        |

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|----------|---------------------|---------------|-----------------------|----------------|------------|-----------|------------------|-----|-----|-----|---------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------|---------------------------|
|          |                     |               |                       |                |            |           | N                | E   | S   | W   |                     |           |                                                                                                                                            |                                |                        |                           |
| G8#b     | Birch               | 260           | 31                    | 3.12           | 12         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 3N                  | A         | A linear boundary group. Some trees multi stemmed. Good vitality. No significant risk features observed.                                   | No action                      | 20+                    | B2                        |
| G8#c     | Birch               | 210           | 20                    | 2.52           | 12         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 3N                  | A         | A linear boundary group. Some trees multi stemmed. Good vitality. No significant risk features observed.                                   | No action                      | 20+                    | B2                        |
| G8#d     | Birch               | 350           | 55                    | 4.2            | 12         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 3N                  | A         | A linear boundary group. Some trees multi stemmed. Good vitality. No significant risk features observed.                                   | No action                      | 20+                    | B2                        |
| G8#e     | Birch               | 190           | 16                    | 2.28           | 12         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 3N                  | A         | A linear boundary group. Some trees multi stemmed. Good vitality. No significant risk features observed.                                   | No action                      | 20+                    | B2                        |
| T9#      | Whitebeam           | 400           | 72                    | 4.8            | 8          | M         | 2                | 4   | 3   | 4   | 1W                  | A         | Codominant form. Boundary tree. No significant risk features.                                                                              | No action                      | 20+                    | B1                        |
| T10#     | Rowan               | 140           | 9                     | 1.68           | 6          | SM        | 0.5              | 1   | 1   | 0.5 | 1E                  | B         | Asymmetrical crown due to adjacent tree. No significant risk features observed.                                                            | No action                      | 20+                    | C1                        |
| G11#     | Elder. Holly. Rowan | 300           | 41                    | 3.6            | 5          | SM to M   | 1.5              | 1.5 | 1.5 | 1.5 | 0N                  | A to B    | A linear boundary group. Limited inspection due to dense vegetation. Averaged measurements. Some dieback evident. 1 x dead Holly in group. | Consider removal of dead tree. | 40+                    | C2                        |
| T12#     | Oak                 | 240           | 26                    | 2.88           | 4          | SM        | 0.5              | 3   | 3   | 3.5 | 1W                  | A         | Asymmetrical crown due to pruning. Good vitality. No significant risk features observed.                                                   | No action                      | 80+                    | C1                        |
| T13#     | Oak                 | 300           | 41                    | 3.6            | 4          | SM        | 3                | 3   | 2.5 | 3   | 0N                  | A         | Good form and vitality. Located adjacent to ditch.                                                                                         | No action                      | 80+                    | C1                        |

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|----------|----------------------------------|---------------|-----------------------|----------------|------------|-----------|------------------|-----|-----|-----|---------------------|-----------|-------------------------------------------------------------------------------------------|-----------------|------------------------|---------------------------|
|          |                                  |               |                       |                |            |           | N                | E   | S   | W   |                     |           |                                                                                           |                 |                        |                           |
| T14#     | Birch                            | 200           | 18                    | 2.4            | 6          | SM        | 2.5              | 2   | 2   | 1.5 | 0E                  | A         | Good form and vitality. Located adjacent to ditch.                                        | No action       | 40+                    | C1                        |
| W15#     | Holly. Birch. Spruce. Oak        | 250           | 28                    | 3              | 7          | SM        | 2                | 2   | 2   | 2   | 0N                  | A to B    | A third party woodland area. No significant risk features observed.                       | No action       | 40+                    | B2                        |
| W15a#    | Birch                            | 350           | 55                    | 4.2            | 12         | EM        | 4                | 4   | 4   | 4   | 3N                  | A         | Third party owned. Located on edge of wood.                                               | No action       | 40+                    | B2                        |
| T16#     | Birch                            | 380           | 65                    | 4.56           | 10         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 1E                  | A         | Codominant form. Good vitality. No significant risk features observed.                    | No action       | 40+                    | B1                        |
| T17#     | Oak                              | 350           | 55                    | 4.2            | 8          | SM        | 4                | 4   | 2   | 4   | 2E                  | A         | Large stem wound at 0.3m but of little concern. Good vitality. Located adjacent to ditch. | No action       | 80+                    | B1                        |
| W18#     | Pine. Oak. Birch. Cherry. Elder. | 200           | 18                    | 2.4            | 8          | SM        | 3                | 3   | 3   | 3   | 1N                  | A         | Third party woodland. No significant risk features observed.                              | No action       | 80+                    | B2                        |
| G19#     | Birch x 8. Rowan x 1             | 320           | 46                    | 3.84           | 14         | EM        | 4                | 4   | 4   | 4   | 2S                  | A         | A boundary group growing in close proximity to wall.                                      | No action       | 40+                    | B2                        |
| G20#     | Birch x 4. Rowan x 3             | 300           | 41                    | 3.6            | 11         | EM        | 3.5              | 3.5 | 3.5 | 3.5 | 0N                  | A         | A boundary group growing in close proximity to wall.                                      | No action       | 40+                    | B2                        |
| T21#     | Birch                            | 450           | 92                    | 5.4            | 11         | M         | 5                | 5   | 5   | 6   | 1W                  | A         | Multi stemmed tree growing in close proximity to wall.                                    | No action       | 20+                    | B1                        |
| T22#     | Rowan                            | 300           | 41                    | 3.6            | 4          | M         | 2                | 1   | 0.5 | 1   | 2N                  | C         | In extensive decline.                                                                     | No action       | 20+                    | U                         |

# BS5837:2012 TREE SCHEDULE



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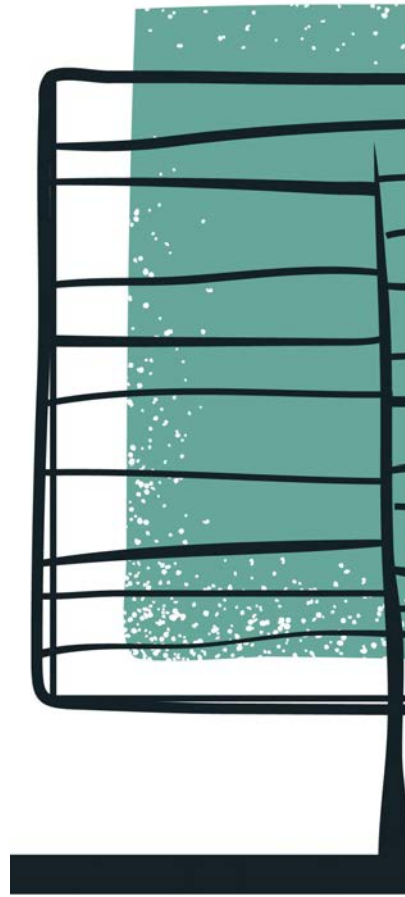
JOB REFERENCE: LTM0385.AIA.01

SITE ADDRESS: Advanced Proteins Facility

| Tree No. | Species                                                       | Stem Dia (mm) | RPA (m <sup>2</sup> ) | RPA Radius (m) | Height (m) | Age Class | Crown Spread (m) |   |   |   | Crown Clearance (m) | Condition | Comments                                                                                                                                                                                                                      | Recommendations                                      | Remaining Contribution | BS5837 Retention Category |
|----------|---------------------------------------------------------------|---------------|-----------------------|----------------|------------|-----------|------------------|---|---|---|---------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------|---------------------------|
|          |                                                               |               |                       |                |            |           | N                | E | S | W |                     |           |                                                                                                                                                                                                                               |                                                      |                        |                           |
| G23#     | Pine. Spruce . Birch.<br>Beech. Cypress                       | 350           | 55                    | 4.2            | 14         | SM to EM  | 4                | 4 | 4 | 4 | 0S                  | A to B    | A linear group of trees used as screening for factory building. Located on bank behind retaining wall. Limited inspection due to dense vegetation. 1 x cypress is leaning but unable to ascertain stability due to no access. | No action                                            | 40+                    | B2                        |
| G24#     | Oak. Birch.<br>Sycamore.<br>Hawthorn. Elder.<br>Willow. Beech | 350           | 55                    | 4.2            | 14         | SM to EM  | 4                | 4 | 4 | 4 | 0S                  | A to B    | A linear belt used as screen for factory. Good form and vitality. Some die back in 1 x Sycamore adjacent to chimney. Limited inspection due to dense vegetation.                                                              | Consider removal of 1 x Sycamore adjacent to chimney | 40+                    | B2                        |
| G25#     | Pine. Beech. Oak.<br>Birch. Alder.                            | 100           | 5                     | 1.2            | 4          | Y to SM   | 2                | 2 | 2 | 2 | 0N                  | A         | A newly established group. No significant risk features observed.                                                                                                                                                             | No action                                            | 80+                    | C2                        |

# Appendix Two

## Glossary of Terms



The following terms are concurrent with best Arboricultural practice and within the guidelines set by the International Society of Arboriculture (ISA), the Arboricultural Association (AA) and the British Standards Institute (BSI).

### **Age Range:**

Age is site specific and categorised:

|                          |                                                           |
|--------------------------|-----------------------------------------------------------|
| <b>Young (Y)</b>         | Out-planted trees that have not yet established.          |
| <b>Semi-Mature (SM)</b>  | Established trees up to 1/3 of expected height and crown. |
| <b>Early Mature (EM)</b> | Between 1/3 and 2/3 of expected height and crown.         |
| <b>Mature (M)</b>        | Between 2/3 and full expected height and crown.           |
| <b>Fully Mature (FM)</b> | Full expected height and crown.                           |
| <b>Over Mature (OM)</b>  | Crown beginning to break-up and decrease in size.         |
| <b>Senescent (S)</b>     | Crown in advanced stage of break-up.                      |

**Height:** Height is estimated and recorded in metres.

**DBH:** Diameter at Breast Height is measured at 1.5m and recorded in metres. Where a tree becomes multi-stemmed below 1.5m the highest possible diameter is measured and indicated. Alternatively, above 1.5m the diameter of each stem or an average diameter is measured and indicated.

**Condition:** Assessment of current physiological condition and structural morphology incorporating vigour and vitality and categorised:

- A -** Tree needing little, if any attention
- B -** Tree with minor, but rectifiable defects, or in the early stages of physiological stress
- C -** Tree with significant structural and physiological flaws and/or extremely stressed
- D -** Tree that is dead, biologically/physically moribund or dangerous.

**Desirability to Retain** – As Outlined in Table 1 of BS 5837:2005 (Trees in Relation to Construction - Recommendations)

## Definition of Physiological & Morphological Terms

- Adaptive Growth** - The process whereby wood formation is influenced both in quantity and in quality by the action of gravitational force and mechanical stresses on the cambial zone.
- Bifurcation** – Forked or divided union.
- Brown Rot** - Form of decay where cellulose is degraded, while lignin is only modified.
- Cankers-** A localised area of dead bark and cambium on a stem or branch, caused by fungal or bacterial organisms, characterised by wound wood development on the periphery. This may be annual or perennial.
- Cavity** - An open wound, characterised by the presence of extensive decay and resulting in a hollow.
- Chlorotic Leaf** - Lacking in chlorophyll, typically yellow in colour.
- Compartmentalisation** - The physiological process that creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms.
- Crack** - Longitudinal split in stem or branch, involving bark and/or underlying wood. These may be vertically and horizontally orientated.
- Decay** - Process of degradation of woody tissues by fungi and bacteria through decomposition of cellulose and lignin.
- Deadwood** - Deadwood is often present within the crown or on the stems of trees. In some instances, it may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).

|                              |                                                                                                                                                                                                                                    |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>End Weight -</b>          | The concentration of foliage at the distal ends of stems and deficient in secondary branches.                                                                                                                                      |
| <b>Girdling Root -</b>       | Root which circles and constricts the stem or roots causing death of phloem and/or cambial tissue.                                                                                                                                 |
| <b>Hazard Beam -</b>         | An upwardly curved branch in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).                                                           |
| <b>Included Bark Union -</b> | Pattern of development at branch junctions where bark is turned inward rather than pushed out. Potential weakness due to a lack of a woody union.                                                                                  |
| <b>Ivy Growth -</b>          | Ivy growth may ascend into the tree's crown, increasing wind resistance, concealing potential defects and reducing the tree's photosynthetic capacity. Ivy growth is often acceptable in woodland areas as a conservation benefit. |
| <b>Live Crown Ratio -</b>    | The relative proportion of photosynthetic mass (leaf area) to overall tree height.                                                                                                                                                 |
| <b>Reaction Wood -</b>       | Specialised secondary xylem, which develops in response to a lean or similar mechanical stress, attempting to restore the stem to the vertical.                                                                                    |
| <b>Root Plate Lift -</b>     | The physical movement of the rooting plate causing soils to shift and crack. May occur during adverse weather conditions. Trees may become unstable.                                                                               |
| <b>Structural Defect -</b>   | Internal or external points of weakness, which reduce the stability of the tree.                                                                                                                                                   |
| <b>Suppressed -</b>          | Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.                                                                                                                          |
| <b>Topping -</b>             | A highly disfiguring practise, likely to cause severe xylem dysfunction and decay in major structural parts of the wood.                                                                                                           |

- White Rot -** Form of decay where both cellulose and lignin are degraded.
- Wound -** Any injury, which induces a compartmentalisation response.
- Wound wood -** Wood with atypical anatomical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound as opposed to the ambiguous term “callus.”
- Woodland Structure -** The vertical and horizontal arrangement of trees within a group or woodland i.e. Dominant - trees with a crown above the upper layer of the canopy, Co-dominant - trees that define the general upper edge of the canopy, Intermediate - trees that have been largely overgrown by others, Suppressed - trees that have been overgrown and occupy an under storey position and grow slowly, often severely asymmetrical.

**Note:** *The definitions described above, may not necessarily be included within the Arboricultural Survey Data.*

# Appendix Three

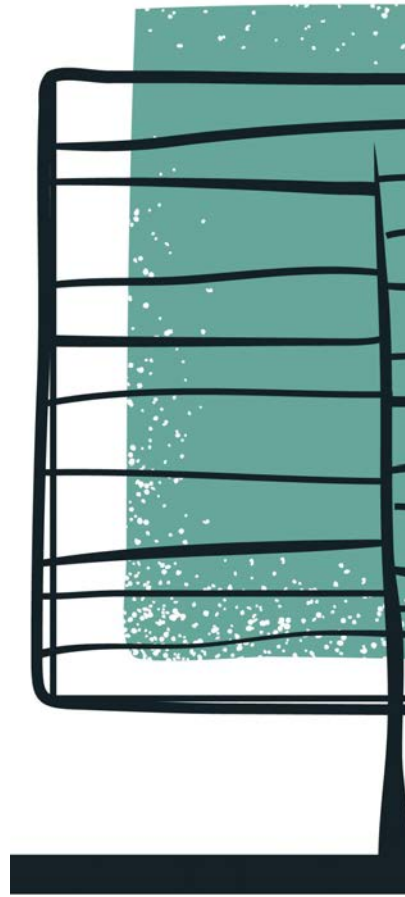
## Cascade Chart



|                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                               |                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Trees for removal                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                               |                                                                                                                                       |
| Category and definition                                                                                                                                            | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                               |                                                                                                                                       |
| Category U<br>Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years | <ul style="list-style-type: none"><li>o Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other U Category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)</li><li>o Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline.</li><li>o Trees infected with pathogens of significance to the health and/or safety of other trees nearby) e.g. Dutch elm disease), or very low-quality trees suppressing adjacent trees of better quality.</li></ul> <p>NOTE: <i>Category U trees can have existing or potential conservation value which might be desirable to preserve; see section 4.7.5</i></p> |                                                                                                                                                                                                                                                               |                                                                                                                                       |
| Trees to be considered for retention                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                               |                                                                                                                                       |
| Category and definition                                                                                                                                            | Criteria and sub-categories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                               |                                                                                                                                       |
|                                                                                                                                                                    | 1) Mainly arboricultural values                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2) Mainly landscape values                                                                                                                                                                                                                                    | 3) Mainly cultural values (including conservation)                                                                                    |
| Category A<br>Trees of high quality: with an estimated remaining life expectancy of at least 40 years                                                              | Trees that are particularly good examples of their species especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Trees, groups or woodlands of particular visual importance as arboricultural and or landscape features                                                                                                                                                        | Trees, groups or woodlands of significant conservation, historical commemorative or other value (e.g. veteran trees or wood-pastures) |
| Category B<br>Those of moderate quality: with an estimated remaining life expectancy of at least 20 years                                                          | Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider area | Trees with clearly identifiable conservation or other cultural benefits                                                               |
| Category C<br>Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm               | Unremarkable trees of very limited merit or such impaired condition that they do not qualify in the higher categories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit.                                                                               | Trees with no material conservation or other cultural value                                                                           |

# Appendix Four

## Plans



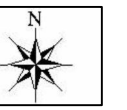


Do not scale this drawing (printed or electronic version).

Contractors must check all dimensions from site

This drawing is for use on this site only and should be used in conjunction with all relevant consultants drawings..

### LEGEND



- 
- Category A
- Category B
- Category C
- Category U
- Root Protection Area (RPA)
- #
- Position estimated on site



|        |          |       |            |
|--------|----------|-------|------------|
| Scale: | 1:500@A1 | Date: | 02/12/2021 |
|--------|----------|-------|------------|

Job: LTM0385.AIA.01

Address  
**Advanced Proteins**  
**Bones Ln, Leek ST13 7BT**

Client: **Earth & Marine Environmental Consultants Ltd**

Drawing Number: LTM0385.TCP.01

Drawn by: **Matthew Lally**

### TREE CONSTRAINTS PLAN



Do not scale this drawing (printed or electronic version).  
Contractors must check all dimensions from site.  
This drawing is for use on this site only and should be used in conjunction with all relevant consultants drawings.

**LEGEND**

- Category A
- Category B
- Category C
- Category U
- Root Protection Area (RPA)
- # Position estimated on site

**Lally**  
TREE MANAGEMENT

|                                     |                                                 |       |            |
|-------------------------------------|-------------------------------------------------|-------|------------|
| Scale:                              | 1:500@A1                                        | Date: | 02/12/2021 |
| Job:                                | LTM0385.AIA.01                                  |       |            |
| Address:                            | Advanced Proteins<br>Bones Ln, Leek ST13 7BT    |       |            |
| Client:                             | Earth & Marine Environmental<br>Consultants Ltd |       |            |
| Drawing Number:                     | LTM0385.AIP.01                                  |       |            |
| Drawn by:                           | Matthew Lally                                   |       |            |
| ARBORICULTURAL<br>IMPLICATIONS PLAN |                                                 |       |            |

# Appendix Five

## Special Surfaces



## METHODOLOGY FOR THE CONSTRUCTION OF HARDSTANDING WITHIN RPA OF A RETAINED TREE

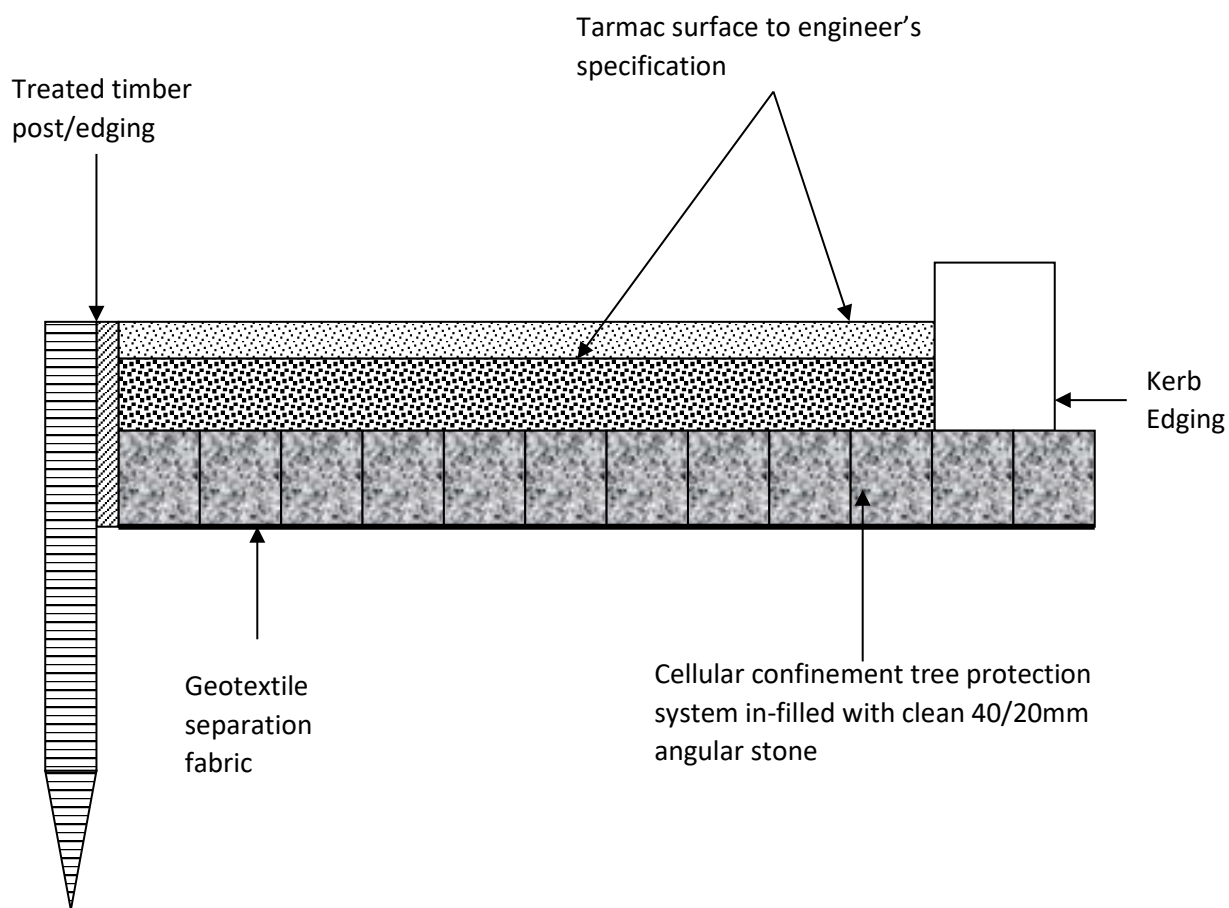
The following methodology supports the drawing indicating the construction of the hardstanding. The methodology is prepared on the basis of the sequence of operations necessary to complete the construction of the hardstanding, with the minimum damage to the trees proposed for retention.

- Surface layer to be scraped off. This can be done either by hand or by very small machinery.
- Erect protective fencing to the edge of the construction area.
- Spread a sub grade material over the length of the hardstanding, to fill any small ruts.
- Construct edging using treated timber if required.
- Lay geotextile mat over smoothed area.
- Extend the Geoweb perforated tree root protection system over the area of the hardstanding, with sufficient overlap such that kerbs can be constructed on top of the Geoweb.
- Fill the voids within the Geoweb with reduced fines Type 1 material working into the site over the top of the Geoweb.
- Lay kerbs and surface over the Geoweb such that the construction binds itself together.
- Construct finished surface as required in line with guidance illustrations below.

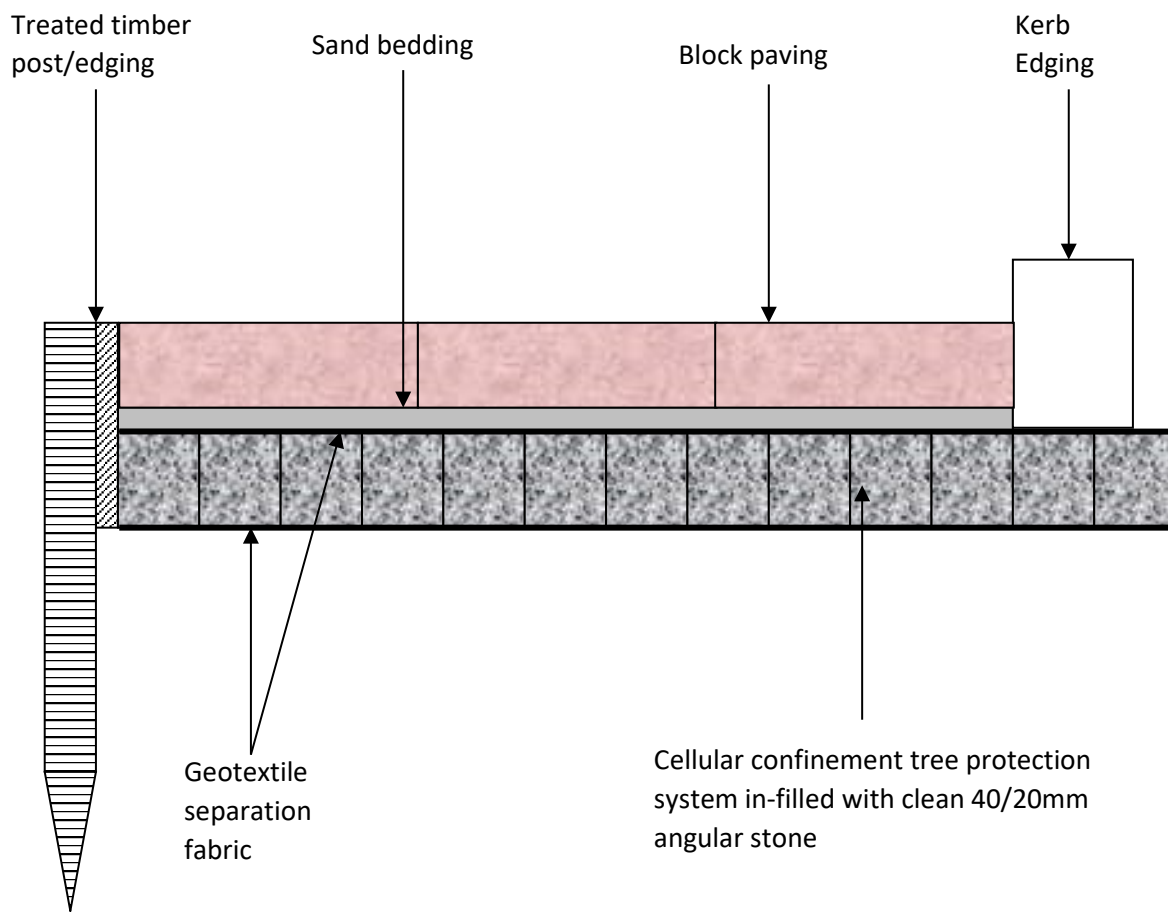
## GEOWEB BASED CONSTRUCTION – (INDICATIVE ONLY)

Depth of confinement system variable according to use- refer to manufacturer

### Tarmac Surface



## Block Paved Surface



## Gravel Surface

