



BS 5837:2012 Arboricultural Impact Assessment and Arboricultural Method Statement

Bedhampton Waterworks
for:

E101 Hub 4 Ltd.

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1.0 Non-Technical Summary

1.1 Arboricultural Survey

- 1.1.1 The approximately 1ha site is a part of the wider Portsmouth Bedhampton Water Treatment Works and is located at Meyrick Road, Havant PO9 3HB. It comprises several large mounds featuring sparsely vegetated land which has been colonised by scrub and grassland.
- 1.1.2 A tree survey in accordance with BS 5837:2012 was carried out by Enzygo Ltd. in December 2023, recording eleven mature trees in the South and Southeast of the site, including sycamore, pine and Norway maple. Four trees are of high value, four of moderate value and two of low value. One tree is unsuitable for retention.
- 1.1.3 The trees are not protected by Tree Preservation Order and do not lie within a Conservation Area.

1.2 Development Proposals

- 1.2.1 The Client proposes the construction of a 150MWh battery energy storage facility and supporting infrastructure, including access via the existing access off Meyrick Road in the East. A landscape scheme forms part of the proposals, which includes a landscape bund along the southern boundary of the site.

1.3 Arboricultural Impact Assessment

- 1.3.1 The development will not require the removal of any trees on site. However, it needs to be proven that the landscape bund in the South can be constructed without any disturbance or level changes within the Root Protection Areas of trees T1-T4.
- 1.3.2 Unless adequate protective measures are provided to *BS 5837 (2012) Trees in relation to design, demolition and construction* and in accordance with this report, operations linked to the development may have an adverse indirect effect on retained trees on site.

1.4 Arboricultural Method Statement

- 1.4.1 Protective measures include Access Facilitation Pruning, the erection of a Protective Barrier to create a sacrosanct Construction Exclusion Zone around retained trees, No-Dig Construction methodologies for proposed new hard landscape and the sensitive design and installation of utilities.

2.0 Objectives

2.1 Introduction

- 2.1.1 Enzygo Limited [Enzygo] have been commissioned by E101 Hub 4 Ltd. to prepare an Arboricultural Impact Assessment and Arboricultural Method Statement at their site at Portsmouth Water Bedhampton Water Treatment Works (WTW), Meyrick Road, Havant PO9 3HB, in support of a planning application for the development of a 150MWh battery energy storage facility on the site.
- 2.1.2 This report should assist both the client, their design team and decision makers in understanding the impact of the development proposals both on trees on and in close proximity to the site and subsequent effects on the wider landscape and which measures should be in place to adequately protect retained trees.

2.2 Structure of the Report

- 2.2.1 **Chapter 2.0** provides a brief description of the site and its location as well as a summary of the existing Arboricultural Survey report on which this report is based.
- 2.2.2 **Chapter 3.0** gives a brief description of the development and details the direct and indirect impact the proposals are expected to have on existing trees.
- 2.2.3 **Chapter 4.0** provides full details of any methodologies to be adopted in order to adequately protect any retained trees during construction and safeguard the health and safety of the trees in the future. It further makes recommendations for the mitigation of any adverse arboricultural impact.

2.3 Site Overview

- 2.3.1 The site is located within the wider Portsmouth Bedhampton Water Treatment Works, approximately 0.2km south of Bedhampton station and 1km west of Havant town centre, in a semi-industrial/semi-suburban location. A small brook (Hermitage Stream) forms the site's southern boundary, and the water treatment works are located to the immediate north, alongside ground mounted solar panels. A railway line passes the site in the Northwest, with a residential area beyond. The JDP Havant pipe supplier's storage yard is located to the east.
- 2.3.2 The site falls within the administrative boundary of Havant Borough Council.
- 2.3.3 The application boundary for the site is approximately 1ha and comprises several large mounds featuring sparsely vegetated land which has been colonised by scrub and grassland.

- 2.3.4 A Public Right of Way (PRoW) passes the site in the South, with views into the site only partially blocked by mature boundary vegetation.

2.4 **Arboricultural Survey**

- 2.4.1 A tree survey in accordance with BS 5837:2012 was carried out by Enzygo Ltd. in December 2023, recording eleven mature trees in the South and Southeast of the site, including sycamore, pine and Norway maple. Four trees are of high value, four of moderate value and two of low value. One tree is unsuitable for retention. The trees are not protected by Tree Preservation Order and do not lie within a Conservation Area.

- 2.4.2 The report includes a full tree survey schedule which describes each tree in accordance with BS 5837:2012 clause 4.4.2.

2.5 **Project Description**

- 2.5.1 It is understood the Client proposes the construction of a 150MWh battery energy storage facility and supporting infrastructure, including access via the existing access off Meyrick Road, Havant PO9 3HB. This will include:

- 132kV Switchyard
- 132/33kV Power Transformer
- DNO Protection / Control Room
- Private 33kV Switchroom
- Private Control Room
- Private 33/0.4kV Auxiliary Transformer
- Private Stores / Metering / Welfare Building [max 2.44m x 6.1m x max. height of 3m above ground]
- 2.4m Palisade Fence
- 3.5m Acoustic Fencing
- 30 units of BESS containers
- 15 units of PCS / Trafo
- Parking for maintenance vehicles
- CCTV Equipment
- Site Lighting

- 2.5.2 A landscape scheme forms part of the proposals, which includes a landscape bund along the southern boundary of the site.

2.5.3 Further details regarding the proposed development can be found in the information submitted with the planning application.

3.0 Arboricultural Impact Assessment (AIA)

3.1 Development proposals

- 3.1.1 This AIA is based on the development proposals as shown on Energy 101's General Arrangement Plan, drawing ref. DACI-4402-E01 Revision 08 dated 23rd April 2024.

3.2 Tree Removal

- 3.2.1 The proposals do not require the removal of any trees on site if it can be proven that the landscape bund along the site's southern boundary will allow for the existing levels within the Root Protection Areas (RPA) of trees T1 to T4 will not be altered.

3.3 Residual impact of development on retained trees

- 3.3.1 Unless adequate protective measures are provided to *BS 5837 (2012) Trees in relation to design, demolition and construction* and in accordance with this report:
- Demolition and construction operations in particular near retained trees T1 to T4 are likely to cause accidental damage of tree trunks and low hanging branches.
 - Vehicle and plant movement during demolition and construction may further cause ground compaction within the northern extent of the RPA of trees T1 to T4 which could lead to irreversible damage of tree roots and the rooting environment within the RPA of retained trees.
 - The construction of hard landscape within the northern extent of the RPA of trees T1 to T4 is likely to have an adverse effect on the rooting environment of retained trees.

3.4 Recommendations

- 3.4.1 All methodologies specified in the Arboricultural Method Statement (AMS) in Chapter 4.0 should be implemented to ensure any retained trees are adequately protected during site set-up, demolition and construction.
- 3.4.2 All site managers and site operatives should be aware of the potential impact of the works on retained trees and follow the protection methodologies specified in the AMS in Chapter 4.0.

4.0 Arboricultural Method Statement (AMS)

This AMS should be read in conjunction with Appendix 1 – Tree Protection Plan.

4.1 Site meetings

- 4.1.1 To ensure all site managers and operatives are aware of the impacts the development may have on existing trees and of the methodologies to be adopted to minimise the impact, a pre-start meeting should be arranged with the Project Arboriculturist.

4.2 Access Facilitation Pruning

- 4.2.1 Prior to the site being set-up, a qualified arborist will carry out any tree works included in the Preliminary Management Recommendations of the Tree Survey Schedule (refer to Arboricultural Survey Report by Enzygo dated April 2024).
- 4.2.2 In addition, the maximum height of the construction vehicles likely to access the site from Meyrick Road in the Southeast should be assessed against the height of the overhanging canopies of T5 and T6.1 to establish the need for crown lifting. The clear crown height over the access road should be 0.5m above the expected maximum vehicle/plant height.
- 4.2.3 Any tree works should be carried out in accordance with *BS 3998:2010- Tree works recommendations*. To find a suitably qualified tree surgeon, please refer to the Arboricultural Association's list of Registered Contractors.
- 4.2.4 Any tree works proposed in the respective survey season should be preceded by a nesting bird and roosting bat check carried out by a suitably qualified ecologist.

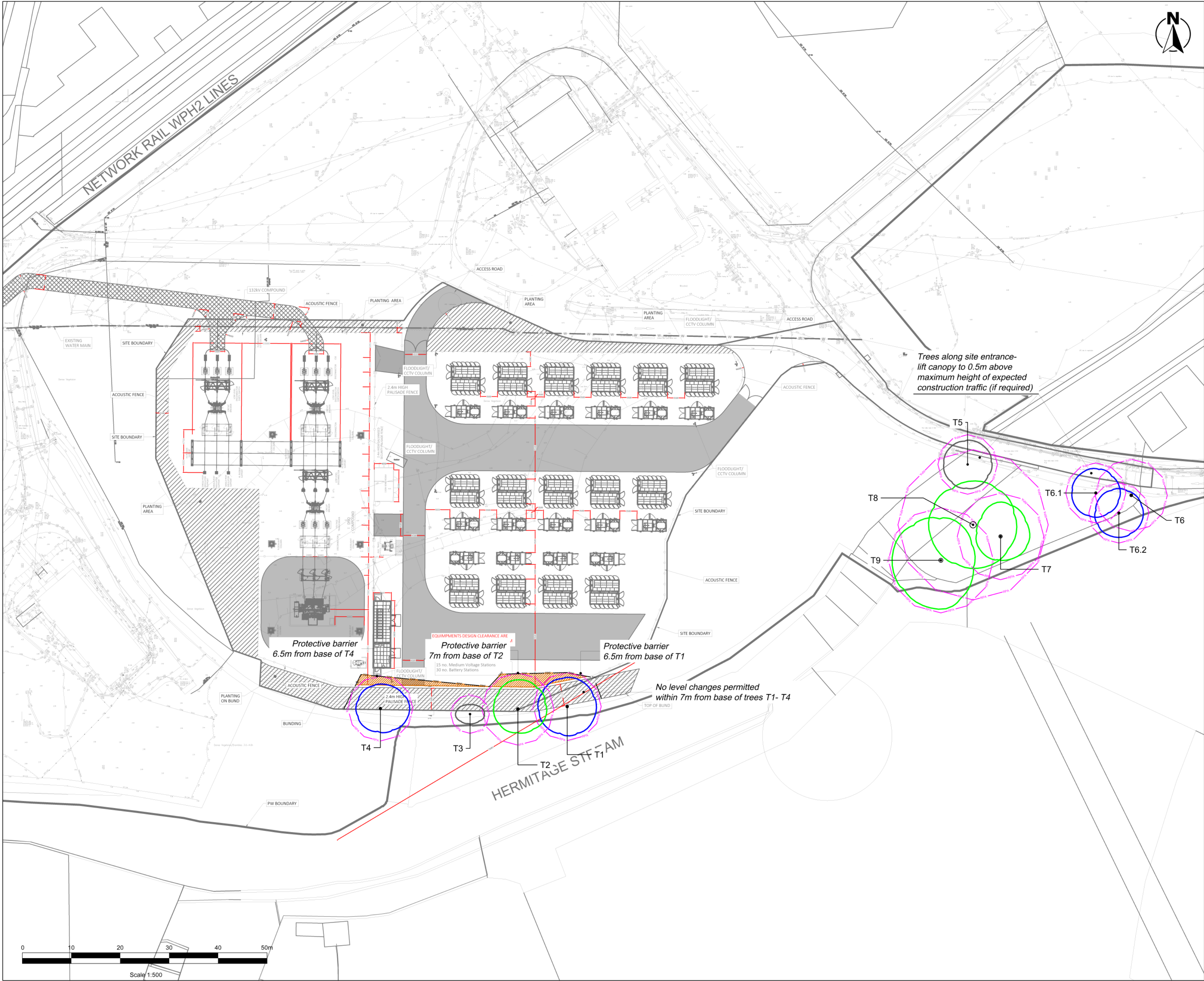
4.3 Protective Barrier

- 4.3.1 Where construction operations are likely to cause damage to above ground parts of retained trees or compaction of the Root Protection Areas (RPA), a protective barrier should be erected prior to commencement of any works on site to create a sacrosanct Construction Exclusion Zone (CEZ). The alignment of the fence should follow the canopy line of the trees or the edges of the RPA, whichever is greater.
- 4.3.2 Where possible, the CEZ should be extended to include any areas proposed for soft landscaping to minimise compaction in these areas and ensure new planting can establish successfully.
- 4.3.3 The alignment of the barrier, including indicative setting-out information, is shown on the drawing included in Appendix 1 – Tree Protection Plan.

- 4.3.4 The protective barrier should be installed in accordance with *BS 5837:2012 Figure 2 Default specification for protective barrier* which consists of a horizontal and vertical scaffold framework that should be braced to resist impact from construction plant and vehicles. Please refer to Appendix 2 – Protective barrier to BS5837:2012 for further information and a detailed specification.
- 4.3.5 All weather notices should be firmly attached to the barrier to inform any site operatives of the purpose of the fencing, e.g. “Construction Exclusion Zone- No access”.
- 4.3.6 Where temporary access of the CEZ is required for the installation of hard landscape or any other permitted work such as fence installation, which is required prior to the main construction works being completed, the barrier may be realigned as shown in Appendix 1 – Tree Protection Plan.
- 4.3.7 The protective barrier must not be removed or realigned unless in accordance with this report or until all construction work has been completed and all construction vehicles and plant have departed from site.
- 4.4 Demolition of existing buildings and removal of hard landscape**
- 4.4.1 Where necessary, areas of hard landscaping should be taken up carefully and without disturbing the ground within the RPA of existing trees. Where new hard landscaping is proposed in the same location, the existing subbase should be retained. Hard landscaping should be retained where otherwise the installation of Temporary Ground Protection would be required.
- 4.5 Level Changes**
- 4.5.1 The reduction of ground levels and the skimming of ground within the RPA of retained trees is not permitted.
- 4.5.2 Where it is required to raise levels within the RPA of retained trees, this should be achieved by use of an inert granular material which remains gas- and water-permeable throughout its design life.
- 4.6 No-dig construction methodologies for new hard surfaces**
- 4.6.1 New hard surfaces may not exceed 20% of the RPA of any retained trees.
- 4.6.2 New hard surfaces proposed within the RPA of retained trees should be installed without any excavations but should be built up on top of existing ground levels.

- 4.6.3 A geotextile membrane will be laid out on top of the existing ground, which may be cleared of all vegetation and loose organic matter. Then a three-dimensional Cellular Confinement System (CCS) specified and approved by the relevant Project Engineer will be installed and filled with inert granular material which allows free drainage and gas exchange (min. 4mm, no fines or sand).
- 4.6.4 With the CCS acting as a sub-base, all remaining layers required by the Project Engineer can be installed on top, finishing with a permeable wearing course which will ensure gas and water exchange between the air and the root zone.
- 4.6.5 An example detail is included in Appendix 3 – Example no-dig construction detail.
- 4.6.6 Kerbing which requires excavations within the RPA of existing trees should be avoided. Peg and board edging may be acceptable for light structures. Where traditional kerbs are unavoidable, excavations for foundations should be carried out carefully and by hand, making sure no roots larger than 25mm diameter are severed. Foundations for traditional kerbs should be installed leaving gaps, allowing the kerb stones to bridge over significant roots.
- 4.7 Installation of Boundary Treatments and Street Furniture**
- 4.7.1 Where the installation of fence posts and street furniture is proposed within the RPA of retained trees, excavations should be kept to a minimum and be carried out carefully by hand.
- 4.7.2 If possible, fence posts should be supported by metal post support spikes. Alternatively, a semi-dry postcrete mix may be acceptable for both fence post foundations and foundations of proposed street furniture.
- 4.7.3 Fences should be aligned to ensure a minimum distance of 1m between the fence and the stems of existing trees to allow for the future growth of the trees.
- 4.8 Installation of Utility Apparatus**
- 4.8.1 Underground services which require excavations should be located outside the Root Protection Areas (RPA) of retained trees, or outside the Tree Protection Zone as shown in Figure 1 of the *National Joint Utility Group (NJUG) Volume 4- Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* (NJUG Volume 4), whichever is greater.
- 4.8.2 Above ground services, including CCTV cameras and lighting, should be sited and installed to avoid the need for detrimental tree pruning in the short and long-term. Installation of above-ground services should further be carried out in accordance with *BS 5837:2012 Clause 7.7.3* and *NJUG Volume 4*.

5.0 Appendix 1 – Tree Protection Plan



- NOTES**
- Do not scale from this drawing for construction purposes
 - This drawing is to be read in conjunction with all relevant drawings and documents associated with this project.
 - All surveyed information including levels and layout is provided by others
 - All existing and proposed dimensions, levels and locations to be checked and verified by the main contractor on site prior to the commencement of the works and any anomalies reported to the engineer.

KEY - Tree Protection Plan

Tree Categories BS 5837 (2012)

Tree Category A

Tree Category B

Tree Category C

Tree Category U

Root Protection Area (RPA)

Protective barrier
BS 5837 (2012) Figure 2

PL01	27/03/25	For Planning	VM	VM	RG
DR	25/04/24	Draft for design input	VM	--	--
Rev	Date	Description	DRA	CHK	APP

Project
Bedhampton Waterworks

Client
E101 Hub 4 Ltd.

Drawing Title
Tree Protection Plan

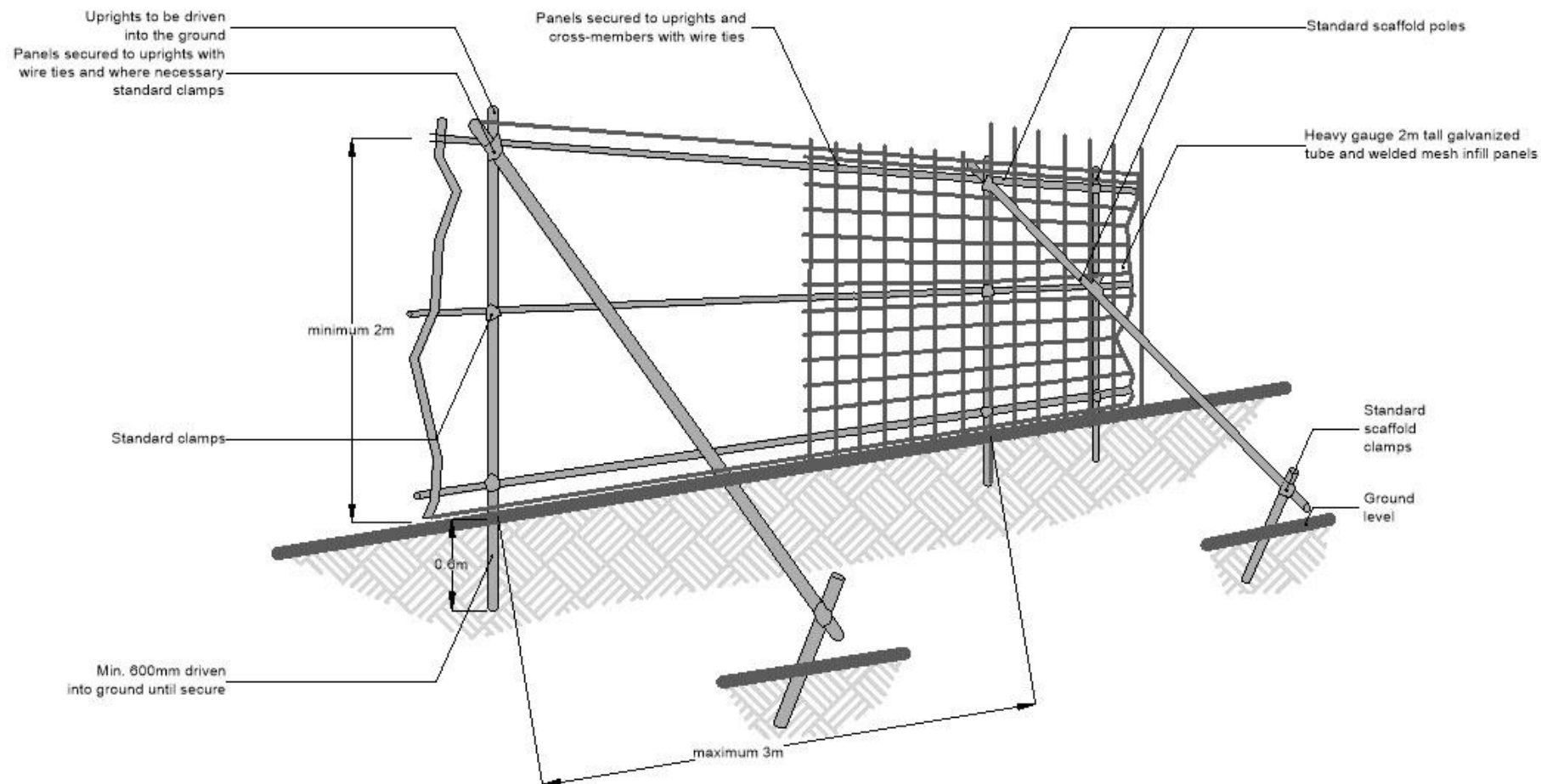
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For Planning	27/03/2025	1:500 @ A2	
Drawn	Designed	Checked	Approved
VM	VM	GB	RG
DWG No.			Revision
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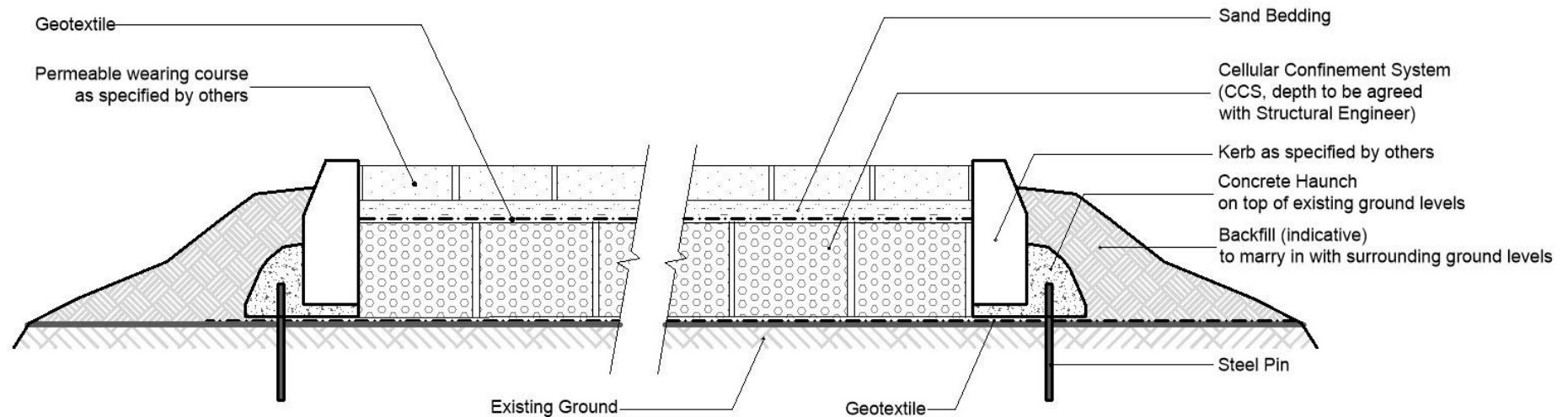
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6.0 Appendix 2 – Protective barrier to BS5837:2012

6.1 Default specification for protective barrier



7.0 Appendix 3 – Example no-dig construction detail



PLEASE NOTE: For illustrative purposes only to show that hard surfaces are to be installed on top of existing ground levels and therefore not require any excavations. Full detail to be agreed with relevant engineer to ensure suitable strength for traffic expected to use the surface.

8.0 Appendix 4 – Methodology

8.1 Introduction

8.1.1 This report and all methodologies adopted to carry out the Arboricultural Impact Assessment and Arboricultural Method Statement are based on recommendations outlined in *British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction- Recommendations*. This was published by BSI Standards Limited and came into effect on 30th April 2012. It supersedes BS 5837:2005 which is withdrawn.

8.2 Arboricultural Impact Assessment (AIA)

8.2.1 Once the Tree Survey and Tree Constraints Plan has been prepared and a site layout is available, these are superimposed to establish the potential impact of the development, including the construction phase, on the existing tree stock.

8.2.2 The requirement for tree removal is ascertained where tree stems are located within or very close to proposed building footprints and hard landscape and/or within areas with significant proposed level changes and other works requiring soil movement (incl. excavations).

8.2.3 In a second stage an assessment is carried out of the impact both the construction operations and the development proposals may have of retained trees, including hard landscape in RPA, vertical structures and tree canopies

8.2.4 Using information provided by the client on construction operations, including site access, construction vehicle and plant movement and location of the site compound and material storage areas, the potential impact on both below and above ground parts of retained trees is assessed.

8.2.5 In addition to assessing the impact of the development on existing trees, Enzygo also include an assessment of the impact of existing trees on the future use of the site, including shading, spatial constraints and the use of gardens, open spaces, paths and roads. Potential conflicts between trees and the safety of the site have also been analysed.

8.3 Arboricultural Method Statement (AMS)

8.3.6 The Arboricultural Method Statement (AMS) gives an overview on all methodologies to be adopted to minimise the effects the development, including construction operations, are expected to have on retained trees.

8.3.7 The AMS further includes a full specification for all methodologies which are necessary to protect retained trees.

- 8.3.8 Methodologies include protective barriers installed to create a Construction Exclusion Zone (CEZ) around retained trees, temporary ground protection where Root Protection Areas (RPA) cannot be fully fenced off, access facilitation pruning where there are conflicts between parts of the canopy and the development, specialist construction methods for buildings within the RPA and any methodologies to be adopted for utilities within the RPA.



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