

## **Arboricultural Method Statement**

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## **Llyn Tegid (Bala Lake) Reservoir Safety Project**

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**Prepared for:**

**Black & Veatch Ltd**

**Our Ref: 19/AMS/SNP/10**

**November 2019**

**Tree Solutions Ltd**

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## SEQUENCE OF OPERATIONS

From commencement of the above development, the following methodology shall be implemented in the manner and sequence described:

1. Tree surgery works
2. Erect temporary tree protective fencing
3. Main engineering phase
4. Re-profiling embankments within RPA of trees
5. Installation of Enkamat & Armorloc within RPA of trees
6. Removal of bound surface within the RPA of tree number 96 & 97
7. Reinstatement of gap in wave wall within RPA of tree numbers 97 & 97
8. Removal of temporary fencing
9. Landscaping within RPA of trees
10. Arboricultural site supervision

### 1. Tree Surgery During Work Stages

1. Before the erection of the temporary protective fencing, all tree works shall be implemented in accordance with the Tree Survey Schedule at **Appendix 1** of the Arboricultural Impact Assessment
2. All possible efforts must be made to prevent damage to retained trees including potential root incursion or compaction caused by vehicle access.
3. All arboricultural works shall conform to the recommendations of BS 3998 (2010) 'Recommendations for Tree Work'
4. All operatives shall be equipped with and use personal protective equipment (PPE) in accordance with current Health & Safety Executive current directives and industry codes of practice.
5. Performance of all arboricultural operations and use of equipment shall be in accordance with current Health & Safety Executive current directives and industry codes of practice

### 2. Erect Temporary Tree Protective Fencing

1. Prior to commencement of any construction, preparation, excavation or material deliveries the main contractor shall erect the temporary protective fencing as detailed in the 'Tree Protection Specification' and in the location indicated on the Tree Protection Plan.
2. Tree protective fencing to be erected in each work phase area i.e. reach 1-reach 3 and to remain in situ for the duration of all work. Upon completion of work within each phase, the Heras fence panels, and plastic mesh is to be dismantled and re-erected for next work phase.
3. Photographic evidence of each phased tree protection area will be issued to the LPA Tree Officer for approval upon completion. Any damage occurring to protective fencing during the development phase shall be made good by the main contractor.

### 3. Main Engineering Phase

1. Tree protective fencing to be erected prior to any construction plant or materials entering the site
2. Tree protective barriers in accordance with BS 5837: 2012 will be erected to prevent damage to the tree stems and any movement of plant with the RPA
3. There shall be no storage of construction material, site parking, site accommodation or equipment in any area designated as the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Fencing
4. No materials that are likely to have an adverse effect on tree health such as oil, bitumen or cement will be stored or discharged within 10 metres of the trunk of a tree that is to be retained. No fires will be lit
5. The site agent shall supervise deliveries by self-loading crane, with vehicles positioned in such a manner that retained trees are not at risk of damage
6. Any damage to trees as a result of construction/engineering work will be logged and reported to the project Arboricultural Consultant

#### **Avoiding Damage to Stems and Branches**

- Care shall be taken when planning site operations in proximity to trees to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious injury resulting in safe retention impossible

## On Site Storage of Spoil and Building Materials

- Prior to and during all site construction works no spoil will be stored within the Root Protection Area of any tree on or adjacent to the site even if proposed site work is to be within the crown spread. Any encroachment within this protected area will only be by the prior agreement of the project arboricultural consultant.

## 4. Re-profiling Embankments within RPA of Trees

1. Tree protective fencing shall be removed where necessary to allow for the re-profiling works
2. All works shall be undertaken from working outside the RPA of trees
3. There shall be no storage of construction material, plant, site accommodation or equipment in any area designated as the Root Protection Area (RPA) and enclosed by temporary protective fencing
4. All construction plant will operate from the top of the existing flood defence wall
5. Any undulation of land within the RPA of trees shall be filled with a 50-50 mix of sharp sand and imported topsoil in accordance with BS 3882 (2015). Fill level must not exceed 100mm and to be spread by hand
6. Movement of material shall be by hand using wheelbarrows. The use of any mechanical excavator or dumper within the RPA of trees is strictly prohibited
7. Any exposed roots shall be pruned back to a side branch, by use of sharp saw or secateurs by the project arboricultural consultant and not construction personnel
8. Care shall be taken to avoid any damage to tree stems and branches from the mechanical backhoe raising and lowering soil profiles. Any damage shall be reported to Tree Solutions where appropriate remedial action will be assessed

## 5. Installation of Enkamat & Armorloc within RPA of trees

1. Tree Protective fencing to be removed to allow for works within RPA of tree
2. Enkamat to be installed by hand, the movement of plant within the RPA of trees is strictly prohibited
3. Enkamat to be installed above existing ground level and held in place by use of Salix Terra Lock system. Excavation of trenches is strictly prohibited
4. Armorloc blocks to be delivered by mechanical teleporter positioned outside the RPA of trees
5. Armorloc to be installed above existing ground level

## 6. Removal of Bound Surface within the RPA of Tree Numbers 96 & 97

Photographic evidence will be submitted to Snowdonia National Park Authority (SNPA) by the project arboricultural consultant of the works being undertaken in accordance with the AMS.

### Works to be undertaken under Arboricultural site supervision

The following steps shall be taken when breaking out the existing tarmac surface:

1. Breaking-out shall be by hand, avoiding damage to the protective bark covering larger underlying tree roots. Excavation will be carried out using pickaxes rather than pneumatic equipment. The use of a mechanical excavator is prohibited.
2. Roots, whilst exposed, shall be wrapped in dry (winter), wet (summer) clean Hessian sacking to prevent desiccation and to protect from rapid temperature changes. Roots smaller than 25mm diameter and roots bound to arisings shall be pruned back preferably to a side branch, by use of sharp saw or secateurs. Roots larger than 25mm shall only be severed following consultation with the SNPA Tree Officer and project Arboricultural Consultant.
3. No machinery shall pass over the surface once broken-out. Arisings shall be picked and removed by manual means.
4. Prior to backfilling any Hessian wrapping shall be removed and retained roots shall be surrounded in at least 35mm of sharp sand or other loose granular fill before any soil is replaced
5. The area will be backfilled with a topsoil and grass seeded to match surrounding area

### 7. Reinstatement of Gap in Wave Wall within RPA of Tree Numbers 97 & 97

Photographic evidence will be submitted to Snowdonia National Park Authority (SNPA) by the project arboricultural consultant of the works being undertaken in accordance with the AMS.

#### Works to be undertaken under Arboricultural site supervision

1. Excavation is to be undertaken by hand tools the use of mechanical excavator is prohibited
2. Exposed roots will be cut cleanly back to a suitable inner node by the project arboricultural consultant by use of sharp saw or secateurs
3. Prior to backfilling with concrete, the sides of the exposed trench shall be lined with a non-porous visqueen to prevent any lime leaching into surrounding soil

### 8. Remove all Temporary Tree Protective Fencing

1. Tree Protective fencing will only be removed upon completion of all engineering/construction work within each phase and once all plant & machinery associated with the works has left site.

### 9. Landscaping within RPA of Trees

1. There shall be **no rotovating** of ground within any area designated as a Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) and enclosed by Temporary Protective Fencing.
2. Other than the approved works, there should be no additional hard landscaping works or excavation for cables, or any other service should be installed within the Root Protection Area (RPA) and Construction Exclusion Zone (CEZ) without the written consent of the LPA.

### 10. Arboricultural Site Supervision

- 1 The contract Arboricultural Consultant will give a toolbox talk training with main contractor on all tree protective measures and working practice within designated RPA's
- 2 The contract Arboricultural Consultant to make visits to site to inspect all tree protection measures during all key development work within proximity to retained trees and when requested by the contractor.

#### **Useful Contacts**

##### Project Arboricultural Consultant

Name: Alistair Henderson (Tree Solutions Ltd)  
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## TREE PROTECTIVE FENCING

- 1 Before the commencement of any site excavations and subsequent construction works (other than those set out in the schedule of tree works contained in this document), protective fencing will be erected as detailed on the Tree Protection Plan and as specified below.
- 2 The fencing will consist of a scaffold framework in accordance with Figure 2 of BS 5837 – 2012 (illustration below) comprising a metal framework, both vertical and horizontal, well braced to resist impacts. Vertical tubes will be spaced at a maximum interval of 3m. Onto this, weldmesh panels shall be securely fixed with wire or scaffold clamps. Weldmesh panels on rubber or concrete feet are not considered resistant to impact and for this reason will not be used. The site manager or other suitably qualified appointed person will be responsible for inspecting the protective fencing daily; any damage to the fencing or breaches of the fenced area will be rectified immediately.
- 3 Clearly legible weatherproof signage, stating “Protected Trees – Exclusion Zone” shall be attached to the fencing 1.5m from the ground, facing out of the Tree Protection Zone located at regular intervals along the fence line. A copy of the tree protection sign is at **Appendix 2**.
- 4 The fencing will remain in place until completion of all site works and then only removed when all site traffic is removed from site
- 5 Other than works detailed within this method statement or approved in writing by the Local Planning Authority (LPA), no works including storage or dumping of materials shall take place within the exclusion zones defined by the protective fencing.

### Protective Fencing Detail

The fence types are shown on the Tree Protection Plan with the following colour key: -

1. **Magenta**

2.0M high heavy-duty rhino panels (with extra central support bar) mounted on scaffold poles (driven into the ground) and secured with anti-tamper bolts – as illustrated below.



**Tree Protective Fencing Specification**

## **Appendix One Tree Protection Plan**



**Tree Protective Fencing Specification**

**PROTECTIVE FENCING: THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.**

**TREE PROTECTION AREA: KEEP CLEAR!**

**Tree Solutions**

**Legend**

- EXTENT OF CONSTRUCTION WORKING AREA
- EXTENT OF MAINTENANCE STRIP
- UPGRADED RIP RAP PROTECTION
- ENKAMAT
- FOOTPATH
- CREST MONITORING PIN REINSTATED
- FENCE REALIGNMENT
- HEDGEROW REALIGNMENT
- CHANGAGE
- LAND DRAINAGE PIPEWORK (SEE NOTE 8)
- HIMALAYAN BALSAM
- JAPANESE KNOTWEED
- ARMORLOC 150 BLOCKS

**Legend**

Root Protection Area Modified to Account for Site Features

Category A (High Quality) Crown Spread Tree Number

Category B (Moderate Quality) Category C (Low Quality) Category D (Dead/Dying/In Decline)

NOTE: Tree group numbers marked with an \* have approximate locations

NOTE: 2.0M high heavy duty thin panels (with extra central support bar) mounted on scaffold poles (driven in to the ground) and secured with anti tamper bolts - as illustrated

Client: Black & Veatch Ltd

Project: Llyn Tegid Reservoir, Bala

Title: Tree Protection Plan

Scale: 1:500@A0 Date: November 2019

Drawn By: DB & AM Revision: A

Job Ref: 19/AIA/SN/110 Drawing No: 03

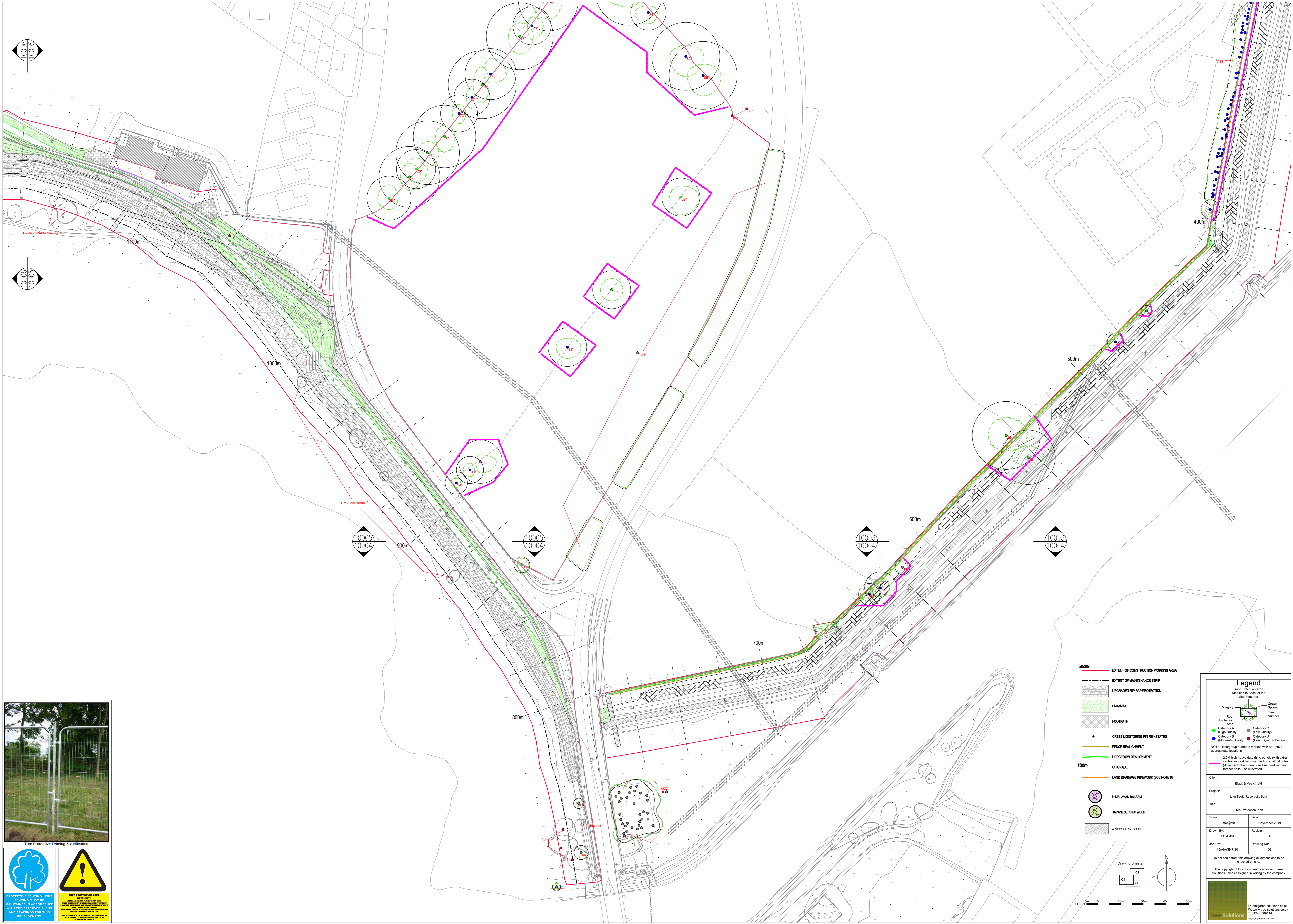
Drawing Sheets: 01, 02, 03

Scale: 0m, 10m, 20m, 30m, 40m, 50m

North Arrow

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**Tree Protective Fencing Specification**

PROTECTIVE FENCING: THIS FENCING SHOULD BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.

**Tree Protective Area**

KEEP OUT!

Tree Solutions logo and contact information.

**Legend**

- EXTENT OF CONSTRUCTION WORKING AREA
- EXTENT OF MAINTENANCE STRIP
- UPGRADED RIP/RAP PROTECTION
- ENKAMAT
- FOOTPATH
- CREST MONITORING PIN REINSTATED
- FENCE REALIGNMENT
- HERDOROW REALIGNMENT
- CHAINAGE
- LAND DRAINAGE PIPEWORK (SEE NOTE 8)
- HIMALAYAN BALSAM
- JAPANESE KNOTWEED
- ARMORCOC 150 BLOCKS

**Legend**

Tree Protection Area Modified to Account for Site Features

Category A (High Quality) - Green circle with crown symbol  
 Category B (Moderate Quality) - Blue circle with crown symbol  
 Category C (Low Quality) - Red circle with crown symbol  
 Category D (Dead/Dying/In Decline) - Black circle with crown symbol

NOTE: Tree group numbers marked with an \* have approximate locations.

2.0M high heavy duty rhino panels (with extra central support bar) mounted on scaffold poles (driven in to the ground) and secured with anti tamper bolts - as illustrated.

Client: Black & Veatch Ltd  
 Project: Llyn Tegid Reservoir, Bala  
 Title: Tree Protection Plan  
 Scale: 1:500@A0  
 Date: November 2019  
 Drawn By: DB & AM  
 Revision: A  
 Job Ref: 19/AIA/SNP110  
 Drawing No: G3

Do not scale from this drawing all dimensions to be checked on site.

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Tree Solutions logo and contact information.

Drawing Sheets: 01, 02, 03

Scale: 0m, 10m, 20m, 30m, 40m, 50m

North arrow pointing up.

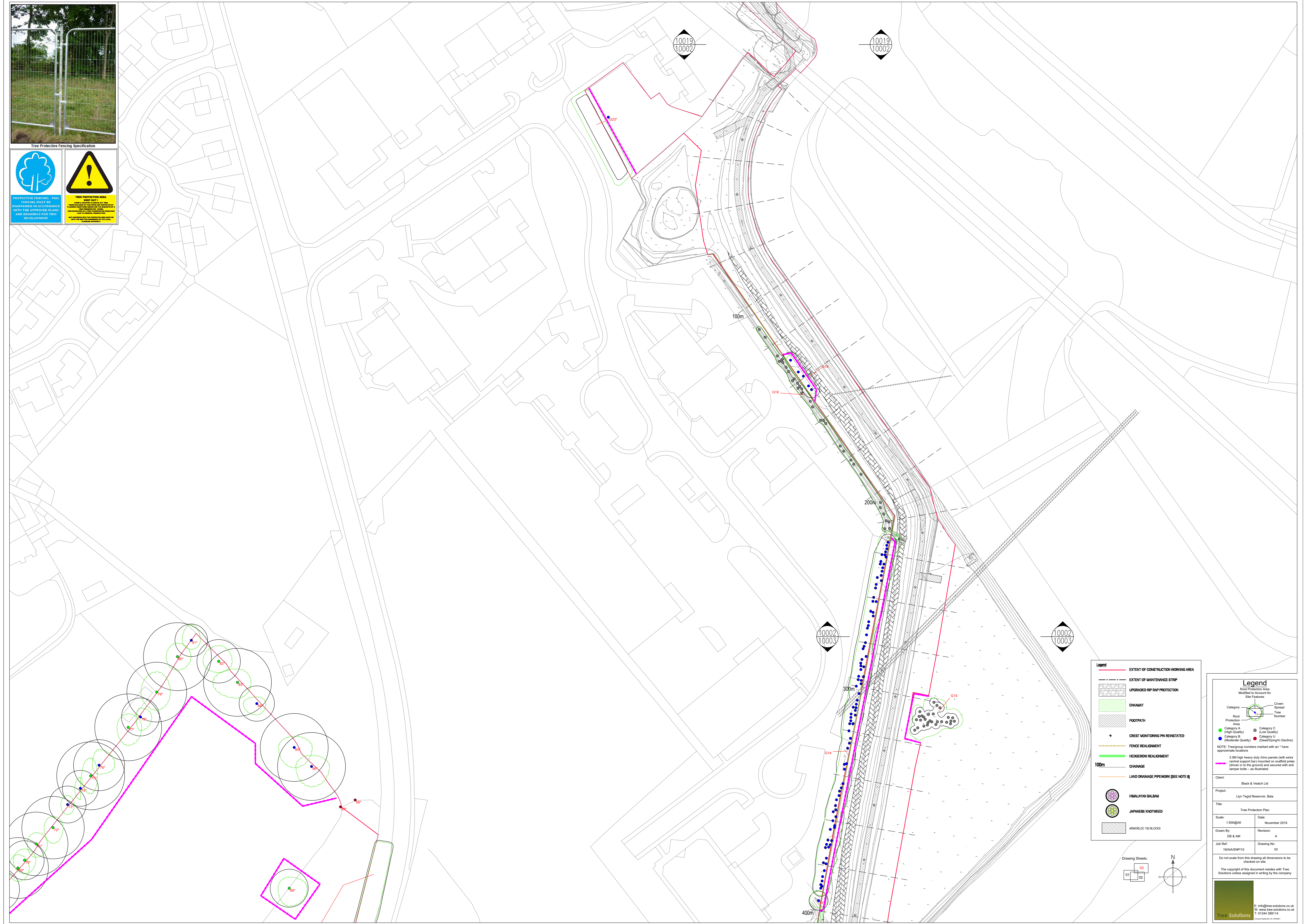




**Tree Protective Fencing Specification**

**PROTECTIVE FENCING** THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.

**THIS PROTECTION AREA** MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.



**Legend**

- EXTENT OF CONSTRUCTION WORKING AREA
- EXTENT OF MAINTENANCE STRIP
- UPGRADED RPP RAP PROTECTION
- ENKAMAT
- FOOTPATH
- CREST MONITORING PIN REINSTATED
- FENCE REALIGNMENT
- HEDGEROW REALIGNMENT
- CHANGE
- LAND DRAINAGE PIPEWORK (SEE NOTE 8)
- HIMALAYAN BALSAM
- JAPANESE KNOTWEED
- ARKWOLD 150 BLOCKS

**Legend**

Root Protection Area Modified to Account for Site Features

Category	Crown	Stem	Tree Number
Category A (High Quality)	Green circle	Blue circle	Green circle
Category B (Moderate Quality)	Blue circle	Red circle	Blue circle
Category C (Low Quality)	Red circle	Black circle	Red circle
Category U (Dead/Dying/In Decline)	Black circle	Red circle	Black circle

NOTE: Tree group numbers marked with an \* have approximate locations

2.0M high heavy duty rhino panels (with extra central support bar) mounted on scaffold poles (driven in to the ground) and secured with anti tamper bolts - as illustrated

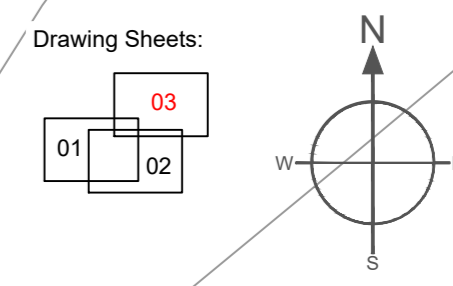
Client:	Black & Veatch Ltd
Project:	Llyn Tegid Reservoir, Bala
Title:	Tree Protection Plan
Scale:	1:500@A0
Date:	November 2019
Drawn By:	DB & AM
Revision:	A
Job Ref:	19/AIA/SNP110
Drawing No:	G3

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## **Appendix Two Tree Protection Sign**



**PROTECTIVE FENCING. THIS  
FENCING MUST BE  
MAINTAINED IN ACCORDANCE  
WITH THE APPROVED PLANS  
AND DRAWINGS FOR THIS  
DEVELOPMENT.**



**TREE PROTECTION AREA  
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)**

**TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY  
PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A  
TREE PRESERVATION ORDER.  
CONTRAVENTION OF A TREE PRESERVATION ORDER MAY  
LEAD TO CRIMINAL PROSECUTION**

**ANY INCURSION INTO THE PROTECTED AREA MUST BE  
WITH THE WRITTEN PERMISSION OF THE LOCAL  
PLANNING AUTHORITY**