Phi Group
Montis Court
Bouncers Lane, Cheltenham
Gloucestershire, GL52 5JG
T: 01242 707600
E: southern@phigroup.co.uk
W: www.phigroup.co.uk

OPERATION & MAINTENANCE - TITAN

1. INTRODUCTION

The Titan Wall system is a vertical reinforced earth structure utilising dry laid concrete blocks as the facing with anchored steel ladder reinforcement between layers of well compacted crushed stone.

Materials used:-

Facing Blocks:	Unreinforced Concrete Block with split or smooth face finish
Main reinforcing elements:	Galvanised Steel Ladders (typically 8-12mm dia)
Connection Pins:	Glass Reinforced Plastic
Reinforced Fill:	Well graded granular fill
Foundation:	Mass concrete strip footing

2. PHI GROUP DESIGN DRAWINGS

Issued to suit project

3. CONSTRUCTION METHODS

As per the standard detail drawings & read in conjunction with project specific Works Package Plan.

4. MAINTENANCE PROCEDURES

Any long term maintenance is basically periodic visual inspections to detect damage or abnormalities. Any damage detected should be reported and advice on repair should be sought from Phi Group. These would be typically annually, but will vary depending on the location of the slope and what it is supporting.

Abnormalities may include: localised bulging of the face, cracking or splitting of individual blocks, vegetation on the face, excessive water coming through the face.

No requirement for regular cleaning is anticipated.

Inspections should check for accidental or malicious damage to the facing of the Titan Wall.

If any fencing has been installed at the top of the wall to prevent falls this will need to be inspected to ensure it remains adequate. Typically any fencing will not last as long as the structure and will need to be replaced during the lifespan of the Titan Wall.

A rear of wall drain will have been installed at construction stage, so the relevant catch pit, manhole or soak away within the development should also be checked annually to ensure this can still flow.

5. POINTS TO BE AWARE OF

5.1 Minor impact damage

Split, cracked or broken blocks (without the steel reinforcement exposed) will not affect the Titan Wall as the steel ladders and stone backfill are providing the structural elements.

5.2 Major impact damage

As with any structure, affected areas may require re-building with localised support of the fill behind. Advice should be sought from Phi Group or a structural Engineer.

5.3 Fire Damage

Local damage from fires should not adversely affect the performance of the reinforced earthworks but may affect the blocks depending on the severity of the fire.

5.4 Graffiti and Staining to the Face

Given the facing block is a split concrete unit these can be cleaned, if required, to remove staining or graffiti. A high pressure jet wash can be used on the blocks, but care should be taken to avoid spraying between the blocks which may wash out the backfill. In extreme circumstances sand blasting could be used but advice should be sought from Phi Group first.

5.5 Cutting of Reinforcement

The reinforcement behind the Titan Wall is a minimum of 8mm steel ladder type and under no circumstances should any layer of reinforcement be cut.

5.5 Settlement

The “method compaction” guidance within Specification for Highways Works; Series 500 is based upon achieving 95% compaction. It follows that some post-construction consolidation should be expected.

5.7 Installation of Fence Posts/Services

Under no circumstances should any layer of reinforcement be cut parallel to the face of the Titan Wall by continuous services. Reference should be made to the as-built drawings to determine if any proposed excavation would penetrate the reinforcement. Installation of fence posts is permitted to the rear of the wall. Post centres are to be determined by referring to the as-built drawings for reinforcement location and posts placed between the reinforcement.

5.8 Vegetation

As the Titan Wall system is a concrete block wall with inert crushed stone behind, it is not expected to be susceptible to vegetation establishment. Vegetation growing on or up the face of the wall will not affect the structure. However, any vegetation growing out of the wall between the blocks should be removed.

5.9 Water

The Titan blocks are dry laid, and have typically 150mm of free draining “pea-shingle” immediately behind them, such that water coming through the face should not occur. If water is coming through the face this would only occur if excessive water is coming from behind the structure and should be investigated to find the water source and remove it.

6. DEMOLITION AND DISMANTLING

No demolition should be undertaken without reference to Phi Group or a Structural Engineer.

7. RESIDUAL RISKS

As any other type of retaining wall, falling from height is a residual risk of a Titan Wall. When Phi Group installs a retaining wall it will normally have a fence already built in to the top of the wall. Occasionally post formers will be left in the top of the wall for the Main Contractor to install a fence after our works are complete. This will ensure that falling from height from the top of the wall has been addressed, but the fencing will need to be maintained for the lifespan of the wall.

8. PRODUCT LITERATURE

Visit the Phi Group website at www.phigroup.co.uk for Brochure and further details.