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## **OPERATION & MAINTENANCE - ANDACRIB**

### **1. INTRODUCTION**

The Andacrib retaining wall system is a gravity structure built at a batter of 6H:1V horizontal (9.5° from Vertical) such that the weight of the wall resists the pressures exerted on it from the ground behind. It comprises precast reinforced concrete components to create a crib structure that is filled with inert crushed stone. The depth of the structure will increase with the height of the wall.

Materials used:-

Crib Components:	40N/mm <sup>2</sup> Concrete with Steel Reinforcing
Reinforcing elements:	10mm High Yield Steel 50mm nominal cover
Fill to the structure:	Well graded granular fill
Foundation:	Concrete strip footing

### **2. PHI GROUP DESIGN DRAWINGS**

Issued to suit project

### **3. CONSTRUCTION METHODS**

As per the standard details on this drawing 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 wall and what it is supporting.

Abnormalities may include, but not limited to: localised bulging of the face; broken components; damage by impact or vandalism; vegetation on the face; excessive water through the face.

No requirement for any cleaning is anticipated.

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 retaining 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 be checked to ensure this can still flow.

## 5. POINTS TO BE AWARE OF

### 5.1 Minor impact damage

Individual broken or damaged concrete components may not affect the structural capacity of the wall and could be repaired locally if required. If several components are broken in the same area such that it will affect other parts of the wall or cause the loss of the infill stone, advice should be sought from Phi Group or a structural Engineer.

### 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 small fires should not adversely affect the performance of the retaining wall as the concrete components, surrounded by crushed stone, will not burn. But after a fire the components should be inspected for damage and advice should be sought from Phi Group or a structural Engineer.

### 5.4 Settlement

The “method compaction” guidance within Specification for Highways Works; Series 600 is based upon achieving 90% compaction. It follows that some post-construction consolidation should be expected. The Andacrib system is also a flexible structure that can accommodate differential settlement, for example seasonal moisture changes, so some minor movements will occur over its lifespan.

### 5.5 Excavation near the wall

Excavation behind the retaining wall may affect the structure but it will be based on how close and to what depth the excavation is carried out. Also the plant used to carry out the excavation can damage and exert large loadings on the wall. If any excavations are required behind the wall advice should be sought from Phi Group first.

Excavation in front of the wall may undermine the structure. Any excavation deeper than 500mm may have the potential to undermine the retaining wall foundations leading to settlement and possible collapse. Any excavation in front of the wall should be checked by a structural Engineer or further advice sought from Phi Group.

### 5.6 Vegetation

The Andacrib system is a crib structure filled with inert crushed stone, so it is not expected to be susceptible to vegetation establishment from within the wall. However, planting bags may have been installed in the wall to aid climbing plants to establish across the face by having localised pockets of soil for the plants roots. Thus the system can accommodate vegetation on the face such as grasses, ivies or small shrubs as these cause no detriment to the design although if they become too large the root system could dislodge the components. So any shrub or plant with trunk greater than 15mm should be removed.

### 5.7 Water

The Andacrib retaining wall has crushed stone within and behind the wall with a rear wall drain to remove the water away from the structure. Thus the wall should have very little evidence of water within it. If water is coming through the face this would mean excessive water is coming from behind the structure and should be investigated to find the water source and remove it. It may also mean that the drain exit has become blocked and needs to be cleared.

## 6. DEMOLITION AND DISMANTLING

The Andacrib system is a modular components system and can be dismantled, however it designed to support the ground behind it so no removal or demolition should be undertaken without reference to a Structural Engineer or Phi Group.

## 7. RESIDUAL RISKS

As with any type of retaining structure, falling from height is a residual risk. When Phi Group installs a retaining structure it will normally have a fence already built in to the top. Occasionally post void formers will be left in the top 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 structure has been addressed, but the fencing will need to be maintained for the lifespan of the structure by others. Retaining structures can be climbed by people and this may also be an issue. The Contractor will need to take any necessary steps to bring this to the end-users attention.

## 8. PRODUCT LITERATURE

Visit the Phi Group website at [www.phigroup.co.uk](http://www.phigroup.co.uk) for Brochure and further details.