

# PORCUPINE

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THE SHAPE OF WALLS TO COME



## A simple to build multi-variable retaining wall system from Armortec

**Porcupine** is a revolutionary and versatile concrete block retaining wall system.

**Porcupine** needs no mortar and requires the minimum of plant and machinery for installation.

**Porcupine** can be laid by relatively unskilled labour once the first row has been installed.

**Porcupine's** unique series of splines interlock to create a stable and strong structure.

**Porcupine** can be built with a variety of different slope angles.

**Porcupine** wall heights can be increased using reinforced earth techniques or mass concrete backfill.

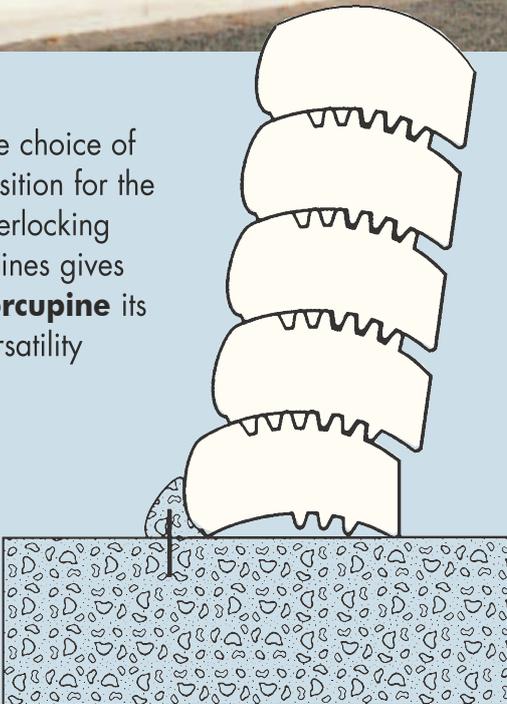


# PORCUP

**PORCUPINE** is undoubtedly the most versatile and economic solution for effective and visually appealing retaining walls



The choice of position for the interlocking splines gives **Porcupine** its versatility



A really green effect can be achieved by planting appropriate hanging or climbing plants above or below the base of the wall. Another option we offer is to add colours to the concrete mix during manufacture.



# INE

The Porcupine System lends itself to a variety of applications from industrial premises to office developments to housing estates and recreational areas.

For normal retaining purposes Porcupine walls can be built to a height of 2.5-3 metres at slope angles varying between 82.5° and 67.5° from the horizontal (7.5° and 22.5° from the vertical).



## Porcupine has been used for:-

- Terracing walls
- Dividing walls
- Culvert wing walls
- Separation of twin level highways
- Protection of rock outcrops
- Watercourse bank protection
- Access denial wall
- Around railway signalling refuges
- Supermarket car parks
- Ha-Ha
- Flood barriers

## A variety of options are available to alleviate the problems from:-

- Insufficient space for installation
- Steep slopes above the top of the wall
- Low bearing capacity of the foundation soil
- Heights in excess of 3m
- Low factor of safety against sliding

Where necessary Porcupine walls can be additionally supported with concrete backing or geogrid reinforced soil slopes as shown on the two lower pictures on the left.

In certain circumstances the Porcupine blocks can be anchored back with proprietary earth anchors.

# TECHNICAL DETAILS

## DESIGN SERVICE

Our Technical Department can offer prospective clients a "Design Suggestion Service" for Porcupine Retaining Walls. Our dedicated computer programme will incorporate customers specific construction parameters to provide a design proposal which will ensure that the required factors of safety can be achieved if the construction is carried out correctly. *For more information telephone our Authorised Agent or Head Office.*

## CONCRETE SPECIFICATION

Min. binder content : 370 kg/m<sup>3</sup>  
Density : 2200 kg/m<sup>3</sup>  
Water absorption : <6%  
Sulphate resistance : Class DS-2



The individual Porcupine block, is an interlocking curved concrete block, which achieves its stability by the spines on the top surface of one block matching those on the bottom of another. No mortar is needed.

Porcupine can be laid very quickly, normally in a simple stretcher bond similar to brickwork, leaving a small coursing gap between adjacent blocks.

Corners can be achieved by in-situ mitre cuts. The wall can be curved to a minimum radius of 8 m during installation, or down to a radius of 3 m by removing the central lower spline and two corresponding upper splines.



## The Porcupine block

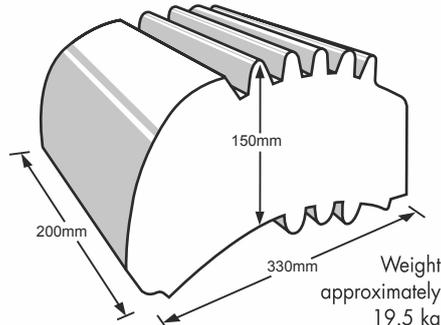
size and weight allows for ease of installation in confined areas.

complies with Health and Safety directives for handling.

is within guidelines for a single man lift.

is available as split face or standard finish.

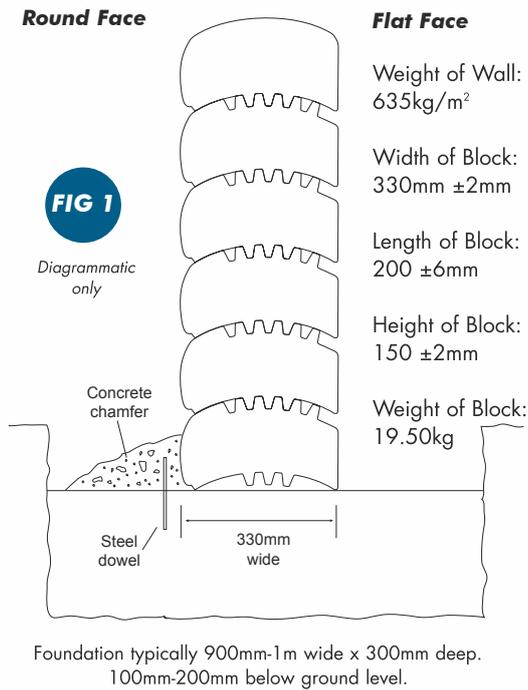
## DIMENSIONS MARK II BLOCK



Porcupine blocks are shrink-wrapped for security and ease of handling and are delivered on pallets.

# Installation Instructions

## TYPICAL DETAILS Mark III Porcupine



## Foundation

It is necessary to lay the Porcupine blocks on a concrete foundation, which must be designed to ensure suitable factors of safety against overturning and bearing stress. We can provide a suggestion of the details, which should be verified by a suitably qualified Engineer.

As a guide for smaller walls the dimensions should be 700-800mm wide by 300mm deep.

We recommend the use of steel dowel bars embedded in a chamfer of concrete. The dowels should be inserted into the wet concrete foundation at the correct distance from the back or front of the footing to ensure the correct alignment of the

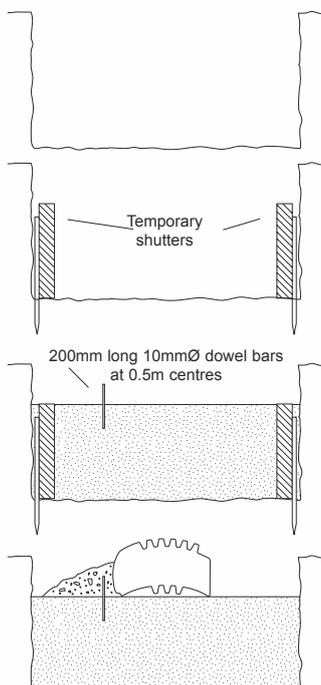
### 1. Dig Trench

### FIG 2

### 2. Install to a level line temporary shutters

### 3. Pour concrete, trowel to a smooth level surface and insert dowel bars

### 4. Lay first row of blocks and place concrete chamfer over dowel bars



blocks. The chamfer will act as an additional factor against sliding.

The position of the blocks on the footing is determined in the calculation of bearing pressures.

In clay soils a shear key detail will assist the prevention of sliding.

**It is important to get the foundation surface level as any irregularity will show in the finished wall.**

## Installation

**The lower block should always be placed horizontally on the foundation so that the flat face is vertical to the rear.**

Changes in angle of the wall can then be made as follows:

Blocks may be placed vertically with either the flat or round face exposed (see Fig 1). Alternatively, they may be raked back in increments of 7.5° per row. This involves the movement of the block one spline backwards per row.

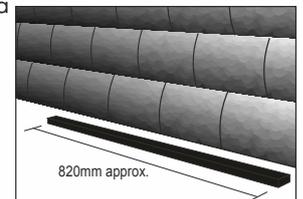
Several examples of how various angles can be achieved are shown in Figures 4, 5, 6 & 7. We do not recommend that Porcupine blocks should be laid at a greater angle than 22.5° from the vertical.

Porcupine blocks are laid in a stretcher-bond fashion. Please note that due to the manufacturing process the length of the blocks varies slightly so they should be spaced approximately 5mm apart.

When constructing a long run of wall it is advisable to use a horizontal gauge-stick to ensure a consistent number of blocks per linear metre, so that the bond is maintained (see Fig 3).

### FIG 3

### Use of Gauge-Stick



**The top splines should be brushed clean on every block before laying the next block on top.**

A string line, similar to that used in bricklaying, should be used to ensure the correct level is maintained. Backfilling and compacting should follow after every two rows.

When constructing vertical walls it is important to ensure the foundation is horizontal from front to back and check the correct verticality of each course to ensure that the 90° is maintained at all times.

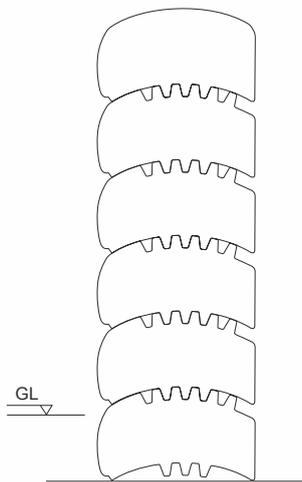
## Bends and Curves

Using standard Porcupine blocks, curves in a wall with a radius down to 8 metres can be constructed. The smaller radii are more easily accommodated when an angle of 7.5° or vertical is adopted for the rake of the wall. By removing the central lower spline and corresponding upper splines, it is possible to achieve a radius down to approximately 3m.

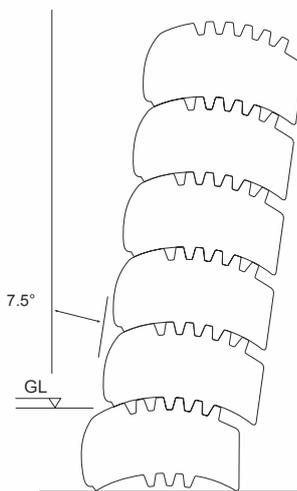
Tighter bends can either be achieved by abutting two separate walls or, more preferably, by mitre cutting the blocks on site.

A mass concrete corner connecting two separate walls is also possible.

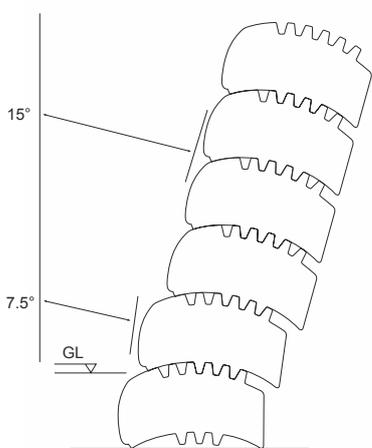
## TYPICAL WALLS



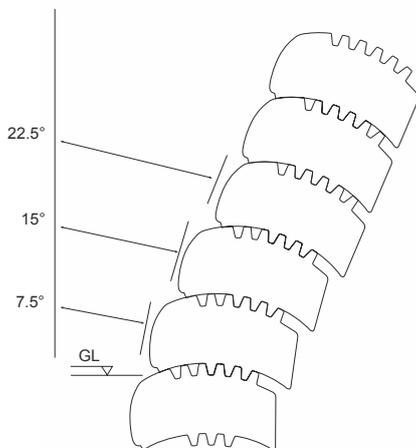
**FIG 4** Vertical Wall



**FIG 5** 7.5° Wall (82.5° from horizontal)

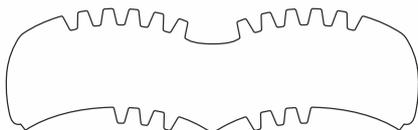


**FIG 6** 15° Wall (75° from horizontal)



**FIG 7** 22.5° Wall (67.5° from horizontal)

**FIG 8**



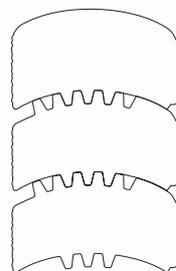
BLOCKS CAN BE MANUFACTURED IN A BUTTERFLY CONFIGURATION FOR USE WHEN AN EXTRA WEIGHT OF WALL IS NEEDED. THESE BLOCKS CAN ALSO BE USED TO CONSTRUCT A FREE STANDING WALL UP TO 5 BLOCKS HIGH

## Design Service

We offer clients a "Design Suggestion Service" for Porcupine retaining walls. Using our dedicated computer program, we will incorporate customer's specific construction parameters to ensure that the required factors of safety can be achieved if construction work is carried out correctly.

Our design suggestion service, which complies with BS8006, does not constitute or imply an indemnified design.

## Split Face Blocks



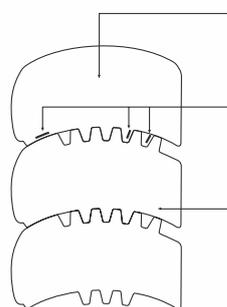
A random surface to the face of the wall can be achieved by using our split face Porcupine blocks.

**FIG 9**

## Coloured Blocks

PORCUPINE CAN BE SUPPLIED IN A RANGE OF COLOURS WHICH ARE MANUFACTURED TO SPECIAL ORDER

## Securing of Porcupine Coping Block



Porcupine Coping Block

Apply Sikadur 31 to top front of block and front face of two interlocking splines.

Porcupine Standard Block

**FIG 10**

## Sikadur 31

Approximate Consumption 75g/m of coping

### Technical Data:

Shear	21 N/mm <sup>2</sup>
Tensile	14.8N/mm <sup>2</sup>
Shelf Life	12 months in original container at 5-25°C
Mixed Material Pot Life	1½ hours @ 10°C 40 minutes @ 20°C

Available in 5kg Standard Pack Units  
NB. Minimum working temperature 5°C



### RPC Ltd

Quarryfields, Ruthin, Denbighshire UK LL15 2UG  
T: 01824 709102 F: 01824 709105  
info@armortec.co.uk  
www.armortec.co.uk

# 01824 709102