Step 1: Site preparation, excavation, trimming & compaction
Prior to laying Armorflex, the base material must be profiled to line and level and should be compacted to a firm and even finish. Obstructions, such as roots and projecting stones should be removed as the quality of the preparation will be reflected in the finished surface. The angle of repose of the in situ material must not be exceeded. Maximum desired slope is 1:1.5

Step 2: Handling & placing by manual labour
Armorflex loose block should be placed in a stretcher bond pattern to achieve the mechanical interlock. At areas such as culvert inlets and outlets, the blocks should be placed to allow for access to the cable ducts.

Step 3: Wiring up in situ
The wire is easily pushed through the cable ducts in the blocks and secured as detailed in Step 4. The choice of wire will depend on the application. A 3.1 mm diameter galvanized fencing wire or a 5 mm diameter polyester rope can be used. In certain situations wiring up may not be necessary. Generally the wire will be threaded perpendicular to the flow.

Step 4: A final twist to the wire
Galvanized wire can be twisted across the block joint for a length of minimum 100mm or a suitable knot used on the polyester cable.

Step 5: Anchorage
Armorflex placed on steep slopes may slide on the geotextile until the system has settled. Temporary or permanent anchorage can be achieved with steel or wooden pegs through the top cable loops.

Step 6: Finishing
Armorflex subject to wave attack should be blinded with a sand/gravel mixture. Above normal waterline, the voids should be sealed and seeded to develop natural vegetation.
When your project calls for protection that can withstand severe applications and climatic conditions, when it must be installed quickly with no in situ concrete, and even when it must be placed under water, ARMOFLEX is the engineered solution. Technicrete can provide design assistance and on site consultation if required.

### The engineered solution

Civil Engineers throughout the world are continually faced with the problem of controlling erosion of coastal shorelines and inland waterways. Coastal areas frequently experience land loss and property damage resulting from the dynamic forces associated with wave attack, while inland waterways experience heavy currents which erode channel banks and beds, consequently resulting in unfavourable environmental conditions.

The ARMOFLEX Erosion Control System provides an engineered alternative for a wide variety of erosion control and drainage projects. The matrix of open cells and projections retain soils, relieve hydrostatic pressure and provide the perfect environment for establishing natural vegetation.

The ARMOFLEX system is flexible, conforming to ground contours, settling without fracture, and requires only limited ground preparation. ARMOFLEX can be supplied palletized in loose block form for manual installation or in preformed mats for mechanical installation. The result is a stable protection designed to withstand high water velocities and wave attack with a finish that is environmentally acceptable.

#### Erosion control

ARMOFLEX provides defence against erosion in fast flowing streams and rivers. ARMOFLEX is particularly suitable for protection of rivers, estuaries, lakes, reservoirs and other areas subject to wave action. ARMOFLEX, with the stability of its specially designed blocks, provides flexible protection unaffected by subsoil and hidden by nature.

#### Roadways

ARMOFLEX provides an ideal heavy duty riding surface for temporary and permanent access roads, parking areas and stormwater drill crossings.

#### Drainage

ARMOFLEX provides an excellent lining for drainage channels. Bed and channel banks are stabilized against erosion caused by high velocities and the tendency of water to change the planned course of a channel. ARMOFLEX aprons at pipe inlets and outlets eliminate pipe undercutting that may lead to severe problems such as surrounding bank failure and siltation downstream. Other drainage applications include: ditch linings, spillways, headwalls, sediment basins and traps, pipe inlet protection, and protection of berms.

### Applications

- **Erosion control**
- **Roadways**
- **Drainage**

### Characteristics

- **Stability**
  - ARMOFLEX provides protection that acts as a single articulating mat to withstand the destructive forces of water. Where necessary, alternative weights and sizes of mats can be produced for special applications.
  - *Flexibility*  
    - ARMOFLEX blocks are of a sophisticated design which allows the mat to remain flexible. The blocks are specially tapered to allow for this flexibility, maintaining minimum stress on the blocks. This facility enables ARMOFLEX to conform to contours even if settlement occurs after installation.
  - *Filtration*  
    - ARMOFLEX mats are placed on a geotextile. The geotextile replaces graded filter materials for a more simplified installation. The permeability of the filter and blocks relieves hydrostatic pressure while its capacity for soil retention prevents leaching of materials through the installation.

- **Vegetation**
  - ARMOFLEX, with stone filling in the cells, will greatly reduce the development of vegetal growth. When the cells are filled with topsoil, ARMOFLEX provides the perfect environment for the establishment of vegetation. Roots will penetrate the geotextile providing a permanent anchor for the installation.

- **Flow resistance**
  - The ARMOFLEX matrix of open cells and projections create a surface with an engineered roughness. This surface roughness causes a loss of energy due to the formation of eddies within each cell, thus reducing the potential for erosion. The Manning Roughness Coefficient, “n”, of ARMOFLEX has a value ranging from 0.025 - 0.035, depending on the material filling the open cells and vegetal cover. ARMOFLEX 140 offers protection against flow velocities up to 3.5 m/s and ARMOFLEX 180 up to 5.5 m/s. Each project should however be carefully assessed to determine the correct specification and product size.

### Table: Dimensions, Normal Plan, and Weight

<table>
<thead>
<tr>
<th>Block Size</th>
<th>Dimensions</th>
<th>Normal Plan</th>
<th>No. of Blocks</th>
<th>Weight of Block (kg/ave)</th>
<th>Open Area (%)</th>
<th>Vol. Material to Fill Joints &amp; Voids (m³/m²)</th>
<th>Mat Sizes (m)</th>
<th>Cable</th>
<th>In Situ Assembled</th>
<th>Vertical Bending Radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARMOFLEX 180</td>
<td>340 x 294 x 115</td>
<td>309 x 294</td>
<td>11</td>
<td>16.4</td>
<td>180</td>
<td>18</td>
<td>0.022</td>
<td>Standard 6.2 x 2.4 (20 x 8 blocks)</td>
<td>galvanised steel wire/synthetic rope</td>
<td>galvanised fencing wire/synthetic rope</td>
</tr>
<tr>
<td>ARMOFLEX 205</td>
<td>340 x 294 x 115</td>
<td>309 x 294</td>
<td>11</td>
<td>19.2</td>
<td>205</td>
<td>8</td>
<td>0.008</td>
<td>Standard 6.2 x 2.4 (20 x 8 blocks)</td>
<td>galvanised steel wire/synthetic rope</td>
<td>galvanised fencing wire/synthetic rope</td>
</tr>
<tr>
<td>ARMOFLEX 140</td>
<td>340 x 400 x 95</td>
<td>309 x 400</td>
<td>8</td>
<td>17.5</td>
<td>140</td>
<td>18</td>
<td>0.017</td>
<td>Standard 6.2 x 2.4 (20 x 8 blocks)</td>
<td>galvanised steel wire/synthetic rope</td>
<td>galvanised fencing wire/synthetic rope</td>
</tr>
<tr>
<td>ARMOFLEX 165</td>
<td>340 x 400 x 95</td>
<td>309 x 400</td>
<td>8</td>
<td>20.6</td>
<td>165</td>
<td>8</td>
<td>0.009</td>
<td>Standard 6.2 x 2.4 (20 x 8 blocks)</td>
<td>galvanised steel wire/synthetic rope</td>
<td>galvanised fencing wire/synthetic rope</td>
</tr>
</tbody>
</table>

**Specifications:** ARMOFLEX blocks consist of machine compressed concrete blocks which are either solid or with vertical holes and two horizontal cable ducts, depending on the application. The block shape is such that they interlock with each other transversely across the mat. The blocks have a partial taper to the sides which allow the system to articulate freely without disjointing. The partial taper encourages the ingress of fine granular particles into the joint between blocks.

**Typical cross-section:** The performance of the system relies on maintaining intimate contact between the blocks, geotextile and the base material.
Armorflex® Strip roads

Protection blocks for the construction of roads and strip roads

Access roads are a vital part of daily life in South Africa. These roads are used for residential, commercial traffic and applications such as agricultural and farm roads in plantations and forests. These roads are subject to a variety of traffic loads from cars to heavy trucks carrying produce and workers. The use of Armorflex®180 and 205 as strip roads is a cost effective solution to the problems associated with gravel roads and earth tracks. These can become impassable in wet weather, causing considerable inconvenience and cost implications for commercial activities. The high cost of maintaining gravel roads and earth tracks can also be reduced making Armorflex® strips roads an economically viable solution.
Armorflex Strip Road Applications

**Typical section through strip road**

- 620 mm
- ±850 mm
- Armorflex 180 blocks

**Detail section through Armorflex strip**

- Fill and compact earth
- Over Break to allow for tying galvanized fencing wire through blocks
- Geotextile
- 3.1 mm dia. galvanized fencing wire through blocks
- Block Thickness ±10 mm to 15 mm
- Compact ground to smooth and even finish. Use max. 20 mm thickness river sand for final leveling

**Armorflex Roadway Applications**

**Armorflex as protection to gravel road at stormwater crossing**

**Strip roads excavation procedure**

1. Excavate to excavation depth = block thickness 20 mm. Keep overbreak to a minimum.

2. Screed river sand bed (20 mm thickness) to form level surface. Place geotextile strip over sand bed.

3. Place Armorflex and wire up.

4. Backfill and compact.

**Section AA**

- Compact after completion of Armorflex
- Geotextile
- Armorflex 180 blocks
- Storm water runoff
- Storm water runoff
- Armorflex drain and road protection
The most engineered yet simple hardlawn paving

Technicrete Grassframe allows the natural greening of paved surfaces to form hard wearing grassed driveways, roadways, footpaths and parking areas. Technicrete Grassframe paving is simple to maintain using conventional lawn maintenance techniques.
# TECHNICRETE

## Concrete Grassframe

the most engineered yet simple hardlawn paving

### Laying Detail

- Surface of layer works to standard specifications SABS 1200 MJ. (max. 10mm in 3m)
- Earthworks designed to suit traffic loading
- Openings topsoiled and grassed prior to trafficking
- Block hand compacted into bedding sand using a rubber mallet.
- River sand bedding (recommend 10mm to 15mm thick)

### General Application

<table>
<thead>
<tr>
<th>Thickness Available</th>
<th>Length/Width</th>
<th>No. Blocks p/m²</th>
<th>Block Mass p/m²</th>
<th>Colours available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driveways, roadways, strip roads, pathways and parking areas. Embankment &amp; light duty erosion protection.</td>
<td>100mm 95mm 90mm</td>
<td>600 x 400 600 x 400 600 x 400</td>
<td>4.17 4.17 4.17</td>
<td>137kg 130kg 123kg</td>
</tr>
</tbody>
</table>

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