

INSTALLATION GUIDE – GABIONS

ITEM	GABIONS
DESIGN	All Sanpac gabion baskets are manufactured from double twisted hexagonal woven steel wire mesh 8 x 10 type and galvanized in accordance to EN 10244-2.
PACKING	All gabion baskets are supplied flat packed, with the end and diaphragm panels already fixed to the base panel, ready to be assembled and filled with stones at the project site. Necessary galvanized lacing wire is supplied for each gabion basket. For Galfan and polymer coated gabions, Galfan and polymer coated lacing wire must be used. Fastening rings can also be used instead of lacing wire. These rings are either Galfan coated or stainless steel.
MATERIALS REQUIRED FOR INSTALLATION	<ul style="list-style-type: none"> - Gabion baskets. - Adequate lacing wire or ring fasteners. - 200 gsm needle punched geotextile. - Correct quality of rockfill material (between 100 – 200mm) - Tools for lacing and bracing operations and closing the lids. (<i>care should be taken to avoid damaging the wire coating</i>) - Drainage and composite drainage systems.
STORAGE	Storage of Gabion baskets must always be in compliance to the manufacturer’s storage instructions and in accordance to site safety protocols.
MACHINERY REQUIREMENT	<p>GABIONS</p> <ul style="list-style-type: none"> - On site, individual units can be moved manually. - Unloading from trucks can be done manually or using handling equipment. <p>BACKFILL</p> <ul style="list-style-type: none"> - Choice of equipment for backfill is left to the discretion of the contractor as it depends on conditions of access and volume of soil fill. <p>COMPACTION</p> <ul style="list-style-type: none"> - For uniformly distributed fine sand – non vibrating rollers are recommended. - Compaction of backfill soil, close to the facing, within a minimum width of 1m – lightweight vibratory compactors or small vibratory rollers.

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<p>INSTALLATION METHODOLOGY</p>	<p>FOUNDATION PREPARATION The foundation shall be level and graded to the elevations as shown on the project construction drawings. It shall be smooth and free from any irregularities, loose material and vegetation, and shall be compacted to the engineer’s specification, to ensure uniform bearing capacity and minimize differential settlement. When founding on a rock, a concrete leveling pad and dowel anchors are recommended. Mark out the start and end point of the wall and any external or internal angle changes or steps.</p> <p>ASSEMBLY Ensure the workers have adequate open space to open individual gabion baskets. Unfold the gabion flat on the ground and stretch so that the creases are in the correct position to form a box. Lift the front, back and end panels to form an open box, ensuring the tops of all 4 sides are at the same level. Fasten the panels together using the projecting heavier wire with the selvedge or edge wire of the intersecting panels and back panel. Repeat the same exercise to secure the diaphragm panel. It is essential that the top corners meet.</p> <p>LACING Secure the lacing at the top corners of the panels to be joined and lace top down. For better productivity, fastening rings are recommended. Where ring fasteners are used, place one ring at the top and bottom of the edge and diaphragm panels, and then fix the rings at maximum intervals of 200mm along all edges to ensure panels are held firmly together. Use of mechanical or pneumatic fastening tools is required.</p>

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<p>INSTALLATION METHODOLOGY</p>	<p>PLACING A GEOTEXTILE</p> <p>The primary function of a geotextile is to prevent loss of fines from the soil from behind the gabion structure through the rockfill. It also prevents the build-up of any water pressure behind the wall. <i>(In some instances it may be necessary to install a composite drainage system and subsoil drainage system to ease the hydro-static pressure behind the gabion structure).</i></p> <p>Care must be taken not to damage the geotextile when placing the foundation layer of gabions on the geotextile, or along the back of the gabion structure and when backfilling and compacting.</p> <p>Overlaps should be a minimum of 300mm.</p> <p>In hydraulic applications, ensure that the upstream section of the geotextile overlaps the downstream section.</p> <p>The geotextile recommended is a 200 gsm needle punched geotextile.</p> <p>PLACING THE UNITS</p> <p>Place a number of laced units side by side and in the required position.</p> <p>Lace adjacent units together at every adjacent edge to form a monolithic cage like structure.</p> <p>All gabion units should be laced to each other at all contact surfaces.</p> <p>TAKE CARE NOT TO DAMAGE THE GEOTEXTILE DURING THIS EXERCISE.</p> <p>Ensure that the gabion structure is aligned properly before the units are filled. Common equipment used for alignment is a Formwork.</p> <p>It is important to ensure that the gabion layout and orientation or positioning of the lids is in such a way that it allows for the worker of frontal loaders to fill the units with ease.</p> <p>Steel pipes can be placed at the top edge of the panels to protect the panels during mechanical filling.</p>

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<p>INSTALLATION METHODOLOGY</p>	<p>FILLING To minimize voids and ensure a dense compacted compartment, well graded stones are recommended as opposed to large stones. 1m deep gabion baskets are filled at intervals of 1/3 depth. 0.5m deep gabions are filled at intervals of 0.25m depth. These depths are ensured by using bracing wires made from the lacing wire provided. Filling is to be done in rows of not more than 1/3 of a meter. When filling a number of gabions, always ensure that the last cell is left empty to facilitate wiring. Gabions should be overfilled by 3 – 5 cm to allow for settlement. The top edge of the diaphragm should always be kept visible, so as to facilitate lacing to the lid. All visible faces should be hand packed carefully to ensure good finish.</p> <p>COMPACTION Compaction of backfill should always be done simultaneously with every row of gabions laid, using lightweight vibratory compactor machines and as per Engineer’s specification.</p> <p>CLOSING Fold the lid down; Stretch into position with the aid of a suitable tool; lace the lid to the front, ends and top of the diaphragm.</p> <p>Where small pipes have to be passed through gabions, cut the steel wire mesh to the diameter of the pipe, bend inwards and tie using lacing wire. Fill the gabion basket with stone up to the elevation of the pipe, place the pipe and cover with a protective membrane, if recommended by the pipe manufacturer and continue to fill with stone.</p> <p>DRAINAGE Engineers must always provide adequate designs for internal and external drainage to ensure the performance of the gabion structure.</p>

DISCLAIMER – The instructions given herein are of a general nature and does not exempt the contractor from the obligations and the responsibilities for the definition and correct execution of all the specific operation required for the implementation of the project. In such respect, SANPAC AFRICA LTD., will not be liable for any inaccuracies or omissions in the execution results and will not bear the consequences of any connected liability.