

ELCOROCK[®]

Installation Guidelines

0.75m³ Sand Containers



Quality - Support - Expertise



ELCOROCK® Installation Guidelines

Please read the important notice at the end of this brochure

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These guidelines are general in nature. Site or project specific conditions may require them to be altered or amended to ensure effective installation. Please follow the guidance of the consulting or site engineer.

1.0 INTRODUCTION

ELCOROCK® engineered sand containers offer excellent performance in durability, robustness and usability. ELCOROCK® sand containers offer the designer, contractor and end user a range of benefits over traditional rock or hessian bag type structures; including more consistent physical properties, a well structured installation process and an amenable, user-friendly end product.

ELCOROCK® 0.75m³ sand containers are designed to be used in rivers and protected coastal revetments, with larger 2.5m³ sand containers being preferable for more exposed conditions and applications. Constructed from staple-fibre polyester and polyester/ polypropylene blends, the ELCOROCK® product is capable of withstanding some of the harshest conditions on the planet ranging from prolonged exposure to extreme ultra-violet radiation to abrasion due to sand and wave action.

The installation of the ELCOROCK® 0.75m³ sand containers is a structured process that has been developed to ensure it is capable of delivering rapid construction times. This document provides a detailed outline of the procedure that should be followed in order to correctly store, fill and install ELCOROCK® 0.75m³ sand containers.

Standard Occupational, Health and Safety guidelines should be followed as per normal site operations. Site safety and safe work practices are the responsibility of the consultant and/or contractor.

2.0 PACKAGING, TRANSPORT AND UNLOADING ON SITE

ELCOROCK® 0.75m³ sand containers are supplied wrapped in waterproof, UV resistant, opaque plastic stretch-wrap on a pallet. For quantities of sand containers per pallet refer to Table 1. Transportation of sand containers is usually by flatbed truck or similar and unloading should be conducted on the pallet as a whole, leaving the protective wrap in place until such time as the sand containers are required for filling. Unloading from the pallet should take place as required and remaining sand containers should be covered with the plastic wrap to prevent water ingress or exposure. Failure to do this may lead to saturation of the bags, making them heavy and difficult to handle.

Table 1: Packaging

Geotextile	Number of containers per pallet
Standard	50
Vandal deterrent	25

3.0 ON SITE STORAGE

All deliveries of ELCOROCK® sand containers should remain in as-delivered protective wrapping until filling and placement commences. Ideally, sand containers should be stored in a location that offers protection from the elements, particularly for longer storage periods.

4.0 INSTALLATION REQUIREMENTS

The following are the minimum requirements to ensure a good filling and placement rate of 0.75m³ ELCOROCK® sand containers;

- 2 Filling frames,
- 0.75m³ J-Bin. Ensure compatibility of excavator quick hitches,
- 13 tonne excavator for filling sand containers,
- 20 tonne excavator for placement of sand containers,
- 3 labourers plus excavators operators,
- 2 Sewing machines,
- Generator,
- Personal protection: hats, steel cap boots, sunglasses, sun screen and long sleeve shirts.

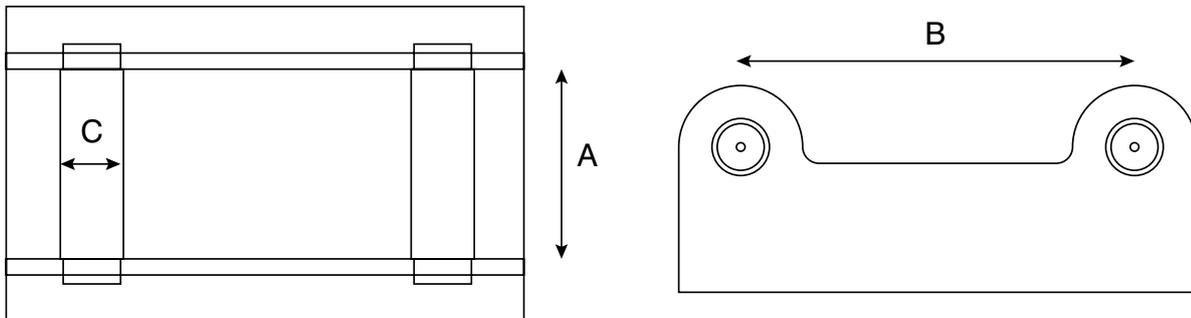
5.0 EQUIPMENT COMPATIBILITY

The J-Bins have been designed to accept a wide range of different excavators by means of an interchangeable quick hitch attachment. If the equipment available does not match the standard quick hitches available (refer to Table 2), project specific hitches can be manufactured to suit. The contractor should allow at least one month for the manufacture of new quick hitch attachments.

Table 2: Standard Quick Hitch Dimensions

Code	A Spread	B Pin Centres	C Pin Diameter
QH 141	221mm	407mm	65mm
QH 201	320mm	440mm	80mm
QH 301	350mm	515mm	90mm
QH 351	420mm	585mm	100mm

Figure 1: Quick Hitch Dimensions



6.0 INSTALLATION TEAM

Before installing ELCOROCK® sand containers this guideline should be read thoroughly by all installation personnel. The installation team should be aware of their individual roles in ensuring a quality installation. Any questions raised by the installation team which cannot be answered by this document should be referred to the supplier.

7.0 SITE AND SUBGRADE PREPARATION

Depending on the size of the project and the number of units to be filled, planning of the site layout and logistics regarding filling and placement will enhance productivity and minimise the need for excessive handling or travelling.

The site must be prepared such that there is no debris and the filling area is level and firm. Failure to ensure a level and firm construction area may lead to damage or instability of the filling apparatus.

8.0 WEATHER CONDITIONS FOR INSTALLATION

ELCOROCK® installations can be sensitive to climatic conditions including tides, waves, rain and wind. Tidal variations may influence the availability of fill material, ability to place and the area available to work and store raw materials and equipment. For safety reasons, strong or severe wave action can have an effect on the ability to work within an exposed coastal region. Rain and wind can present hazardous situations in and around the work site, particularly where electricity is present. All of the above factors must be taken into account when planning an installation.

9.0 FILLING

The 0.75m³ ELCOROCK[®] sand containers are filled using a product specific filling frame. The filling frame is designed such that a container can be filled and the frame released and moved on to the next container filling point, reducing delays in production.

The following guidelines should be followed to ensure an efficient and effective work rate:

1. Ensure a sufficient stockpile of sand and an adequate supply of fuel for the generator.
2. Remove one ELCOROCK[®] sand container from the pallet and place it in a filling frame, following these steps.
3. Insert the sand container up from the inside of the fixing ring and fold over the fixing ring.
4. Pull the sand container down until between 250 to 300mm overhang is achieved.

Note: When using vandal deterrent geotextiles, the top 250mm of the sand container should be folded over prior to insertion into frame, as this simplifies the task.
5. The bottom of the sand container must hang approximately 25mm above the ground.

Note: The empty sand container should be hanging uniformly in the filling frame. This prevents the container from folding or creasing during the filling operation. This will limit the fill volume and reduce the stability of the sand container.
6. Secure the container using the clamping ring supplied. The clamping ring must lock in below the rim of the fixing ring.
7. Fill the sand container with sand to within 300mm of the top of the fixing ring (refer to Figure 2).

Note: The first load of sand should be dispensed slowly so that the possibility of the sand container folding along the base is limited and the sand container can be manhandled to free up any folds.
8. Using great care, release the sand container from the frame by removing the lock ring.
9. Push excess sand into the corners of the sand container and pull the two faces of the sand container together. Approximately 75mm vertical surface is required to allow a sewn closure to be facilitated.

Note:

 1. If more than 100mm of material is available for sewing, the sand container is under filled and more sand should be added.
 2. If less than 50mm of material is available for sewing, remove sand from the sand container as the limited depth will restrict the movement of the sewing machine and may cause it to jam.
10. Slide the filling frame forward and repeat the procedure.



Dimension Range	
Depth (mm)	350-400
Width (mm)	1200-1500
Length (mm)	1600-1800



Figure 2. Filling sand container

10.0 CLOSURE

Only sewing machines and sewing yarn supplied by Geofabrics Australasia should be used for this operation. Use of other materials may compromise the longevity of the structure and the speed of the closure operation.

The hand held sewing machines require special attention and details regarding their operation are provided below.

Sewing machine operation:

1. The sewing machine must be threaded correctly in accordance with factory diagrams. Minor errors in threading are sufficient to create a faulty seam.
2. Ensure that the yarn/thread is not tangled or caught around any components as it dispenses from the spool. This may occur between STOP/START of sewing, laying down of the machine, on windy days or after unpacking.
3. Ensure the machine is clean and free of sand or dirt. Compressed air is an effective means of cleaning around needle/looper end feeds.
Note:
 1. Compressed air is dangerous when not used safely,
 2. Check for yarn/thread tangles after blowing clean.
4. The sewing machine relies on 240v AC current. When operating in the field, ensure that a suitable earth leakage protection device is utilised.
5. Never continue sewing if the machine has snagged and is not progressing forward. Follow this procedure:
 - Unplug power supply,
 - Turn drive assembly over to relieve foot pressure on the fabric,
 - Cut tangled thread to clear machine.
6. Always ensure fabric is clear of debris such as shells, sand or small stones.

The sewn closure consists of two full sewn runs and locked off corners, as described below.

Sewing:

1. First seam - Straight line

Start sewing at the factory seamed edge and sew across the top of the sand container towards the folded edge. Ensure there are no folds in the fabric as this will jam the sewing machine or cause the machine to go out of alignment.

2. Second seam - "Sine Wave"

Start sewing at the factory seamed edge (refer to Figure 3) and sew across the top of the sand container towards the folded edge, crossing first seam at least 5 times (refer to Figure 4 and Figure 5).

3. Locked corners - Diagonal locks to sewn seams

Sew downwards from the top of the sand container, lock off corners twice;

- Note:**
- Always apply light forward pressure to the sewing machine to assist travel over the geotextile. If the sewing machine is allowed to pull itself over the geotextile it may become jammed,
 - Slow the machine when sewing off the edge of the geotextile. Sewing off at high speed may cause the machine to go out of alignment,
 - The machine can be stopped or started at any time during sewing. It is better to stop sewing to clear a fold or potential jam than trying to continue sewing despite obstacles.



Figure 3.



Figure 4.



Figure 5.

11.0 HANDLING AND PLACEMENT

The 0.75m³ sand containers must be handled using purpose made J-Bins supplied by Geofabrics Australasia. The J-Bins limit the stress on the geotextile during handling and allow accurate placement. A simple quick-hitch attachment on the sand container allows 13 to 35 tonne excavators to rapidly deploy sand containers. Modified rock grabs are not suitable for use as they place the container under high levels of stress, which can stretch the fabric out of shape, or even cause a failure of the seam.

The sand containers should be stored on a soft, sand surface and not stacked. This is to ensure the J-Bin can easily dig under the container and lift it as shown. Failure to do this may lead to lost production or damage to the sand containers.

The placement of the sand container should be completed in such a way that the site closed seam is buried/hidden from exposure.

1. Connect the excavator to the J-Bin quick hitch.
2. Push the container over onto its side, ensuring the longitudinal factory seam is parallel to the ground.
3. Pick up the sand container with the J-Bin (refer to Figure 6).
 - a. Push the nose of the J-Bin down into the sand until the upper bar touches the top of the container.
 - b. Rotate the J-Bin upwards to lift the container.
4. Shake the J-Bin from side to side to remove sand trapped below the container (refer to Figure 7).
5. Walk the excavator into position and place the sand container (refer to Figure 8). A slight backwards and forwards shaking movement of the J-Bin may be required to assist in allowing the sand container to slide forward out of the J-Bin. Ensure site seam is placed so that it is not exposed.
6. Press down on the top of the container using the back of the J-Bin to achieve desired height.



Figure 6.



Figure 7.



Figure 8.

12.0 MAINTENANCE

It is the responsibility of the owner to adequately maintain the structure once complete. This will require regular inspections to identify and repair any damage that may have occurred to the structure. It is important to note that where sand containers are located in submerged or intertidal zones the sand retained within the container can be removed rapidly due to wave and current movements and it is imperative that repairs be carried out as soon as any damage is identified.

If the ELCOROCK[®] sand container is allowed to lose fill material to a point where the geotextile can flap, the geotextile will tear along the fatigue lines created by the flapping action and catastrophic failure of the container is likely to occur.

The following general guidelines are recommended: walk over the structure once a month; identify sand containers with damage or showing signs of deterioration: ensure all sand containers are inspected; patch or repair damaged containers immediately as per details provided in section 13.

13.0 REPAIRS

While the geotextile used to manufacture ELCOROCK® sand containers is extremely tough and durable, the material can be damaged by boat impact, vandalism or other factors. An effective method has been developed to patch the sand containers both above and below the waterline.

1. Patch preparation

- a. The patch should extend at least 300mm beyond the edge of the hole,
- b. Ensure all corners of patch are rounded 100mm radius minimum,
- c. 5mm holes should be burnt (using a hot soldering iron) at 100mm centres along the edge of the patch and 50mm in from the edge.

2. Surface preparation

- a. Scrub the area with a coarse brush to remove all algae growth,
- b. Shake the geotextile to dislodge the sand trapped in the outer layer of the geotextile, it will not be possible to remove all sand but the more porous the surface the better the bond between the patch and the sand container.

3. Patch placement

- a. Place the patch over the hole and punch a hole in the sand container using a sharpened screw driver,
- b. Screw first screw into place, continue process around the patch,
- c. Ensure a thick layer of Silastic 732 adhesive/sealant is applied to the surface of the sand container to ensure a good bond between patch and container,
- d. After all screws are in place, press down firmly on patch to ensure the adhesive is forced into the geotextile and squeezes evenly out along the edge of the patch,
- e. Where adhesive does not extrude out from under the edge of the patch extra adhesive must be applied to the area by pushing the nozzle under the patch.

Contact Geofabrics Australasia for advice on any unusual repairs or maintenance requirements.

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