

A STABILISING & DEFENSIVE BARRIER AGAINST COASTAL EROSION

ELCOROCK® GEOTEXTILE SAND CONTAINER

INSTALLATION GUIDE

The Elcorock shoreline protection system consists of sand filled geotextile containers built to form a stabilising, defensive barrier against coastal erosion. The Elcorock Geotextile Sand Containers are made from Texcel, a unique staple fibre blend of polyester and polypropylene, providing flexibility and allowing the product to resist the natural forces of the marine environment. Each sand container is filled with sand or gravel mix to build breakwaters, sea walls, revetments, groynes and artificial reefs.

Elcorock system details

The Elcorock Geotextile Sand Containers covers a range of sizes and systems from hand filled 40kg containers to hydraulically filled mega containers and tubes. Specialist filling and placement equipment is available for most container sizes to provide a consistent, stable and aesthetically pleasing finish.

40kg to 100kg 0.3m³ containers

Containers should be placed on a firm level surface. Open the top of the container as wide as possible. Slowly tip sand into the container ensuring the bottom corners are full of sand and not folded or creased. Fill the container to approximately 100mm from the top ensuring both sides of the top of the container can be pushed together. The container should stand on its own at this point. To close 40kg containers simply pull the pillow slip over and press the velcro together.

The 100kg and 0.3m³ containers should be stitched closed using an industrial sewing machine. The sewing machine along with the thread can be supplied by Geofabrics. Using the sewing machine, sew a straight line across the top of the container, ensure there are no folds in the fabric as this will jam the machine. With the next seam, use a sine wave or zig zag pattern crossing the initial seam 3-4 times.

0.75m³ & 1.2m³ containers

These containers are filled using dry sand poured into the hopper system on the Geofabrics filling frame. The hopper funnels the sand into the Elcorock container.

Before placing the container on the hopper, ensure the trunk located inside the container opening is pulled out.

The geotextile loops on the exterior of the container attach to hooks on each side of the fill frame to suspend the container at the correct height for filling. Slide the trunk over the base of the hopper. Slowly pour sand into the hopper. Ensure the bottom corners are full of sand and not creased or folded.

Once the container is full and bulging on both sides, it's imperative that the top corners of the container are filled with sand. This may mean over filling the container and then moving sand into the top corners by hand. Ensuring the opening can be closed tight, lace close the opening using the supplied cord, ensuring a double reef knot is used to tie off the cord.

These containers sizes are also available as an open top, sewn closure version.

2.5m³ containers

To ensure safe and effective filling of these large containers, Geofabrics provided filling equipment which consists of a hopper arrangement

complete with two J bins for filling and placement.

- 35 tonne or similar excavator for placement of sand containers
- 13 tonne or similar excavator for filling sand containers
- 2" high volume water/pump supply

Once the filling and placement apparatus is assembled, a sand container is placed into a J bin with the two trunks pulled out, the sand container can then be placed into position. The trunks are braced onto the funnels on the filling frame. Water is fed into the funnels through the apparatus manifold. Sand and water are used to fill the container with the water passing through the geotextile. Once filled, the two trunks are rolled into the container and the container openings are then laced close.

The sand container is now ready to be lifted into place with use of the J bin. The back of the J bin can be used to manoeuvre and tap the container into position.

Additional filling advice and documentation is available from Geofabrics.

5.0m³ containers

The 5.0m³ containers have a filled mass of approximately 10 metric tonnes. They are filled using pumped sand slurry from a dredge or slurry pump. When filled correctly these units can be handled by two wide lifting slings and an appropriately rated excavator or crane.

Where conditions permit they can be filled in-situ. The filling trunks are sealed inside the container, and then covered with a screwed and glued cover. Depending on the fill shape some tamping of the unit may be required to the top surface in order to reduce any fill humps.

Mega containers

Experience and good organisation is critical when installing mega containers. Weather, tides, location, equipment and site access should be considered to ensure project runs smoothly.

Deployment, alignment & installation of anchor points for mega containers should be planned well in advance. There are several options for anchor points dependent on the application ranging from posts to concrete blocks.

Elcorock mega containers are delivered rolled up on a pipe core and should be handled using a carpet prong or lifting slings. Plant equipment used to maneuver the container should be rated for the weight of the container, which could exceed 450kg.

When the container is in position and secured, a dredge line must be securely fastened to the ports. Filling of the container with a typical slurry mix of at 15% solids can now commence. Filling of a standard 20m container should take between 40 minutes and

2 hours depending on the dredge size and fill material quality. Measure level of fill material within the mega container by pushing firmly against the side or top of the container. The mega container is full when solid and unyielding under foot.

The final step in the process is to seal the mega container to prevent material escaping. This is done by firstly rolling up the trunk and inserting into the container, then using a factory supplied cover which is glued and screwed into place.

Sewn closure

The 0.75m³ and 1.2m³ Elcorock containers are also available with a sewn closure. Some clients prefer this option. The objective with any sewn closure is to replicate the seam efficiency and reliability of the factory seams. This is best achieved utilised the Union Special 2200GAU and 100% polyester M11 sewing thread supplied by Geofabrics. The closure consist of two passes, one straight, one intersecting sine wave, and final corner lock of stitches to ensure absolute security.

Geofabrics can provide on site training for the installation crews to ensure competencies are in place to deliver reliable and efficient sewing practices.

Typical installation methodology

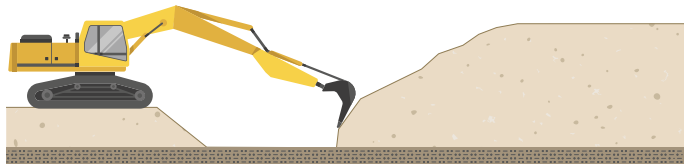
Step 1:

Filling apparatus incorporating a hopper system and J-bins used to fill Elcorock containers on site. Water filling jets allow for hydraulic compaction of the fill material.



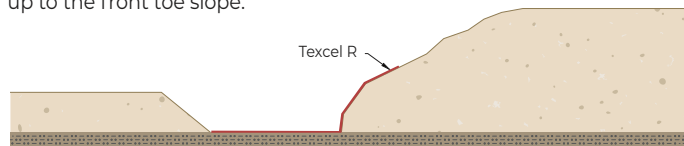
Step 2:

Excavate down to firm base over a distance of 30m to accommodate the first row of 10 - 12 Elcorock containers and shape slopes. Remove any rocks or tree stump protrusions and fill with sand.



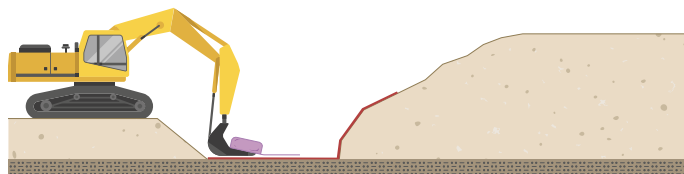
Step 3:

Cut and lay Texcel® R in a 6m wide strip over the length of the excavated section down the slope and through the base of the trench up to the front toe slope.



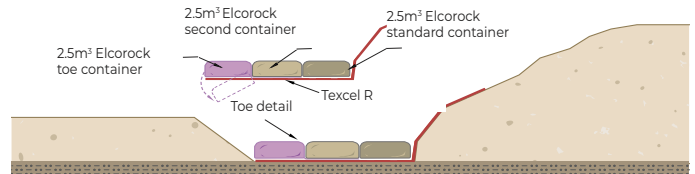
Step 4:

Place Elcorock toe container starting along the line forming the front of the revetment with the longer length parallel to shoreline.



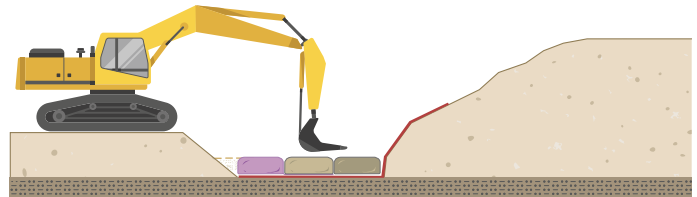
Step 5:

Place inner Elcorock second container followed by the Elcorock standard container up against the cut profile at the rear with the longer length parallel to shoreline.



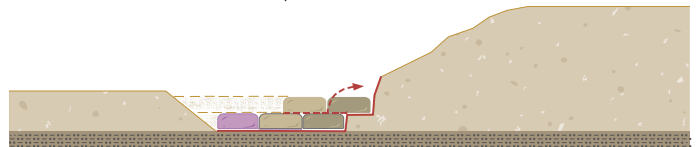
Step 6:

Fill and level off layer with the specified backfill once the length of the revetment is a minimum of three containers. Press down using the back of the J-bin/bucket to level the Elcorock containers to an even height over the surface area.



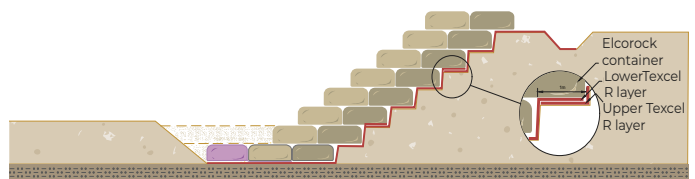
Step 7:

Fold Texcel R back over the Elcorock containers and then bench out the rear profile for the next Elcorock containers. Fold Texcel R back up the slope and lay Elcorock containers at the specified setback in a stretcher bond layout, backfill the front of the revetment with sand up to level with the containers and compact. Bucket press Elcorock containers to achieve a level profile.



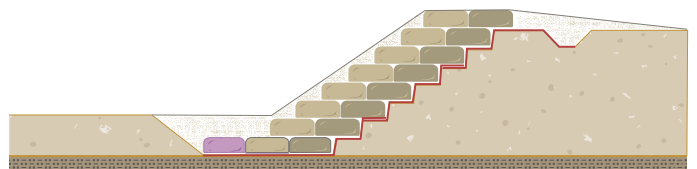
Step 8:

Continue placement of Elcorock containers into benched profile. Excavate trench and lay Texcel R geotextile into the trench with 1m overlaps down the slope. The geotextile overlap should incorporate the upper layer placed below the lower layer.



Step 9:

Level off the face of the revetment with sand backfill. Complete filling along the crest tapering off behind the revetment.



Visit geofabrics.co or call 1300 60 60 20 (AU)
or geofabrics.co.nz or call 0800 60 60 20 (NZ)

GEOFABRICS®
Sustainable solutions