



TECHNICAL APPLICATION BROCHURE

Kontainer™ Geobags for CONTAINMENT, CAPPING & CLOSURE

Turning difficult sediments and tailings into engineered landforms.



RETAIN THE MATERIAL. BUILD THE GEOMETRY. DESIGN THE CAP.

An outcome-led closure concept for contaminated sediments, dredged material and very soft tailings - where the geobag becomes part of the final works, not temporary process equipment.

01 Permanent containment core

02 Soft-ground capping support

03 Progressive landform creation

CLOSURE STARTS WITH THE FINAL FORM

Design the placement - not only the dewatering

For contaminated sediments and tailings, dewatering is a means. The real project value is a defined footprint, a stable geometry, controlled water, fewer handling steps and a landform that can be closed progressively.

KEEP material within a controlled footprint	FORM repeatable geometry for the final profile	BUILD access and staged closure over soft ground	CLOSE cap, drain, protect and revegetate
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One product. Two distinct closure pathways.

PATHWAY A Relocate, contain and form Dredge or pump sediment into geobags inside a lined and drained cell. Consolidate, stack and shape the units as the permanent landform core, then construct the project-specific barrier and cover.	PATHWAY B Cap the material where it lies Deploy high-strength woven over the soft surface. Use sand-filled geobag ribs, starter berms or controlled load strips beneath staged fill to establish access and support the closure platform.
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Outcomes the system can be designed to deliver

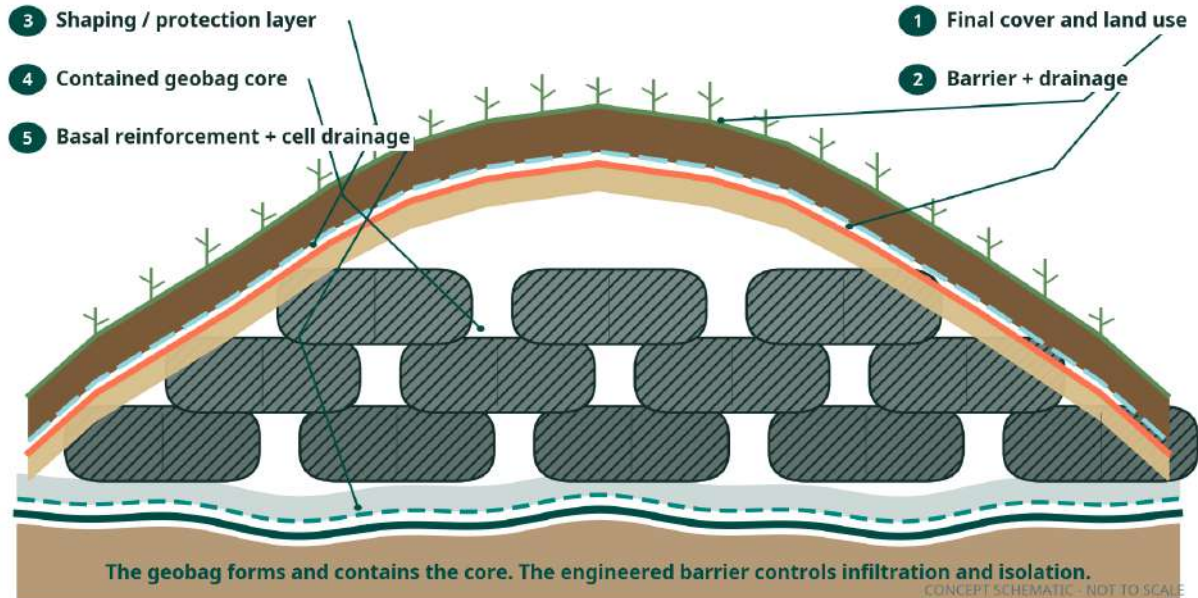
On-site retention Avoid a second excavation and hauling campaign where on-site placement is permitted.	Water control Collect filtrate and consolidation water within a planned drainage and treatment train.
Progressive closure Construct the final footprint in stages rather than leaving closure to the end of operations.	Useful final form Create a mound, berm, containment cell, working platform or graded cover profile.

The bag is not the environmental barrier.
 It contains the solids and creates geometry. Basal reinforcement, drainage, liner/cap and cover layers perform the other closure duties.

Technical basis: geotextile containment principles [5], stacked closure precedents [1-3] and soft-ground platform research [4].

Each layer has one job

Treat the geobag as one engineered component within the closure section. Performance comes from the interfaces between containment, foundation support, water management, barrier and cover - not from a bag in isolation.



Generic permanent landform concept. Layers and geometry are project-specific.

01 Final cover + land use

Surface drainage, erosion resistance, protection, revegetation and agreed post-closure use.

02 Barrier + drainage

Limits infiltration or migration and manages water without excessive pore pressure.

03 Shaping / protection

Smooths the irregular core, protects barrier layers and establishes final grades.

04 Contained geobag core

Retains solids, shortens drainage paths and creates modular, stackable geometry.

05 Foundation + basal system

Provides separation, drainage, bridging, tensile support and a stable construction sequence.

QA Interfaces govern

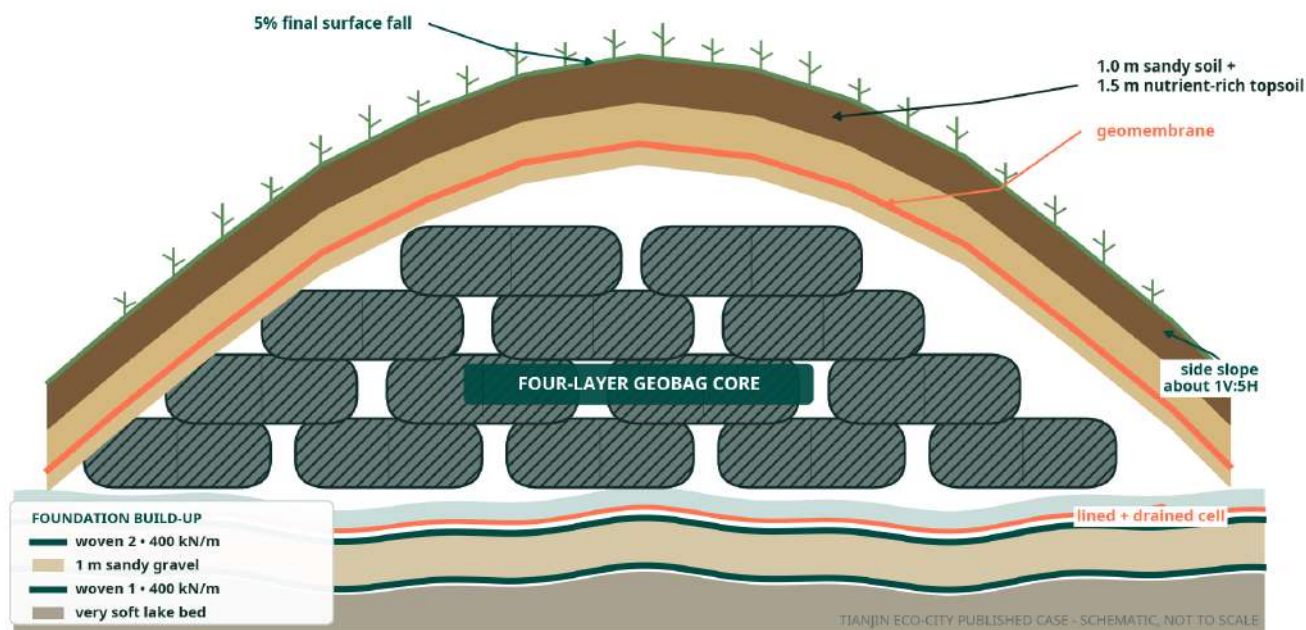
Check sliding, seams, ports, drainage, settlement, global stability and CQA at every layer.

Concept synthesis from Lawson [5], Zhu et al. [3] and Kontainer™ Geobags technical data. No layer shown is a universal specification.

From wastewater lake sludge to a landscaped mound

At Tianjin Eco-City, selected contaminated lake sediment was retained in a purpose-built, lined and drained facility. The stacked geobag mass became the permanent core of a capped lakeside landform.

2.4M m³ sediment selected for geobag treatment	≈390,000 m³ trial-based final volume estimate	≈120,000 m² facility footprint	4 layers stacked in the completed mound
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Published Tianjin Eco-City case reconstructed as an original schematic from the archived paper.

FINAL LANDFORM Capped, graded and planted

The reported closure used a geomembrane over the prepared mound, then 1.0 m sandy soil and 1.5 m nutrient-rich topsoil. The finished surface was graded at 5% and landscaped.

SETTLEMENT ALLOWANCE The core kept consolidating

The lower two layers reportedly compressed by about 1.6 m after the third layer was placed. A fourth layer was added to recover target elevation - proof that closure height must include both tube compression and foundation settlement.

What this precedent demonstrates

Site for final placement

Plan the operating cell around the ultimate landform footprint.

Allow for compression

Set layer count and target elevation using core and foundation settlement.

Cap as a separate system

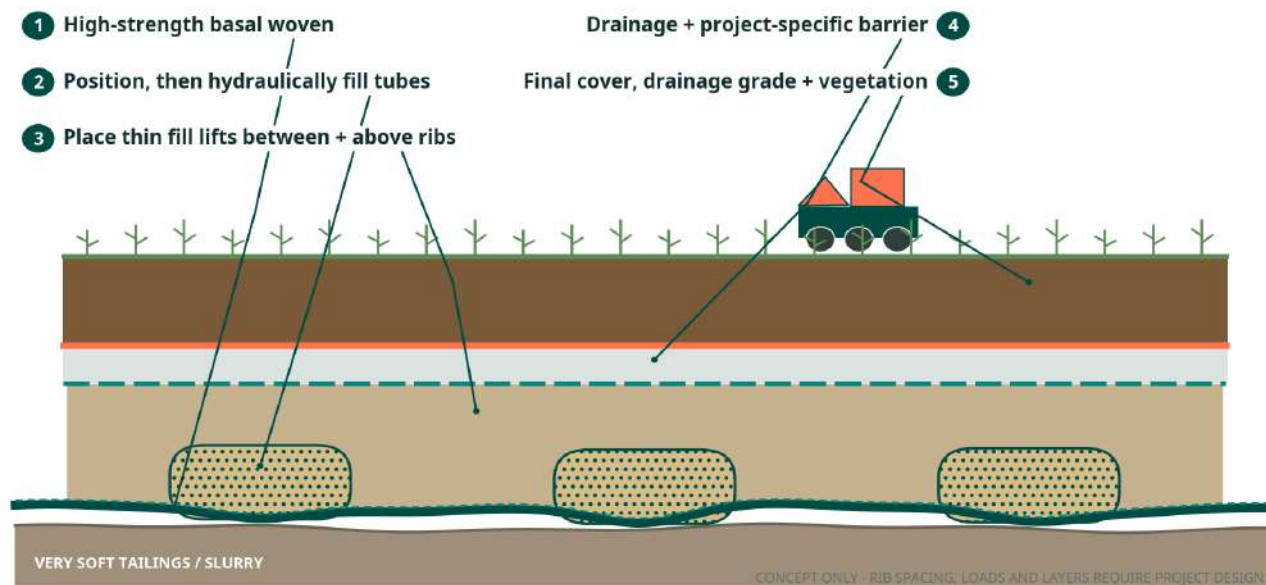
Give barrier, drainage, protection and cover layers their own design duties.

Case-specific values only. Sources: Yee et al. (2011) [1] and Yee (2013) [2]. The ≈390,000 m³ figure was a trial-based design estimate, not a generic reduction factor.

CAPPING VERY SOFT TAILINGS

Build the first safe lift over ground that cannot carry plant

Where the residual stays in place, sand-filled geotextile tubes can form controlled ribs above a high-strength basal woven. The aim is to mobilise a reinforced, staged platform - not to pretend the soft foundation has disappeared.



Concept pathway for a reinforced working/capping platform over very soft tailings.

RESEARCH PRECEDENT Modified Broms field trial

A 3,600 m² trial over up to 12.5 m of very soft marine-clay slurry used a high-stiffness woven sheet and hydraulically filled sand tubes. The measured sheet deformation was about 0.5 m; predicted maximum tensile strain was about 2.2%. Dimensions and materials were project-specific.

CLOSURE PRECEDENT Basal reinforcement at Sotiel Coronada

A 35 ha pyrite-tailings closure used a 1 m stone working platform over a 400 kN/m PET geocomposite above about 18 m of soft tailings. It was not a geobag project; it demonstrates the separate role of basal reinforcement in closure.

How the modified Broms field sequence mobilised the sheet

01

Spread + tension

seam and mechanically draw out the basal woven before tube placement

02

Position + fill

lay empty tubes across the sheet, then pump fluidised sand

03

Build in stages

tube load deforms the sheet; thin fill lifts complete the platform

Do not copy a tube spacing or reinforcement strength from a precedent.

Contact width, spacing, long-term tensile stiffness, interface shear, drainage, plant loading, construction rate and ground response must be analysed together.

Sources: Chen et al. (2021) [4]; mining-closure precedent reviewed in the archived closure collateral; stability framework from Zhu et al. (2010) [3].

The closure logic starts before the cap goes on

These projects were undertaken for different immediate duties, but each demonstrates an outcome relevant to containment and closure: controlled placement, reduced wet handling, use of a constrained footprint or deliberate reshaping of a tailings facility.



CONTAMINATED SEDIMENT

Port-side lined cell

Two stages of about 6,000 m³ and 4,000 m³ were managed on a tight wharf footprint. The outcome was stackable sediment retained inside a controlled, bundled cell.



MINE TAILINGS

Placed over soft TSF surface

Twenty-eight nominal 1,000 m³ units were laid directly over soft tailings. Some settlement occurred, but the units dewatered strongly and supported the discharge objective.



BAUXITE RESIDUE TRIAL

A dry, cracked retained solid

Direct-spigot red mud dewatered without polymer in the trial and cracked over roughly two weeks - supporting further study of bund and retained-fill concepts, subject to geochemistry.

Where an outcome-led geobag concept may fit

Permanent mound core

Contained sediment stacked, shaped and incorporated into the final cover profile.

Closure starter platform

Sand-filled ribs or berms over high-strength woven beneath staged cap construction.

Containment berms

Geobag elements that define cells, lagoons, flumes or perimeter geometry.

Progressive reclamation

Add controlled lifts during operations so closure work and final grades advance together.

Acid sulfate / reactive solids

Only where conditioning, oxidation risk, leachability and filtrate treatment are validated.

Dredged contaminated sediment

Confined placement within a lined, drained and auditable management system.



TAILINGS FLOW CONTROL

Reshape how the TSF fills

At an NSW coal TSF, geobags of varying diameter were arranged as berms and flumes over an HDPE protection mat. The outcome was deliberate redirection of tailings flow and usable storage opened in targeted areas - not dewatering for its own sake.

Australian examples are project experience summarised in Kontain's current case-history collateral [7]. They are not presented as universal performance guarantees.

Prove the closure system before you price the bags

A strong concept moves quickly from characterisation to a field-relevant trial, then through geometry, stability, water and closure checks. Product selection comes after the duty is understood.

01 Characterise material, ground and closure duty	02 Trial filtration, conditioning and filtrate	03 Concept footprint, stacking and section	04 Design stability, drainage, barrier and staging	05 Verify CQA, monitoring and closure record
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DESIGN CHECK	WHAT MUST BE PROVEN
01 Material + chemistry	Solids content, particle size, mineralogy, contaminant classification, leachability, acidity/alkalinity, oxidation and gas potential.
02 Filtration + conditioning	Representative trial, solids retention, filtrate quality, conditioning window, geotextile compatibility and water-treatment destination.
03 Bag + stack geometry	Fill height, fabric and seam capacity, ports, anti-roll details, layer offsets, shaping allowance and construction tolerances.
04 Foundation + stability	Bearing, basal reinforcement, settlement, rate of loading, weak interfaces, sliding, overturning and global stability.
05 Water + barrier	Lined cell, drainage capacity, pore-pressure relief, cap infiltration target, erosion/scour, seepage collection and discharge criteria.
06 Closure performance	Final elevation and fall, differential settlement, cover thickness, revegetation, monitoring, regulator acceptance, CQA and as-built record.

Work over soft tailings is life-safety work before it is geosynthetics work.

Access protocol, exclusion zones, plant selection, load limits, staged placement, instrumentation and rescue planning sit above the product specification.

Useful starting inputs: ground profile and undrained strength • slurry volume and solids • chemistry and contaminants • available footprint • target final use • closure criteria and programme.

Design framework synthesised from [2-5] and Kontain's current technical data. Permanent containment requires project-specific geotechnical and environmental engineering.

Make the retained material do useful work

Kontain brings Kontainer™ Geobags, reinforcement, drainage and containment conversations together early - so the final landform drives the concept, trial programme and product selection.

Kontain can support

- Feasibility and pathway selection
- Representative trial programme
- Indicative footprint, stack and section layouts
- Geobag and basal-geosynthetic selection
- Technical submittals and manufacturer coordination
- Construction planning, CQA input and targeted site support

The goal is a buildable closure concept with clear design boundaries - not a bag count detached from the ground and the cap.

Technical basis

- [1] Yee, Ding, Lim & Wang (2011), Geotextile containment and dewatering of contaminated sediments in China, WEDA Technical Conference.
- [2] Yee (2013), Estimating the vertical deformation of a stacked mound of geotextile tubes, Advances in Geotechnical Infrastructure.
- [3] Zhu, Kulasingam, Beech & Brussel (2010), Modeling Stability of Stacked Geotextile Tubes, GeoFlorida 2010, GSP 199.
- [4] Chen, Chu, Guo & Lam (2021), Modified Broms' method for formation of working platform on very soft soil, Geotextiles and Geomembranes 49, 57-71.
- [5] Lawson (2008), Geotextile containment for hydraulic and environmental engineering, Geosynthetics International 15(6), 384-427.
- [6] Da Silva, Stacked deposits of thickened and filtered fluid fine tailings using geotextile tubes - archived technical paper.
- [7] Kontain, Geotextile Dewatering Tube Projects - Australia, Rev D (2026), and Geobag Series technical data.

Bring the ground profile, the material and the closure duty.

We will help determine whether the project is a containment-landform problem, a soft-ground capping problem, or a different problem entirely.

Send four things first

GROUND

profile, strength and access constraints

MATERIAL

volume, solids and chemistry

FOOTPRINT

available area and staging limits

END STATE

closure criteria and final land use



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Adelaide-based | Australia-wide project supply and support

This brochure presents conceptual applications and published precedents. Project-specific investigation, testing, design, regulatory approval, construction methodology, safety controls, CQA and closure verification remain required. Published case values are not product guarantees.