



Royal HaskoningDHV
Enhancing Society Together

Constructing a Coastal Protection Structure with Geofabric MEGAcontainers

Lessons Learnt

October 2019
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Matt Smith (Soil Conservation Services)



Stockton Landfill

- Oceanic storm event in January 2018 eroded Stockton Beach frontage
- Legacy landfill exposed by the storm erosion.
- The majority (120m) on Hunter Water land
- Public safety concerns
- Significant media attention



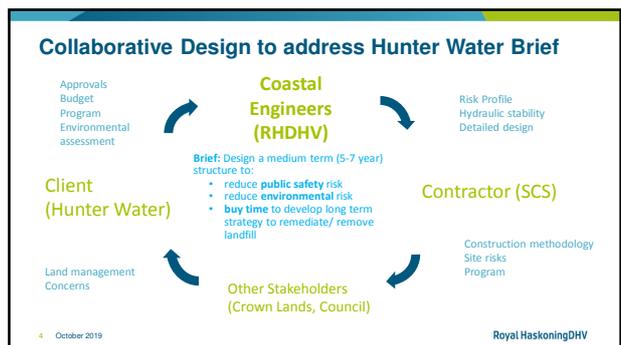
HERALD
NEWCASTLE
JANUARY 22 2018 - 03:00AM
Garbage tip washing into the sea at Stockton due to erosion, north of Corroba Oval near Hunter Water land
Carrin Palmer and Emma Page

Royal HaskoningDHV

Emergency Response - Addressing Public Health & Safety Concerns



DANGER
ASBESTOS

Innovative MEGAcontainer Design Solution

To work within site constraints an innovative solution was required.

Single layer realigned 2.5m³ geocontainers:

- Reduce number of bags
- Reduce program and cost

MEGAcontainer base:

- Rapid deployment (filled in a day)
- Can be filled in the wet
- Better stability incomplete
- Self supporting for future landfill rehabilitation

5 October 2019

Construction begins Jan 2019
Excavation challenges - spearpoint dewatering and temporary sheetpiles required.

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MEGAcontainer filling

- Excavation of MEGAcontainer footprint
- MEGAcontainer positioned for optimum overlap and secured in place
- Imported sand mixed into a slurry in a slurry pond
- Slurry pumped into one porthole through 200mm pipe
- Tweaking rate to maintain stability and optimise filling

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MEGAcontainers - Specialists through Experience

- SCS refined the filling operation over time, fine tuning pumping operations to optimise shape and completion time.
- Sequence of filling to avoid rotation due to water flow scour differential

Practical Onsite Design Iterations

- Connecting designs to the ground – practical changes maintaining design intent
- Collaboration and communication



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Every infill is unique...



SCS are experienced in customising infills to suit each unique situation

10 October 2019

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On a roll now...



11 October 2019

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Megacontainers complete...



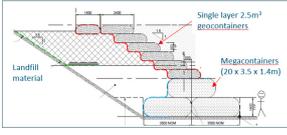
12 October 2019

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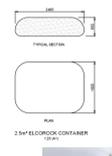
Preparation for 2.5m³ bags...

- Infills between MC's
- Geofabric
- Backfilling



13 October 2019 Royal HaskoningDHV

2.5m³ geobags...

16 October 2019



15 October 2019

Layer upon layer...



- Curved flanks challenging
- Temporary sheetpiles removed
- Backfilling on seaward side underway

16 October 2019

Extreme Weather tests



Facing 6m waves mid-construction takes careful planning and clear direction

17 October 2019

HERALD
NEWS PAPER OF THE SHIRE OF HUNTER WATER

Huge sand embankment built on Stockton beach to protect Hunter Water's sea wall works

UPDATE JUNE 4: Parts of the sand wall did not survive the wild weather overnight, but the sand bags remain in place.

The temporary sea wall held up against the raging ocean, protecting the old council rubbish tip site.

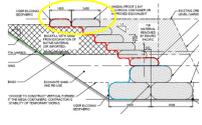


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Articulating Crest



- Self healing crest
- Reduces risk of overtopping failure



18 October 2019

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Contaminated beach to clean stable environment



Before



After



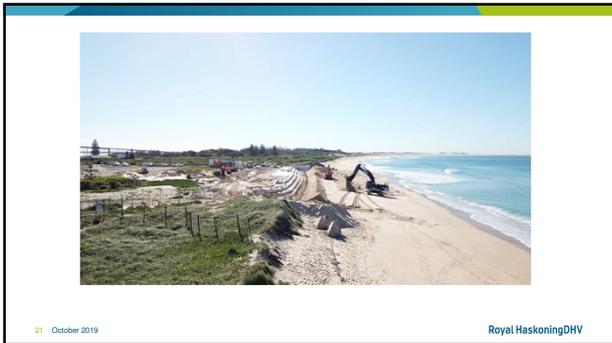

20 October 2019

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20 October 2019

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Lessons Learnt

- **Scale up** the size of geobag containers = scale up the degree of **skill and expertise**
- Best approach is through **collaborative** relationships
- **Flexibility** in design and construction is needed and clear **communication** to ensure design intent is maintained through any design iterations
- **MEGA**containers can be a rapidly deployed, hydraulically stable temporary to medium term **protection option** for our coastline

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Success through Collaboration

Collaborative effort between SCS, Royal Haskoning DHV, Subcontractors & Hunter Water. Collaboration ensured all challenges were overcome and a successful outcome was achieved.

Specialist partnership in design and construction of MEGAcontainer and geobag structures