INNOVATIVE SEAWALL DESIGN DEVELOPMENT IN NSW, AUSTRALIA: 4 RECENT CASE STUDIES

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Coastal development is coming under increasing pressure from climate change. Management of erosion hazards essentially involves retreat or protection. Where hard coastal protection structures are selected, the aesthetics and amenity benefit, in addition to the protection functionality, are subjected to ever-increasing scrutiny. With legislative changes in NSW essentially limiting temporary coastal protection to sand-filled geocontainer structures and decision-makers becoming more stringent about hard structures, the demand for temporary structures is also on the rise.

This presentation will cover four recent, completed case studies in NSW including two temporary medium-term structures at Stockton (Newcastle) using geocontainer and Rock Bags and two longer term hard structures at Kingscliff (Tweed Shire) and Avoca (Central Coast). Innovative solutions have been developed for the varying design scenarios.

MEGACONTAINER SEAWALL STOCKTON

A landfill located predominantly in Hunter Water land and dating back to the 1960's was exposed at Stockton beach, following a storm event in January 2018.

Hunter Water was granted approval to construct a temporary structure to prevent wash out of the landfill material, while a long-term strategy for coastal erosion at Stockton is developed by the NSW Government and Newcastle City Council. A collaboration between Hunter Water, RHDHV and NSW Soil Conservation Services



(SCS) developed the design of a medium-term structure using MEGAcontainers (20 x4 x2m sand-filled geocontainers) in combination with smaller $2.5m^3$ geocontainers.

The challenges of working with MEGAcontainers on an exposed beach were plentiful and many design and construction lessons were learnt.

ROCK BAG SEAWALL STOCKTON

Stockton beach has experienced long-term recession of 1m/year on average since the 1950s. This recession is now threatening roadway infrastructure and housing., City of Newcastle required a coastal protection structure with a design life of 5 years to be constructed along a 220m frontage directly adjacent to an existing rock revetment prior to the completion of the latest Stockton Coastal Management Plan and the adoption of longterm coastal management actions. The narrow, highly exposed beach created a challenging and high-risk construction environment. 4-tonne Kyowa Rock Bags were selected for their ease of implementation, reusability, hydraulic stability (superior to equivalent mass geocontainers) and wave energy dissipation characteristics. The structure has proven to be robust, flexible, enhances sand capture and is popular with beach users.



KINGSCLIFF COASTAL PROTECTION

Kingscliff Beach in far northern NSW fronts a large public precinct including a surf club, tourist park and bowling club. Hard protection works were constructed 10-20 years ago at the surf club and bowling club, and Tweed Shire later secured funding for an upgrade of existing temporary protection between these two facilities.



Concept design investigations were undertaken by Water Research Laboratory in collaboration with RHDHV involving selection of design parameters and stepped concrete and sloped rock seawall types extending over 420m. Secant piled walls and architecturally inspired reinforced concrete steps and bleachers merge with a substantial multilayer rock structure including a piled viewing platform and innovative removable beach access structures spaced along the shore.

AVOCA BEACH COASTAL PROTECTION

This project presented the challenge of balancing coastal protection functionality, cost, scale, aesthetics and amenity. The innovative solution involved a combination of rock armour and bleacher-style steps constructed from sawn sandstone blocks to create a natural aesthetic pleasing to the Central Coast Council and the local community.

