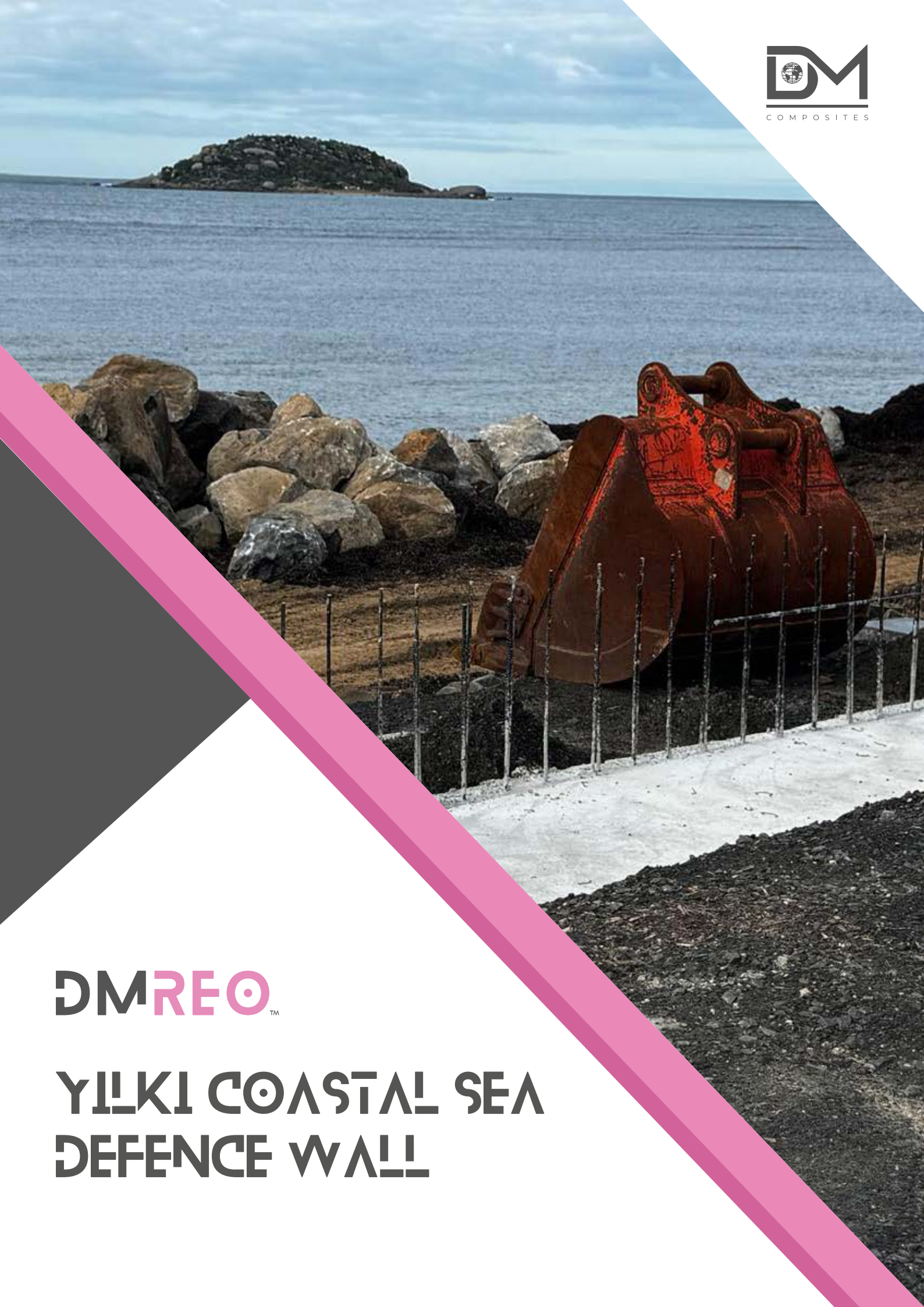


DMREO™

YILKI COASTAL SEA DEFENCE WALL

PROJECT OVERVIEW (BUILDING RESILIENCE AT THE EDGE OF THE SEA)

Along the picturesque coastline of Encounter Bay, the Yilki Coastal Sea Defence Wall project represents a critical investment in protecting one of South Australia's most vulnerable foreshore areas.

Driven by the City of Victor Harbor's Coastal Adaptation Strategy, this major infrastructure upgrade aims to safeguard coastal communities, public assets, and natural environments against the growing threats of sea-level rise, tidal surges, and storm-induced erosion.
The coastline between Fell Street and Charles Street had been experiencing frequent overtopping and erosion, particularly during king tides and severe weather events. Each season brought visible scouring and structural loss along the Encounter Bikeway, compromising public safety and long-term infrastructure stability.

The Stage 1 construction of the Yilki Sea Defence Wall delivers immediate protection for the community — reinforcing 650 metres of shoreline with modern, sustainable materials designed to perform where traditional steel reinforcement fails.

LOCATION:
Victor Harbor (SA)

CONSTRUCTION COMPLETION:
December 2025

DM COMPOSITES' ROLE

DM Composites was selected to supply DMREO™ FRP (Fibre Reinforced Polymer) Rebars, a high-performance reinforcement system developed to meet the stringent requirements of AS 5204:2023 – Fibre-Reinforced Polymer (FRP) Reinforcing Bars.

Our supply scope included:

- **FRP Rebars for reinforced concrete flood walls and wave deflection barriers, designed to endure constant saltwater exposure without corrosion.**
- **Straight and L-shaped rebars in 12 mm and 16 mm diameters, precision-cut and bundled according to contractor schedules.**
- **Technical support for design integration and detailing to replace conventional steel with composite reinforcement.**
- **Coordination of delivery schedules aligned with concrete pours for the rock armour toe wall and vertical wall stem construction.**

DESIGN & TECHNICAL CONTEXT

The Yilki sea wall was designed as a hybrid rock armour and concrete defence system — combining geotechnical stability with a vertical reinforced barrier to deflect wave energy and resist overtopping.

Technical Features:

- Reinforced concrete wall and wave barrier designed to AS 3735 (Concrete Structures Exposed to Marine Conditions).
- FRP reinforcement used in lieu of steel to prevent corrosion and spalling common in coastal structures.
- Rock armour revetment built from locally quarried basalt, interlocked with the wall footing to absorb wave impact.
- Integration of FRP dowels and tie bars to secure pre-cast wave panels and minimise chloride ingress at joints.

Unlike traditional steel reinforcement, DMREO™ FRP Rebars do not rust, expand, or require protective coatings — offering a permanent, maintenance-free alternative ideally suited for marine and intertidal exposure.

Material Design Parameters:

- Guaranteed tensile strength: 1312 MPa (minimum)
- Nominal tensile modulus: 65,600 MPa
- Bar type: V-Rod HM or equivalent, Grade III
- Design life: 100 years, exposure class U (marine/intertidal)
- Reinforcement cover: ≥ 40 mm (minimum) to concrete surface
- Maximum bar spacing: 600 mm (typical)
- Anchorage and lap splice lengths: as per AS 5204 and manufacturer's design guide

Design Objectives:

- Achieve full durability under marine salt exposure with zero corrosion risk.
- Maintain equivalent structural capacity to N12–N16 steel reinforcement with reduced self-weight.
- Provide long-term performance without maintenance, coating, or cathodic protection.

ENVIRONMENTAL & SUSTAINABILITY BENEFITS

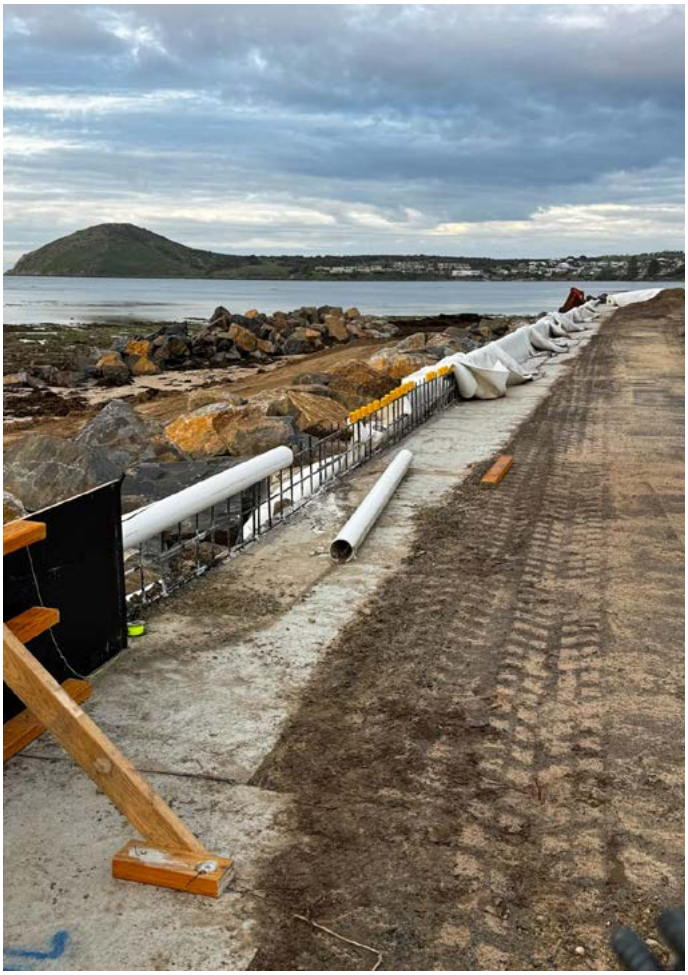
The Yilki Coastal Sea Defence Wall is as much an environmental milestone as it is an engineering one.

The City of Victor Harbor's procurement policy prioritises environmentally preferred materials, aiming to foster a circular economy within South Australia. DM Composites' FRP rebars — produced with recycled content and zero leaching characteristics — align perfectly with this sustainability framework.

KEY ENVIRONMENTAL OUTCOMES:

- Zero corrosion, eliminating future maintenance, repainting, or cathodic protection.
- No metallic leaching, preserving coastal water quality and marine life.
- Reduced CO_2 footprint, due to lighter transport loads and lower embodied energy compared to steel.
- 100-year design life potential, extending the replacement interval for critical assets.

This forward-thinking approach not only enhances structural resilience but also directly supports local and state sustainability targets for climate adaptation.



CONSTRUCTION CHALLENGES & SOLUTIONS

1. Working in a Dynamic Marine Zone

The project site is subjected to daily tidal movement, high winds, and wave action. Delivering materials required precise coordination with tidal windows and concrete placement schedules. DM Composites supplied rebars in bundled, pre-tagged units for rapid placement between tides, enabling efficient installation within limited access hours.

2. Replacing Steel with FRP in Design

Transitioning from conventional reinforcement to FRP required close collaboration between the structural engineer and DM Composites' technical team. Adjustments to development lengths, anchorage zones, and bend radii were made to meet AS 5204 standards while maintaining design integrity.

3. Coastal Logistics & Handling

To avoid contamination or mechanical damage, FRP materials were delivered to site using non-metallic slings and padded racks. Lightweight bundles allowed manual handling in constrained foreshore zones where cranes were impractical.

INNOVATION THROUGH MATERIAL SCIENCE

FRP reinforcement represents the future of coastal and marine infrastructure. Compared to steel, it delivers a superior strength-to-weight ratio, exceptional resistance to chloride penetration, and long-term performance under extreme exposure.

DM Composites' DMREO™ technology utilises a proprietary glass-fibre and vinyl ester resin matrix, fully compliant with Australian marine exposure classes. Every bar supplied to the Yilki project was traceable, batch-certified, and quality-assured under ISO 9001 manufacturing protocols.

COMMUNITY & COASTAL RESILIENCE

Beyond its technical success, the Yilki Sea Defence Wall delivers a profound community benefit — protecting the Encounter Bikeway, the Franklin Parade promenade, and nearby residential zones from future inundation.

The wall now forms part of a larger, regionally significant network of coastal resilience projects that aim to preserve South Australia's coastlines for generations. Residents and visitors alike can now enjoy a safer, more stable foreshore that withstands both daily tides and severe storm events.

DM COMPOSITES

DMREO™

YILKI COASTAL SEA DEFENCE WALL