



DMMARINE™

CYCA
REPLACEMENT DECK

PROJECT OVERVIEW – RENEWING A SYDNEY ICON

Nestled on the edge of Rushcutters Bay, the Cruising Yacht Club of Australia (CYCA) stands as one of the country’s most prestigious sailing institutions and the home of the world-renowned Rolex Sydney Hobart Yacht Race. The marina and deck structures at CYCA are exposed daily to saltwater spray, UV radiation, and high foot traffic — a combination that accelerates corrosion and wear on conventional materials.

To maintain the club’s reputation for excellence and ensure long-term structural resilience, CYCA initiated the Replacement Deck Project, covering a 30-metre by 12-metre waterfront deck at the heart of the marina precinct. The works were designed to modernise the facility with materials capable of resisting the extreme marine environment while preserving the aesthetic of a traditional timber deck.

DM Composites was appointed to redesign and supply a fully FRP substructure system, providing the strength, corrosion resistance, and long-term performance the club demanded for this landmark refurbishment.

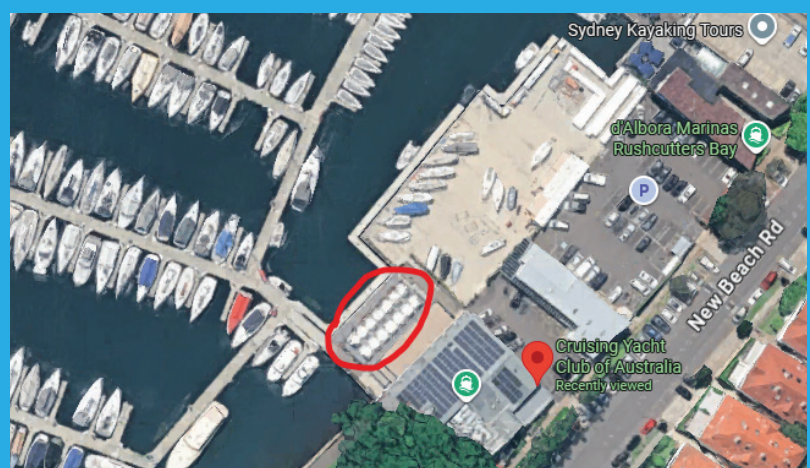


LOCATION:

Edithburgh (SA)

CONSTRUCTION COMPLETION:

December 2025

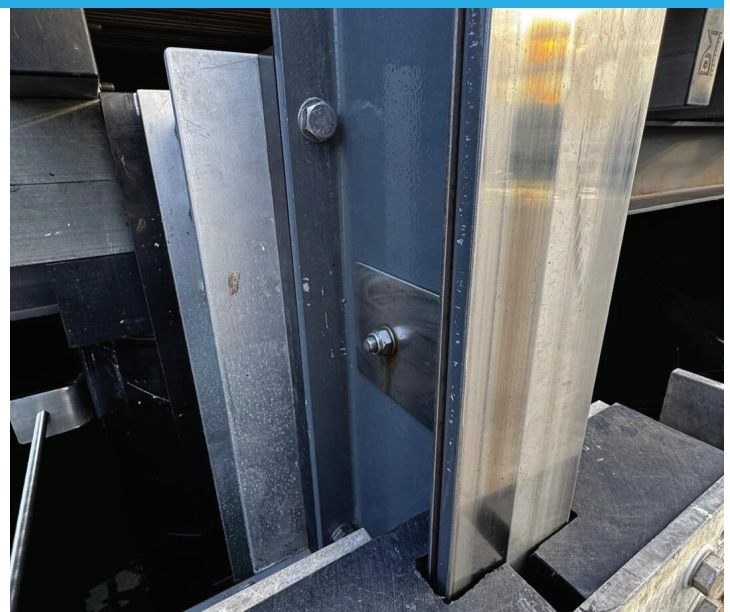


DM COMPOSITES' ROLE

DM Composites was engaged to deliver the design and supply of the entire FRP subframe assembly for the new deck structure. This included:

- **FRP Beams and Bearers:** Using the DMRECT™ rectangular hollow profile (204 × 102 × 9.5 mm) for both primary and secondary members.
- **FRP Joists:** Spanning the deck width with DMRECT™ 204 × 102 × 9.5 mm RHS sections, designed to evenly distribute live loading and accommodate natural timber deck fixings.
- **FRP I-Beam Guide Rail:** DMBEAM™ 203 × 102 × 12.7 mm structural profile (6 m lengths) for the pontoon's vertical guide rail system, complete with 316 stainless-steel wear brackets (3 mm thick).
- **316 Stainless Steel Hardware:** Including brackets, rivets, and anti-crush tubes for inter-member connections, ensuring uniform load transfer and long-term integrity.
- **Design Certification:** Full structural design and engineering documentation, including the gangway-to-deck connection system with a 20 mm diameter stainless-steel pivot pin for articulation under tidal movement.

The FRP frame was designed to support 150 × 50 mm hardwood decking planks, compliant with AS 2082 (Grade 2), maintaining CYCA's traditional visual character while eliminating the corrosion and fatigue issues associated with steel substructures.



TECHNICAL SOLUTION DELIVERED

The CYCA replacement deck required a structural system capable of withstanding marine exposure, dynamic loading from foot traffic, and live loads from service equipment without degradation.

Key Design Features

Corrosion-Resistant Substructure: Entire subframe fabricated from pultruded FRP profiles with a protective resin-rich surface layer for maximum UV and saltwater resistance.

Hybrid Interface System: DM's engineering team developed custom stainless-steel anti-crush tubes and hybrid fasteners to prevent localized compression at connection points between FRP and the marina's existing steel frame.

Timber Compatibility: The FRP joists were engineered with precise spacing and screw retention properties to accommodate hardwood planks fixed with 316 stainless 14-gauge bugle head screws (pre-drilled and countersunk).

Lightweight Installation: Compared to steel, the FRP frame reduced installation weight by over 60%, easing crane demands and enabling modular on-site assembly.

Thermal & Electrical Insulation: FRP's non-conductive properties eliminated grounding issues common to metallic decks near electrical infrastructure.

proprietary, free-flowing, shrinkage-compensated underwater grout, with anti-washout characteristics and a minimum compressive strength requirement. The method included centralising the pile, sealing the annulus, pressure testing grout lines, injecting from the lowest point, and completing the operation continuously to displace water/air.

Structural Performance

Live load capacity: 5 kPa pedestrian loading.

Design Life: 50+ years, Exposure Class U

(marine environment).



DESIGN CRITERIA



The FRP substructure was designed and certified in accordance with the following standards:

- AS 1657 – Fixed Platforms, Walkways, Stairways, and Ladders
- AS/NZS 1170.1 – Structural Design Actions: Permanent, Imposed, and Environmental Loads
- AS 4100 – Steel Structures (for connection design and stainless hardware)
- AS 2082 – Timber – Hardwood – Visually Graded for Structural Purposes
- AS 4997 – Guidelines for the Design of Maritime Structures

These standards ensured the replacement deck achieved full structural equivalence to a traditional steel system while exceeding performance expectations in marine durability and serviceability.

Sustainability & Durability

The new FRP deck structure reflects CYCA's forward-thinking approach to sustainable infrastructure:

- Zero corrosion: FRP profiles will never rust, eliminating ongoing repainting or galvanizing cycles.
- Low embodied energy: Manufacturing FRP requires significantly less energy than steel, lowering lifecycle emissions.
- Recyclable and non-toxic: DMRECT™ profiles are fully inert and recyclable, containing no leaching agents harmful to marine ecosystems.
- Extended service life: A design life exceeding 50 years ensures long-term value and reduced maintenance costs.

CONSTRUCTION CHALLENGES & SOLUTIONS

1. Working in a Live Marina Environment:

CYCA remained operational throughout construction. DM Composites coordinated modular deliveries to fit within tight access windows, allowing the marina to stay active with minimal disruption.

2. Integration with Existing Steel Pontoon Frame:

The original steel piles and pontoon guides required a hybrid connection system. DM Composites developed custom 316 stainless-steel anti-crush sleeves and pivot joints to maintain load continuity between FRP and steel, preventing galvanic corrosion.

3. Preservation of Aesthetics:

To maintain the club's premium appearance, the FRP substructure was finished in graphite grey with a matte coating, allowing the hardwood decking to retain its natural look while concealing the modern composite frame beneath.

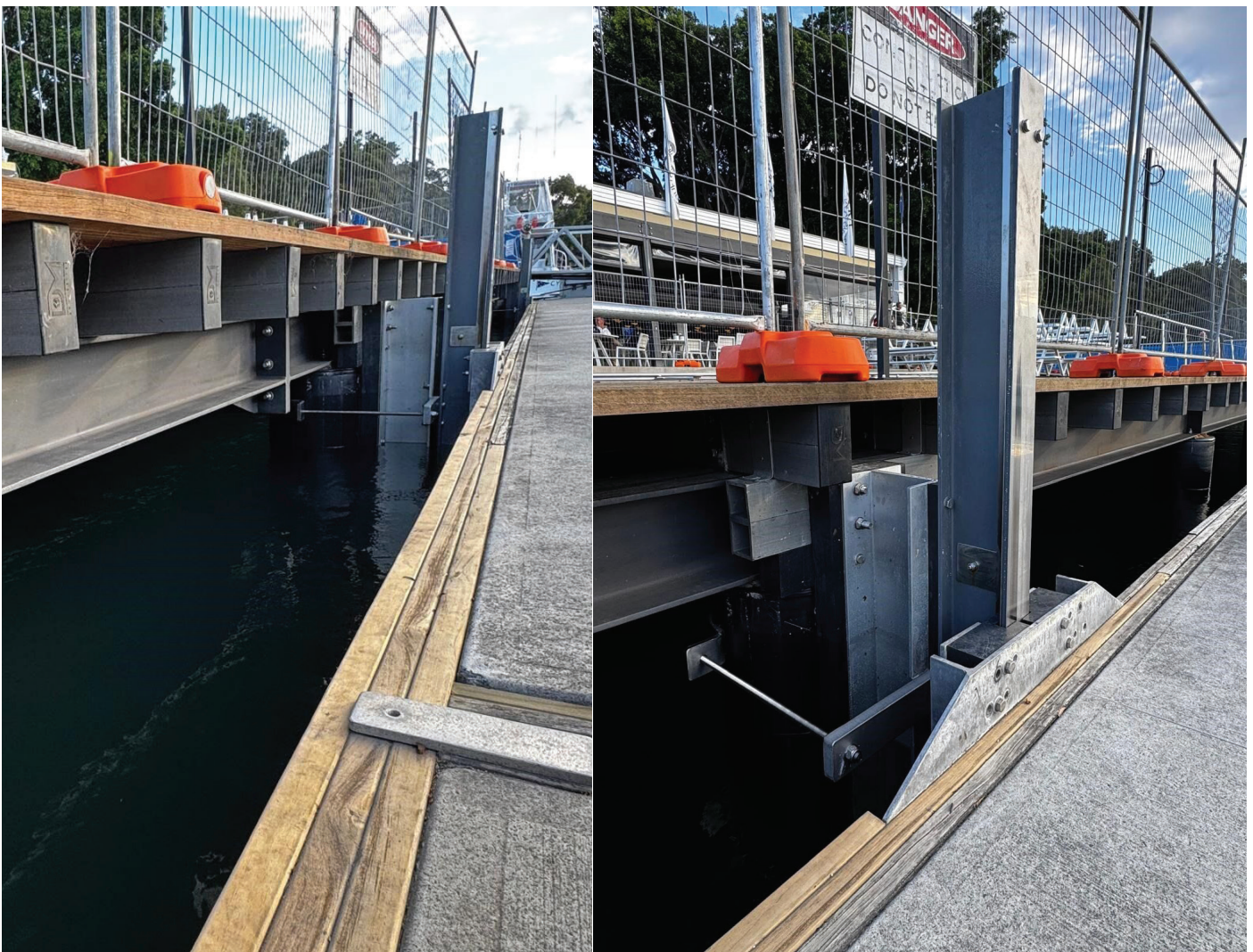


PROJECT OUTCOMES

The CYCA Replacement Deck now serves as a flagship example of how advanced FRP technology can extend the life of marine infrastructure while preserving its aesthetic and heritage.

Key Benefits:

- Corrosion-proof FRP substructure eliminating steel fatigue and rust.
- 50-year design life with minimal maintenance.
- Seamless integration of modern materials with traditional timber decking.
- Lighter structure reducing load on pontoons and sub-piles.
- Environmentally responsible materials supporting CYCA's sustainability initiatives.



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