



Cape Palliser – storm resilience

Overview

This EcoReef® system was the first of its kind, designed and installed as a “Proof of Concept”.

For comparative analysis, traditional riprap was installed at either end of the EcoReef® structure, all subjected to the same coastal forces during storm events.

Since being installed in early 2022, the EcoReef® structure has served as a critical early test of the system’s ability to withstand coastal erosion and dynamic environmental forces without the benefit of ongoing maintenance.

The trial site provided key insights into long-term structural performance and informed the subsequent design enhancements adopted in newer installations.

EcoReef® performance during May 2025 red level storm event

Despite the severity of the storm, the EcoReef® structure performed exceptionally well. Notably:

- **Structural Integrity Maintained:** Despite the impact of large rocks during the event, all EcoReef® modules remained securely in place, with no signs of damage or compromise to their structural soundness.
- **Minimal Fill Loss:** Although the site has never received maintenance, only minimal loss of fill has occurred, even during this recent high-energy event. Though it is important to note that the EcoReef® modules do not rely on fill for their structural performance.
- **Integrity of Road Preserved:** The structure effectively shielded the road, preventing damage and preserving its integrity.
- **Validation of Early Investment:** Not only did the EcoReef® structure perform well, but its resilience during this extreme weather event also reinforced the foresight and commitment shown by South Wairarapa District Council in supporting an untried and innovative system over three years ago.



Project Cape Palliser

Location:
Cape Palliser, South Wairarapa

Storm Size:
120km wind gusts
90km sustained wind
7 meter wave height

Storm Duration:
48 hours

Storm Date:
1st and 2nd of May 2025

Client:
South Wairarapa District Council

Design evolution since installation

Several improvements have been made to the EcoReef® modules since this trial installation:

- **Wall Thickness:** Increased from 96mm to 110mm (+15%)
- **Corner Radius:** Increased from R20 to R60
- **Impact Strength:** These changes have collectively improved the theoretical impact resistance by approximately 50%.

Additionally:

- **Half-Block Modules:** Newer systems include top-mounted half blocks to reduce overtopping splash and subsequent washout – this early structure predates their development.
- **Compaction Protocols:** Compaction is now standard in all new installations to enhance durability; this trial site was not compacted at the time of installation.

Conclusion

This trial provided a direct comparison between the EcoReef® system and traditional riprap, installed at either end of the structure and exposed to identical storm conditions. During a red-alert storm event, the riprap was completely washed away, leaving the adjacent road exposed and unprotected. In contrast, the EcoReef® structure demonstrated superior performance – effectively shielding the roading infrastructure, which remained intact despite sea debris being scattered across its surface.

This outcome highlights EcoReef®’s enhanced ability to dissipate wave energy and resist debris impact, reinforcing its value as a resilient and sustainable alternative to conventional coastal protection. The site continues to serve as a compelling demonstration of the system’s durability under extreme conditions, with insights from this installation directly informing ongoing product development and best-practice methodologies.



EcoReef® structure fully intact

Rip Rap structure washed away