

# Manase Beach Replenishment Savai'i, Samoa



## Client

Samoa Tourism Authority.

## Project overview

In December 2012, Cyclone Evan slammed into Samoa, wreaking immense damage and causing significant economic and infrastructural losses. Tragically, fourteen people lost their lives in the Category 4 storm - including two children and eight fishermen.

The Samoan Government estimated total disaster losses at \$USD203.9 million, with tourism losses estimated \$USD124.77 million. Job losses directly attributable to Evan were estimated at 9,600 - most from the tourism sector.

The Samoan Tourism Agency - established to assist the Samoan tourism sector to rehabilitate and re-build - administers the Tourism Cyclone Recovery Programme (TCRP), which is funded by the New Zealand Aid Development Programme. Manase Beach, on the island of Savai'i, was identified by the TCRP, the Disaster Management Office (DMO) and the Planning and Urban Management Agency (PUMA) for the first comprehensive study of coastal protection options and design.

Tonkin + Taylor International (T+TI) was commissioned by the Samoa Tourism Authority to assess options for shoreline protection for Manase Beach, to carry out preliminary design and develop an implementation plan for the best and most practical solution.

The stunning white sand beach and pristine lagoon make Manase - also home to a number of private fales and meeting houses - a popular tourist destination. Cyclone Evan caused severe erosion to the beach, slashing visitor numbers and devastating the local economy.

T+T found that coastal erosion had been an ongoing issue at Manase. Analysis of historic aerial photos showed shoreline retreat since 1955 of up to 40m at the western end of the beach and 30m at the eastern end. The shoreline in the middle of the beach had accreted by 20m over the period.

A range of options to address the issues of coastal erosion were compared - including their technical feasibility, time of effectiveness, economics and social and environmental effects. Preferred short, medium and long-term options were selected to address erosion problems and increase resilience to natural hazard and climate change.

To address coastal erosion in the short-term, beach replenishment along 170 m of eastern Manase Beach using 2000 cubic metres of externally-sourced sand was proposed, along with control structures to maintain sand position and limit migration out of the replenishment area.

While there are no significant living corals, fish or invertebrates found on around the area of work, there are extremely significant sea grass and algae beds which support a population of endangered green turtles. In consideration of this, size and location of the beach replenishment and offshore control structures were designed to ensure that there was no disturbance of the seagrass area.

Two low crested, emergent breakwaters were built to maintain a beach in front of Vacations and Regina's Beach Fales. Each is 35m long (25m at the water level) and located some 50m offshore. These increase wave sheltering and modify the wave direction to shore, reducing sediment losses offshore and alongshore.

Tonkin + Taylor International are delighted to have been the coastal and environmental engineers of choice for the Manase beach replenishment and to have been part of restoring a valued beach amenity for tourists and locals, while providing improved protection for the adjoining land from coastal erosion and storm damage.

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