



# Case Study - Access Structure - Two Rocks

## Overview



Two Rocks, WA

Customer: City of Wanneroo, WA  
Designer: Landmark Products  
Product: Public Access Staircase and Platform  
Ref No: 32911



The Two Rocks Beach Access Project commenced following significant beach and dune erosion during storm conditions in May and June 2016. This resulted in the undermining of the existing timber beach access staircase foundations and structural damage.



In the interest of public safety, the structure was removed in October 2016 and a temporary observation point was installed by the City of Wanneroo. Following the removal of the structure, the City of Wanneroo engaged a Coastal Engineering Consultant to undertake the Two Rocks Beach Access Options Assessment.



This study assessed various beach access types and locations based on a detailed multi-criteria analysis. This recommended a replacement beach access staircase and viewing platform - setback approximately 20m from the original staircase location, piled into bedrock and constructed out of an Aluminium staircase with FRP open grid deck. The assessment was presented to and endorsed by Council in April 2017.

Landmark Products Pty Ltd has PI insurance and an experienced design team, providing turnkey solutions to projects when design input is required. From a delivery perspective Landmark Products operates manufacturing plants and has a team of skilled tradespeople.



## Challenges

The project design and construction was required to adapt to the fast coastal erosion and rising sea-level. Significant earthworks were undertaken and sand dunes cut and formed up to fit the new staircase location which was established with a 20m set back.

Due to the dynamic shoreline, the staircase design has large steel UC piles driven in limestone bedrock. With this method we have achieved a minimum 25 years design life for the new staircase.

At the end of the project, the site has been rehabilitated and sand dune stabilisation undertaken with coir matting and local vegetation planted to assist restoration of the sand dunes.

## Our Solution

Landmark Products' design team worked with the coastal engineers at the City of Wanneroo and their consultants to deliver on the specifications of the tender.



**NOTE:**  
COIR-MESH MAT (ENVIRO MAT) TO BE INSTALLED TO ALL EARTHWORKS DISTURBED AREAS. MATTING TO BE REVEGETATED WITH PLANTINGS AS PER 2.3.2 OF THE TENDER SPECIFICATIONS.



## Risers

The staircase uses FRP (Fibre Reinforced Plastic) mini-mesh decking throughout, allowing sand to pass through, giving a crisp finished look as well as being slip and rot resistant. The 59 risers, 4 landings and lookout deck are manufactured from recycled plastic while the supporting joists are manufactured of aluminium - thus fulfilling this requirement of the highly corrosive environment. The risers were delivered to the site pre-cut to size and secured by stainless steel anti-vandal bolts.

## Sub-Frame Structure

Aluminium is the obvious choice for coastal areas due to its resistance to salt-induced corrosion. It's weather-proof, corrosion-resistant and immune to the harmful effects of UV rays, ensuring optimal performance over a very long lifetime. The sub-frame structure and balustrades (including beams and grating supports) were delivered in pre-fabricated panels and assembled on-site.

The aluminium substructure as a material meets relevant AS 1657 standard for Fixed Platforms, Walkways, Stairways - Design, Construction and Installation. The aluminium balustrades were finished off with WPC caprails, giving a clean and softer finish.

## Installation

The structure was installed and project managed by Landmark Products' WA operations. From start to finish (including the demolition and removal of the previous structure) took 4 weeks, during which time - pedestrians were directed to an alternate beach access to the north. The new structure was joined to an existing staircase at the top of the dunes. As part of the service, Landmark Products assisted the City of Wanneroo with all relevant compliance requirements, including:

- Development approval
- Building permit
- Clearing permit
- Archeologist inspection during construction
- Aboriginal heritage site management during construction



\*Structural warranty on orders



## Design

Upon being awarded the tender, the entire design was managed by the Landmark Products' in-house design team in consultation with the City of Wanneroo.

## Site

The site presents all the inherent challenges of seaside and sand-based constructions with the added challenge of frequent high afternoon winds, which causes sand build-ups.

## Outcome

The City of Wanneroo are delighted with the end results, as are the frequent users of the staircase who access the popular protected swimming spot of the Two Rocks community.

