ENVIRONMENTAL RESTORATION PROGRAMME AT MONACO'S PORTS
ECONCRETE®
- TECHNICAL INFORMATION -

As part of the government's policy on protecting marine biodiversity, the Department of the Environment is implementing an environmental restoration programme for the country's ports. The programme focuses on the installation of five tide pools designed by ECOncrete® in the Port of Fontvieille.

ECOncrete® was founded in 2012 and offers a suite of "bio-enhancing" concrete solutions that enhance the ecological value of urban, coastal, and marine infrastructure while also improving structural performance.

The company produces:
- coastal defence systems that can replace riprap
- lining solutions for the smooth sides of caissons
- pile encapsulation solutions for retaining structures

The various solutions available appear to be interesting from an environmental point of view and could easily be implemented in a number of locations in the Principality.
ECOncrete® brings life to concrete infrastructure using a unique combination of bio-enhancing concrete admixtures, complex surface textures and innovative, science-based designs, while at the same time improving structural performance.

The eco-friendly technologies employed by ECOncrete® make use of biological processes to help the environment. The company's products are designed to promote the growth of flora and fauna, thus offering valuable bioprotection.
The aim is to significantly improve the biological integration of these structures into the marine environment.

IMPLEMENTATION IN MONACO

Initial testing in the Principality is focused on five tide pools installed at the entrance to the Fontvieille harbour basin, in the riprap belt of the outer port. These structures have been designed to create water retaining elements which mimic the natural rock pools typically found along rocky coastlines, and enhance local biodiversity and biological productivity by integrating with traditional coastal defences.

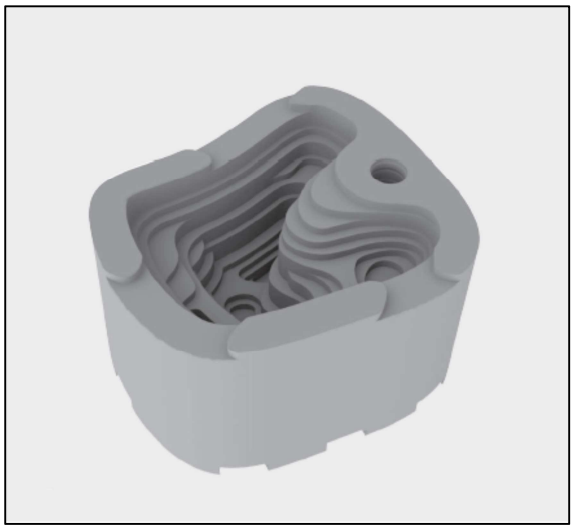
The tide pools will be subject to scientific monitoring in order to evaluate their performance over a period of three years. If this test is a success, other, similar structures could be installed in different locations along the Monegasque coast.

TECHNICAL DETAILS

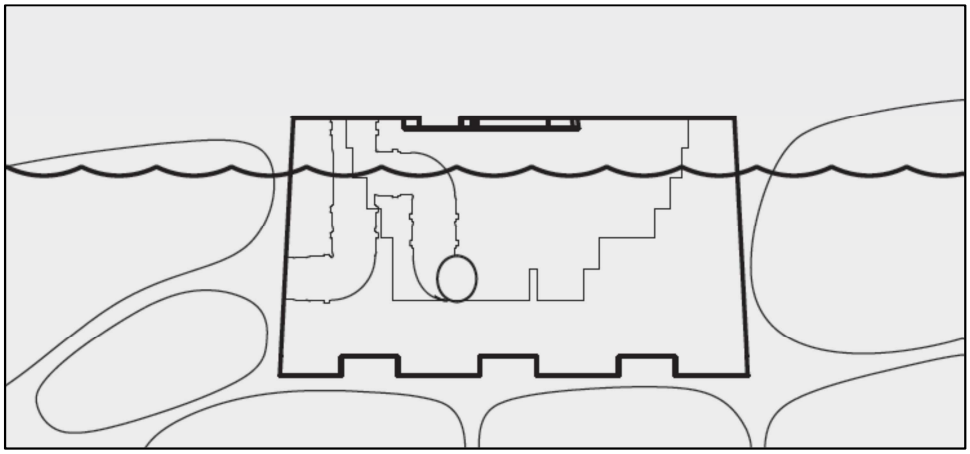
The dimensions of the tide pools are specifically designed in accordance with the prerequisites of each project.

Direction de la Communication
10, Quai Antoine 1er - BP 458
Tel : (+377) 98 98 22 22
Fax : (+377) 98 98 22 15
presse@gouv.mc
www.gouv.mc

These bio-enhancing concrete blocks can be up to 120cm long, 110cm wide and 70cm high. With a volume of 600 litres, they can weigh around 1.4 tonnes.



They are designed to mimic natural inter-tidal areas (areas which are influenced by tides). They can be integrated into coastal defence systems such as riprap sea walls to improve their ecological production.

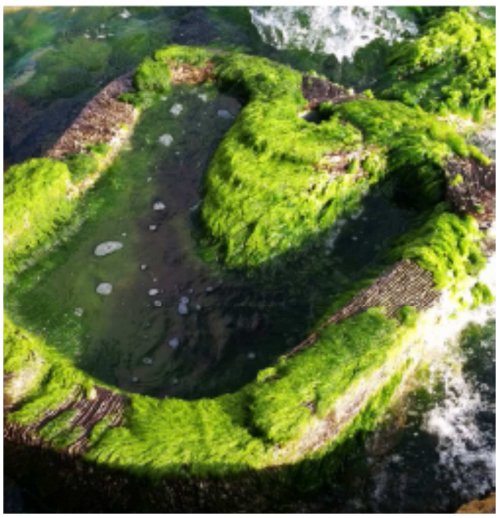


FEEDBACK FROM A SIMILAR PROJECT

As part of a renovation plan for Brooklyn Bridge Park in New York City, an environmental restoration project using ECOncrete® technology was developed. Tide pools were installed in

Direction de la Communication
10, Quai Antoine 1er - BP 458
Tel : (+377) 98 98 22 22
Fax : (+377) 98 98 22 15
presse@gouv.mc
www.gouv.mc

the new riprap embankment to provide stability for the embankment and improve the structure's ecological performance. Initial results showed live cover of 90–100%, comprising a variety of types of seaweed and a multitude of living organisms (copepods, amphipods, isopods, marine worms, etc.).



Direction de la Communication
10, Quai Antoine 1er - BP 458
Tel : (+377) 98 98 22 22
Fax : (+377) 98 98 22 15
presse@gouv.mc
www.gouv.mc

ENVIRONMENTAL RESTORATION IN MONACO

In recent years, the Monegasque Government has rolled out several environmental restoration projects both for the marine environment (artificial nurseries, transfer of protected species, larval recruitment, etc.) and on land (installation of nest boxes, insect hotels, cleaning and restoration of the Rocher cliffs).

As part of these efforts, Monaco's two ports have benefitted from an initial environmental restoration campaign known as Project Nappex (*Nurseries Artificielles Pour les Ports Exemplaires* – Artificial Nurseries for Exemplary Ports). The aim of the project was to improve the capabilities of the ports to function as nurseries. The Principality was the first port on the Mediterranean coast to get involved in this programme, setting up 40 artificial nurseries (biohuts on docks and pontoons) and thus creating habitats conducive to the growth of juvenile fish and many other marine species (shellfish, molluscs, etc.).

Environmental monitoring conducted as part of this project has confirmed the programme's effectiveness, with a total of 15 different post-larval fish species and more than 300 individuals counted, an average of 40 individuals per zone equipped with a biohut. Finally, as a result of the monitoring work, 35 species of fauna and fixed flora were recorded, along with 39 species of mobile fauna (with an average of 53 individuals per biohut).

Figure 2: Plan d'installation des Biohut à Fontvieille

Direction de la Communication
10, Quai Antoine 1er - BP 458
Tel : (+377) 98 98 22 22
Fax : (+377) 98 98 22 15
presse@gouv.mc
www.gouv.mc