

EDITORIAL:**SOUTH SOLITARY ISLAND LIGHTHOUSE**

Coffs Harbour, New South Wales - Australia

Project:

South Solitary Island Lighthouse

Project Owner:

Australian Maritime Safety Authority

Contractor:

Mager Constructions

Project Manager:

Michael Johnson

Repair Contractor:

Danseal - Dan Winter

Total Area:30 m²**Mapei Co-Ordinator:**

Rod Howard

Year of Completion:

2020

Mapei Products:Planitop Smooth & Repair R4, Aquaflex WPU,
Mapeband Easy, Mapeflex PU 45 FT, Planiseal MR

PROJECT HISTORY:

South Solitary Island Lighthouse is one of only two lighthouse islands in New South Wales.

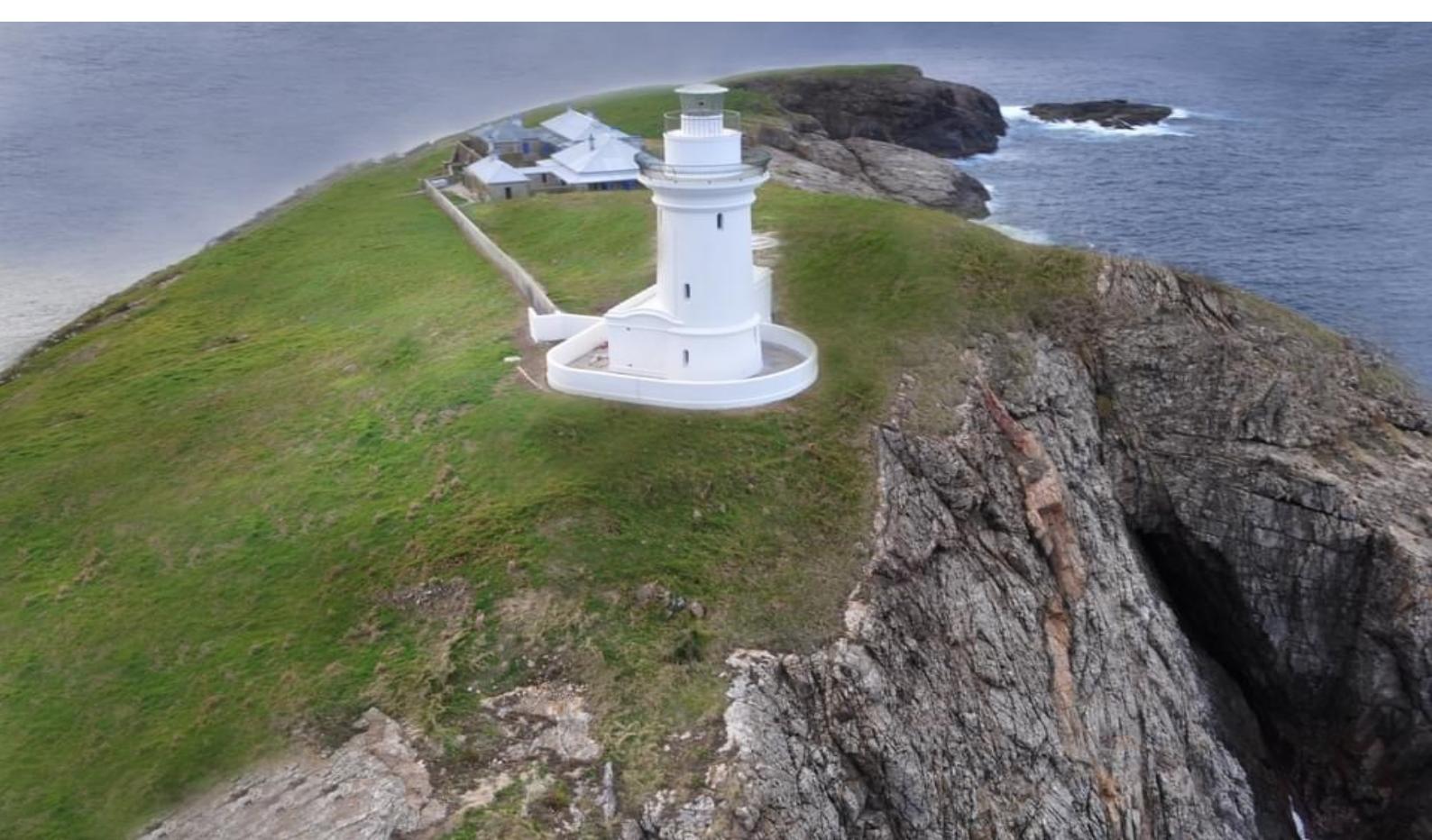
South Solitary Island is situated on the east coast of Australia, approximately 18 kilometres from the coastal town of Coffs Harbour and is only accessible by helicopter.

It is a precipitous rocky isle, rising at the south end to a height of 41 metres above high watermark. It contains about 13 acres of land and is one of a group of nine barren rocky islands off the North Coast of New South Wales.

The buildings were constructed in 1880 and are considered to be the oldest in the area.

The island is not accessible to the public, it is under the care of National Parks & Wildlife.

The lighthouse was automated in 1975 which resulted in the Head Keepers Quarters and Assistant Keepers Quarters being abandoned.



PROJECT OVERVIEW:

The Lighthouse tower is a conical, or slightly tapered, cylindrical structure of mass concrete construction finished externally with white painted cement render.

The tower is 17 metres high and is surmounted by a lantern house which contains the optic lantern. The squat tower is enlivened by the projecting balcony, supported on a simple moulded cornice, with the typical Barnet style outwards sloping gunmetal balcony railing.

At the base of the tower is a small annex, attached to the northern side and containing the original oil store. This structure is also of mass concrete and its classical lines form a visual counterfoil to the tower.

A circular cast iron geometric stair winds up the inner face of the tower walls, providing access to the upper stone external balcony and the new lantern house, which is constructed of cast iron, wrought iron and fibreglass. Trapezoid shaped glazing in aluminium frames provides little interruption for the light.

The current lantern is a Chance 3700mm diameter murette surmounted by the NALI fibreglass and aluminium lantern, now powered by solar panels.

The light is set at an elevation of 58 metres and has a range of 17 nautical miles.



PROJECT REQUIREMENTS:

The South Solitary Island lighthouse has stood for 140 years, but its exposure to the elements has brought the need for some major restoration works.

The restoration costs were estimated to be over \$1.5 million but the proposed works would ensure the ageing beacon remained in order for decades to come.

Workers and supplies were flown into the island by helicopter. The onset of COVID-19 made the helicopter flights more frequent, making the project more complicated.

Part of the restoration requirements was for the lighthouse to remain in use as it provides a backup to satellite navigation systems in the area.

Among the works completed was the removal of lead paint, filling crumbling cement with epoxy, and repainting inside and out.

One of the more difficult concerns with the project was the logistics difficulty of accessing the island for supplies and contractors.

The tiny island is mostly craggy rock – making it impossible to ship workers and supplies there, even though that was how it was done when lighthouse keepers and their families lived on the island.



AWARDED PROJECT

Mager Constructions Pty Ltd were awarded the restoration project in conjunction with sub-contractor Danseal Waterproofing.

Mager Constructions are a commercial and civil building contractor. They fabricate and repair items in steel, aluminium and stainless using latest equipment and technology.

The 140-year-old bluestone pavers located around the lighthouse were repaired using MAPEI's **Planitop Smooth & Repair R4** repair and smoothing mortar. **Planitop Smooth & Repair R4** is a structural R4-class, rapid-setting, shrinkage compensated, thixotropic, fibre-reinforced, cementitious mortar, applied in a single layer from 3 to 40 mm thick, for repairing and smoothing concrete.

All metal rails, steel structures and metal mounts were painted with a steel primer. Once dry, contractors primed and sealed the main structures using MAPEI's **Planiseal MR** (two component water-based epoxy primer and moisture barrier suitable for green concrete and damp substrates).

Mapeband Easy (easy to apply, highly elastic, vapour-proof and waterproof rubber bandage used with liquid waterproofing membranes) was installed in the first layer of the **Aquaflex WPU** waterproofing membrane to form a perfect seal in corners and around edges. Three (3) coats of **Aquaflex WPU** were then applied with a light broadcast of sand in the third layer to provide an anti-slip surface.

All expansion joints were perfectly sealed with **Mapeflex PU 45 FT** that is a rapid-hardening paintable polyurethane sealant and adhesive with a high modulus of elasticity for movements up to 20%.



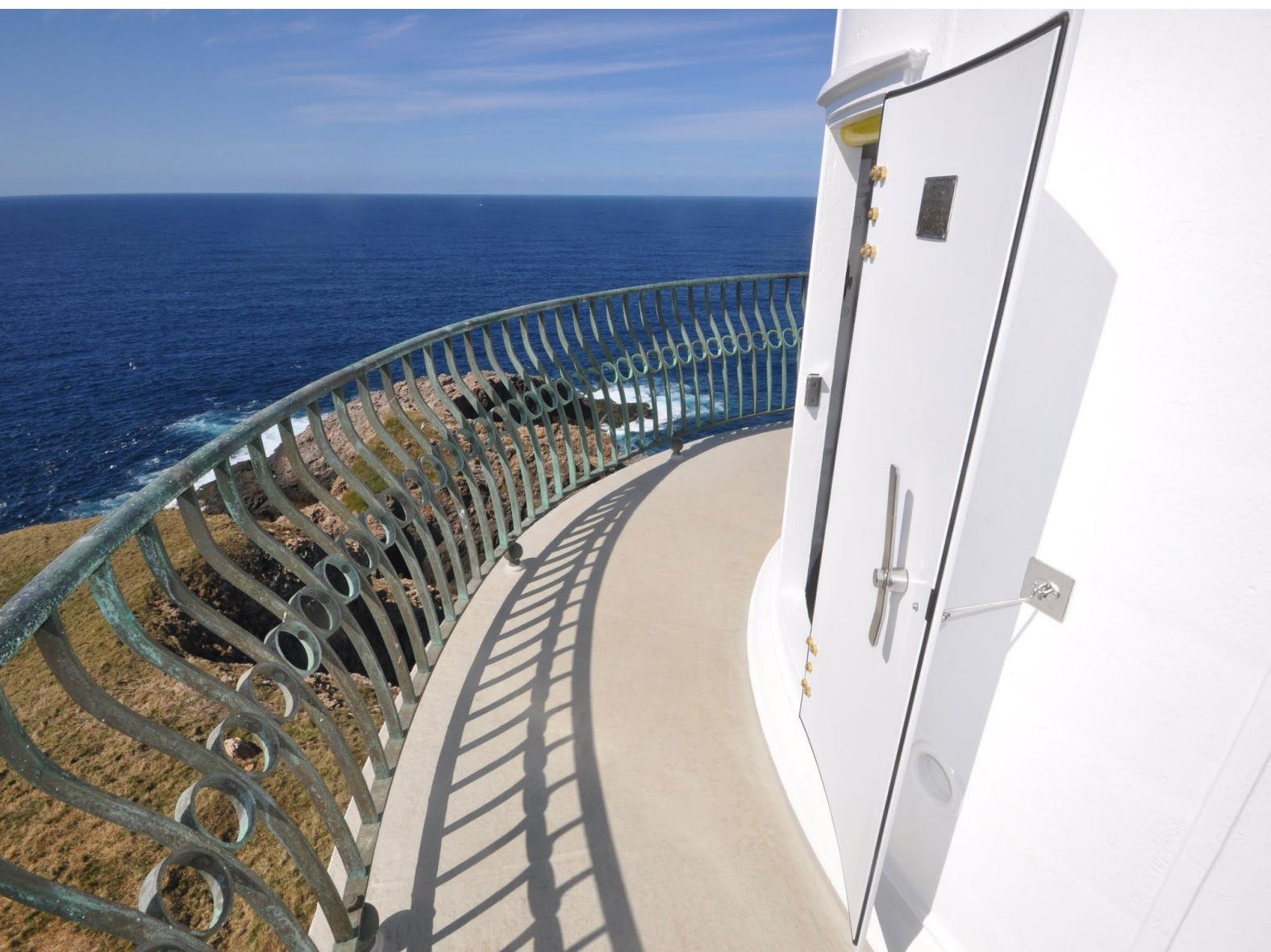
SUCCESSFUL OUTCOME AND BENEFITS:

While the \$1.5 million cost of restoring the lighthouse is significant, the running costs in between works are minimal thanks to the automation of the lighthouse in 1975.

The restoration works were an important part of maintaining maritime safety, but it was also an important process in preserving the history of the lighthouse and the families who lived there for almost a century.

The local people who grew up on South Solitary Island as children, have a great affinity to that lighthouse.

Now with the completion of the total restoration, this lighthouse is not only now aesthetically pleasing, but it has preserved the heritage of the island as well as paying respect to those who have gone before.



Helicopter used to transport Mapei products to site for the rectification work.

