



# HMAS STIRLING LOW LEVEL BRIDGE REPAIRS

GARDEN ISLAND, WA

CONCRETE REPAIRS - BRIDGES

## PROJECT

HMAS Stirling Low Level Bridge Repairs

## CLIENT

Department of Defence  
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 RPS Project Management

## DURATEC / DDRIC CONTACT

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## DESCRIPTION

HMAS Stirling is the Royal Australian Navy's primary base on the west coast and is located on Garden Island, 5km off the WA coast. The 305m low level bridge is located at the mainland end of the causeway which links the island to Point Peron.

The bridge comprises a reinforced concrete deck supported by a steel structure on steel piles, providing a two lane roadway. The abutments are reinforced concrete and steel sheet piling. There have been various repair works conducted since its commission in 1972, including most recently in 2007/2008.

Duratec Australia and DDR Indigenous Contractors were engaged to perform repairs due to the accelerated deterioration of the structural steel under the bridge deck. The scope of works included repairs to:

- ▶ Structural steel supporting the deck (beams and piles).
- ▶ Steel sheet piling.
- ▶ Reinforced concrete abutments including cathodic protection.
- ▶ Reinforced concrete deck soffits.
- ▶ Reinforced concrete deck edges.
- ▶ Guardrails.
- ▶ Expansion joints at abutments and bents.

Also included was the removal of existing coal tar epoxy coatings from the underside of the bridge which required a fully encapsulated work area for the safe management of a hazardous material in a full working environment, including a negative air pressure filter and HEPA filters.

## HIGHLIGHTS

- ▶ Duratec and DDRIC developed an adjustable access system to allow for changes in the water level caused by tidal and climatic fluctuations.
- ▶ The works were carried out in part of the Cockburn Sound Marine Park. Duratec and DDRIC's strong environmental management systems and controls ensured minimum impact on the environment.



IMAGES (FROM TOP TO BOTTOM)

- ▶ Overview of the low level bridge.
- ▶ Original condition of the bridge structure.
- ▶ Original condition of the underside of the bridge.



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IMAGES (FROM TOP TO BOTTOM)

- ▶ Cranage of adjustable access system.
- ▶ Access system in place.
- ▶ Rope access for non-destructive testing of structure.

IMAGES (FROM TOP TO BOTTOM)

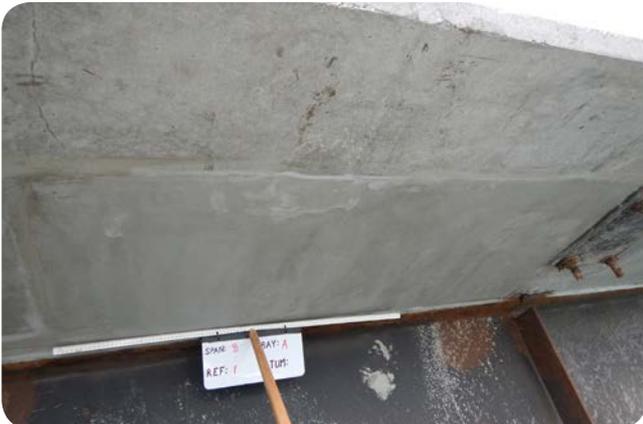
- ▶ Concrete soffit breakout from scaffold.
- ▶ High pressure wash of breakout area.
- ▶ Abutment CP TR unit.



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## IMAGES (FROM TOP TO BOTTOM)

- ▶ Application of Silane to soffit area.
- ▶ Finished concrete profile after repair.
- ▶ Encapsulation set up with vacuum system.

## IMAGES (FROM TOP TO BOTTOM)

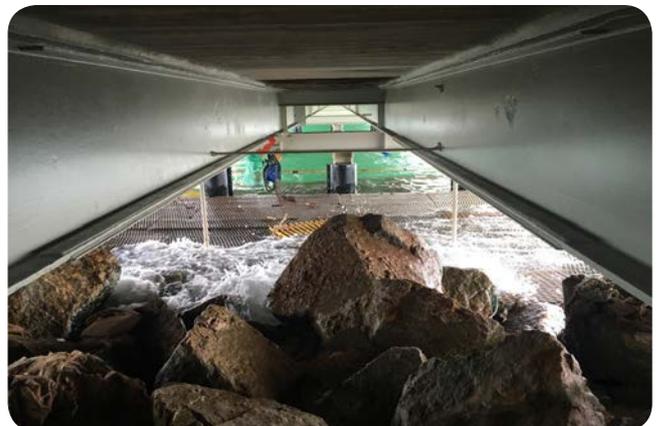
- ▶ Abrasive blasting to class Sa2.5.
- ▶ Verification of steel strengthening.
- ▶ Completed protective coatings.



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## IMAGES (FROM TOP TO BOTTOM)

- ▶ Pile jacket installation.
- ▶ Cathodic protection marked out at northern abutment.
- ▶ Vibrating wire gauge installed at expansion joints to enable monitoring of bridge movement.

## IMAGES (FROM TOP TO BOTTOM)

- ▶ Expansion joint limitation repair.
- ▶ Structural brace repair to overcome eccentricity.
- ▶ Completed internal bridge works.