



Sustainability in Bridge Construction

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Biography:

Kieran is a construction environmental manager currently involved in the delivery of two major projects as part of the Woolgoolga to Ballina Pacific Highway Upgrade in NSW. Kieran's expertise in environmental planning and management has been gained through 10 years in environmental roles on construction projects within both the private and public sector. Throughout his career, Kieran has been actively involved in the delivery of best practice aquatic rehabilitation projects within northern NSW including projects within the Manning, Hastings and Richmond Rivers.

Abstract:

In the delivery of recent major infrastructure projects in northern NSW, the Lendlease bridge construction team have faced significant logistical and environmental challenges regarding the delivery of these works within shallow, highly sensitive estuarine environments.

One of the main challenges associated with these works is the construction and operation of temporary in-stream structures, particularly rock platforms, used to construct the main bridge structures. These challenges include:

- High potential for sediment mobilisation from the in-stream structures during installation and removal; and
- High potential for hydrocarbon spills on the rock platform entering the rivers.

From these challenges, the project team has developed innovative strategies to deliver in stream works within the Wilson, Hastings and Richmond Rivers that is not only sustainable, but sets a new benchmark for bridge construction in shallow rivers.

These strategies have included the development of a coffer dam which enhances previous rock platform designs with a sheet-piled surround. This allows the rock to be installed and removed from the environmentally sensitive environment with a significantly improved level of protection. The main benefits of this innovation include:

- Reduced temporary works footprint in comparison to traditional rock platforms, minimising riparian vegetation clearing and disturbance to the river bed.
- Separation between the rock and the waterway, significantly minimising the risk of water pollution as a result of sediment mobilisation from the platform and uncontrolled hydrocarbon spills within the river.

With regard to sustainability and material re-use, over 95% of the structures have been re-used in project works. This includes reuse of rock from the structures in drainage and other roadworks and extraction and provision of all the sheet-piles back to the supplier.



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Following the removal of these structures, rock used in the construction of coffer dams has been used to create 'rock fillets' (small rock walls installed parallel to the river bank). These structures create a depositional zone along the river bank which allows mangroves to regenerate following river bank disturbance, providing enhanced habitat for aquatic and intertidal species. These structures have been implemented both within the works footprint and along other degraded sections of river bank within the Hastings, Wilson and Richmond Rivers to provide an ongoing positive legacy for the local communities following the completion of these projects.