Case Study
REDCOR® weathering steel
October 2026

BlueScope

Taking the high road

REDCOR® weathering steel supports reduced ‘whole-of-life’ cost savings for the ACT’s tallest road bridge



RedCor®

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REDCOR® weathering steel

Driven by long-term vision and meticulous planning, the $226 million dollar Molonglo River Bridge project stands as a model of how rigorous consultation, thoughtful product selection, innovative design and careful financial evaluation can deliver an enduring civic asset that sits harmoniously into its environment.

While concrete remains the traditional choice for bridge construction in Australia, the use of BlueScope's REDCOR® weathering steel in the Molonglo River Bridge showcases how steel enabled a bridge to be created that integrates beautifully into the natural surroundings while minimising the impact on the surrounding environment during construction, and over the life of the bridge.

Project Background

The Molonglo River Bridge is a 200-metre-long road bridge designed to replace the flood-prone Coppins Crossing causeway and provide an all-weather connection across the Molonglo River. At completion, this major piece of infrastructure will be Canberra's tallest road bridge.

The bridge is elevated above the 1-in-100-year flood level and incorporates provisions for future light rail, water and sewer services, shared pedestrian and cyclist paths, and twin viewing platforms.

The bridge will provide a much-needed, reliable all-weather transport corridor to support the growth of Molonglo Valley and strengthen the connection to the town centres of Whitlam and West Belconnen.

Response to the landscape

The bridge spans the ecologically sensitive Molonglo Nature Reserve, an area of national environmental significance, stated Michael McGrath, Senior Director within Infrastructure Canberra, ACT Government.

Minimising the disturbance to the riverbed and protecting the local native fauna, including platypus nesting sites, waterfowl, microbats, and the vulnerable pink-tailed worm lizards, was critical. Consequently, design, construction, operation, and maintenance considerations had to be considered from the project's very inception. 'This is a very visible structure and needs to sit sensitively within the landscape' Michael elaborated.

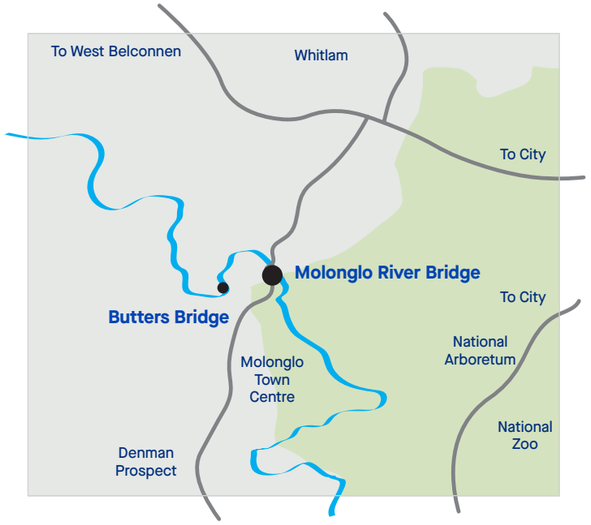
'Family of Bridges'

Initial planning for the Molonglo River Bridge began in 2015, when the ACT Government undertook a comprehensive assessment of transport, environmental, community and future infrastructure requirements, while ensuring alignment with "Family of Bridges" design philosophy.

This philosophy creates a recognisable and consistent bridge identity across a series of bridges in the region. By using common architectural forms and materials that respond to the landscape, each bridge complements the character of the Molonglo River Valley.

The Molonglo River Bridge is the latest bridge design in a lineage that began with Butters Bridge around a decade ago. By incorporating weathering steel-encased piers, Butters Bridge demonstrated how infrastructure could achieve both durability and a visual character that sits comfortably within the natural landscape.

With the Molonglo River Bridge project, the use of REDCOR® weathering steel was expanded from the substructure to the bridge's superstructure, enabling a lighter, more refined bridge design that blends more seamlessly into its surroundings.







The Molonglo River Bridge crosses an area of 'National Environmental Significance'. The selection of REDCOR® weathering steel ensured the bridge would achieve both its aesthetic and environmental design objectives.

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'Whole-of-Life' Design

REDCOR® weathering steel

REDCOR® weathering steel is a high-strength, low-alloy steel manufactured by BlueScope that develops a stable protective oxide layer, known as a patina, when exposed to alternating wet and dry conditions.

The distinctive appearance of REDCOR® weathering steel evolves over time, from bright orange to deep brown and purple tones that blend harmoniously into Australian landscapes. When correctly detailed and used in a suitable environment, the naturally forming 'patina' enhances REDCOR® weathering steel's corrosion resistance without the need for conventional protective coating system. The naturally forming 'patina' enhances the steel's corrosion resistance without the need for paint or protective coatings.

Using REDCOR® weathering steel significantly reduces long-term maintenance requirements compared with conventional painted steel structures. As an alternative to painting at regular intervals, the protective patina that develops on REDCOR® weathering steel resists corrosion throughout its design life.

For a bridge elevated 20 metres above the valley floor, eliminating the need to recoat also removed the future need for scaffolding, traffic management, and work-at-height operations required for ongoing coating maintenance, thereby reducing future costs and safety concerns.

Preliminary Design and Innovation

To minimise risk to the budget, construction schedule, and environmental impact, the ACT Government developed a robust, buildable reference design called the Preliminary Sketch Plan (PSP) as part of the tender documents. Jacobs Engineering who were contracted to work through the design during the early concept phase, consulted with BlueScope on the appropriate adoption of REDCOR® weathering steel and its technical detailing requirements. This initial work was further refined as the project progressed.

The contract to build the Molonglo River Bridge was awarded to BMD Constructions, who led the design and construction consortium including pitt&sherry, COWI, GHD, Cox Architecture, and Civmec.

Senior Principal Engineer and General Manager of Bridges & Structures at pitt&sherry, Irene Scott, said that 'as the ACT Government provided such a detailed PSP that fully captured their requirements, the consortium was able to focus on innovation of the design to deliver improved safety, constructability and environmental outcomes beyond that achievable from the reference design'.

Innovation through Consultation

The initial bridge design featured a 225-metre-long superstructure with a 60-metre, 93-metre and 72-metre span configuration, using three rectangular box girders per carriageway made from REDCOR® weathering steel.

By realigning John Gorton Drive - the primary road leading to the bridge, the consortium's design reduced the overall bridge length to 200 metres, with a symmetrical layout of 60-metre-80-metre-60-metre spans.

Replacing the rectangular box girders in the original reference design with haunched, trapezoidal trough girders made from REDCOR® weathering steel, the bridge's impressive 80 metre central span could be supported with fewer in-river supports, minimising the impact on the sensitive environment of the Molonglo Nature Reserve.

This critical redesign of the girders also reduced steel use by 20% to 3500 tonnes, delivering cost and embodied carbon savings for the project.

To support the ACT Government's goal of future environmental, safety, and long-term cost savings, the design incorporated future requirements to extend the light-rail network over the bridge. This forward-thinking approach would address the region's long-term transport needs without compromising the project's overall environmental objectives.

By including an additional trapezoidal trough girder within the bridge's superstructure, the consortium's redesign can accommodate the future light-rail line, as well as space to house the specialised lifting equipment needed for its eventual installation, enabling the future construction of the light-rail to be conducted entirely from the bridge's deck, thereby reducing future disturbance to the environmentally sensitive river corridor below.

Precision Fabrication

The weathering steel used to form the girders was locally manufactured at BlueScope's facility at Port Kembla, before arriving at Civmec's fabrication facility in Tomago, Newcastle, where the REDCOR® weathering steel was engineered and fabricated into the final girders. These girders needed to be fabricated with such precision to align seamlessly at their final destination.

To manage the enormous scale of the components that would ultimately form the bridge's superstructure, Civmec engineered and constructed three massive, bespoke 'fabrication jigs' tailored to the different girder configurations, including haunch, midspan, and abutment girders. These custom jigs supported the immense weight of girders ranging from 80-120 tonnes during assembly and fabrication. Additionally, remote-controlled Self-Propelled Modular Transporters (SPMTs) were deployed to ensure the safe movement of steel components as they progressed through fabrication stages within the workshop.

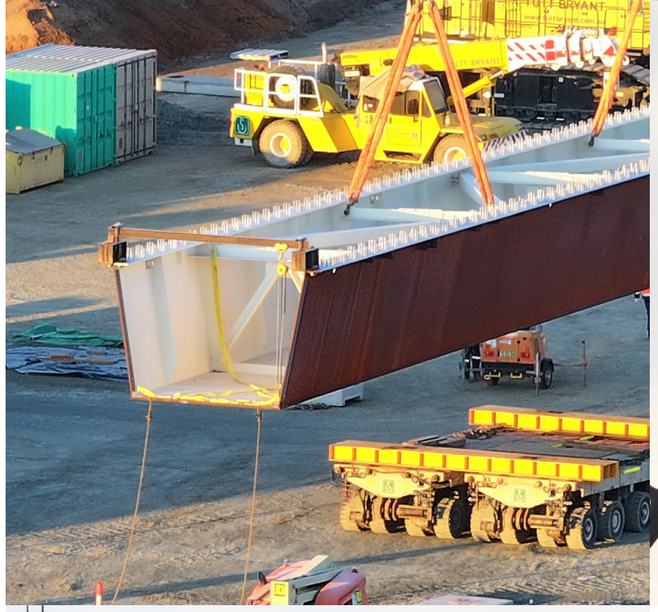
According to Andrew Sams, Civmec Quality Manager for the project, 'these specialised jigs allowed for controlled handling and fabrication of the steel girders, minimising physical handling and the potential for surface damage during the manufacturing process.' For weathering steel, preserving surface integrity is critical to ensuring a uniform protective patina develops once exposed to the natural environment.

The 3,500 tonnes of REDCOR® weathering steel used in the project varied in base metal thickness (BMT) from 16mm to 80mm and required over 17 kilometres of welding to assemble the girders.

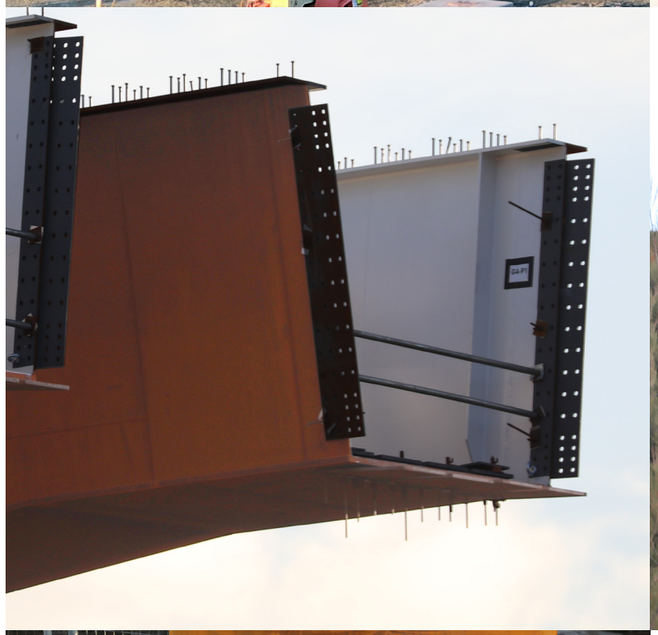
Civmec also fabricated hundreds of splice plates to connect the girder segments during construction, which involved the pre-drilling of ~7200 holes that would accommodate the installation of the weathering steel connection bolts, once at site. To minimise potential assembly issues during construction, Civmec conducted alignment checks of the bolted connections prior to delivery.

Before dispatch to site, all girders underwent grit blasting and three controlled wet-and-dry cycles to initiate the natural weathering patina in compliance with Australian Standards.

These final checks were scheduled in accordance with BMD's construction timeline.













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Construction at Scale

The construction of the Molonglo River Bridge superstructure, led by BMD Constructions Project Engineer Joel Zuccato, was a carefully orchestrated exercise in engineering, transport and heavy-lift logistics.

Transporting the girders to their final destination required meticulous planning throughout. To ensure safe navigation through tight physical constraints along the route, the team conducted a comprehensive review of options before determining the final route and executed the move over three nights under full police escort.

The physical tightness of the critical path to site was evident: the load cleared one overhead bridge with only 50mm clearance, and certain power lines required temporary lifting during the move.

Once on site, the construction team shifted its focus to assembling the massive girder beams. The four completed girders within the bridge superstructure consisted of five 40-metre-long segments; two abutment segments, two haunch segments and one mid-span segment.

Australia's largest operational crane, a 1,600-tonne-capacity Demag crawler, was required to position the enormous segments into position. Relocated from Western Australia, this massive crane required no fewer than 125 semi-trailers to transport in parts and, once on site, took three weeks to assemble.

To minimise the high-risk working-at-height activity, the team utilised a ground-level splicing method to bolt the abutment and haunch segments together before lifting into position. As these spliced assemblies weighed a staggering 270 tonnes, a specialised "Christmas tree" rigging arrangement was deployed to safely balance the load when lifting.

During construction, twelve carefully orchestrated major lifts were performed to move the eight 80-metre-long spliced girder assemblies and four 40-metre-long mid-span sections into position.

Conclusion

A key factor in the success of the Molonglo River Bridge was the use of BlueScope REDCOR® weathering steel. The bridge demonstrates what can be achieved when long-term durability and sustainability objectives are considered from the earliest stages of design. By adopting REDCOR® weathering steel as the structural material within the design, the project is expected to provide whole-of-life maintenance and constructability benefits. The use and redesigned long-span steel girder reduced the number of in-river supports required. Rethinking the configuration and design of the girders enabled the bridge's extensive spans to be constructed with greater efficiency and safety, while minimising the impact on the surrounding environment.

Demonstrating the environmental credentials of this project, the ACT Government and BMD Constructions have made a joint submission to the Infrastructure Sustainability Council's As-Built IS Rating under version 2.1 of the ISC rating scheme. If successful, the project would be the first in the ACT, and among the first in Australia, to obtain this rigorous standard.

BMD Constructions utilised Australia's largest operational Demag crawler crane to perform the heavy lifts required for the 80-metre-long, 270-tonne girder assemblies.



Project Details

Project: Molonglo River Bridge

Location: Whitlam, Australian Capital Territory

Client: ACT Government
• Michael McGrath, Senior Director, Infrastructure Canberra, ACT Government

Builder: BMD Constructions
• Joel Zuccato, Project Engineer

Lead Engineer: pitt&sherry. **Engineers:** COWI, GHD.
• Irene Scott, Senior Principal Engineer. General Manager Bridges and Structure

Architect: Cox Architects

Fabricator: Civmec Tomago
• Andrew Sams, Quality Manager

Product/Application: 3,500 tonnes of REDCOR® weathering steel in grade WR350B

BlueScope: Rob Danis – National Engineering Manager – Infrastructure

Project Value: $226M

steel.com.au/products/redcor-steel

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