

#15 SEPTEMBER, 2024

INFORMER

YOUR QUARTERLY FRC NEWS & TECHNICAL UPDATE FROM INFORCE

PROJECT WALGURU STEEL, AU

Walguru Steel, located in Queensland, Australia, is recognized as a leader in steel fabrication, offering cutting-edge technology, extensive capacity, and robust infrastructure.

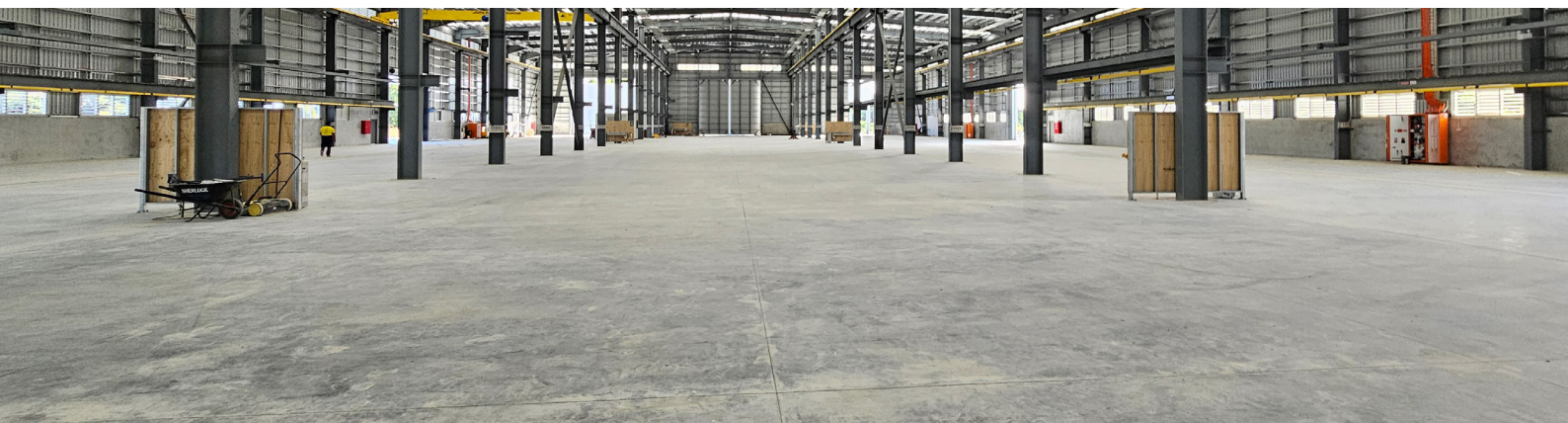
The project included the construction of 9,000 square meters of internal, and 10,000 square meters of external steel fibre pavements. Hurst Constructions (MC) chose Inforce for the design of these pavements due to the cost savings, and time efficiency offered by fibre reinforcement. Our slab solution assisted the client with meeting the project requirements for a tight schedule and cost-effective approach.

Desired Outcome

The goal was to create a future-proof slab capable of accommodating various forms of manufacturing without limitations. The client sought a high-strength slab that provided flexibility for different types of project work.

Was the Desired Outcome Achieved?

Yes, the desired outcome was successfully achieved. Inforce conducted an assessment of the existing manufacturing site, reviewing machinery and ongoing work to tailor the design to the client's needs. The result met the client's expectations, delivering a high-strength, versatile slab that provided the desired flexibility for future projects. The client expressed great satisfaction with the outcome.





PROJECT MARLBOROUGH HUB

Quay Connect, CEL & Wineworks are collaborating to develop a new container and product storage warehousing facility right in the heart of Marlborough's wine country. With volumes set to increase, this facility is a critical step forward. This build promises the Marlborough wine industry better service and a faster logistics link to the world.

The Marlborough Hub features circa 13,000m² of pavement in total. 5,000 square meters of internal jointless flooring + an additional 1,000 square metres of canopy slab, 5,000 meters of external hybrid container slab pavement, and 2,000 square meters of driveway and drive-thru areas. Tuatara Structures collaborated with Inforce to design a cost-effective and high-performance slab capable of handling heavy loads, ensuring a long-term, future-proof investment for the client.

Desired Outcome

The project required an area capable of block stacking three containers high externally and providing bulk storage for wine and wine bottles internally. The client needed a slab capable of handling heavy loads without limiting its use for alternative storage purposes. To meet these needs, a jointless slab was used internally to eliminate saw cuts, increasing the slab's capacity. Externally, a hybrid slab with no saw cuts was implemented, allowing for greater utilization of the concrete. The external slab was constructed with a thickness of 275 mm, using a combination of fibre and mesh, while the internal slab was 180 mm thick, utilizing fibre only.

Outcome Achieved

The desired outcome of a durable and future-proof slab was successfully achieved through the engineering expertise of Inforce.



NCAT AND MNROAD TEST TRACKS: PIONEERING PAVEMENT RESEARCH

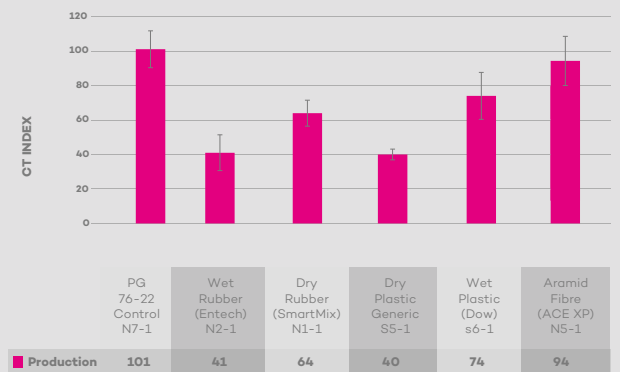
The NCAT Test Track in Alabama and MnROAD test track in Minnesota are leading facilities for pavement performance testing. NCAT focuses on accelerated testing under heavy traffic loads, while MnROAD addresses cold climate performance. Their partnership since 2015 enables comprehensive evaluations of asphalt across varied climates, helping improve road durability.

ACE Aramid Fiber: Enhancing Asphalt Performance

The ACE Aramid Fiber is an advanced additive that has been incorporated into test sections at both NCAT and MnROAD facilities. This fibre is designed to strengthen asphalt mixtures, improving their resistance to fatigue cracking and extending pavement service life. Through the Additive Group (AG) experiments, NCAT has been evaluating the effectiveness of aramid fibres under heavy, accelerated loading to simulate real-world traffic in southern climates. This research aims to provide agencies with data-driven decisions for building longer-lasting pavements. With the completion of the first cycle of testing at NCAT (10 million ESALs) and a PCI (Pavement Condition Index) report of 100, it has been decided to put this section through a 2nd test cycle of 10 million ESALs to test the limits of Aramid reinforced asphalt.

Fatigue Testing and Ideal CT Results

The performance of these mixtures was measured using the **Ideal Cracking Test** (Ideal-CT), a reliable method for evaluating the fatigue resistance of asphalt. Results confirmed that ACE Aramid Fibre offers crack resistance similar to that of SBS-modified mixes. This demonstrates that engineers can achieve high-performance results using aramid fibre without the higher costs associated with polymer-modified asphalt and at a lot lower carbon footprint.



Comparison to SBS Polymer Mixes

Key findings from these tests have shown that ACE Aramid Fibre performs on par with **SBS (styrene-butadiene-styrene) polymer-modified asphalt**, a commonly used material for enhancing flexibility and durability in pavements:

1. The **fibre-modified** mixtures exhibited **similar stiffness** to SBS-modified control sections, demonstrating the ACE fibres ability to support the structural integrity of the pavement under heavy traffic loads.
2. The **fatigue performance** of the fibre-modified mixtures was also found to be **comparable to SBS-modified asphalt**, indicating that ACE Aramid Fibre is equally effective in preventing cracking and extending the lifespan of pavements.

Proven Benefits for Asset Owners

The adoption of **ACE Aramid Fibre** offers a proven solution to reduce cracking and rutting in Asphalt and enhances the longevity of roadways. Supported by extensive testing at both NCAT and MnROAD, this innovative additive provides a cost-effective, high-performance alternative to SBS polymer-modified asphalts, making it an attractive choice for future infrastructure projects across various climates.

RECENTLY COMPLETED PROJECTS



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PALMERSTON NORTH



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