Case study
Carrum Station
December 2023

Framing made from TRUECORE® steel underpins the form and function of Victoria's new groundbreaking rail stations

Project Details:
Project: Carrum Station
Location: Currum, VIC
Principal Steel Product: 18,000 lineal metres of LGS framing made from TRUECORE® steel
Builder: Laing O'Rourke
Steel Fabricator: CMG Frames
Architect: Cox Architecture
Photographer: Construction photos by CMG Frames, imagery by Cox Architecture

THE INNER STRENGTH

Lightweight and strong, light gauge steel (LGS) framing made from TRUECORE® steel was 3D designed and prefabricated to meet the exact tolerances and timing efficiencies demanded by the project.

Located just 125m from Port Phillip Bay in Melbourne's South East, Carrum Station is the first of 12 new rail stations that comprise the Victorian Level Crossing Removal Projects. Created to remove 19 dangerous level crossings, the project will improve safety, reduce congestion and increase train frequency along the Frankston line.

The design and use of LGS framing made from TRUECORE® steel to underpin the CFC (compressed-fibre-cement) cladding, helped to realise the following benefits:

Engineered for dynamic load
Carrum Station is an elevated platform that needs to allow for both dynamic and wind loading, due to vibration and movement from trains as well as an increase in wind speeds because of the close proximity to Carrum Beach. CMG Frames designed a 3D module frame section (4.5 metres wide) that was engineered to withstand these forces while still leaving a large cavity for necessary services and, at the same time, achieve the design intent.

Designed with expertise
CMG Frames worked closely with BlueScope's technical representatives to obtain a Design Life Statement for the project and to ensure the prefabricated LGS frames were designed to suit the environment, the specific application and were compatible with other materials used in the project.

Minimal on-site disruption
Level Crossing Removal Projects demand minimal disruption to commuters, so on-time delivery of all trade works is essential.
"By using a prefabricated modular design, all manufacturing is done off-site, reducing on-site time by over a third because only installation was required on-site," said Luke Cockerell, Managing Director, CMG Frames.

True to architectural design
By using LGS framing made from TRUECORE® steel instead of structural steel, CMG Frames were able to deliver a solution true to the architectural design. The LGS framing was programmed and fabricated so accurately that the CFC cladding and steel framing could be manufactured simultaneously, speeding up the entire process. Being able to manufacture to exact specifications also helped to minimise waste and reduce material costs.

Project highlights
Commissioned by the Victorian Government, the $3 billion Level Crossing Removal Projects aim to remove 19 dangerous level crossings and build 12 new train stations along Victoria's Frankston line. The projects seek to improve safety, reduce congestion and increase train frequency.

Using the new stations as vehicles, COX Architecture saw opportunities to create communal spaces that reinforce local character, celebrate heritage and increase commercial viability. Andy Hayes, Director, COX said, "These projects represent a story of connection, how infrastructure can become catalysts for new public places."

To deliver an aesthetic that hides the station's complex essential services from view, builder Laing O'Rourke adopted a fully collaborative approach with the Victorian Government, sub-contractor Casello Group and steel fabricator CMG Frames.

The project had a high degree of engineering complexity and involved significant community impacts. To ensure issues and risks were resolved creatively and promptly, the contracting partners and many other stakeholders worked with a mindset of transparency, innovation and support.

Working closely with Casello Group, CMG Frames designed and prefabricated LGS frame box sections made from TRUECORE® steel. These were pre-clad and then lifted into place to conceal services on the underside of the station overpass. "The project had a short timeframe with heavy site restrictions, as streets needed to be re-opened", said Dan Thomson at CMG Frames. Project Manager Gary Fidanza at Casello added, "The LGS frames made from TRUECORE® steel were manufactured with precision and accuracy, immensely strong yet lightweight and easier to handle than we thought possible. This project delivered exceptional cost benefits."

The Carrum Station project was awarded the Victorian ASI Steel Excellence Award, Engineering Projects.

The Carrum Station project was also described by the Jury for the Joseph Reed Award for Urban Design as "an extraordinary offer of civic generosity". The project not only encourages the use of public transport but also fosters a place to gather and connect, feeling intuitive and safe. Thinking "beyond the station", the design was chosen after hearing from the community, with locals keen to see the station enhance the bayside village feel of the suburb.

Carrum Station was completed in 2020 and was used as the impetus for over a dozen level crossing redevelopments in suburbs such as Lilydale, Cheltenham, Edithvale and Glenhuntly.

"As work has continued across further level crossing projects, the designs have become even more intricate and ambitious. Designers have become more aware of the versatility of framing made from TRUECORE® steel and its ability to be pre-modelled and engineered."

Luke Cockerell, Managing Director, CMG Frames

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