



Liberty OneSteel delivers cold-temperature solution

Photography: NewCold

ASI fabricator Samaras Structural Engineers turned to Liberty OneSteel to ensure the steel it required for a new cold-storage facility was fit for purpose.

Liberty OneSteel has applied a bespoke testing and assurance regime to ensure its steel members can withstand the freezing temperatures of a new cold-storage facility.

Construction firm Hansen Yuncken looked set to source the steel it needed for Dutch logistics company NewCold's new cold-storage warehouse from an overseas supplier before Liberty OneSteel demonstrated to the firm that local steel could meet the requirements of the project.

NewCold Advanced Cold Logistics recently opened two warehouses in Truganina, 15km west of Melbourne, one of which is an innovative, fully automated 'dark' cold storage and logistics facility. The opening of the two new warehouses forms part of the company's expansion in the Asia-Pacific region.

The first of its kind in Australia, the 'Advanced Cold Logistics #2' facility is a 12 storey-high insulated panel warehouse that features eight double satellite stacker cranes. With a 23,500sqm footprint, the site can hold up to 110,000 standard pallets. It will handle chilled and ambient product for dairy company Fonterra Australia at temperatures as low as -23°C.

The facility is designed for efficiency, with robotic pick and pack of orders enabling the handling of over 10,000 pallets daily on a first expired, first out (FEFO) basis. It's equipped with oxygen-reducing fire safety technology and state-of-the-art systems designed to deliver a significant reduction in electricity consumption compared to conventional cold-storage warehouses. It comprises 19 docks with automated truck unloading capability and large-scale shipment buffer zones designed to minimise truck delivery and despatch times.

A unique challenge

The scale of the NewCold warehouse and the need for column-free void space necessitated the use of structural steel in construction. Mounted to the building's structural steel frame are insulated panels that ensure consistency of temperature within the warehouse, a first in Australia for a building of this size.

The need to ensure cold-temperature steel performance presented a challenge to Gillman-based fabricator Samaras and steel supplier Liberty OneSteel Metalcentre. The Metalcentre team turned to the metallurgists at Liberty OneSteel to develop a testing and assurance regime to ensure its 300 Grade steel had impact toughness at -30°C.

Principal Process Engineer at Liberty OneSteel's steelworks, **Mark Bubicich** explained that the metallurgical and engineering teams had assessed the capability of its steel and Australian Standard design service temperatures for the application at that temperature. Liberty OneSteel was unable to certify products to -30°C as such a grade does not exist in Australian Standard AS/NZS 3679.1.

"The AS/NZS 3679.1 Standard has minus 15 degrees as the lowest impact temperature at which domestic steel can be certified," he said.

"If we want to go below that, we actually have no domestic product standard specification to certify our product against."

Bubicich explained that Liberty OneSteel is responsive to its customers' needs and has technical experts to assist its customers. Coincidentally, as part of its quality control system, it has just completed a full round of 'charpy' impact tests at various sub-zero temperatures, including the -15°C (L15 grade). These tests provided confidence that L15 grade steels could perform adequately at -30°C.

“To answer the Samaras enquiry, we had to implement a revised testing regime for our steel,” Bubicich said.

“We had to ask ourselves: Can our NATA-certified testing facilities capably and reliably perform testing at this lower temperature and does our manufacturing process and production control support capable production of such grades?”

“We hadn’t done production and testing of that type of product requirement on a commercial basis before. And then we had our business process and systems to deploy, too.”

Bubicich said the strategy was to provide a compelling information pack, which included design guidance, supply of certified product and indicative lower-temperature performance results to Samaras to prove that the steel was suitable for the NewCold project.

“We had our Liberty OneSteel technical team examine the minimum testing requirements implied by the product Standard AS/NZS 3679.1 to confirm impact grades and how the design Standard AS 4100 should be interpreted. They were then able to offer commentary to our customer,” Bubicich explained.

“Though we couldn’t certify our products to the temperature, we could provide data and transition curve information that showed how the steel performed at temperatures lower than that mandated by the Standard.

“We had some additional random samples tested at -30°C on the section range required that confidently showed that our L15 grade steel was still above the minimum impact requirements at the temperature for Samaras.”

Solution found

Liberty OneSteel Metalcentre SA Sales Manager, **Tony Nickson** said it was important to demonstrate the cold-temperature performance of its structural steel for the NewCold facility.

“Without the extra effort that went into our cold-temperature testing regime, we may not have been able to fulfil the requirements of the project,” Nickson said.

“We were committed to finding a solution to enable us to provide a locally manufactured and supplied steel solution. Our manufacturing team was able to meet the unique requirements of this project and, consequently, we were able to supply all of the structural steel for the project, with test certificates and ACRS accreditation.

“Equally importantly, we were able to provide our client a high degree of confidence.”



Photography: Hansen Yuncken

Steel for the project was supplied between December 2016 and July 2017. Construction commenced in June 2016 and was completed in September 2017. The facility began operation in October 2017.

“It’s great to see that ASI steel fabricator member Samaras, which recently became independently certified to Construction Category 3 of the National Structural Steelwork Compliance Scheme appropriate for more complex structures, performed so well on this project,” ASI National Technical Development Manager, **Dr Peter Key** said.

PROJECT TEAM

Client: NewCold Advanced Cold Logistics

Builder: Hansen Yuncken

ASI Steel Fabricator: Samaras Structural Engineers

ASI Steel Distributor: Liberty OneSteel Metalcentre

ASI Steel Manufacturer: Liberty OneSteel



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