

Imported Fabricated Steelwork: Case Study #2

Establishing the traceability of imported steel



Project

Warehouse, Auckland

This Auckland warehouse was built using portal frame construction. The portals, which span 31m, are set at 13m intervals creating six bays. The portal frames taper from 350mm to 600mm at the knee, which is 6m in height. The portal steel, all of which is galvanised, is made from welded I beams. All the steel was sourced from China.

Issues

Structural inspections by Auckland Council identified issues with the imported steel's grading and certification. Specifically, the documentation accompanying the steelwork included a reference to

New Zealand steel standards; a reference which had not been authorised by the international accreditation body SGS who was responsible for the paperwork.

Unfortunately, the project engineer was unaware of the requirements for imported products, including the need for quality certification, verification and traceability of the steel, bolts and welded structural products.

Ultimately, compliance with the Building Code must be established before the Council can grant a building consent. The test results from China lacked traceability and the Council could not be sure the certification matched the product. Their initial concerns included:

- Sampling did not test the main structural elements

Take outs

- **Project engineer unaware of compliance requirements for imported steelwork**
- **All steel should be traceable with reference to heat numbers to ensure that the steel tested can be used in construction**
- **Two months of extensive independent testing required by Auckland council created additional cost and delays to the project**

Establishing the traceability of imported steel



- A local Optimech certificate related to the steel's chemical composition but did not provide any mechanical properties
- The SGS test certificate referred to an out-of-date version of the current standard and, accordingly, did not show compliance with AS/NZS 3678 2011
- The SGS weld inspection report did not state that welding had been undertaken in accordance with AS/NZS 1554.1

Testing

In situations where there is a dispute over the acceptance of steel, AS/NZS 3678 requires independent testing by an ILAC (International Laboratory Accreditation Cooperation) accredited test laboratory.

As credible evidence of compliance could not be provided for the portal frames, Q Designz (engineering consultants to Auckland Council), in consultation with SCNZ, recommended a series of testing procedures be carried out by an ILAC-accredited test laboratory in New Zealand.

At this point, the portal frames were already on site. Several samples were taken from the fabricated steelwork: purlins, rafters, columns, bolts and welds.

After more than two months of local testing to determine the strength, ductility and weld quality, which delayed progress on the project, the Council agreed there was sufficient information to satisfy it that the fabricated materials were compliant.

“Traceability is a requirement of the New Zealand Building Code; retrospective testing is problematic to say the least.”

– Richard Ritsma, Building Control, Auckland Council