AUSTRALIAN STEEL INSTITUTE

Design as strong as the weakest link

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The Steel Industry concern over the increase in imported fabricated steelwork is well documented, however when raised by the ASI at industry presentations to consulting engineers, it doesn't seem to have hit the radar to the same extent as the steel manufacturing or fabrication sectors.

What has hit the radar is the debate on the use of Australian specifications and ensuring compliance to these, judging by some comments received by the ASI from a well reputed Consulting Engineer member company:

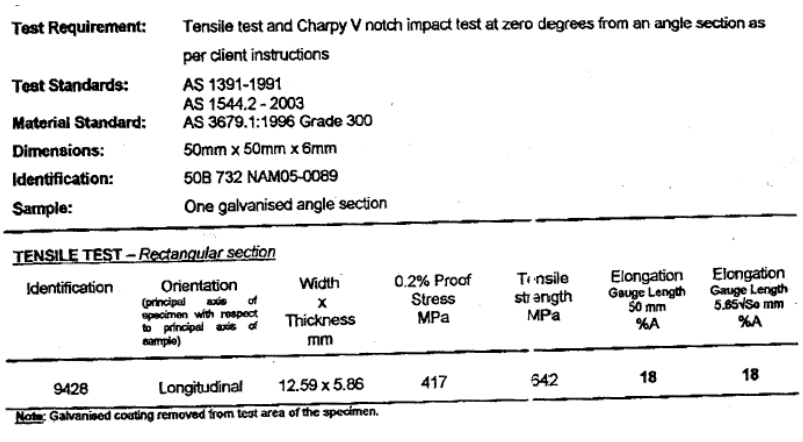
- *"It is difficult to distinguish what is what...as far as I am aware we do not have a specific marking for steel grade"*

- *"Australian standards are our bible…but I admit our checking of whether steel is complying is not always the best"*

These issues are becoming increasingly a matter of concern for designers as the percentage of imported sections and fabricated steel increases.

The monitoring of test certificates is one example.

The image left shows a certificate from an overseas steel supplier which indicated that the product does not meet the 22% minimum elongation requirement and is a FAIL, but the test certificate does not indicate this. (Note the test standard quoted as AS 1544.2-2003 is also incorrect.)



Test Requirement:	Tensile test and Charpy V notch impact test at zero degrees from an angle section as per client instructions
Test Standards:	AS 1391-1991 AS 1544.2 - 2003
Material Standard:	AS 3679.1:1996 Grade 300
Dimensions:	50mm x 50mm x 6mm
Identification:	50B 732 NAM05-0089
Sample:	One galvanised angle section

TENSILE TEST – *Rectangular section*

Identification	Orientation (principal axis of specimen with respect to principal axis of sample)	Width x Thickness mm	0.2% Proof Stress MPa	Tensile strength MPa	Elongation Gauge Length 50 mm %A	Elongation Gauge Length 5.65√So mm %A
9428	Longitudinal	12.59 x 5.86	417	542	18	18

Note: Galvanised coating removed from test area of the specimen.

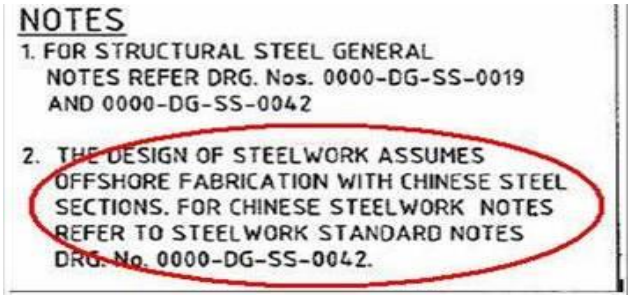
Also of concern is the substitution of an overseas material or welding standard into the Australian Steel Design Standard AS 4100.

This specification is based on the building blocks of material standards like AS 1163, AS 3679 and AS 3678 which have been calibrated based on known Australian steels, testing statistics and work practices.

There is a requirement for the designer to know what the basis of his or her design is and if there is product substitution then there may be a need to adopt a conservative approach, certainly in the area of Capacity Reduction Factor. The Building Code of Australia is quite specific here. According to AS 4100, if there is doubt on the authenticity of the material, it must be down rated to 170 MPa, because it is required to be treated as unidentified steel.

ASI steel fabricators are being asked to quote on tenders with a strong suspicion that overseas supply has already been decided by the global supply chain procurement process.

For example:


NOTES
1. FOR STRUCTURAL STEEL GENERAL NOTES REFER DRG. Nos. 0000-DG-SS-0019 AND 0000-DG-SS-0042
2. THE DESIGN OF STEELWORK ASSUMES OFFSHORE FABRICATION WITH CHINESE STEEL SECTIONS. FOR CHINESE STEELWORK NOTES REFER TO STEELWORK STANDARD NOTES DRG. No. 0000-DG-SS-0042.

All of this together with the cover-up of failures when they occur under the terms of settlement of claims, suggests that the global supply of steel into this country needs to be accompanied by a similar tightening of the quality assurance systems.

Standards Australia, driven by market concerns, has recently required the hollow sections standard AS 1163 to be tightened and have more stringent test certification and product marking requirements. The response from members of the design community of the ASI (approximately 3000 members) has been very positive toward this tightening of the required practice and the ASI encourages designers to exercise due diligence to ensure materials supplied for the design comply with the standards listed in AS 4100.