AS/NZS 5131 – Why Another Fabrication and Erection Standard?

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1.0 Introduction

In New Zealand we have the undesirable situation of an aged Structural Steel standard by international standards and we also have two sets of standards provisions that address the minimum requirements for the fabrication and erection of structural steelwork (NZS 3404:1997 – including amendments 1&2 and NZS 3404.1:2009) This is compounded by the fact that that the most recent provisions are not cited as a verification method document.

The introduction of a new joint Australia/ New Zealand structural steelwork fabrication and erection standard on the face of it appears to be adding to the problem. In this paper the rationale for developing this new standard is discussed along with an outline of its content and a vision of how this standard might fit within a suite of AS/NZS standards covering the design, fabrication and erection of composite and non- composite structures in New Zealand

2.0 Background to AS/NZS 5131

Following the publishing of the 2007 amendment 2, the intention had been to break NZS 3404 into seven sections (NZS 3404.1-7) and once this process of revising and reformatting was complete, to cite the suite of seven standards as verification documents. This process stalled after the publishing of NZS 3404.1:2009 due to standards funding and committee resourcing issues, this resourcing issue was exacerbated by the Canterbury Earthquakes and their aftermath.

During this time globalisation of construction product sourcing has seen an increase in the prevalence of imported structural steelwork in developed countries including New Zealand. This change in procurement practice raises the risk of non-compliant product and requires more robust product conformance requirements in steelwork execution standards to help construction reviewers ensure structural steelwork meets the requirements of the Building Code.

Seeing the need for a fabrication and erection document that could supplement the content of NZS 3404.1:2009 with international best practice, HERA and SCNZ worked with the Australian Steel Institute in developing the Structural Steelwork Fabrication and Erection Code of Practice which was published in 2014. This became the basis for AS/NZS 5131. In developing this standard reference was made to the European standard EN 1090-2.

AS/NZS 5131 introduces the fundamental concept of 'construction category' (CC), which is linked to the Importance level of the structure and provides the minimum levels of workmanship required to ensure the design assumptions remain valid. It is expected the CC categorisation will be implemented in other standards such as NZS 3404, AS/NZS 2327, AS/NZS 5100.6 and AS 4100 in due course. The CC categorisation in AS/NZS 5131 forms the framework for the recently launched Steel Fabricator Certification scheme.

3.0 Scope of AS/NZS 5131

The draft standard, AS/NZS 5131 developed by a joint Australian and New Zealand technical committee sets out the minimum requirements for the construction of structural steelwork involving:

- Fabrication including bolting and welding
- Preparation of steel surfaces for corrosion protection
- Corrosion protection comprising painting and galvanising
- Erection and modification of steelwork

It applies to complete structures, individual members and components, and manufactured components pre-fabricated for inclusion in steel structures. AS/NZS harmonises existing sections of other standards to provide a dedicated document on fabrication and erection requirements.

4.0 NZS 3404.1:2009 and AS/NZS 5131

Most of the content of NZS 3404.1:2009 has been included in AS/NZS 5131 either in the body of the document or as New Zealand only content. The obvious omissions are chapter 2 and chapter 5; Materials and Brittle Fracture and Coating Protection respectively. The rationale for this is that these best fit in a design standard not an execution standard and can be incorporated into a future revision of the design provisions of NZS 3404. In the interim until this happens, reference can still be made to NZS 3404.1:2009 for this information.

5.0 Future Steel Structures Standards Development and AS/NZS 5131

There is a trend towards globalisation of standards to facilitate trade and also to reduce the cost of developing and maintaining world best practice documents. Historically NZS 3404 has been based on a substantial portion of the Australian Structural Steel Standard AS 4100, this has included fabrication and erection provisions. The main departures being seismic design and fabrication and composite structure design provisions.

There is currently a joint Australian/New Zealand Steel-concrete composite standard (AS/NZS 2327) under development with a technical committee comprising Australian and New Zealand representatives. This standard will cover the design of composite beams, columns, slabs and systems. It will likely be out for public comment in the last half of 2016. A similar process is underway for a joint steel-concrete composite bridge standard (AS/NZS 5100.6).

Once AS/NZS 5131 and AS/NZS 2327 have been published, there is the potential for these standards to replace the steel-concrete composite and fabrication and erection provisions of NZS 3404. A possible way forward to revise the remaining design provisions of NZS 3404 would be to develop a joint Australian/ New Zealand standard with NZ only provisions for seismic design. This would follow a similar approach to the joint loadings standard AS/NZS 1170. In such a standards framework, AS/NZS 5131 would provide a harmonised set of fabrication and erection provisions for all the structural steel design standards (composite and non-composite, buildings and bridges). Key stake holder consultation and agreement would be required to confirm this approach.

Possible Harmonised AS/NZS Structural Steel Standards