

AS/NZS 5131, THE NEW NATIONAL STEELWORK SPECIFICATION AND CERTIFICATION

TOOLS FOR RISK MINIMISED PROCUREMENT OUTCOMES



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Outline:

- ‘Setting the scene’ – why you need to mitigate risk
- The ‘cost’ of noncompliance
- The tools ASI provides to mitigate risk
- The new AS/NZS 5131
- NSSS – the National Structural Steelwork Specification
- NSSCS – National Structural Steelwork Compliance Scheme
- Update – where are we up to?



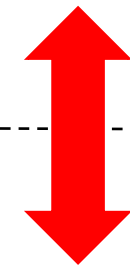
We all know why we need to mitigate risk.....

Non-compliance is across all construction products:



Plywood delamination

LIFE RISK



COST



The replacement of sub-standard glass at the 150 Collins St building project is estimated to cost \$18 million, the CFMEU said today. Grocon has revealed today it has to replace half the glass in the \$180 million building. The glass came from Chinese supplier, China Southern Glass."

We all know why we need to mitigate risk.....

FRAUD:



'Silastic' welds!

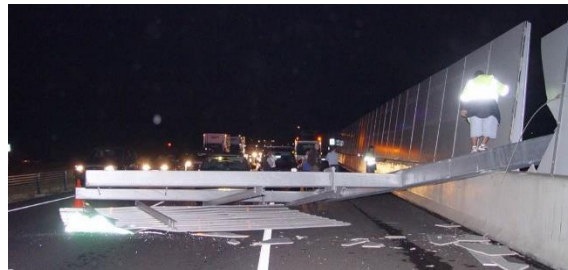


Water-filled members!

MATERIALS:



Pressure vessel cracking



Bolt failures

Note revision to AS/NZS 1252!

Boron 'spiking'



Material cracking



Poor galvanising results

WORKMANSHIP:



Poor workmanship



Weld cracking



Poor welding



Poor painting

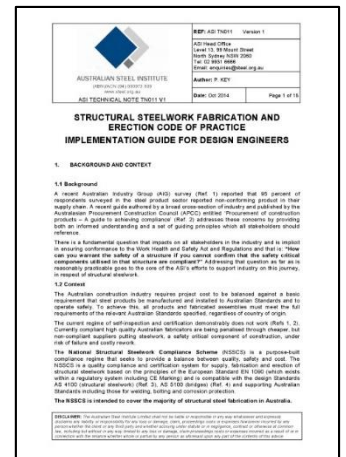
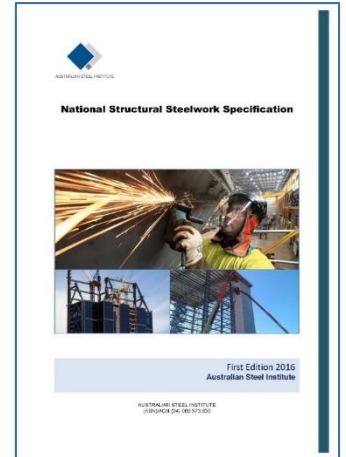
The 'cost' dimensions of non-compliance

1. The **cost of rework** to repair or replace non-compliant product
2. The **cost of a life** due to faulty materials or products
3. The **cost to enact increased maintenance regimes** over the lifetime of the structure
4. A **reduction in lifetime** of the structure
5. **Cost to your reputation**



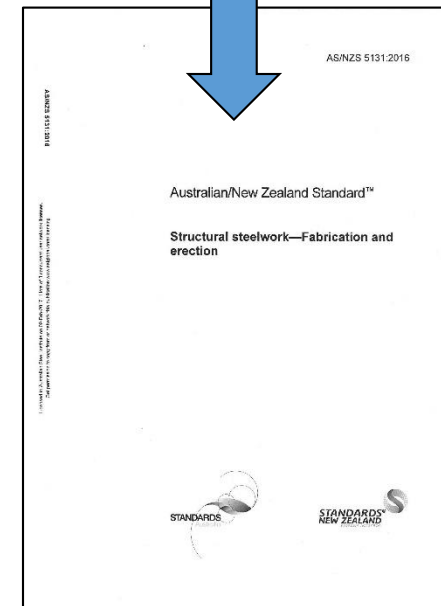
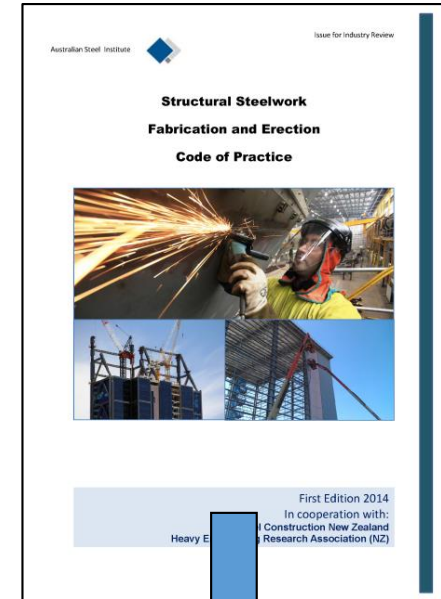
The tools and initiatives we have to mitigate risk:

- The new **AS/NZS 5131** : Structural Steelwork – Fabrication and erection
- The new **National Structural Steelwork Specification (NSSS)**
- The NSSCS and certification – **Steelwork Compliance Australia (SCA)** (<http://www.scacompliance.com.au/>)
- Awareness initiatives
- Work with industry – NATSPEC, Roads authorities etc



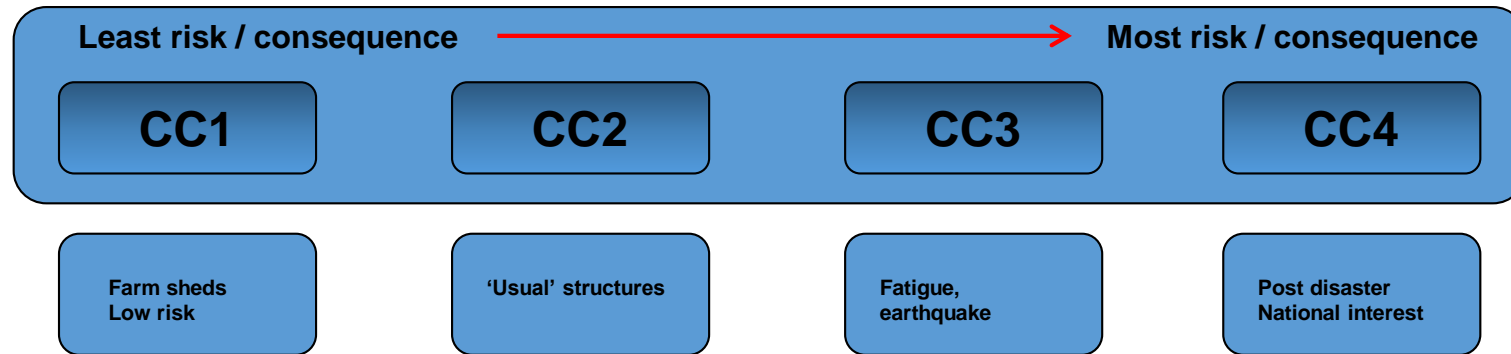
- Based on ASI 'Structural Steelwork Fabrication and Erection Code of Practice'
- Represents international 'good practice'
- Overlays a risk-based fit-for-purpose approach – the Construction Category
- Overlays project specific choices

'Three layer model'



What is the Construction Category (CC)?

A risk-based fit-for-purpose classification:



- The engineer assigns a 'Construction Category' (CC) – *Simple!*
- The engineer adjusts his specification – *easy!*
- The fabricator works to the processes required by the CC – *good practice!*



For everybody, this de-risks the process and makes life easier!

Assessing the Construction Category:

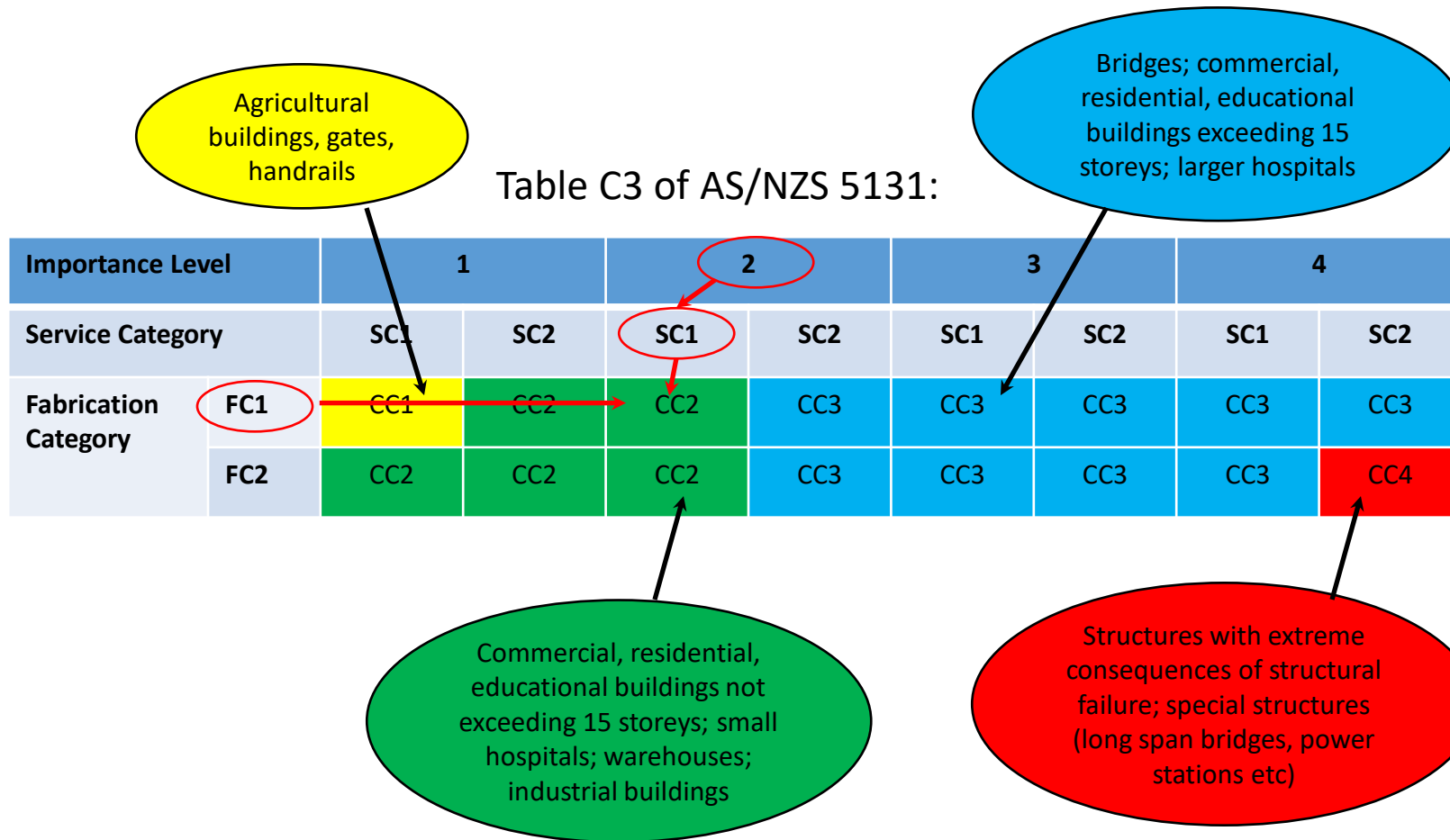


- From NCC for domestic/residential/commercial structures in Australia
- From AS/NZS 1170.0 for structures outside scope of NCC
- From AS/NZS 1170.0 for New Zealand

Table C1 Suggested Criteria for Service Categories	
Categories	Criteria (Simplified)
SC1	<ul style="list-style-type: none"> • Quasi-static actions • Low seismic activity
SC2	<ul style="list-style-type: none"> • Where fatigue assessment influences design outcomes • Regions of medium to high seismic activity

Table C2 Suggested Criteria for Fabrication Categories	
Categories	Criteria (Simplified)
FC1	<ul style="list-style-type: none"> • Non welded components • Welded components less than or equal to Grade 450
FC2	<ul style="list-style-type: none"> • Welded components above Grade 450 • Site welded safety critical components • Components receiving thermic treatment during manufacturing • CHS end profile cut components

Assessing the Construction Category:



Potential classification of typical roads infrastructure

Construction Category	Typical roads infrastructure
1	<ul style="list-style-type: none"> No structures applicable
2	<ul style="list-style-type: none"> Vehicle restraint components – low and regular performance barriers Bus station structures – on ground General road furniture
3	<ul style="list-style-type: none"> Bridges conforming to AS/NZS 5100.6 Over road hardware – cantilever and overhead gantries, high mast lighting poles Vehicle restraint components – medium, high or special purpose barriers Bus station structures - elevated
4	<ul style="list-style-type: none"> Project specific based on high risk and/or extreme consequences of structural failure

Message: The final categorisation will become industry accepted and only out-of-the-ordinary projects will require detailed consideration

A solution involving the whole supply chain:

Designers:

- Select the appropriate **'Construction Category'**
- Ensure **Specifications** for the project correctly implement the AS/NZS 5131 requirements
- Where contracted, provide support to builder/client in reviewing project compliance

Distributors:

- Provide **test certificates** with steel supplied. Where not ACRS Certified and requested by the fabricator, provide 'Declaration of Compliance'
- Maintain **traceability** through necessary documentation
- **'Steel processors'** have added requirements

Fabricator:

- Ensure processes and documentation are consistent with the **Construction Category**
- Provide necessary **project specific documentation** as and when needed
- Provide the **Declaration of Compliance (DoC)** for the products covered

Builder:

- Establish **clear responsibilities** – recommend a **'Compliance Management Plan'** for the project
- Ensure **fabricator capability** (check SCA website listing)
- Assemble and submit required **compliance documentation**
- Manage **duty of care** to WHS Act and 'chain of responsibility'



An ecosystem connected by information and knowledge

Where are we up to?

- AS/NZS 5131 was published late 2016
- ~~AS/NZS 5131 has been sewn into the revised AS/NZS 5100.6~~
- **AS 4100 is currently being revised to incorporate AS/NZS 5131 – will sew AS/NZS 5131 into the NCC**
- ~~Fabricator certifications commenced 4th quarter, 2014 and are ongoing (more on this later)~~
- JAS ANZ Accreditation of SCA

Did you know:

- Projects are increasingly being specified with construction categories
- Large consulting engineers such as Arcadis, ARUP, and Aurecon have all implemented AS/NZS 5131, based on review of our NSSS
- State Governments are supporting our initiatives. SA is a leader in this regard!



Why a National Structural Steelwork Specification?

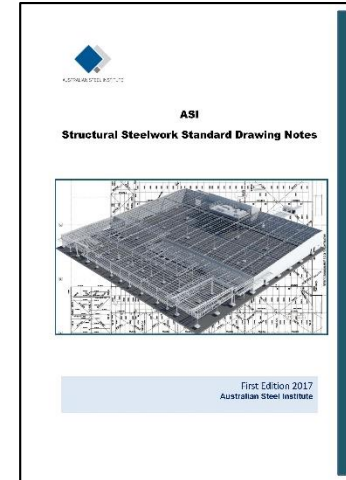
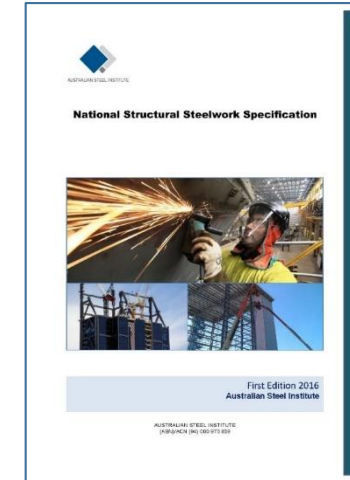
- Helps to ensure compliant outcomes
- Standardisation and efficiency
- An opportunity to develop a rational **national technical prequalification scheme**



The National Structural Steelwork Specification (NSSS)

Context:

- Developed by ASI using AS/NZS 5131 as the technical foundation
- Peer reviewed
- Incorporates the ‘three layer model’ from AS/NZS 5131
- Includes separate ‘Standard drawing notes’

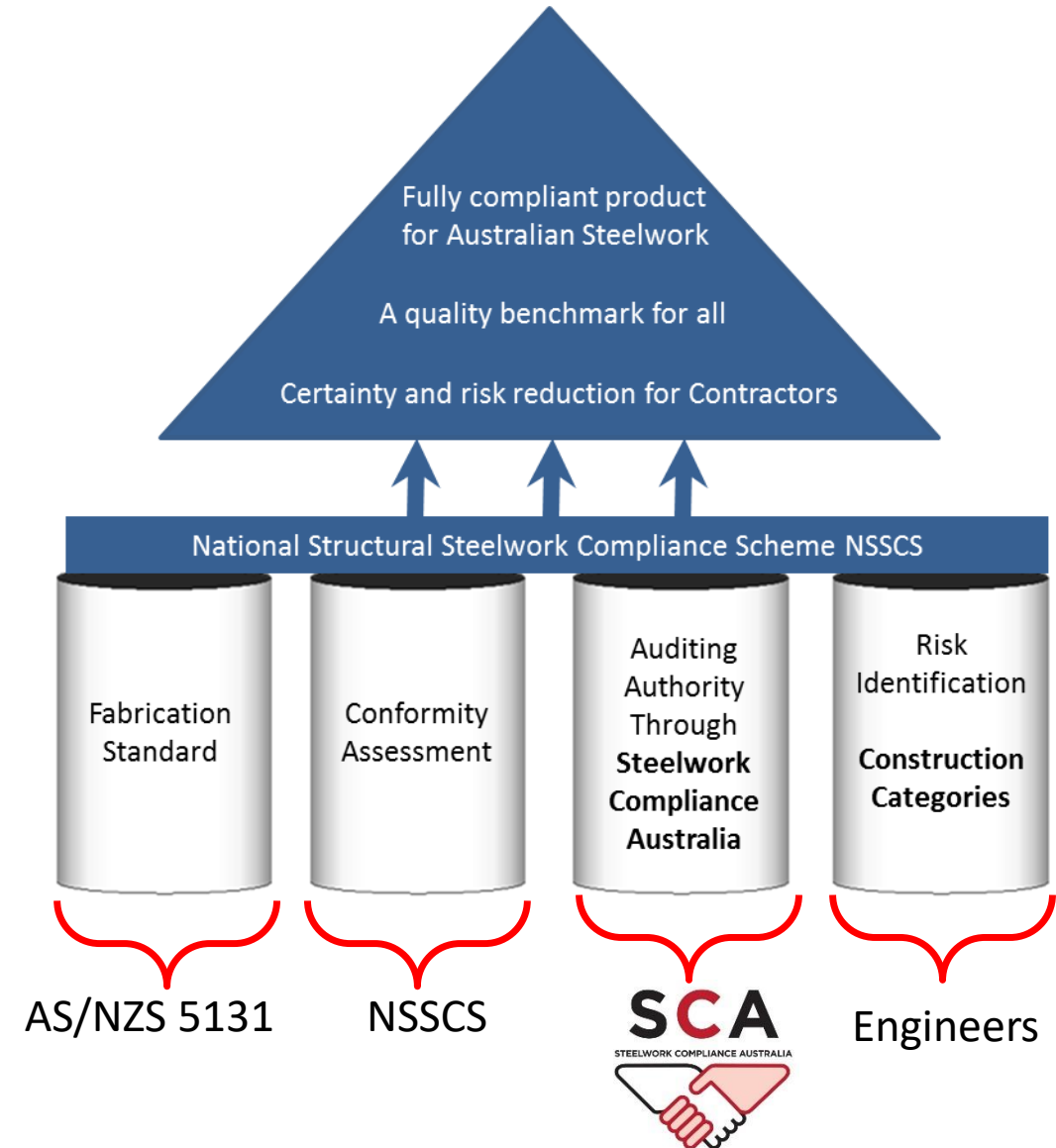


The NSSS is available for free download in Word and PDF format off our website:
<https://www.steel.org.au/focus-areas/quality-and-compliance/national-structural-steelwork-specification/>

A Compliance Scheme for Australia

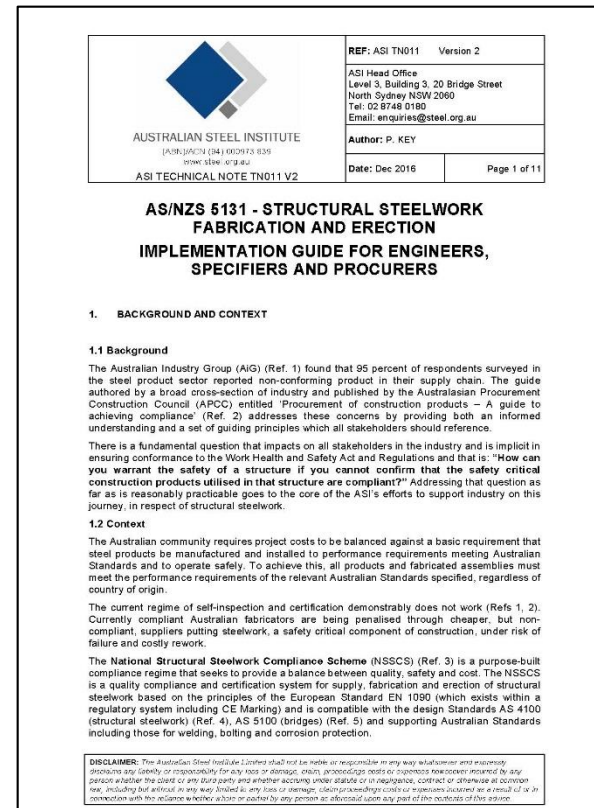
The NSSCS ...

- Is based on best international practice
- Requires independent 3rd party auditing to the fabrication Standard AS/NZS 5131
- Provides reassurance to the market place that the fabricator has the capability to fabricate and erect steelwork to the construction category in which they are certified.
- Provides specifiers, engineers, builders and end users with the ability to select steelwork fabricators who are capable
- Provides a structured approach for structural steel fabricators to develop and improve their quality processes and QMS.



Where do I get help?

- Visit our compliance website: <https://www.steel.org.au/focus-areas/quality-and-compliance/>
- Review the NSSCS for Builders: <https://www.steel.org.au/focus-areas/quality-and-compliance/nsscs-for-builders/>
- Download Tech Note TN-011: <https://www.steel.org.au/focus-areas/quality-and-compliance/nsscs-for-engineers/>
- New eLearning modules! (coming soon)
- Support – training, publications
- Email me: peterk@steel.org.au
- Join our mailing list
- **Talk to SCA!:** <http://www.sacompliance.com.au/>



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AS/NZS 5131 - STRUCTURAL STEELWORK FABRICATION AND ERECTION IMPLEMENTATION GUIDE FOR ENGINEERS, SPECIFIERS AND PROCURERS

1. BACKGROUND AND CONTEXT

1.1 Background

The Australian Industry Group (AIG) (Ref. 1) found that 85 percent of respondents surveyed in the steel product sector reported non-conforming product in their supply chain. The guide authored by a broad cross-section of industry and published by the Australasian Procurement Construction Council (APCC) entitled 'Procurement of construction products – A guide to achieving compliance' (Ref. 2) addresses these concerns by providing both an informed understanding and a set of guiding principles which all stakeholders should reference.

There is a fundamental question that impacts on all stakeholders in the industry and is implicit in ensuring conformance to the Work Health and Safety Act and Regulations and that is: "How can you warrant the safety of a structure if you cannot confirm that the safety critical construction products utilised in that structure are compliant?" Addressing that question as far as is reasonably practicable goes to the core of the ASI's efforts to support industry on this journey, in respect of structural steelwork.

1.2 Context

The Australian community requires project costs to be balanced against a basic requirement that steel products be manufactured and installed to performance requirements meeting Australian Standards and to operate safely. To achieve this, all products and fabricated assemblies must meet the performance requirements of the relevant Australian Standards specified, regardless of country of origin.

The current regime of self-inspection and certification demonstrably does not work (Refs 1, 2). Currently compliant Australian fabricators are being penalised through cheaper, but non-compliant, suppliers putting steelwork, a safety critical component of construction, under risk of failure and costly rework.

The **National Structural Steelwork Compliance Scheme (NSSCS)** (Ref. 3) is a purpose-built compliance regime that seeks to provide a balance between quality, safety and cost. The NSSCS is a quality compliance and certification system for supply, fabrication and erection of structural steelwork based on the principles of the European Standard EN 1090 (which exists within a regulatory system including CE Marking) and is compatible with the design Standards AS 4100 (structural steelwork) (Ref. 4), AS 5100 (bridges) (Ref. 5) and supporting Australian Standards including those for welding, bolting and corrosion protection.

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ASI Code of Practice for Fabrication and Erection of Structural Steelwork

An Introduction for Structural Engineers

Introduction

The steel supply chain in Australia

- The supply chain is changing.....
- The veracity of the supply chain is important
- The Work Health & Safety Act 2011 places legislated responsibilities on all stakeholders

Knowledge Check

Learning Objective: Reinforce your understanding of the steel supply chain

Instructions: Drag the correct icon on the left to the position on the supply chain diagram on the right

Manufacture (Steel) | Importer | Project

Basis for an Australian Compliance Scheme

Existing International Schemes:

- American scheme
- European scheme

The ASI Steelwork Compliance Scheme:

- Fit for purpose
- Uniquely Australian

American (AISC): Market driven, Voluntary, Some legislation, Supported by industry created specifications and Codes of Practice

Australia / New Zealand: Market driven, Voluntary, Supported by Standards and Codes of Practice, Supported by SCA, WHS Act, Technically rigorous

European: Highly regulated, Based on CE Marking, Supported by Harmonised Standards, Technically rigorous

A Unique Australian Compliance Scheme

Thank you

Questions?

Email me: peterk@steel.org.au

