GOOD PRACTICE STEELWORK PROCUREMENT

Guidance for Building Surveyors

AUSTRALIAN STEEL INSTITUTE

Building Surveyors and steelwork procurement

Building surveyors have responsibilities to meet requirements for sufficient inspections under applicable legislation, a component of their role for managing the building approval process with all relevant practitioners. This important role influences compliance levels for building work.

A primary mechanism for ensuring compliance is the implementation of an inspection schedule that is responsive to the type of structure (Building Class 1 to 10 in the National Construction Code (NCC)) and project-specific requirements. It is generally recognised that a risk-based approach allows building surveyors to take an overall view of the safety requirements of the building and establish an inspection schedule.

A fundamental component of the compliance of the overall building is ascertaining the compliance of the safety critical construction products to meet the performance requirements under the NCC. Ascertaining the compliance of those construction products is far from trivial, in particular with increasing international procurement and, done properly to meet duty of care under Workplace Health and Safety requirements, can impose significant time and cost. Certainly, there is pressure to reduce that time and cost, leading to potentially non-compliant outcomes and elevated risk to our community.

Under these scenarios, it is important that stakeholders in the procurement chain are provided pragmatic cost-effective tools that enable their processes to be undertaken efficiently and demonstrably meet duty of care. With regard to steelwork procurement, the Australian Steel Institute (ASI) has underwritten the development of the new Australian Standard **AS/NZS 5131 Structural steelwork – Fabrication and erection** and, using AS/NZS 5131 as the technical foundation, published the **'National Structural Steelwork Specification'** (NSSS) and developed the **'National Structural Steelwork Compliance Scheme'** (NSSCS).

This advisory note provides building surveyors an understanding of these recently developed tools and how they may be adopted and utilised to provide building surveyors with more effective and efficient processes to meet duty of care. Importantly, it provides a basis for establishing a risk-based approach and a consequent **sufficient inspection schedule**.

The new AS/NZS 5131– What is it?

The new Australian Standard AS/NZS 5131 defines **good practice** for fabrication and erection of structural steelwork for projects in Australia and is the basis for the new NSSCS.

AS/NZS 5131 addresses:

- Requirements for **documentation and specification**
- **Materials**, including steel, welding consumables, fasteners and grout
- **Preparation and assembly**, including cutting, shaping and holing
- **Welding**, including welding processes and qualification of welding procedures and personnel
- **Mechanical fastening** (bolting, tensioning of bolts, special fasteners, post-fixed anchors)
- **Surface treatment and corrosion protection**
- **Architecturally exposed structural steelwork**
- **Erection**
- **Geometrical tolerances**
- **Inspection, testing and correction**
- **Site modifications and repair of existing structures**

AS/NZS 5131 utilises a **risk-based fit-for-purpose approach** implemented through the classification of the **'Construction Categories'** (CC) for the whole or parts of the structure. The CC is strongly aligned with the Structure Importance Levels from the NCC. This establishes a **Quality Benchmark** responsive to the needs of your project and client.

AS/NZS 5131 in the project process

Fitting AS/NZS 5131 into your project process is straightforward:

DESIGN:

- Engineer designs structure and creates specification
- Specification calls up AS/NZS 5131, Construction Category and project-specific selections

FABRICATION AND ERECTION:

- Client/builder selects fabricator, who works to requirements in AS/NZS 5131
- Best outcomes with a fabricator independently certified under the NSSCS

CERTIFICATION AND SIGN-OFF:

- Building surveyor collates compliance documentation and undertakes inspections – issues occupation certificate
- Best outcomes with an NSSCS supported procurement process

Fabricator certification and the National Structural Steelwork Compliance Scheme

Using AS/NZS 5131 as the technical foundation, the ASI has developed the NSSCS, comprising four supporting pillars:

- AS/NZS 5131 as the technical foundation
- Risk assessment and engineer selection of the **'Construction Category'**
- Conformity assessment to the requirements of AS/NZS 5131
- Auditing and certification of fabricators through **Steelwork Compliance Australi**a (SCA)

SCA
STEELWORK COMPLIANCE AUSTRALIA

Industry association led compliance schemes are commonplace in the UK, US, Canada and New Zealand, and in Europe (and the UK) compliance is legislated as a mandatory safety requirement for all structural steelwork. New Zealand has joined Australia in developing an industry-led compliance scheme based on AS/NZS 5131.

The benefits of the NSSCS and fabricator certification

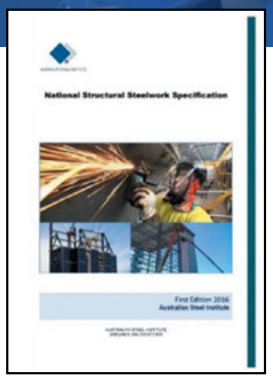
- Provides a **high level of assurance** that the fabricated steel for your project is from a qualified competent fabricator
- Is an **open scheme** and any fabricator based in Australia or overseas who can demonstrate capability to meet the requirements of the new Standard can be certified
- **Saves significant project resources and time** in checking of product compliance

- Is effectively a **National Steelwork Technical Prequalification Scheme,** which in time will save the Australian community significant costs in making the project tendering process more efficient

The benefits of the NSSCS for building surveyors

- **Saves significant project resources and time** in auditing of product compliance, both the steel and the completed steelwork structure
- Provides a high level of assurance that the fabricated steel for your project is from a qualified competent fabricator

- Is effectively a **National Steelwork Technical Prequalification Scheme**, which in time will save the Australian community significant costs in making the project procurement process more efficient
- Complements a risk-based approach to project certification
- Helps to manage your risk and duty of care under Workplace Health and Safety requirements (Safe design of structures)



The National Structural Steelwork Specification (NSSS)

The new ASI NSSS has been developed as the primary implementation tool for engineers and specifiers to embed the requirements of AS/NZS 5131 into standard practice. Together with the companion structural steelwork 'Standard Drawing Notes', these tools are available for free download from:

steel.org.au/key-issues/compliance/national-structural-steelwork-specification/

A risk-based approach to establishing a sufficient inspection schedule

The use of a risk-based approach to developing and implementing a sufficient inspection schedule for building surveyors can be achieved through a risk matrix that assigns the steelwork structure a rating based on certain criteria. The risk rating assists the building surveyor in determining an inspection schedule, including the type and frequency of inspections required, commensurate with other factors which will determine the application of inspectorial resources.

How to use the risk matrix

The risk matrix outlined below is intended purely for the perspective of supply, fabrication and erection of the structural steelwork component of the building project. Three risk categories of low, medium and high are established, where a risk level is established when all the criteria under a particular level are met. If any criterion is not met under that particular level, the structures risk level is increased to the next relevant level.

Risk factor	Risk level		
	Low risk	Medium risk	High risk
Construction category [1]	CC1, CC2, CC3	CC1, CC2, CC3, CC4	CC2, CC3, CC4
NSSCS compliant	Yes	No	No
Steel supply	Proof that steel is supplied from mill that has third-party certification to Australian Standards, with traceability via valid Test Certificates Steel from ACRS (or equiv) certified manufacturer, with valid test certificate supplied	From mill manufacturing to Australian Standards, including supply of valid Test Certificates from an ILAC accredited laboratory [2] Valid Test Certificate from ILAC laboratory	From mill with non-compliant product or no Test Certificates supplied. No, or non-compliant, Test Certificate supplied [3]
Steelwork fabrication	SCA certified fabricator	Fabricator with demonstrated experience working to Australian Standards [4]	Fabricator with unproven or limited experience working to Australian Standards
Steelwork surface protection	Contractor with recognised third-party certification or managed under SCA certified fabricator	Contractor with demonstrated experience working to Australian Standards [4]	Contractor with unproven or limited experience working to Australian Standards
Steelwork erection	Contractor with recognised third-party certification or managed under SCA certified fabricator Verified erection planning to ASI Steelwork Erection Guide [5]	Contractor with demonstrated experience working to Australian Standards [4]	Contractor with unproven or limited experience working to Australian Standards

Notes:

(1) The Construction Category, as defined in AS/NZS 5131, is usually provided by the engineer, ideally on the project drawings.

(2) Mills manufacturing to Australian Standards should be able to provide the documentation stated in the applicable product Standards, including AS/NZS 1163, AS/NZS 3678, AS/NZS 3679.1, AS/NZS 3679.2 as appropriate. See also Ref [2].

(3) Proving the performance equivalence of structural steel manufactured to non-Australian Standards is not straightforward. Building surveyors must critically examine certifications received. See also Ref [1].

(4) The competency and track record of contractors involved is an important indicator of likely project risk. The building surveyor should request records of contractor experience on similar size or complexity projects working to Australian Standards. AS/NZS 5131 provides guidance on the processes the contractor must undertake and an indication of competency requirements. Preferably, from the perspective of minimising the work required of the building surveyor, contractors should be certified under a recognised third-party certification scheme.

(5) Ref [3] outlines a robust approach to planning steelwork erection. Elements are included in AS/NZS 5131.

Establishing a sufficient inspection schedule

A sufficient inspection schedule will reduce a building surveyor's liability, protect the interests of the builder responsible for the overall construction program and protect the community against the risks and long-term maintenance issues associated with non-compliant building products and installation procedures.

The extent and type of inspections required as part of a 'sufficient inspection schedule' should be strongly linked to the risk assessed from the risk matrix noted above, and may comprise a combination of:

1. Review of drawings and specifications compared to planned construction and against applicable Standards and Codes.
2. Desktop audit of certification documentation for steel products compared to the requirements of the relevant Australian Steel Product Standards.
3. Requiring the engineer to rigorously demonstrate performance equivalence where alternative solutions under the NCC are proposed. Alternative solutions include steel products not manufactured to Australian Standards.
4. Visits to contractor shops where required to assess capability.
5. Review of any third-party certification credentials. Often this can be a simple matter of accessing the certification authority website and checking status of the entity claiming certification.

   Visit: www.scacompliance.com.au/certified-companies/
6. Construction site visits to visually check required identification markings on steel products. It is convenient to audit these elements when they are accessible and able to be clearly viewed. An inspection schedule that complements the building program should be established.

A building surveyor should require all necessary information to be readily available to assist in formulating an inspection schedule. The importance of detailed and timely documentation should not be underestimated in the context of inspecting building work.

Where to from here?

To maximise the benefits for all of the stakeholder chain:

- Ensure the engineer has called up AS/NZS 5131 and clearly **specified the appropriate Construction Category**.
- If engaged early in the project, **encourage the adoption of the NSSCS**.
- Encourage use of the **National Structural Steelwork Specification and Standard Drawing Notes**.

References

1. Hogan, T.J., Technical Note TN005 *Guidelines to designing to AS 4100 when imported materials are involved,* version 3, Australian Steel Institute, 2012. Download from steel.org.au/elibrary/asi-technical-notes/
2. OneSteel, *'2016 Structural steel standards and specifications: Strengthening compliance requirements'*, 2016. Download from www.onesteel.com/media/2894/new-standards-brochure_2016.pdf
3. Australian Steel Institute, *'Practical guide to planning the safe erection of steel structures'*, 2016. Download from steel.org.au/key-issues/fabrication-competitiveness/erection/

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