

Chapter 9

FABRICATION AND CONSTRUCTION PRACTICE

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9.1. SCOPE AND GENERAL

Steel framing is simple and straightforward to fabricate and construct. The sections in this chapter are aimed at highlighting “hints and precautions” to enhance fabrication and construction practice. As with all construction, correct attention to designers’ instructions and good trade practice are essential to good quality construction outcomes.

9.2. FABRICATION SYSTEMS

9.2.1. Quality management

Frame fabrication should be carried out under an auditable quality assurance system. Such a system should be designed to ensure, as a minimum, the manufacture of all structurally critical components and assemblies to relevant standards. Some of the key elements of such a system are material sampling, material identification and manufacturing tolerances.

9.2.2. Material sampling

A key issue in ensuring that a material is fit for purpose is ensuring that this material is regularly sampled and tested during the construction process, to ensure compliance with relevant Standards. The Performance Requirements of the BCA in both Volumes 1 & 2 state that material properties are to be specified as five percentile values (Part BP1.2 in Volume 1 and Part

P2.1 in Volume 2). A sampling procedure is required to develop five percentile values for the material properties. The sampling procedure proposed in Appendix B of AS 1397 “Steel sheet and strip – Hot-dipped zinc coated or aluminium/zinc-coated” recommends sampling of metallic coated sheet steel every 50 tonnes. This is considered to be a minimum appropriate sampling procedure for generating five percentile values for steel framing systems in accordance with the BCA. For typical steel framing systems, this might be equivalent to sampling of material from every 20th frame. The five percentile values may be obtained from the steel coil supplier, or may be obtained by checking of properties elsewhere, such as at the point of frame manufacture.

9.2.3. Material identification

Having established the properties of the materials, it is important that parties involved in the design and approval of steel framing systems can easily identify key properties such as the base metal thickness, the yield strength, the coating class and any documents that the material complies with. It is recommended that a means is established to ensure that these details are easily identifiable and that any identification complies with the requirements of the relevant standard.

9.2.4. Manufacturing tolerances

Refer to NASH Standard Part 1, Appendix C for manufacturing tolerance requirements. Designers should also be familiar with specifications and tolerances for sundry components not within the scope of the Standard.

9.3. SAFETY

9.3.1. Fabrication and construction safety

Wherever possible, hazards should be eliminated in the design process. Design documentation should highlight specific hazards.

Flying and falling building debris is a serious hazard to life and property. All construction practitioners should be aware of the need to prevent any part of the building envelope from becoming detached, and to secure unfixed and waste materials during the construction process.

Fabricators and installers should adopt safe work practices and comply with relevant regulations.

9.3.2. Electrical safety

All electrically conductive sections of steel structural frames should be earthed in accordance with the requirements of the local electricity authority. As soon as practical in the frame erection process, a temporary earth should be established until the permanent earth is installed.

9.3.3. Temporary bracing

Wall panels, roof panels and trusses derive mutual stability in the finished frame structure. During construction, they may require temporary propping to prevent collapse and to ensure secure footing for installation workers. Designers should highlight, and builders should ensure, that there is always sufficient support for the freestanding structure (wall panels and roof trusses) by adding temporary props or bracing as required. Typically every wall panel or truss should be individually propped until secured to the permanent, fully braced structure. This is particularly necessary for long runs of walls or large truss spans.



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NASH Handbook

Design of Residential and Low-rise Steel Framing



©NASH 2009

ISBN 978-0-646-51133-7

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The National Association of Steel-Framed Housing (NASH) is committed to enhancing the availability and dissemination of information relating to the development of steel framing. The NASH Handbook – Design of Residential and Low-rise Steel Framing (the Handbook) is provided for general information only and should not be taken as providing specific advice on any issue. In particular, this Handbook is not mandatory or regulatory in nature. Rather, it is designed to assist in making information on this topic readily available.

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- Guarantee acceptance or accreditation of a design, material or building solution by any entity authorised to do so under any law;
- Mean that a design, material or building solution complies with the Building Code of Australia (BCA);
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Preface

Steel framing is commonly chosen for houses and other forms of low-rise construction as it is:

- Cost effective
- Dimensionally stable
- Non combustible
- Termite and borer proof
- Durable
- Strong but lightweight
- 100 percent recyclable
- Consistent in its properties and performance

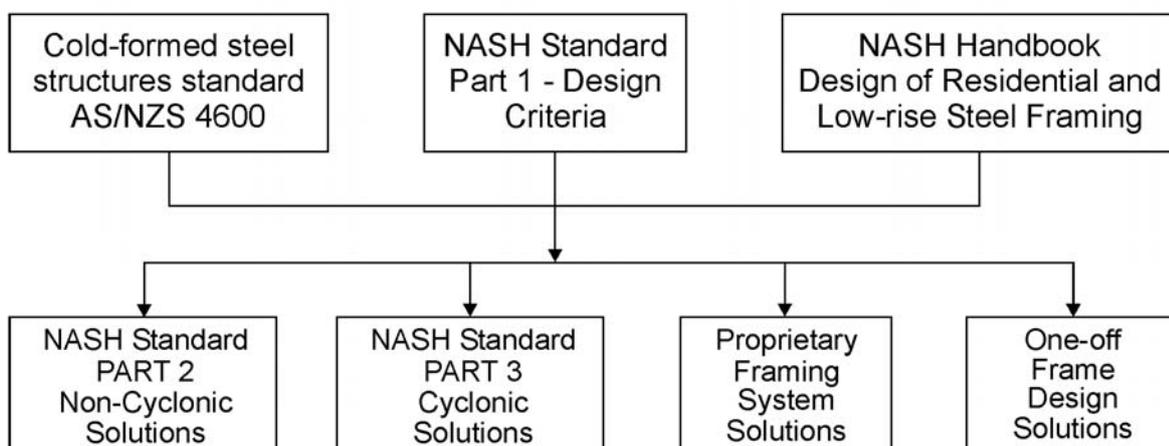
The NASH Standard – Residential and Low-rise Steel Framing Part 1: Design Criteria sets out the design criteria, in terms of structural adequacy and serviceability, for use in the design of low-rise steel framing. This includes houses as well as other low-rise residential and commercial buildings.

This Handbook aims to assist the steel framing designer in the application of the NASH Standard Part 1. However, it does not purport to provide a detailed guide on the use of the Cold-formed steel structures standard AS/NZS 4600 or replace engineering judgement.

The Handbook contains performance data for a number of proprietary components such as screws, rivets, bolts and anchors. This information has been reproduced in Appendices in good faith from information provided by the relevant manufacturers. It has been included to assist the use of the Handbook as a reference for users, but is not exhaustive. Handbook users should contact relevant manufacturers directly for additional performance information.

Two separate Standards (Part 2 & 3) are being developed to provide steel framing span tables and related information and these will be published in due course. The relationship between the Standards and this Handbook is illustrated below.

The NASH web site www.nash.asn.au is regularly updated and provides supplementary information to this Handbook.



National Association of Steel-Framed Housing Inc

NASH is an active industry association centred on light structural framing systems for residential and similar construction. NASH represents the interests of suppliers, fabricators and customers – all those involved in steel framing systems.

NASH's key objectives are to:

- Support the long term growth and sustainability of the steel frame industry.
- Maximise awareness of the steel frame industry in the market place.
- Promote the advantages of steel frames to the building industry and homeowners.

Acknowledgements

The following companies, organisations and individuals were represented on the industry committee responsible for preparing this Handbook:

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Kavitha Mysore	BlueScope Lysaght
Graeme Stark	BlueScope Steel
Trevor Clayton	BlueScope Steel
Lex Somerville	BMCC Services
Lam Pham	CSIRO – Sustainable Eco Systems
David Collinson	ITW Buildex
Ken Watson	National Association of Steel-Framed Housing Inc
Michael Kelly	National Association of Steel-Framed Housing Inc
Hayden Dagg	OneSteel Australian Tube Mills
Ross Dempsey	OneSteel Australian Tube Mills
Andrew Byrne	Rondo Building Services
Subo Gowripalan	Stramit Building Products
Greg Anderson	Structerre Consulting Engineers
Les McGrath	TGM Group
Emad Gad	University of Melbourne / Swinburne University of Technology
Bruce Cannon	Welding Technology Institute of Australia

International contributors

Gordon Barratt	NASH New Zealand
Hennie de Clercq	Southern African Light Steel Framing Association

The following companies provided their proprietary data which has been reproduced in Appendix D and Appendix E:

- ITW Buildex
- Bremick Fasteners
- Henrob
- Acument Australia
- Ramset
- Boral Plasterboard.