

# Chapter 3

## WALL SYSTEMS

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### 3.1. SCOPE AND GENERAL

This chapter covers the design of wall framing systems. It includes load bearing and non load bearing walls as well as external and internal walls. The wall components include studs, top and bottom plates, lintels, noggings and posts. This chapter covers the design of walls to resist loads arising from roofs and floors and wind loads normal to the wall. The design of a wall to resist horizontal forces in the plane of the wall (bracing or racking) is covered in Chapter 6 Bracing Systems.

For wall framing terminology refer to Appendix A.

A typical wall system is shown in Figure 3.1. Various common forms of studs are given in Figure 3.2.

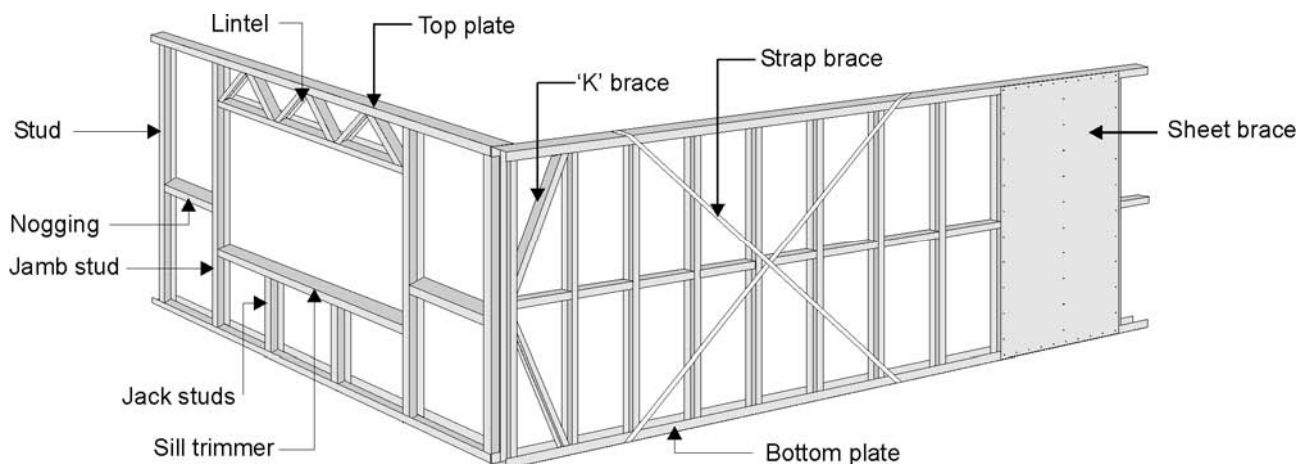


Fig. 3.1 Typical wall framing system



Fig. 3.2 Common forms of wall studs

### 3.2. STRUCTURAL PERFORMANCE AND DESIGN

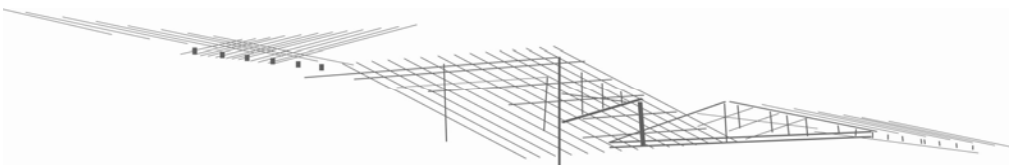
- Load bearing walls should be designed to carry permanent and imposed actions from roof and/or floor above.
- Non load bearing walls are not designed to carry vertical loads from floors or roof but may be designed to support ceiling and may also act as nominal or designated bracing walls.
- External walls should be designed to carry the net wind pressure normal to the wall as well as wind action effects from the roof (and relevant bracing loads).
- Internal walls should be designed to carry the differential internal pressure between the wall faces together with any other loads as appropriate for load bearing or non load bearing wall (and relevant bracing loads).
- All wall framing should be designed to resist human impact.
- In cyclonic areas, internal pressure coefficients based on dominant openings (ie. full internal pressure) should be applied unless the building envelope (windows, doors and roof and wall cladding) is capable of resisting impact loading as described in AS/NZS 1170.2. Shutters or protective frames over openings may be designed to achieve the required impact resistance. Pressure coefficients selected from the NASH Standard Part 1 are based on full internal pressure.
- Walls should also be designed for construction load cases including the effects of safety items such as scaffolding.



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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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# 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

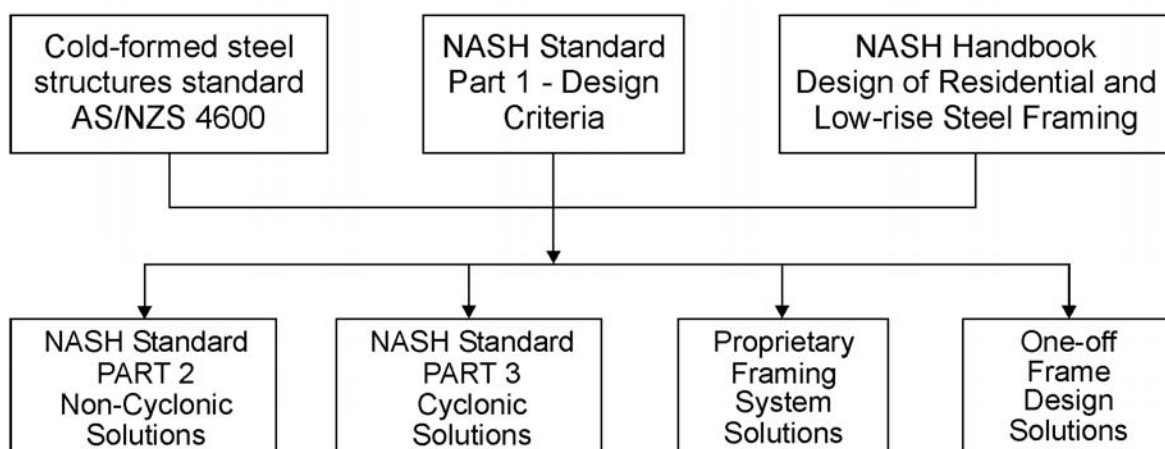
The NASH Standard – Residential and Low-rise Steel Framing Part 1: Design Criteria sets out the design criteria, in terms of structural adequacy and serviceability, for use in the design of low-rise steel framing. This includes houses as well as other low-rise residential and commercial buildings.

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](http://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*

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|------------------|--|
| 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.