

## SCI / NHBC Stage 1 System Certification

### *Steel Formed Sections Ltd*

15<sup>th</sup> December 2016 - Certificate number 20191215

#### 1. Introduction

The Steel Construction Institute has assessed the structural aspects of this system for Stage 1 – System Certification and confirms that it is suitable for use in the construction of dwellings in accordance with NHBC Standards Chapter 6.10 “Light steel framed walls and floors”.

This certificate is valid until 15/12/2019 unless it is withdrawn or updated before that date. Please contact SCI (Tel: 01344 636525) to confirm validity or visit the SCI Assessed website ([www.sci-assessed.com](http://www.sci-assessed.com)) to confirm validity.

For contact details of the technical department of *Steel Formed Sections* please refer to the *Steel Formed Sections System Manual*.

#### 2. Description of the system

This certificate relates to the *Steel Formed Sections* system, a light steel frame system for walls and floors of residential dwellings up to five storeys high. As its basic components, the *Steel Formed Sections* system uses cold rolled galvanized C-sections for wall studs and for floor joists.

The wall studs are produced to BS EN 10346: 2015, steel type S450GD +Z275 and are typically 70 mm to 100 mm deep and 1.2 to 2.0 mm gauge. Floor joists are formed from sections produced to BS EN 10346: 2015, steel type S450GD+Z275. The joists are typically 200 to 300 mm deep and are formed from sections typically 1.5 to 2.0 mm gauge.

The system of construction is based on the ‘warm frame’ principle, where the primary insulation is placed outside the structural frame. In this way, the risk of condensation is minimised. Secondary insulation may be used in the stud zone to achieve enhanced U-values. Appropriate acoustic performance is achieved by using multiple layers of board and quilt.

*Steel Formed Sections* domestic floors comprise timber board, joists and plasterboard ceiling. Separating floors have additional layers to provide acoustic and fire resistance to meet Building Regulation requirements.

#### 3. Scope of this certificate

Although it may be possible to use *Steel Formed Sections* for applications beyond these limits, the scope of this certificate is restricted to the following:

- (i) Residential structures, hotels, student accommodation, other hospitality, offices, shops, commercial, educational and other similar structures.

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- (ii) A maximum of five storeys
- (iii) Full calculations to be provided for every project based on the design philosophies presented in the *Steel Formed Sections System Manual*.
- (iv) The holding down anchorage is project specifically designed to resist the applied tensile forces.
- (v) Lightweight finishes may be supported by the stud walls
- (vi) Masonry and other heavy claddings should be laterally restrained by the stud walls, but the vertical loads from such claddings must not be carried by the stud walls.
- (vii) Walls around ducts, such as occur at staircases, may sit directly one above the other with no intermediate floor to offer lateral restraint. The head / base of walls in such positions must be laterally restrained by a structural member ('stairwell stiffener') and calculations are to be provided for such members.

#### 4. Information for designers and project certifiers

Designers and light steel frame project certifiers must obtain a copy of the *Steel Formed Sections System Manual*, which contains design data.

Additionally, for all projects particular attention should be paid to the following:

- a. Ensure the project falls within the scope of this certificate, or ensure acceptable solutions are provided for items outside the scope of this certificate.
- b. Confirm the grade of steel. Design data in the *Steel Formed Sections System Manual* assumes sections are S450.
- c. Ensure that a full set of calculations for the structure is available, following the philosophies agreed in the *Steel Formed Sections System Manual*.
- d. If the ground floor slab is to be provided by *Steel Formed Sections*, structural calculations and construction details must be provided.

Signed  .....  
SCI Chief Executive

Dated 16.12.16 .....

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## Appendix A: Summary of the *Steel Formed Sections System Manual*

### A1 Contents

The contents of the *Steel Formed Sections System Manual* covered by the Stage 1 certificate are:

Section	Title	Page Number
--	Front Cover	1-1
--	Contents	1-2
1	System Description	1-4
2	Durability	2-1
3	Strength and Stability	3-1
4	Loading	4-1
5	Loadbearing Walls and Floor Construction	5-1
6	Structural Integrity & Robustness	6-1
7	Connections	7-1
8	Accuracy and Tolerance	8-1
9	Claddings	9-1
10	Warm Frame Principles	10-1
11	Building Physics	11-1
12	Appendix A. Load Bearing Sample Calculations	12-1
13	Appendix B. Infill Sample Calculations	13-1
14	Appendix C. Oversail Sample Calculations	14-1
15	Appendix D. Loadbearing Details	15-1
16	Appendix E. Stud and Track Details	16-1
17	Appendix F. Fire Test Results	17-1
18	Appendix G. Acoustic Test Reports	18-1
19	References	19-1

### A2 Design philosophy

The design philosophy may either follow:

- BS5950-5 in terms of section properties and member capacities using loading to BS6399-1, -2 and -3.
- BS EN 1993-1-3 in terms of section properties and member capacities using loading to BS EN 1991-1-1, -2 and -3.

Section properties take into account the influence of local buckling. Section properties take into account the influence of local buckling and the reduced thickness of the section

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to take account of the zinc coating. Calculations are produced on a project basis using wind calculations that are specific to the site.

*Steel Formed Section* structures are very simple in concept. Connections are pin jointed and structures are braced for overall stability. The bracing comprises conventional plan bracing of the roof truss system, diaphragm action of the floor plates in the horizontal plane and generally crossed flats or integral 'W' or 'K' bracing in the vertical plane. A wind girder may be used to stabilise the joint between the gable wall and the gable infill at eaves level.

### **A3 Structural Integrity**

Robustness or structural integrity complies with BS 5950-5 or EN 1991-1-7 and is achieved by multiple inter-connections between the light steel members. Structural calculations to determine the number of fixings between components are provided for each project.

### **A4 Resistance to overturning**

When calculations show that it is necessary, the wall panels will be anchored to the foundations at the ends of braced bays to ensure that racking loads can be resisted.

### **A5 Holes through members**

The *Steel Formed Sections* system features holes through the webs of light steel joints and studs for the incorporation of service cables and pipes. Holes will feature a swaged edge or a protective rubber / plastic grommet to protect cables and pipes from damage.

Circular holes, not exceeding 60% of the depth of the member and positioned on the member centreline have a negligible influence on structural properties. The position of these holes relative to the end of the member should not be less than 1.5 times the size of the un-stiffened aperture.

Rectangular holes should be positioned on the member centreline and their depth should not exceed 40% of the depth of the member and their length should not exceed three times the hole depth.

### **A6 Wall ties**

Wall ties are 'flat' stainless steel in vertical runners at a vertical spacing of not more than 450 mm and horizontal spacing of not more than 600 mm. But such that the equivalent density is at least 3.7 ties/m<sup>2</sup> which exceeds the requirements of Building Regulations (2.51 ties/m<sup>2</sup>) and meets the NHBC 6.10 requirement (3.7 ties/m<sup>2</sup>). Additional ties are placed directly around openings at not more than 300 mm vertically and set within 225 mm of the reveal.

### **A7 Tolerances**

The *Steel Formed Sections* system is highly accurate. The as-built tolerance of each frame is +/- 5 mm on panel length. The installed tolerance allows for inaccuracies in

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position and foundation levels, but a maximum positional tolerance of +/- 5 mm can be achieved on site with good site control.

Wall panels are packed up from foundation level using galvanized steel shims under each stud position to a maximum of 10 mm. For gaps of 10 to 20 mm galvanized steel shims are required under each stud position, and sand:cement grout is required under the whole of the base rail. For gaps of 20 to 30 mm, galvanized steel shims are required under each stud position, and non-shrink high-strength cementitious grout under the whole of the base rail.

## Appendix B: Certification Procedure

There are two stages to the NHBC certification process for light steel framing.

### B1 Stage 1 - System Certification

The issue of this certificate confirms completion of Stage 1 for *Steel Formed Sections*.

### B2 Stage 2 - Project Certification

The NHBC requires the builder to appoint a steel frame project certifier to check the specific design of the steel framing on each specific site.

The steel frame project certifier will ensure that the building design is in accordance with:

- The manufacturer's system certificate issued by SCI, and
- NHBC Standards Chapter 6.10 'Light steel framed walls and floors'.

In order to provide confirmation that both documents have been satisfied for a specific project, the steel frame project certifier will need to check supporting details and calculations.

If satisfied that the specific project details are satisfactory, the steel frame project certifier will issue a 'project certificate' to the builder.

Project certificates can only be issued by steel frame certifiers who have been approved by NHBC. The project certificate should be made available on site for inspection by NHBC.

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