SCI / LABC Warranty Stage 1 System Certification

Hadley Industries Holdings Ltd, HadleyFRAME system

19th November 2022 - Certificate number 202511191

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 the LABC Warranty Technical Manual Version 14, Section 6.3 “Light Gauge Steel Frame”.

This certificate is valid until 19/11/2025 unless it is withdrawn or updated before that date. To confirm validity please visit the SCI Certification and Assessment website (www.sci-assessed.com) or contact SCI (Tel: 01344 636525).

For contact details of the technical department of *Hadley Industries Holdings Ltd* please refer to the *HadleyFRAME System Manual*.

Scope summary

Performance issues considered in the scope of this certification:

- Durability: Yes
- Strength and stability: Yes
- Additional details for volumetric construction: Not applicable
- Behaviour in relation to fire: No
- Acoustic performance: No
- Moisture control, thermal performance, condensation risk and water ingress: No
- Wall construction: No
- Balconies, terraces and parapets: No

2. Description of the system

This certificate relates to the *HadleyFRAME* system, a light steel frame system for walls and floors of residential dwellings up to 15 storeys high. As its basic components, the *HadleyFRAME* system uses cold rolled galvanized C-sections for wall studs and floor joists.

The wall studs are produced to BS EN 10346: 2015, steel type S450GD +Z275 and are typically 70 to 150 mm deep and 1.2 to 2.0 mm gauge. Floor joists are formed from C-sections produced to BS EN 10346: 2015, steel type S450GD+Z275. The joists are typically 200 to 305 mm deep and are formed from sections typically 1.4 to 2.5 mm gauge. Floors may be formed of profiled steel

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decking with composite concrete topping. The decking with composite topping is outside of the scope of this certificate. Component sizes are determined on a project basis.

For more severe environmental conditions where steel framing is less than 150 mm above external ground level, galvanizing to Z450 or Z600 may be specified, as required by the LABC Warranty Technical Manual, Section 6.3.

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.

HadleyFRAME 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

The scope of this Stage 1 certificate is limited to the structural and durability aspects of the structural steel frame. System specific solutions for fire resistance, sound insulation, resistance to moisture and thermal performance must be assessed on a project specific basis. When presented with proposed use of the system, such solutions will be considered by LABC Warranty in accordance with their internal processes and procedures. The submission of additional information demonstrating further compliance with the LABC Warranty Technical Manual and/or the Building Regulations, as applicable, will be required.

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

(i) Residential structures, hotels, student accommodation and other similar structures.

(ii) A maximum of 15 storeys when used as a load bearing structure. For the purposes of this clause a load bearing structure is one supporting load in addition to its own self weight and wind load.

(iii) Full calculations to be provided for every project based on the design philosophies presented in the *HadleyFRAME System Manual*.

(iv) Lightweight finishes may be supported by the stud walls.

(v) Masonry and other heavy claddings should be laterally restrained by the stud walls, but the vertical loads from such claddings are not generally carried by the stud walls.

(vi) A maximum uplift force at each bolt down location will be determined for each project. Structures are generally designed to avoid net uplift, however, if there is net tension, a project specific detail is provided.

(vii) Walls around voids, 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

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must be laterally restrained by a structural member 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 *HadleyFRAME 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 *HadleyFRAME System Manual* is based on sections which are S450.

c. Ensure that a full set of calculations for the structure is available, following the philosophies agreed in the *HadleyFRAME System Manual*.

d. Ensure that the ground floor slab or podium structure is suitably constructed to provide adequate anchorage and support for the loads from the light steel system. If the ground floor slab is to be provided by Hadley Industries Holdings Ltd, structural calculations and construction details must be provided.

Signed …… Dated …27th September 2022

SCI Chief Executive

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Appendix A: Summary of the *HadleyFRAME System Manual*

A1 Contents

The contents of the *HadleyFRAME System Manual v1.1* (dated 10/05/2022) covered by the Stage 1 certificate are:

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A2 Design philosophy

The design philosophy follows BS EN 1993-1-3 in terms of section properties and member capacities using loading to BS EN 1991-1. Section properties take into account the influence of local buckling and distortional buckling and the reduced thickness of the section to take account of the zinc coating.

Calculations are produced on a project basis using wind calculations that are specific to the site.

HadleyFRAME 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 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 EN 1991-1-7 and the UK National Annex 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

To meet the serviceability deflection limit of height / 500 for racking loads, the shear resistance per braced bay is limited to 4.5 kN.

To ensure that racking loads can be resisted the wall panels are anchored to the foundations at the ends of braced bays. Holding down is generally in the form of resin anchors located through bolt-down brackets at bracing positions. The holding down anchorage is project specifically designed to resist the applied tensile forces.

A5 Holes through members

The *HadleyFRAME* 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 or plastic grommet to protect cables and pipes from damage.

Generally, for members primarily subjected to bending, circular holes not exceeding 60% of the depth of the member and positioned on the member centreline generally have a negligible influence on structural performance. The position of these holes relative to the end of the member and any significant point load should not be less than 1.5 times the depth of the section.

A6 Wall ties

Wall ties are 'flat' stainless steel in vertical runners at a vertical spacing of not more than 450 mm and a horizontal spacing of not more than 600 mm. When wall ties are at 600 mm horizontal centres, the vertical spacing should be a maximum of 375 mm. When wall ties are at 400 mm horizontal centres, the vertical spacing should be a maximum of 450 mm. Additional ties are placed either side of openings at not more than 300 mm vertically and set within 225 mm of the reveal.

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A7 Tolerances

The *HadleyFRAME* system is highly accurate. The as-built tolerance of each frame is +/- 2 mm on panel length up to 5 m and +/- 4 mm on panel length up to 10 m. The installed tolerance allows for inaccuracies in position and foundation levels, but a maximum positional tolerance of +/- 5 mm can be achieved on site with good site control.

Where necessary, 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 40 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 LABC Warranty certification process for light steel framing.

B1 Stage 1 - System Certification

The issue of this certificate confirms completion of Stage 1 for the *HadleyFRAME* system.

The scope of this Stage 1 Certificate and the procedures for assessing project specific solutions are described in Section 3.

B2 Stage 2 - Project Certification

LABC Warranty 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
- The LABC Warranty Technical Manual, Section 6.3 "Light steel frame".

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 LABC Warranty. The project certificate should be made available on site for inspection by LABC Warranty.

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