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Agrément Certificate  
**05/4265**  
Product Sheet 1

## ROLLALONG RELOCATABLE BUILDING SYSTEMS

### ROLLALONG LiNX RELOCATABLE BUILDING SYSTEM

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Rollalong LiNX Relocatable Building System, for use as single-storey educational, office, institutional, barracks and non-residential accommodation other than dwellings. The Certificate holder offers adaptations to the system for the construction of buildings up to three storeys, but these have not been assessed by the BBA.

#### AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

#### KEY FACTORS ASSESSED

**Structural performance** — the building system has adequate strength to resist the loads associated with in-service loading (see section 6).

**Thermal performance** — the building system panels contribute to the overall thermal performance of the building construction (see section 7).

**Condensation risk** — walls, floors, roofs, openings and junctions with other elements will adequately limit the risk of surface condensation (see section 8).

**Behaviour in relation to fire** — the structural external walls and steel protection and roof assemblies provide sufficient fire protection when constructed in accordance with the requirements of UK Building Regulations (see section 9).

**Durability** — the main structural framework will have a 60-year minimum service life provided it is protected by the external and internal finishes. Other elements can achieve a life of between 20 and 60 years depending on the materials used and degree of maintenance (see section 14).



The BBA has awarded this Agrément Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Brian Chamberlain

Head of Approvals — Engineering

Greg Cooper

Chief Executive

Date of First issue: 18 May 2010

Originally certificated on 7 March 2006.

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.*

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# Regulations

In the opinion of the BBA, the Rollalong LiNX Relocatable Building System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



## The Building Regulations 2000 (as amended) (England and Wales)

<b>Requirement:</b> A1	<b>Loading</b>
<b>Comment:</b>	The buildings will have adequate strength and stability. See sections 6.1 to 6.8 of this Certificate.
<b>Requirement:</b> B2	<b>Internal fire spread (linings)</b>
<b>Requirement:</b> B3(1)(4)	<b>Internal fire spread (structure)</b>
<b>Requirement:</b> B4(1)(2)	<b>External fire spread</b>
<b>Comment:</b>	The building will meet the relevant requirements within the limitations set out in this Certificate. See sections 9.2, 9.3 and 9.6 of this Certificate.
<b>Requirement:</b> C2(a)	<b>Resistance to moisture</b>
<b>Comment:</b>	Walls can adequately limit the risk of moisture ingress from the ground. See sections 11.1 and 11.2 of this Certificate.
<b>Requirement:</b> C2(b)	<b>Resistance to moisture</b>
<b>Comment:</b>	Walls can adequately limit the risk of moisture penetration from precipitation and wind-driven spray. See sections 11.4 and 11.5 of this Certificate.
<b>Requirement:</b> C2(c)	<b>Resistance to moisture</b>
<b>Comment:</b>	Walls can adequately limit the risk of surface condensation and contribute to minimising the risk of interstitial condensation. See sections 8.1 and 8.2 of this Certificate.
<b>Requirement:</b> L1(a)(1)	<b>Conservation of fuel and power</b>
<b>Comment:</b>	Walls can contribute to limiting heat loss within a dwelling. See sections 7.1 to 7.4 of this Certificate.
<b>Requirement:</b> Regulation 7	<b>Materials and workmanship</b>
<b>Comment:</b>	The system is acceptable. See section 14.1 and the <i>Installation</i> part of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b> 8(1)(2)	<b>Fitness and durability of materials and workmanship</b>
<b>Comment:</b>	The use of the system satisfies the requirements of this Regulation. See sections 13.1, 13.2, 14.1 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b> 9	<b>Building Standards – construction</b>
<b>Standard:</b> 1.1(a)(b)	<b>Structure</b>
<b>Comment:</b>	Buildings incorporating the system will have sufficient strength and stiffness when designed and constructed in accordance with sections 6.1 to 6.8 of this Certificate, with reference to clause 1.1.1 <sup>(1)</sup> .
<b>Standard:</b> 2.3	<b>Structural protection</b>
<b>Comment:</b>	Walls using the appropriate lining can achieve a period of fire resistance of short duration, with reference to clauses 2.3.1 <sup>(1)</sup> to 2.3.5 <sup>(1)</sup> . See section 9.3 of this Certificate.
<b>Standard:</b> 2.5	<b>Internal linings</b>
<b>Comment:</b>	Walls and ceiling surfaces can satisfy this Standard, with reference to clause 2.5.1 <sup>(1)</sup> . See section 9.3 of this Certificate.
<b>Standard:</b> 2.6	<b>Spread to neighbouring buildings</b>
<b>Comment:</b>	External walls can satisfy the relevant requirements of this Standard, with reference to clause 2.6.1 <sup>(1)</sup> . See section 9.2 of this Certificate.
<b>Standard:</b> 2.8	<b>Spread from neighbouring buildings</b>
<b>Comment:</b>	Roofs can satisfy this Standard, with reference to clauses 2.8.1 <sup>(1)</sup> and 2.8.2 <sup>(1)</sup> . See section 9.7 of this Certificate.
<b>Standard:</b> 3.4	<b>Moisture from the ground</b>
<b>Comment:</b>	Walls can satisfy this Standard, with reference to clauses 3.4.1 <sup>(2)</sup> and 3.4.5 <sup>(1)</sup> . See sections 11.1 and 11.2 of this Certificate.
<b>Standard:</b> 3.10	<b>Precipitation</b>
<b>Comment:</b>	The buildings are acceptable, with reference to clauses 3.10.1 <sup>(1)</sup> and 3.10.7 <sup>(1)</sup> . See sections 11.4 and 11.5 of this Certificate.
<b>Standard:</b> 3.15	<b>Condensation</b>
<b>Comment:</b>	Walls can adequately minimise the risk of surface condensation, with reference to clauses 3.15.1 <sup>(1)</sup> and 3.15.4 <sup>(1)</sup> . See section 8.1 of this Certificate. Walls can contribute to minimising the risk of interstitial condensation, with reference to clauses 3.15.1 <sup>(1)</sup> and 3.15.5 <sup>(1)</sup> . See sections 8.1 and 8.2 of this Certificate.
<b>Standard:</b> 6.1(b)	<b>Carbon dioxide emissions</b>
<b>Standard:</b> 6.2	<b>Building insulation envelope</b>
<b>Comment:</b>	The building fabric will adequately limit heat loss to satisfy these Standards, with reference to clauses 6.2.1 <sup>(1)</sup> , 6.2.4 <sup>(1)</sup> and 6.2.5 <sup>(1)</sup> . See sections 7.1 to 7.4 of this Certificate.

(1) Technical Handbook (Non-Domestic).



## The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 14.1 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See sections 13.1 and 13.2 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The buildings are acceptable. See sections 11.1, 11.2, 11.4 and 11.5 of this Certificate.
Regulation:	C5	Condensation
Comment:		Walls can contribute to minimising the risk of interstitial condensation. See section 8.2 of this Certificate.
Regulation:	D1	Stability
Comment:		The buildings will have adequate strength and stability. See sections 6.1 to 6.8 of this Certificate.
Regulation:	E3	Internal fire spread – Linings
Regulation:	E4	Internal fire spread – Structure
Regulation:	E5	External fire spread
Comment:		The buildings will meet the relevant regulations within the limitations set out in this Certificate. See sections 9.2, 9.3 and 9.6 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3 (2)	Target carbon dioxide Emissions Rate
Comment:		The system will enable, or contribute to enabling, a wall to satisfy these Regulations. See sections 7.1 to 7.4 of this Certificate.

### Construction (Design and Management) Regulations 2007

### Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.2 and 3.3) and 17 *Procedure* (17.2) of this Certificate.

## Non-regulatory Information

### NHBC Standards 2008

In the opinion of the BBA, the use of the Rollalong LiNX Relocatable Building System, in relation to this Certificate, is not subject to the requirements of these Standards.

## General

This assessment does not cover internal partitions, staircases, windows, doorsets, fittings and raised access floors or the adequacy of the plumbing, drainage and electrical services supplied with the buildings or the ventilation of bathrooms and rooms containing sanitary conveniences, which will vary according to use.

The system is relocatable and extendable, and can be used to construct buildings with a variety of plan forms.

The steel structure framework has a minimum life of 60 years. The design life of the external envelope and internal finishes is between 20 and 60 years.

The management systems of Rollalong Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by SGS United Kingdom Ltd (Certificate No GB94/3223).

## Technical Specification

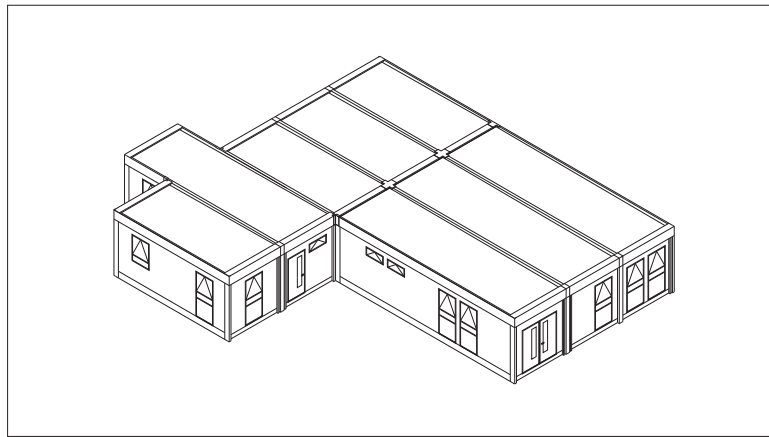
### 1 Description

#### General

1.1 This Certificate relates only to the form of construction described below and in the Rollalong LiNX Relocatable Building System Technical Specification approved by the BBA, when applied to single-storey buildings.

1.2 The Rollalong LiNX Relocatable Building System is based on a module consisting of a structural steel framework, composite timber-frame (with bracing as required), external-wall construction, galvanized riveted floor, and roof frame with infill softwood framing. Mineral wool provides insulation to walls, floor and roof. Floor decking is of OSB. Vinyl-wrapped plasterboard is bonded to the internal face of external walls and is screwed to the ceiling. The modules incorporate a variety of wall constructions to suit the location in the building (see Figure 1).

Figure 1 Typical Rollalong LiNX relocatable building



1.3 The modules are available in the standard range of sizes given in Table 1.

Table 1 Size range

Description	Module type	Floor area (m <sup>2</sup> )	External length (m)	External width (m)	External height (m)	Internal length (m)	Internal width (m)	Internal ceiling height (m)
LiNX 120	End module	34.20 41.40	12.49	3.0 3.6	3.2	12.00	2.85 3.45	2.5
	Mid module	36.00 43.20		3.0 3.6			3.00 3.60	
LiNX 108	End module	30.78 37.26	11.29	3.0 3.6	3.2	10.80	2.85 3.45	2.5
	Mid module	32.40 38.88		3.0 3.6			3.00 3.60	
LiNX 96	End module	27.36 33.12	10.09	3.0 3.6	3.2	9.60	2.85 3.45	2.5
	Mid module	28.80 34.56		3.0 3.6			3.00 3.60	
LiNX 84	End module	23.94 28.98	8.89	3.0 3.6	3.2	8.40	2.85 3.45	2.5
	Mid module	25.20 30.24		3.0 3.6			3.00 3.60	
LiNX 72	End module	20.52 24.84	7.69	3.0 3.6	3.2	7.20	2.85 3.45	2.5
	Mid module	21.60 25.92		3.0 3.6			3.00 3.60	
LiNX 60	End module	17.10 20.70	6.49	3.0 3.6	3.2	6.00	2.85 3.45	2.5
	Mid module	18.00 21.60		3.0 3.6			3.00 3.60	

1.4 The full specification and drawings for the materials and components covered by this Certificate have been examined and are retained by the BBA. This section gives only general details of the system. Typical details are shown in Figures 2 to 6.

Figure 2 Details in plan

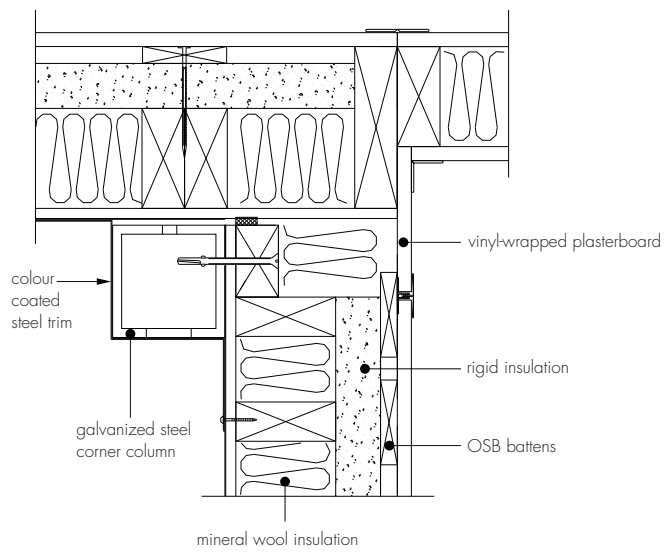
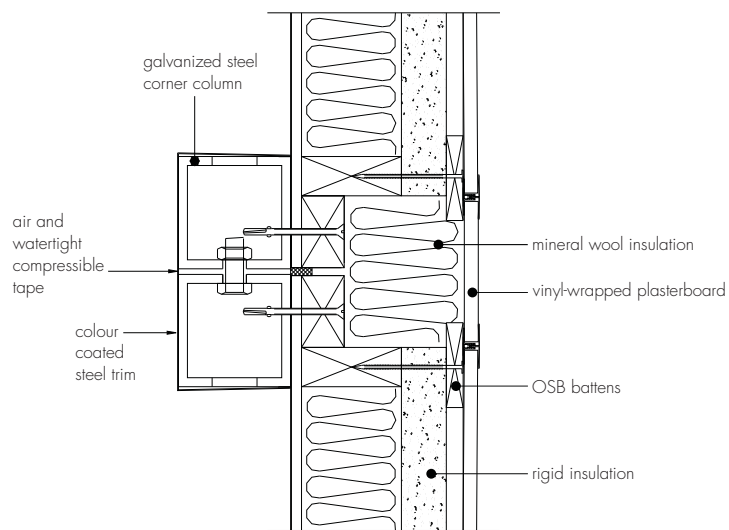
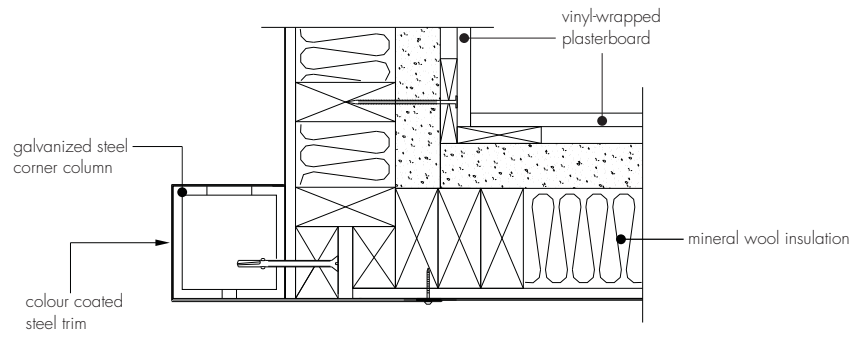


Figure 3 Long wall section

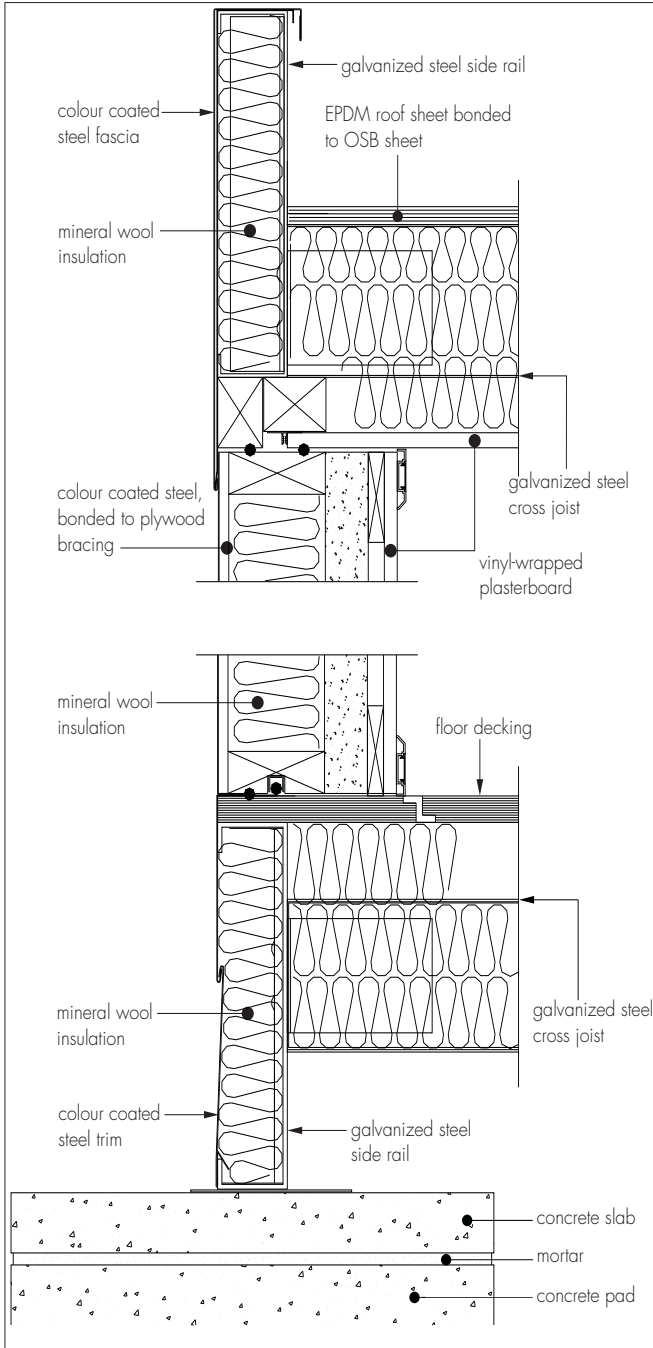


Figure 4 Short wall section

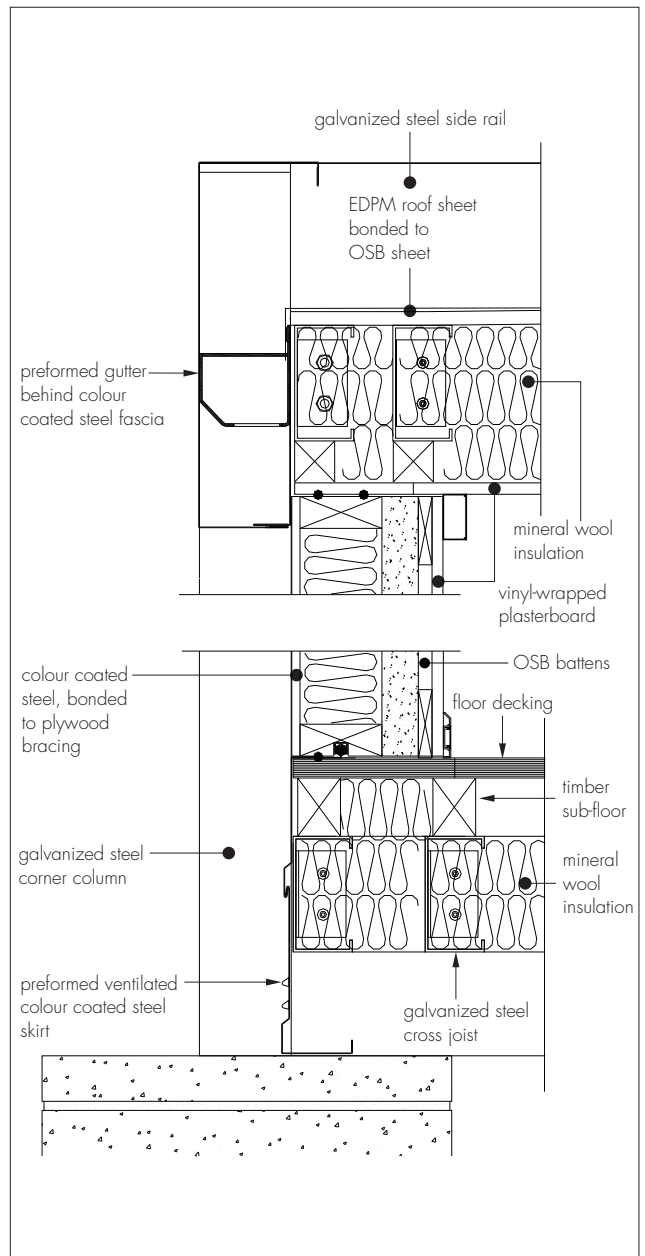


Figure 5 Section through junction — two modules joined end to end

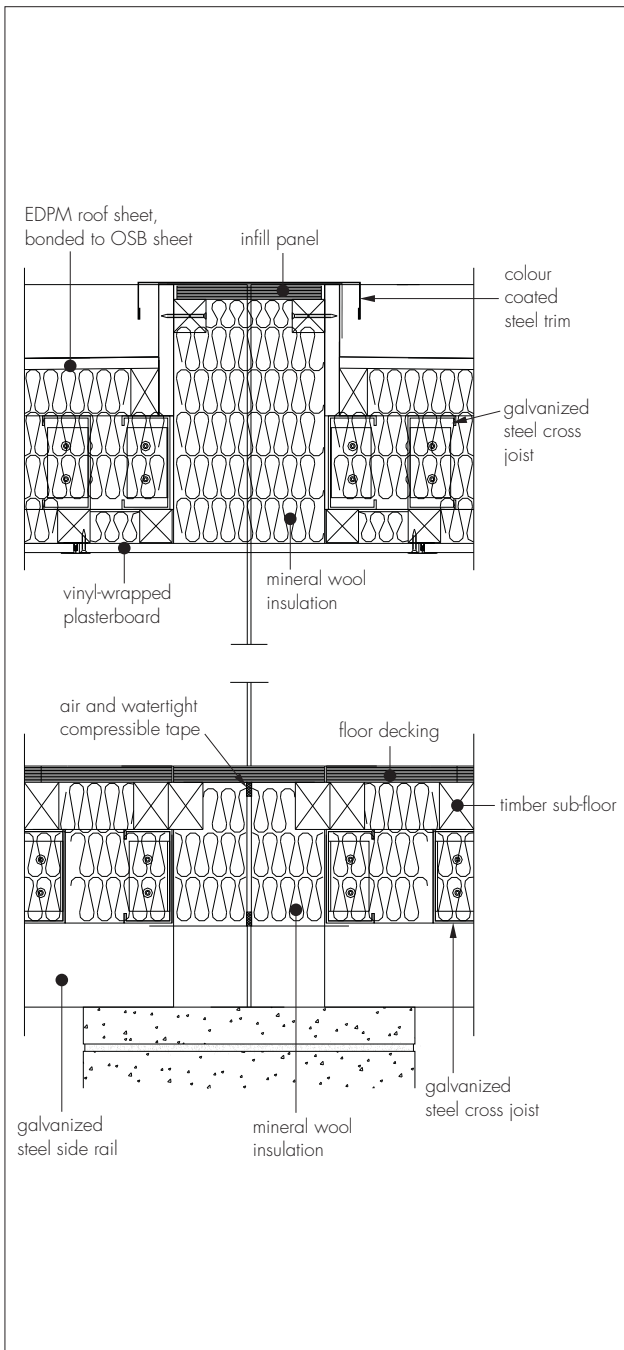
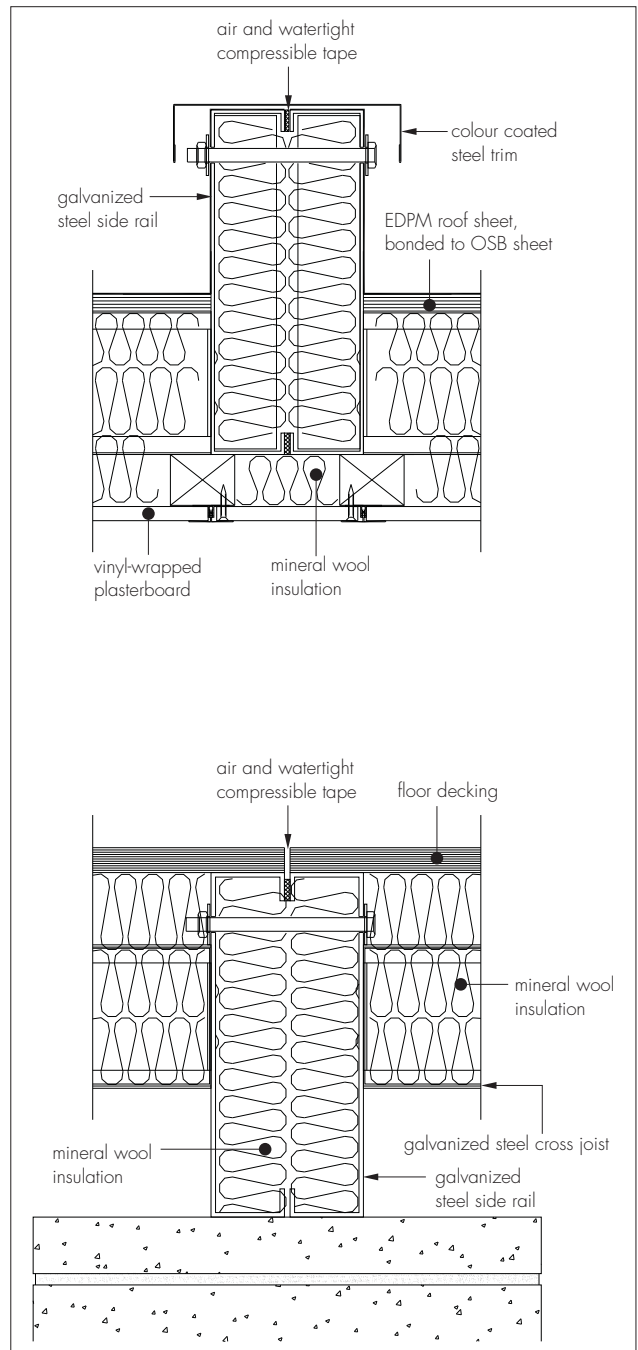


Figure 6 Section through junction — two modules joined side by side



### Structural frame

1.5 The structural framing to each module consists of 100 mm by 100 mm by 5 mm SHS corner columns bolted to cold rolled channel section edge beams, of a depth to suit the span requirement, with M16 x 25 bolts. Columns and channels are bolted together. The external walls are not designed to carry vertical loads but provide additional racking resistance to the module. They provide resistance to lateral (wind) load, transferring load through fixings to the structural frame.

1.6 Each column head has a top plate with a 32 mm diameter, centrally-drilled clearance hole with an M30 nut welded onto the back to receive an eyebolt to allow the complete module to be lifted by crane. Upper floor modules<sup>(1)</sup> have a pin within the bottom of the columns to locate in the holes in the column heads of the lower modules.

(1) Outside the scope of this Certificate.

## Floors

1.7 Floor framing is of hot-dipped galvanized (Z35 grade Fe E350G-coated G275 to BS EN 10326 : 2004) cold-formed channel sections used as both edge beams and cross-floor joists. Connection is by M10 bolts and 6.6 mm by 14.1 mm long steel Megagrip rivets.

1.8 Floor decking is water-resistant, 22 mm thick oriented strand board, type OSB3/4 to BS EN 300 : 1997, fixed to floor side rails using 47 mm self-drilling screws and to decking supports with 50 mm ring-shank nails. Floor decking supports are 64 mm by 38 mm softwood timber, fixed to cross-floor joists at 400 mm centres using 85 mm by 5.5 mm self-drilling screws.

1.9 Thermal insulation is provided by 120 mm thick mineral wool, suspended between the floor joists with a vented polythene membrane.

## External walls

1.10 External walls are of composite construction comprising 89 mm by 38 mm C16/24 CLS studwork framing at a maximum of 600 mm centres, and internally clad with 40 mm thick closed-cell urethane foam and battened at 600 mm centres using 75 mm by 15 mm OSB. Internal lining is 12.7 mm thick vinyl-wrapped plasterboard, screwed top and bottom and bonded to the OSB battens.

1.11 All external walls are fixed to the perimeter galvanized steel floor channels with steel self-tapping screws and to SHS corner columns using similar fixings. The wall-to-wall corner trims are fixed with colour-matched nails.

## Internal walls and finishes

1.12 Typically, internal walls<sup>(1)</sup> are 12.7 mm thick vinyl-wrapped plasterboard, screwed top and bottom and bonded to the timber framing. Where required for sound insulation, cavities are filled with mineral wool insulation. Skirtings are of white PVC in two parts.

(1) Outside the scope of this Certificate.

## Roof

1.13 Each module roof is of composite construction using hot-dipped galvanized (Z35 grade Fe E350G-coated G275 to BS EN 10326 : 2004) cold-formed channel sections used as both edge beams and cross-roof joists. Connection is by M10 bolts and 6.6 mm by 14.1 mm long steel Megagrip rivets. The roof/ceiling is pitched at 0.6°.

1.14 Roof decking is water-resistant, 15 mm thick oriented strand board, type OSB3 to BS EN 300 : 2006, fixed to timber furring pieces which are fixed to cold-formed channel-section cross joists.

1.15 A timber ceiling frame is screwed to cross-joists using 65 mm by 6.7 mm self-drilling screws. Internal lining is 12.7 mm thick vinyl-wrapped plasterboard, screwed to the timber ceiling frame.

1.16 External roof covering is a single-layer roofing system (Firestone Rubberguard EPDM — BBA Certificate 89/2216 — fire retardant version, 1.15 mm thick). The membrane is bonded to the OSB ceiling using a water-based decking adhesive.

1.17 Thermal insulation is provided by mineral wool to totally fill the roof voids.

## Protection of exposed steelwork

1.18 All exposed structural steelwork is shot-blasted, hot-dip galvanized to BS EN ISO 1461 : 2009, coated with primer and finished in gloss paint.

1.19 Roof flashings and wall drips fabricated from Colorcoat EPS steel are fitted around support columns, the perimeter of the roof, and the lower perimeter of all modules.

## Pitched roof system

1.20 Lightweight steel roofs to various pitches and designs are available but are outside the scope of this Certificate.

## 2 Manufacture

2.1 Bought-in materials and components are to agreed specifications or in accordance with British Standards or Agrément Certificates.

2.2 Steel-framed components of the system are fabricated using conventional metalworking techniques.

2.3 Quality checks are made on the sub-assemblies, such as wall and roof panels and the steel frame, and on the final assembly of the modules. During manufacture checks are made on dimensions, squareness and welding.

## 3 Delivery and site handling

3.1 The modules are transported to site on a flat-bed lorry or trailer, long enough to fully support each module.

3.2 The modules are unloaded and positioned by crane using eyebolts screwed into the column-head plates.

3.3 The open sides of the modules are weatherproofed using polythene sheeting during transit. The polythene sheeting also provides protection during storage on site should the modules not be positioned on the day of delivery.

# Assessment and Technical Investigations

The following is a summary of the technical investigations carried out on the Rollalong LiNX Relocatable Building System.

## Design Considerations

### 4 Use

The Rollalong LiNX Relocatable Building System is suitable for use as single-storey accommodation in educational, office, institutional, barracks and other non-residential applications.

### 5 Practicability of installation

Installation of the system is carried out by contractors trained and approved by the Certificate holder in accordance with the Certificate holder's installation manual.

### 6 Strength and stability



6.1 The design of the Rollalong LiNX Relocatable Building System is generally in accordance with:

- BS 5950-1 : 2000
- BS 5950-5 : 1998
- BS 5268-2 : 2002
- BS 5268-6.1 : 1996
- BS EN 594 : 1996.

6.2 The system is designed to support loads evaluated in accordance with:

- BS 6399-1 : 1996
- BS 6399-2 : 1997
- BS 6399-3 : 1988
- BS 6767-1 : 1999
- BS 6767-2 : 1998.

6.3 The racking resistance of the building is generally provided by the external walls and, in some building configurations, the internal walls, with additional bracing depending on site, location and building layout. The structural design is generally in accordance with BS 5950-1 : 2000, BS 5950-5 : 1998 and BS 5268-6.1 : 1996. Any post-construction changes to steel framing, external walls (or internal walls where applicable) must be agreed by the Certificate holder.

6.4 The roof is designed to support a uniformly distributed imposed load of  $0.60 \text{ kN}\cdot\text{m}^{-2}$  or a concentrated load of  $0.9 \text{ kN}$ , in accordance with BS 6399-3 : 1988, and is therefore acceptable where access is required only for cleaning or repair.

6.5 The ground floor is designed to support a uniformly distributed imposed load of  $5 \text{ kN}\cdot\text{m}^{-2}$  or a concentrated load of  $4.5 \text{ kN}$ , in accordance with BS 6399-1 : 1996, and is therefore acceptable in, for example, classrooms and offices for general use.

6.6 Most building configurations do not require the modules to be bolted to foundations. Stability calculations are available from the Certificate holder justifying any requirements for bolting modules to the foundation.

6.7 Foundations must be designed in accordance with BS 8004 : 1986.

6.8 If dismantled and relocated, full account must be taken of any changes made to the layout and use of the reconstructed modules in respect of structural adequacy. The Certificate holder's advice should be sought before modifications to any of the structural components of the modules are made.

### 7 Thermal insulation



7.1 The building elements are designed to achieve or improve on the following U values ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ). The actual U value for an element such as a wall or a floor will depend upon the design of the building, for example, the fraction of timber used in the construction and the extent of the thermal bridges associated with mechanical fixings that penetrate the insulation layer:

- Floor<sup>(1)</sup> 0.16
- External wall<sup>(1)</sup> 0.20
- Roof<sup>(1)</sup> 0.20
- Window<sup>(2)</sup> 1.30.

(1) This value has been calculated with the assumption that mechanical fixings do not cause thermal bridges.

(2) The performance of windows and doors is outside the scope of the Certificate, however, it should be specified to meet the thermal transmittance noted above.

7.2 The building fabric's 'conductive' heat losses (see Table 4) should not exceed those specified for a 'notional' building (with metal cladding) in the Simplified Building Energy Model (SBEM) or the fabric performance limits specified in the relevant documents supporting the national Building Regulations.

7.3 Designers must select services, envelope airtightness and window/door specifications that will achieve a carbon emissions reduction of 23.5% to 28% for the complete proposed building when compared to the 'notional' building.

7.4 The  $\psi$  ( $\Psi$ ) value and temperature factor for a specific construction should be determined in accordance with BRE Report (BRE 497 : 2007) *Conventions for calculating linear thermal transmittance and temperature factors*, and compared to values given in BRE information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings*.

## 8 Condensation



8.1 Provided the building system is properly assembled as detailed in sections 16 and 17, the risk of surface and interstitial condensation under normal use will be minimal.



8.2 A condensation risk assessment was conducted in accordance with BS 5250 : 2002 on the specified wall, floor and roof (given in section 1) demonstrating minimal condensation risk under normal conditions of temperature and humidity. Any condensate that may occur will dissipate during the summer months.

8.3 The buildings are not suitable for use where the internal relative humidity is expected to exceed 70% for any significant length of time, since condensation may occur. Assuming normal internal conditions of temperature and humidity, and appropriate ventilation (see section 10), it is considered that the amount and duration of any condensation will be insufficient to significantly affect the structural or thermal properties of the building.

8.4 If the floor is penetrated by services, eg soil pipes, the joints between the services and the floor deck and floor insulation must be adequately sealed to prevent the ingress of water and water vapour.

8.5 Equipment producing large quantities of water vapour, for example flueless heaters, must not be used.

8.6 Adequate underfloor ventilation is provided to ensure that any condensation on the steelwork or insulation is effectively dispersed.

## 9 Behaviour in relation to fire

9.1 Statements in this section relate to the system being used in single-storey applications only. The information on fire resistance does not support any other applications.



9.2 Buildings subject to Building Regulations have not been assessed for use within one metre of a boundary. Due regard must be taken of all 'unprotected areas'.

9.3 It has been shown by tests and assessment that the buildings will meet Building Regulations requirements for fire rating as given in Table 2.

9.4 The external claddings of Plastisol-coated steel are assessed as having surface spread of flame characteristics<sup>(1)</sup> of Class O<sup>(2)</sup>.

- (1) As defined in the national Building Regulations thus:  
**England and Wales** — Approved Document B, Appendix A  
**Scotland** — Mandatory Standard 2.5, Annex 2E  
**Northern Ireland** — Technical Booklet E.

(2) 'Low risk' in Scotland.

9.5 The internal surfaces of walls and ceilings are assessed as having surface spread of flame characteristics of:

- vinyl-wrapped plasterboard Class O<sup>(1)</sup>
- ceiling surface Class O<sup>(1)</sup>

(1) 'Low risk' in Scotland.



9.6 The roof is designated EXT. F. AA in accordance with the national Building Regulations. When tested in accordance with BS 476-3 : 2004, a roof construction consisting of Firestone Rubbergard EPDM FR, latex/neostrene blend contact adhesive on 12 mm thick OSB/2 substrate, achieved an EXT. F. AA rating. Therefore, the roof is unrestricted under the national Building Regulations:

**England and Wales** — Approved Document B, Appendix A  
**Northern Ireland** — Technical Booklet E.



9.7 The designation of the roof in Scotland must be determined in accordance with Mandatory Standard 2.8.1.

9.8 Adequate provision must be made for escape in case of fire.

9.9 Where it is necessary for fittings, services or ducts to penetrate part of the fire-resisting construction, the detailing must ensure that the relevant fire resistance is not impaired, particularly in relation to the integrity requirements.

9.10 When dismantling, relocating and re-assembling the building system, the re-assembly process must include measures to ensure that the relevant fire resistance is not impaired, particularly in relation to the integrity requirement.

Table 2 Fire rating<sup>(1)</sup>

Component	Duration
External walls	Half-hour <sup>(2)</sup>
Combined ceiling and floor assembly	Half-hour <sup>(2)</sup>
Steel column protection	Half-hour <sup>(2)</sup>

(1) Fire ratings given in this table relate to single-storey applications only.


(2) 'Short duration' in Scotland.

## 10 Ventilation

10.1 The two window types supplied with the system incorporate 8000 mm<sup>-2</sup> trickle vents and are able to be opened to allow rapid ventilation when required. For individual projects, windows should be designed so that the amount of openable window ventilation is a minimum of 5% of the floor area or provision of mechanical ventilation considered. The Certificate holder should be consulted with regard to the requirements for background ventilation which can be facilitated by the standard windows used.


10.2 The void beneath the ground floor must have at least 600 mm<sup>-2</sup> of open ventilation area per metre run of external wall.

## 11 Weathertightness and damp-proofing

 11.1 The steel supporting columns raise the building clear of the ground, giving it an inherent resistance to ground moisture.

11.2 The ground beneath the building, as a minimum, should be effectively cleared of turf and other vegetable matter at least to a depth sufficient to prevent later growth. The Certificate holder recommends that a polythene or other suitable membrane be placed over the surface to inhibit future weed growth.

11.3 In preparing the site for erection of the building, adequate drainage must be provided, to prevent water collecting beneath or against the building structure. Landscaping should not be positioned so that loose soil can become banked against the building perimeter.

 11.4 The roof and external wall surfaces provide adequate weather resistance. The final weathertightness of the building is dependent upon correct positioning and sealing of the roof beam casings and the sealing of the horizontal and vertical joints between modules.

11.5 The buildings are provided with rainwater gutters and downpipes<sup>(1)</sup>.


(1) The Certificate holder can supply design calculations on request but these are outside the scope of this Certificate.

11.6 The performance of windows and doors is not covered by this Certificate; however, the perimeter joints between windows and doors and the wall panels have been assessed and are adequate to ensure that water penetration will not occur at these positions.

## 12 Services

Electrical and plumbing services are outside the scope of this Certificate. However, in designing and installing these services, precautions must be taken to avoid the possible risk of long-term damage to the structure or the services by, for example, the ingress of water, water vapour or condensate from cold water service pipes.

## 13 Maintenance and Repair

 13.1 The external wall skin of Colorcoat HP200 requires an occasional washing with water containing a mild detergent. Where a high aesthetic standard is required, maintenance painting may be required after a period of between 10 and 30 years, depending on colour and environmental conditions, using a paint recommended by the Certificate holder.

13.2 The walls, ceilings and internal surfaces can be cleaned using water containing a mild detergent. These surfaces can be decorated using a paint recommended by the Certificate holder.

13.3 Should it be necessary to replace or repair the vinyl floor covering, all joints must be welded. Any replacement vinyl floor covering must be to an equivalent specification as the original.

13.4 In the event of impact or other damage to an external wall, a replacement steel panel can be fitted over the original panel by the Certificate holder. If necessary, additional insulation can be inserted into the core of the wall before fitting the replacement panel. This will restore the appearance and ensure that the weathertightness and insulation are unaffected.

13.5 Trims or skirt panels can be readily replaced if necessary.

## 14 Durability



14.1 The main structural framework is assessed as capable of achieving a design life of 60 years. Other elements can achieve a design life of between 20 and 60 years depending on the materials, construction and degree of maintenance. Reference may be made to BS 7543 : 2003, or relevant Agrément Certificate in this respect.

14.2 Particular care is required in the arrangement of damp-proof courses, integrity of vapour control layers and weathertightness of the building envelope.

14.3 Foot traffic over the roof weatherproofing finish should be restricted to maintenance only and suitable precautions taken to avoid the risk of damage to the single-layer reinforced roofing system.

14.4 The Colorcoat coating and galvanizing will be effective for the building's projected lifespan. The relevant BBA Certificate should be consulted for further information.

14.5 The ceiling covering will remain effective for the period specified in section 14.1.

14.6 The sealants used in the construction of the modules in the factory and to seal between modules on site are concealed and are not subject to excessive movement. They should not normally require replacement during the building's projected lifespan.

## Installation

### 15 General

15.1 The Rollalong LiNX Relocatable Building System must be erected with due regard to any boundary (see sections 9.1 to 9.2).

15.2 Erection or re-erection of the system can be carried out by either the Certificate holder or an appointed installer team<sup>(1)</sup>. Training is offered to hire companies.

(1) The team will have been suitably instructed by the Certificate holder.

15.3 The arrangements for erection have been assessed and found to be satisfactory.

### 16 Preparation

16.1 Clients are normally responsible for provision of suitable foundations and services and, therefore, the following aspects should be subject to supervision and should be checked before the modules are delivered to site:

- setting out and level of foundations
- setting out of service connections.

16.2 The requirements for access to the site by crane must be agreed with the client prior to erection and installation.

16.3 Modules are lifted off the delivery vehicle by crane and placed on prepared foundations using purpose-designed lifting points incorporated in the corner columns.

16.4 Temporary weatherproofing and bracing are removed prior to final lifting into position.

16.5 Where specified, the building modules must be bolted to the foundations.

### 17 Procedure

17.1 The end module is lifted into position on prepared foundations and levelled. Shims beneath column base plates are used to make up any inaccuracies in foundation levels.

17.2 The second module is lifted and positioned next to the end module and fixed together using the site fixing stud bars, threaded through the centre holes of the corner posts.

17.3 Once lined and levelled the posts, roof and floor interfaces are bolted together. The site fixing bars are removed and replaced with a bolted connection.

17.4 The erection process is repeated for the remainder of the ground-floor modules with cappings, cover skirts, gutters and rainwater pipes being fixed in position as work proceeds.

### 18 Investigations

18.1 An examination was made of existing data to assess:

- structural strength and stability
- impact resistance of floor and wall panels
- load capacity of roof and floor
- behaviour in fire
- effect of thermal bridging
- roof and wall U values to BS EN ISO 6946 : 1997
- floor U values to BS EN ISO 13370 : 2008 and BS EN ISO 10211-1 : 1996
- weathertightness
- durability
- maintenance requirements.

18.2 Calculations were made and computer simulations carried out to determine the effectiveness of the insulation arrangements and the risk of condensation.

18.3 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

18.4 A site visit was carried out to witness the installation process of a single-storey classroom block.

## Bibliography

- BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*
- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 5268-2 : 2002 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*
- BS 5268-6.1 : 1996 *Structural use of timber — Code of practice for timber frame walls — Dwellings not exceeding four storeys*
- BS 5950-1 : 2000 *Structural use of steelwork in building — Code of practice for design — Rolled and welded sections*
- BS 5950-5 : 1998 *Structural use of steelwork in building — Code of practice for design of cold formed thin gauge sections*
- BS 6399-1 : 1996 *Loading for buildings — Code of practice for dead and imposed loads*
- BS 6399-2 : 1997 *Loading for buildings — Code of practice for wind loads*
- BS 6399-3 : 1988 *Loading for buildings — Code of practice for imposed roof loads*
- BS 6767-1 : 1999 *Transportable accommodation units — Recommendations for design and construction of the basic unit*
- BS 6767-2 : 1998 *Transportable accommodation units — Recommendations for design and installation of services and fittings with guidance on transportation, siting and aspects relating to habitation*
- BS 7543 : 2003 *Guide to durability of buildings and building elements, products and components*
- BS 8004 : 1986 *Code of practice for foundations*
- BS EN 300 : 2006 *Oriented Strand Boards (OSB) — Definitions, classification and specifications*
- BS EN 594 : 1996 *Timber structures — Test methods — Racking strength and stiffness of timber frame wall panels*
- BS EN 10326 : 2004 *Continuously hot-dip coated strip and sheet of structural steels — Technical delivery conditions*
- BS EN ISO 1461 : 2009 *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BS EN ISO 9001 : 2008 *Quality management systems — Requirements*
- BS EN ISO 10211-1 : 1996 *Thermal bridges in building construction — Heat flows and surface temperatures — General calculation methods*
- BS EN ISO 13370 : 2007 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*

## 19 Conditions

19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

19.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

19.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

19.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

