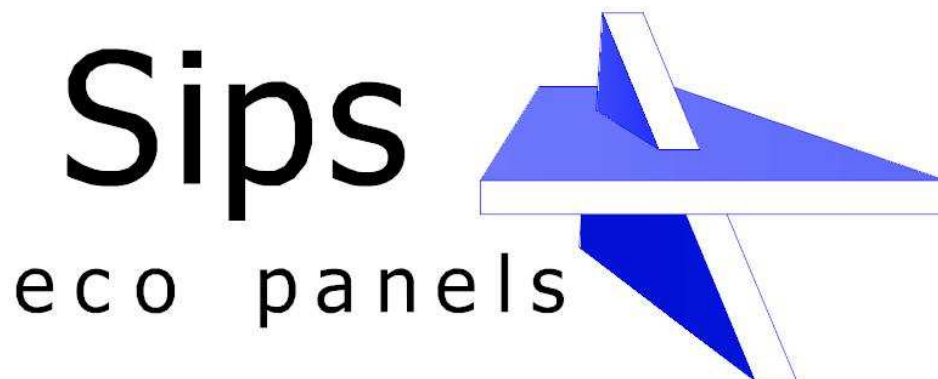




**Q-MARK REGISTRATION SCHEDULE
FOR**

SIPS ECO PANELS LTD

SIPS ECO PANEL BUILDING SYSTEM



Company:

SIPs Eco Panels Ltd

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Establishment ID:

024/2642

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1 INTRODUCTION

The Q-Mark Building Systems Scheme is a third-party product certification scheme operated by BM TRADA Certification Ltd. "Building Systems" is a generic term for buildings that are manufactured from pre-designed and prefabricated components produced in series off-site.

The scheme is based on the principles of ISO9001, EN 45011/12, ISO Guide 62/65 and confirms compliance with the main requirements of ETAG 007, together with a specific set of performance criteria set by TRADA, (as defined in Clause 4 of this document) in order to attain a design which performs to a high standard. The relevant standards listed above are to be read in conjunction with this document.

The scheme covers factory production control, documentation and test/assessment evidence, and the resultant certification is specific to clearly defined products and their constituent components.

The objectives of the scheme are:

- To improve the quality and performance of the Building System.
- To provide unambiguous evidence of compliance with the relevant standards.
- To provide manufacturers with a clear route toward CE marking.
- To provide specifiers, regulators and inspection authorities with the appropriate information for them to identify suitable products

2 DEFINITIONS & ABBREVIATIONS

The following definitions and abbreviations are used throughout the document. Other definitions are as given in the relevant standards.

Assessment	A considered judgement to determine whether products meet the criteria laid down in the relevant technical specifications.
Audit	Visit by BM TRADA or other certification body to examine the quality management system and production processes of a manufacturer or supplier, usually to determine appropriate compliance to ISO 9001, with specific emphasis on the factory production control elements.
Member	Company holding membership of the Q-Mark scheme.
QMS	Quality Management System (e.g. one meeting BS EN ISO 9001).
Schedule	The certification schedule, which identifies the scope and range of products covered by the membership certificate.
Scheme	The BM TRADA Q-Mark Building Systems Scheme.

3 SCOPE

The Scheme is applicable to Building Systems which fall within the scopes of the product standards referenced in clause 1 of this document, and applies to the main components of the structure – walls, columns, beams, floors and roofs as manufactured and supplied, and before being installed onto the construction site. The following range of products has been assessed under this certificate.

4 PRODUCT DESCRIPTION

The Sips eco panels Building system is based upon the use of Sips eco panels (a type of Structural Insulated Panel (SIP)) connected together to form larger rigid panels and three-dimensional forms. The panels are connected together using OSB or solid wood splines with expanding polyurethane sealant used at each and every junction.

Floors are constructed using engineered timber I-joists or solid timber joists supported by the Sips eco panels and internal load bearing stud walls.

Constructions are limited to 2 ½ storeys based on expected dead and live loads.

4.1 Ground Floor

Ground level floor construction consists of an insulation layer on top of a damp proof course, the insulation is followed by a vapour control barrier and a layer of anhydrite screed or chipboard flooring.

Refer to Annex 5 for examples of details assessed as part of the certification process.

4.2 Party Floor

Party floors comprise of the following layout:

- 18mm layer of T&G flooring
- A layer of 19mm Gyproc plank
- Resilient composite battens
- A layer of 15mm OSB 3/4
- One of three joist options
- Two layers of 15mm plasterboard (refer to section A5.1 for the appropriate board type)

All voids are filled with mineral wool. Refer to Annex 6 for details assessed as part of the certification process.

4.3 External Wall Construction

The external walls consist of Sips eco panels, sheathed with Lafarge E Board internally and a suitable cladding externally. A drained and vented cavity also forms part of the construction.

Refer to Annex 1 for examples of details assessed as part of the certification process.

4.4 Internal Wall Construction

The internal walls comprise of softwood timber studwork, lined on either side with Lafarge E Board with the stud void filled with mineral wool for sound insulation where required.

Refer to Annex 2 for examples of details assessed as part of the certification process.

4.5 Party Wall

Party walls may be constructed using a timber frame construction only. Refer to Annex 3 for details of dimensions and exact layout.

4.6 Intermediate floors

Typical constructions comprise of the following:

- 22mm chipboard flooring
- solid timber, or Finnjoist I-joist
- 15m gypsum plasterboard

Cavity voids are part filled with mineral wool insulation. Refer to Annex 6 for examples of details assessed as part of the certification process.

4.7 Roof Construction

Roof construction consists of Sips eco panels, lined with a breather membrane and covered in roof tiles secured to timber battens on counter battens.

Refer to Annex 4 for examples of details assessed as part of the certification process.

5 INTENDED USE

Under the scope of this certification, the Sips eco panels Building System is approved for residential use as defined by purpose groups 1-5 in Table D1 of Approved Document B and for environmental category C1 as defined in BS EN ISO 12944. Sips eco panels Buildings shall be erected to a maximum of 2 ½ storeys.

6 BUILDING REGULATIONS

The Sips eco panels Building System is certified under the BM TRADA Q-Mark Building Systems Scheme. It is the opinion of BM TRADA that if used in accordance with the requirements of this scheme and in accordance with the installation manual, then the building will satisfy, or contribute to satisfying the relevant requirements of the following Regulations:

- The Building Regulations 2000 (England and Wales)
- The Building (Scotland) Regulations 2004
- The Building Regulations (Northern Ireland) 2000.

7 SCHEME REQUIREMENTS

BM TRADA has determined that the Member conforms with the requirements within these clauses by auditing and/or other forms of verification where appropriate.

7.1 Quality Management System (QMS)

The manufacture of the products has been conducted under the control of an appropriate QMS.

The QMS shall be subject to periodic audit (not less than once per year).

All new Members are subject to an initial inspection.

7.2 Documentation

The following documents are controlled under the requirements of this scheme:

- Manufacturing documentation (e.g. Quality Manual, procedures)
- Product specification/range documentation and Assessment
- Installation instructions
- Test reports and Sampling
- Q-Mark certificate and schedule(s)

7.3 Manufacturing Documentation

The Member has supplied details of their manufacturing documentation to BM TRADA for review. Typically, this will comprise of the Quality Manual, procedures, works instructions and test data.

8 MINIMUM QMS REQUIREMENTS

8.1 Factory Production Control

As part of the documented process control procedures the company has:

- Demonstrated that the product is being fabricated in accordance with documented manufacturing procedures from purchase of raw material to the production of the finished product.
- These procedures control all critical aspects of the production.
- Target limits are defined at each one of these areas.
- All performance characteristics claimed are controlled in order to remain consistent by including appropriate checks or testing in the QMS to ensure a consistent and similar product is produced.

8.2 Management Responsibility

The management of the company carries out regular reviews of the system, which shall include production records and any complaints that have been received. Notes are kept of any topics discussed and decisions made.

8.3 Company Representative

A member of the management team is responsible for the QMS.

8.4 Internal Audits

Routine internal audits are carried out to ensure compliance with the requirements of the scheme is met.

8.5 Documentation

Inspection and test records are kept in a format that is acceptable to BM TRADA Certification for a minimum of 5 years.

8.6 Work Instructions

Work instructions and target values are placed at the critical production points throughout the manufacturing process.

8.7 Procedures for Non-conforming Product

Where factory production control/target values are out of specification there is a procedure for identifying and correcting these deficiencies. The factory production control system has been assessed and found to be able to detect non-conforming product quickly enough so that affected product can be quarantined.

8.8 Traceability

There are procedures, which enable appropriate traceability of production runs through to dispatch.

8.9 Training

The company maintains records to show that staff have been satisfactorily trained to undertake the manufacturing and inspection tasks that they have been assigned. Records are kept of this training and the personnel's job description shall be clearly defined.

8.10 Complaints

The company maintains a register of all complaints received on the quality of their product, which should show the steps they have taken to deal with the problem and their analysis of the causes. These records shall be kept for a minimum of 5 years.

8.11 Document Control

There are procedures in place for effectively controlling the quality of documentation issued to the relevant personnel, so that they have up-to-date procedures.

8.12 Machinery Maintenance and Calibration

All machinery and measuring/testing equipment that could affect the quality of the product is properly maintained and calibrated so that a consistent product can be produced and tested. There is a maintenance and calibration schedule. A record is kept of the maintenance and calibration carried out.

9 OTHER REQUIREMENTS OF THE SCHEME

9.1 Assessment of System Design and Specification Documents

A full structural design must be carried out for each project by a suitably qualified structural engineer. The full design procedure to be used for Sips eco panels Building Systems and the process, which was used in the assessment, is detailed in Sips eco panels' Sips eco panels Structural Design Manual. Any changes or amendments to the approved design process must be notified to BM TRADA Certification Limited for appraisal.

The dead and imposed loading shall be determined in accordance with BS 6399-1. The wind loading shall be determined in accordance with BS 6399-2. The imposed roof loading shall be determined in accordance with BS 6399-3.

The specification and design of the connection systems must be determined by the building engineer responsible for the stability of the building. Connection design and checking is an essential part of the design process.

9.2 Transport and Storage Instructions

This must be carried out in accordance with the manufacturer's instructions.

Wall panels and roof sections are transported from the factory to site in covered lorries. Due to the speed of erection smaller buildings can be constructed and roofed within one or two days. If larger or phased developments are undertaken, the kit should be covered with plastic sheet to protect it from rain over night. Suitable fall arrest measures would be required around any opening in the floors.

9.3 Installation

Erection of the system must comply with the details given in the Sips eco panels Manual, standard details and the provisions of this certificate.

The main contractor must ensure that the accuracy of the foundation is in accordance with Sips eco panels Building Systems instructions. For best practice in screeded ground floors only, TRADA requires that foundations for any load-bearing internal walls incorporate a brick up-stand onto which the sole plate is mounted. This ensures that the sole plate is not installed below the surface of the floor screed. It is the responsibility of the manufacturer and main contractor to ensure that a suitable and accurately placed up-stand is provided/erected.

The connection systems used on site must be in accordance with the design engineer's specification as determined during the design process.

9.4 Durability and Serviceability

Sips eco panels Building Systems achieve durability through appropriate design, detailing and construction. Designers have been found to be implementing proven and reliable construction details. As long as these details and procedures are met, Sips eco panels Building Systems will have comparable durability of at least 60 years.

As regards serviceability, Sips eco panels Buildings have sufficient stiffness to avoid unacceptable bowing, deflections and vibrations from normal use.

10 TEST AND VERIFICATION REQUIREMENTS

10.1 Test Reports and Sampling

BM TRADA has assessed the results of testing and sampling, and/or calculation that has been carried out in accordance with the scheme rules. A list of the documents and evidence is given in Annex 8.

11 INITIAL TYPE TESTING/CALCULATION

11.1 Mechanical Resistance and Stability

Mechanical resistance and stability has been assessed by investigation of the design procedure using worked examples.

11.2 Safety in Case of Fire

11.2.1 Reaction to Fire

The reaction to fire of the standard details has been assessed against the British Standard classification. Approved Document B of the Building Regulations confirms that a gypsum based fibre board surface achieves the highest rating of Class 0. External claddings have not been considered within this scope of approval.

11.2.2 Resistance to Fire

The fire resistance performance of the standard details have been assessed against the current fire resistance test standard ref.: BS 476: Parts 20, 21 and 22 (as appropriate). The required integrity performances of 30 and 60 minutes for both walls and floors, against the appropriate standard detail, have been confirmed as having been achieved.

It should be noted that floor and wall construction is limited to those tested in Table 23 of section A8.1.5 of this Schedule. Any deviation from these tested configurations falls outside the scope of this certificate.

11.2.3 External Fire Performance of Roof Covering

Roof coverings have not been considered within the scope of this certification.

11.3 Hygiene, Health and Environment

11.3.1 Vapour Permeability and Moisture Resistance

The risk of condensation has been assessed with the external wall construction described in 4.1.1 and there is no significant threat of interstitial condensation.

11.3.2 Water Tightness

11.3.2.1 External Envelope

Primary protection from the elements for external walls is provided by suitable external cladding systems, typically traditional brick, rain screens or render. Note that these cladding systems have not been included within the scope of this certification but shall be assessed or certified in their own right as being suitable for use with Sips eco panel Building Systems. Analysis of standard details shows all systems follow the two stage principle, in that a drained and vented cavity is formed between the cladding and sheathing, which has an appropriate breather membrane.

Table 1 Minimum Required Cavity width

Cladding	Cavity Width (mm)
Masonry & un-backed lathing	50
Render on backed lathing	50
Timber Cladding	19

In addition any applied cladding system must also comply with NHBC requirements sections 6.9 and 6.10. Note that cladding loads are taken into consideration as part of the structural design process.

The lowest structural timber must be at least 150 mm above external ground level.

11.3.2.2 Internal Surfaces

The water tightness of internal surfaces has not been determined as part of this assessment.

11.3.3 Release of Dangerous Substances

The Sips eco panels used as part of the building system contain styrene which is listed as a regulated VOC as defined in the EU database. Based on the declaration of the manufacturer EPS 70 meets the requirements of EN 13163 and does not contain CFC, HCFC or HFA and so have zero ozone depletion potential. The Oriented Strand Board (OSB) used in the SIP panels has a classification E1 according to EN 13986 as measured according to EN 120.

11.4 Safety in Use

11.4.1 Slipperiness of Floor Finishes

The slipperiness of floor finishes has not been determined as part of this assessment.

11.4.2 Resistance to Eccentric Loads (Including Impact Resistance)

Partitions detailed for use in the Sips eco panels Building System have been determined to have sufficient robustness for the intended use of the adjacent areas. The BS 5234 'Category of duty' of the partitions has been verified by comparison with third party BS 5234 classification of partition systems. The recommendations of BS 5234 are shown in the *Table 2*.

Partitions used as part of the Sips eco panel Building System fall in the Light duty (LD) Grade.

Table 2 Partition grades by categories of duty (BS 5234-1: Table 2)

Grade	Category of duty	Examples
Light duty (LD)	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse	Domestic accommodation
Medium duty (MD)	Adjacent space moderately used, primarily by persons with some incentive to exercise care. Some chance of accident occurring and of misuse	Office accommodation
Heavy duty (HD)	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring and of misuse	Public circulation areas Industrial areas
Severe duty (SD)	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormally rough use	Major circulation areas Heavy industrial areas

11.4.3 Falling due to changes in level or sudden drops

Handrails and balustrades shall be provided as required by national building regulations. These handrails and balustrades should be designed for loadings from BS 6399-1. The appropriate code of practice should be used for the selected handrail or balustrade.

11.5 Protection against Noise

11.5.1 Airborne Sound Insulation

TRADA has assessed Sips eco panels Standard Details and has found that based on previous knowledge and experience, Sips eco panel Building systems are capable of complying with minimum performance requirements of Building Regulations. Airborne sound insulation tests between rooms with typical wall constructions have been carried out on Sips eco panels in accordance with BS EN ISO 140-4 to verify this.

11.5.2 Impact Sound Insulation

TRADA has assessed Standard Details and has found that based on previous knowledge and experience, Sips eco panel Building systems are capable of complying with minimum performance requirements of Building Regulations. Airborne sound insulation tests between rooms with typical wall constructions have been carried out on Sips eco panels in accordance with BS EN ISO 140-4 to verify this.

11.6 Energy Economy and Heat Retention

11.6.1 Thermal Resistance

The calculated value for Thermal Resistance for the typical main Sips eco panels elements, as detailed in Annex 1, 2 & 3 and summarised in 11.6.1.1 & 11.6.1.2, is given in *Table 4*.

Table 4 U-values

Building Element	U-Value* (W/m ² K)
External Wall	0.22 (Blockwork & render, 97mm core)
	0.23 (Brickwork, 97mm core)
	0.25 (Render on battens, 97mm core)
	0.22 (Tile, 97mm core)
	0.22 (Timber Weatherboard, 97mm core)
	0.15 (Blockwork & render, 172mm core)
	0.15 (Brickwork, 172mm core)
	0.14 (Render on battens, 172mm core)
	0.15 (Tile, 172mm core)
	0.14 (Timber Weatherboard, 172mm core)
Roof	0.18

*Calculations to BS EN ISO 6946

11.6.1.1 Wall Construction Detail

Table 5 Sips eco panels blockwork & render, 97mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	18	Render (External surface)
2	100	Blockwork, medium
3	60	Standard cavity
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	97	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	336	

*These 3 components form the Sips eco panel

Table 6 Sips eco panels brick, 97mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	100	Brick (Outer leaf)
2	60	Standard cavity
3	1	Tyvec Reflex Breather membrane
4	11	OSB*
5	97	Lambdatherm*
6	11	OSB*
7	1	Polythene, 500 gauge
8	25	Airspace/timber battens
9	12	Plasterboard, standard
Total Thickness	318	

*These 3 components form the Sips eco panel

Table 7 Sips eco panels render on battens, 97mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	25	Render (External surface)
2	6	Lathes
3	50	Airspace/timber battens
4	1	Breather membrane
5	11	OSB*
6	97	Lambdatherm*
7	11	OSB*
8	1	Polythene, 1000 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	239	

*These 3 components form the Sips eco panel

Table 8 Sips eco panels tile, 97mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	12	Tiling, clay (External surface)
2	50	Airspace/timber battens
3	50	Airspace/timber battens
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	97	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	270	

*These 3 components form the Sips eco panel

Table 9 Sips eco panels timber weatherboard, 97mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	12	Hardwood, dry (External surface)
2	50	Airspace/timber battens
3	50	Airspace/timber battens
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	97	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	270	

*These 3 components form the Sips eco panel

Table 10 Sips eco panels blockwork & render, 172mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	18	Render (External surface)
2	100	Blockwork, medium
3	60	Standard cavity
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	172	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	411	

*These 3 components form the Sips eco panel

Table 11 Sips eco panels brickwork, 172mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	100	Brick (Outer leaf)
2	60	Standard cavity
3	1	Tyvec Reflex Breather membrane
4	11	OSB*
5	172	Lambdatherm*
6	11	OSB*
7	1	Polythene, 500 gauge
8	25	Airspace/timber battens
9	12	Plasterboard, standard
Total Thickness	393	

*These 3 components form the Sips eco panel

Table 12 Sips eco panels render on battens, 172mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	18	Render (External surface)
2	6	Lathes
3	50	Airspace/timber battens
4	50	Airspace/timber battens
5	1	Tyvec Reflex Breather membrane
6	11	OSB*
7	172	Lambdatherm*
8	11	OSB*
9	1	Polythene, 500 gauge
10	25	Airspace/timber battens
11	12	Plasterboard, standard
Total Thickness	357	

*These 3 components form the Sips eco panel

Table 13 Sips eco panels tile, 172mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	12	Tiling, clay (External surface)
2	50	Airspace/timber battens
3	50	Airspace/timber battens
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	172	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	345	

*These 3 components form the Sips eco panel

Table 14 Sips eco panels timber weatherboard, 172mm core

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	12	Hardwood, dry (External surface)
2	25	Airspace/timber battens
3	25	Airspace/timber battens
4	1	Tyvec Reflex Breather membrane
5	11	OSB*
6	172	Lambdatherm*
7	11	OSB*
8	1	Polythene, 500 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	295	

*These 3 components form the Sips eco panel

11.6.1.2 Roof Construction Detail

Table 15 Sips eco panels roof detail

Construction Details		
Layer Index	Thickness (mm)	Material Name
1	12	Tiling, clay (External surface)
2	25	Airspace/timber battens
3	25	Airspace/timber battens
4	1	Breather membrane
5	11	OSB*
6	174	Lambdatherm*
7	11	OSB*
8	1	Polythene, 1000 gauge
9	25	Airspace/timber battens
10	12	Plasterboard, standard
Total Thickness	297	

*These 3 components form the Sips eco panel

11.6.2 Air Permeability

Sips eco panel Building systems are capable of complying with minimum performance requirements of Building Regulations. If better performance is required additional information will need to be assessed.

11.7 Aspects of Durability

The use of Sips eco panels Buildings is limited to environmental condition C1 as defined in EN 12944. This is defined as very low risk. Assessment of the Standard Details provided the use of appropriate insulation and a breather and vapour membrane ensure this.

The minimum working life of Sips eco panels Buildings can be demonstrated to be at least 60 years.

11.8 Performance Verification

An ongoing performance verification programme, based on mechanical resistance and stability has been agreed with the client to confirm maintenance of stated product performance.

12 IDENTIFICATION AND USE OF THE BM TRADA AND Q-MARK LOGOS

Correct identification of approved Building Systems, is vital in order that purchasers and controlling authorities clearly understand the status of products presented to them. It is therefore a requirement that all products or at least the packaging of the products, covered under the scheme are identified as “BM TRADA Q-Mark Approved” or other similar wording, and/or display the Q-Mark badges. This will assist subsequent inspection authorities to recognise acceptable products. For similar reasons, Members are encouraged to make use of the Marks on marketing and technical documentation.

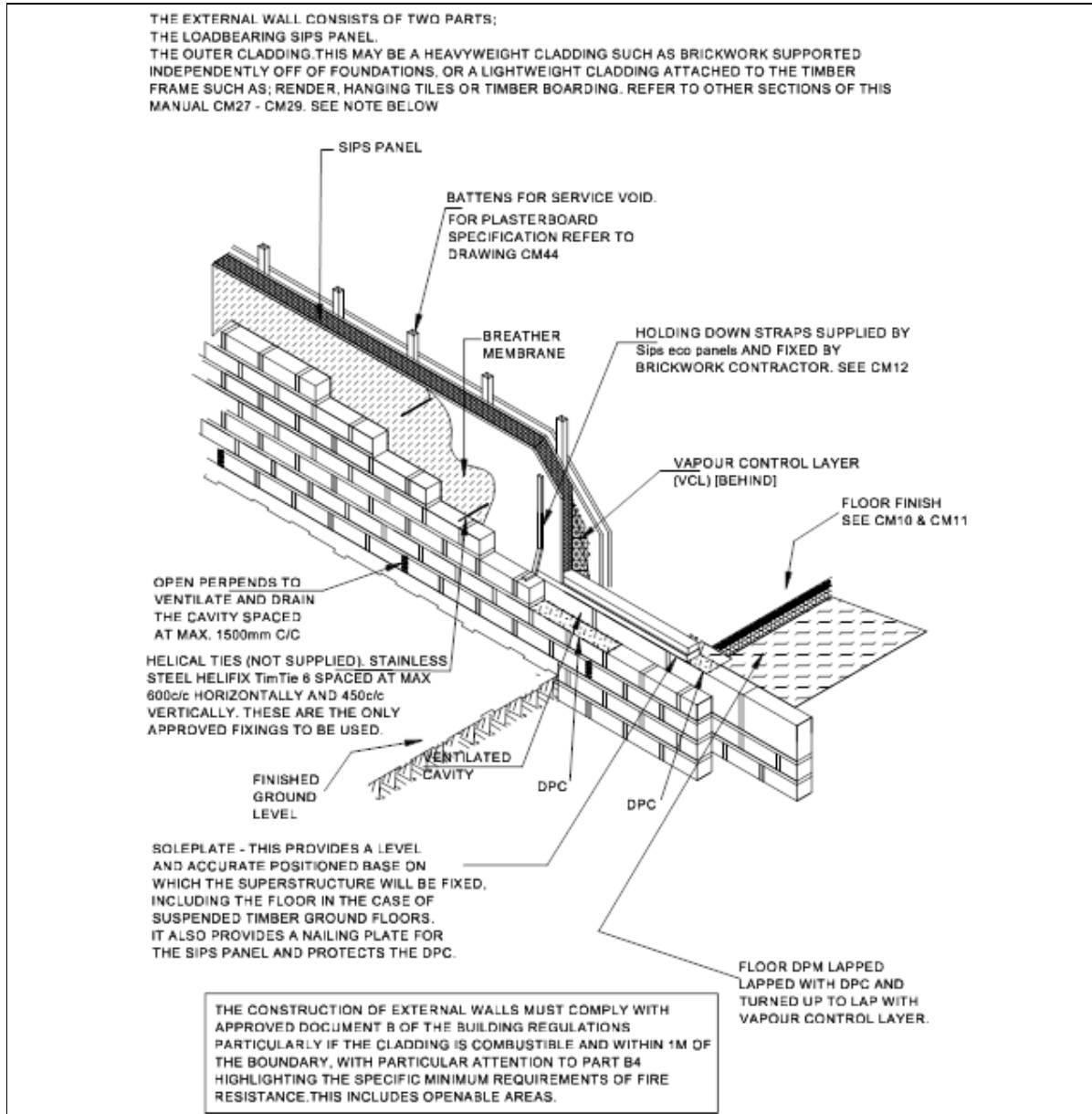
13 GUARANTEES

The scheme makes no requirement on its Members to give a minimum guarantee. This is entirely up to the discretion of the Member.

ANNEX 1 EXTERNAL WALL

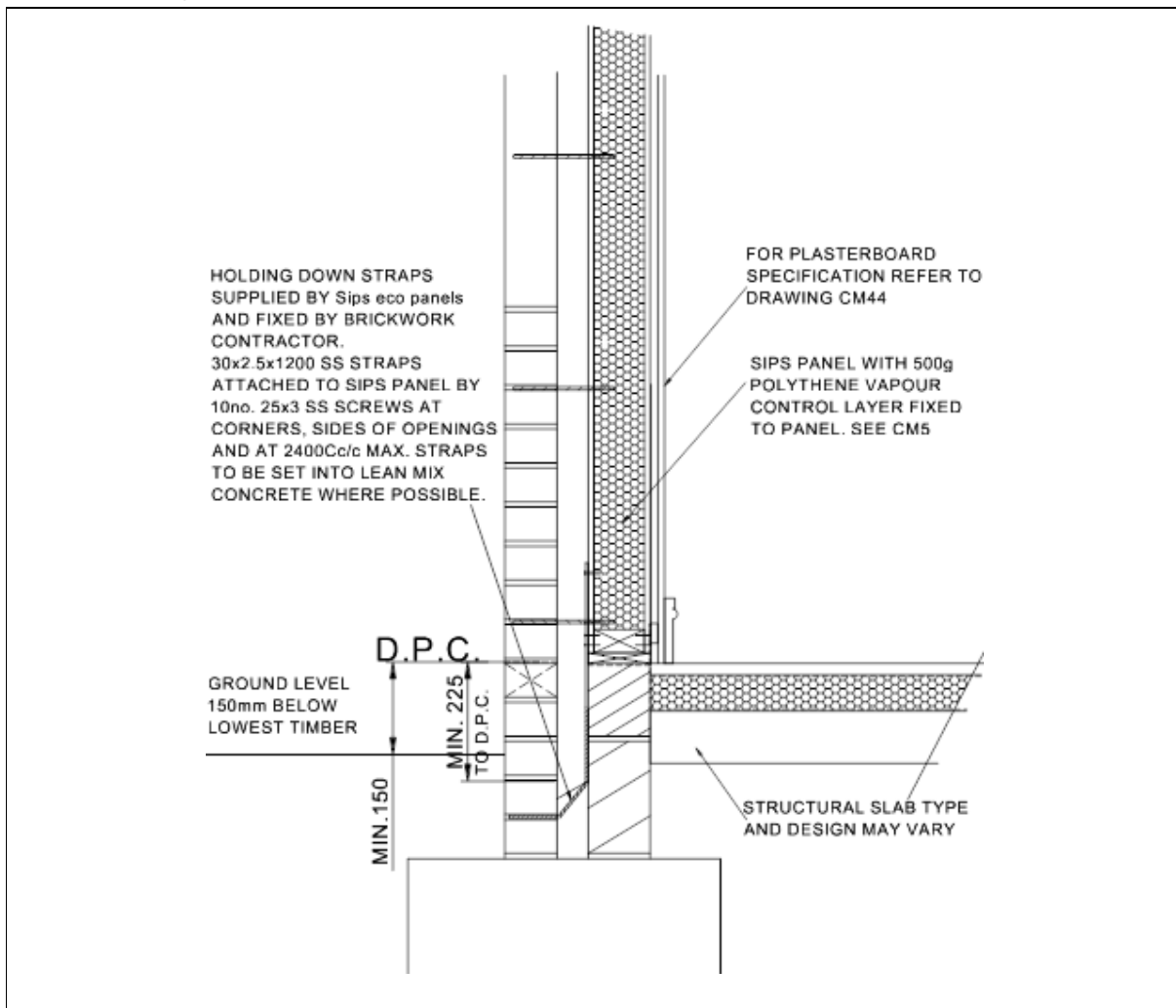
A1.1 Detail of External Wall – Typical External Wall

Drawing Ref. CM5, ISSUE 4 31.01.09



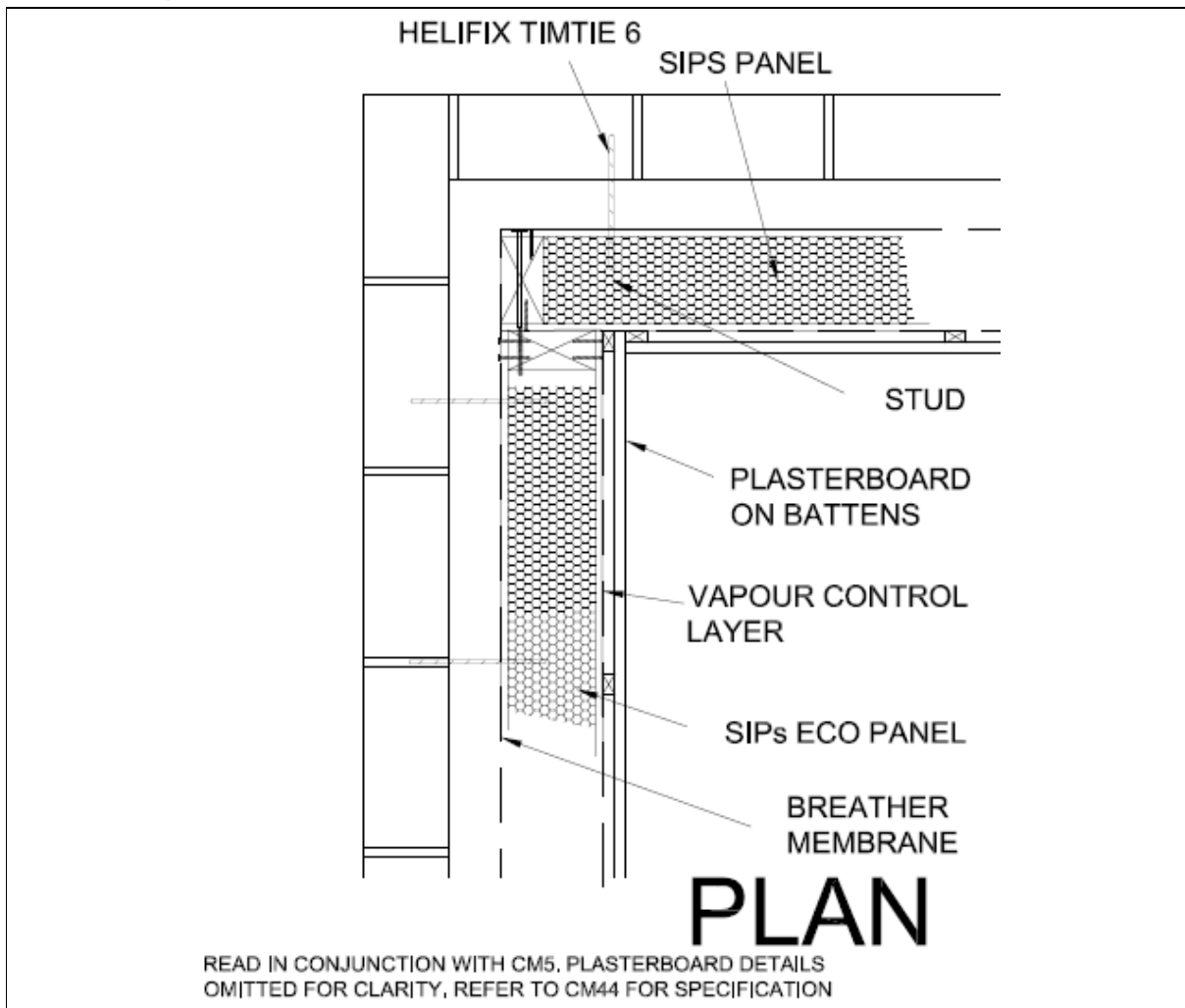
A1.2 Detail of External Wall – Restraint Strap Fixing

Drawing Ref. CM12, ISSUE 2 31.01.09



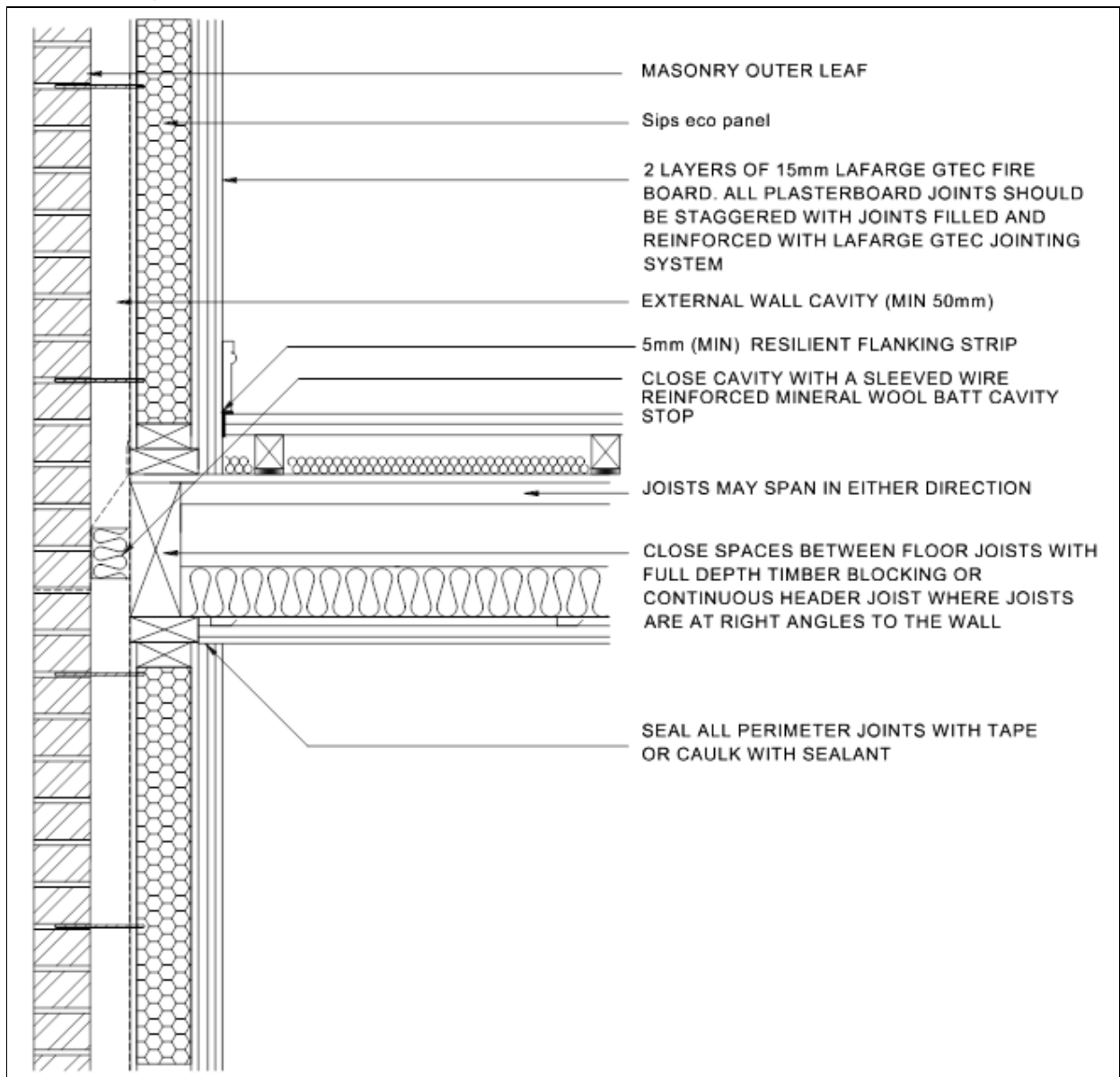
A1.3 Detail of External Wall – External Wall Corner

Drawing Ref. CM30, ISSUE 4 31.01.09



A1.4 Detail of External Wall – External Flanking Wall Junction

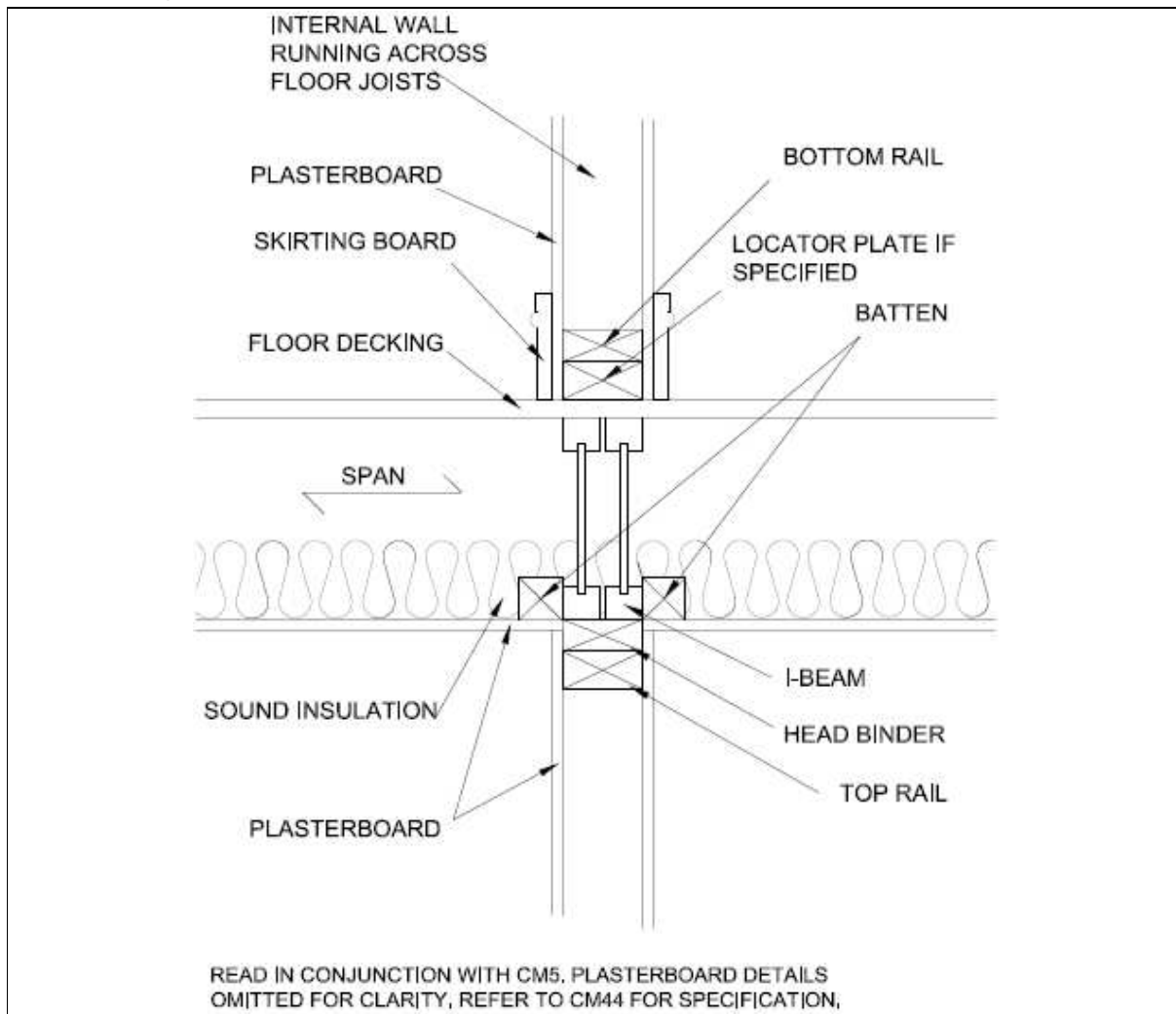
Drawing Ref. *ROBUST DETAIL 4, ISSUE 4 31.01.09



**ROBUST DETAIL refers to the 'Sips eco panel Robust Details manual' and should not be confused with Robust Details Ltd. Refer to the above mentioned manual for clarification.*

A2.2 Detail of Internal Wall - Junction of Internal Load Bearing Wall

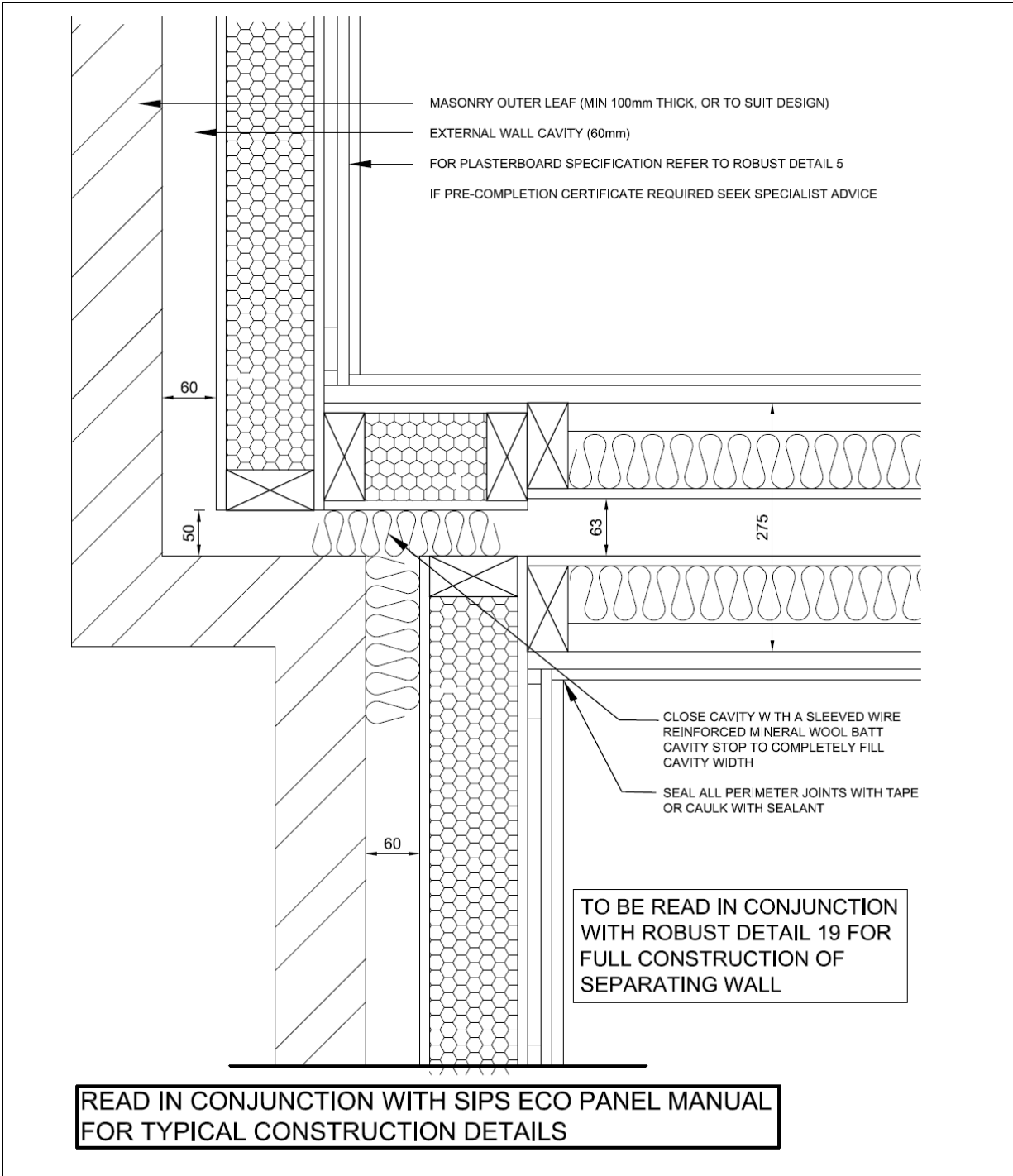
Drawing Ref. CM35, ISSUE 4 31.01.09



ANNEX 3 PARTY WALL

A3.1 Detail of Party Wall – Staggered Party Wall Timber Frame

Drawing Ref. *ROBUST DETAIL 6, ISSUE 4 31.01.09

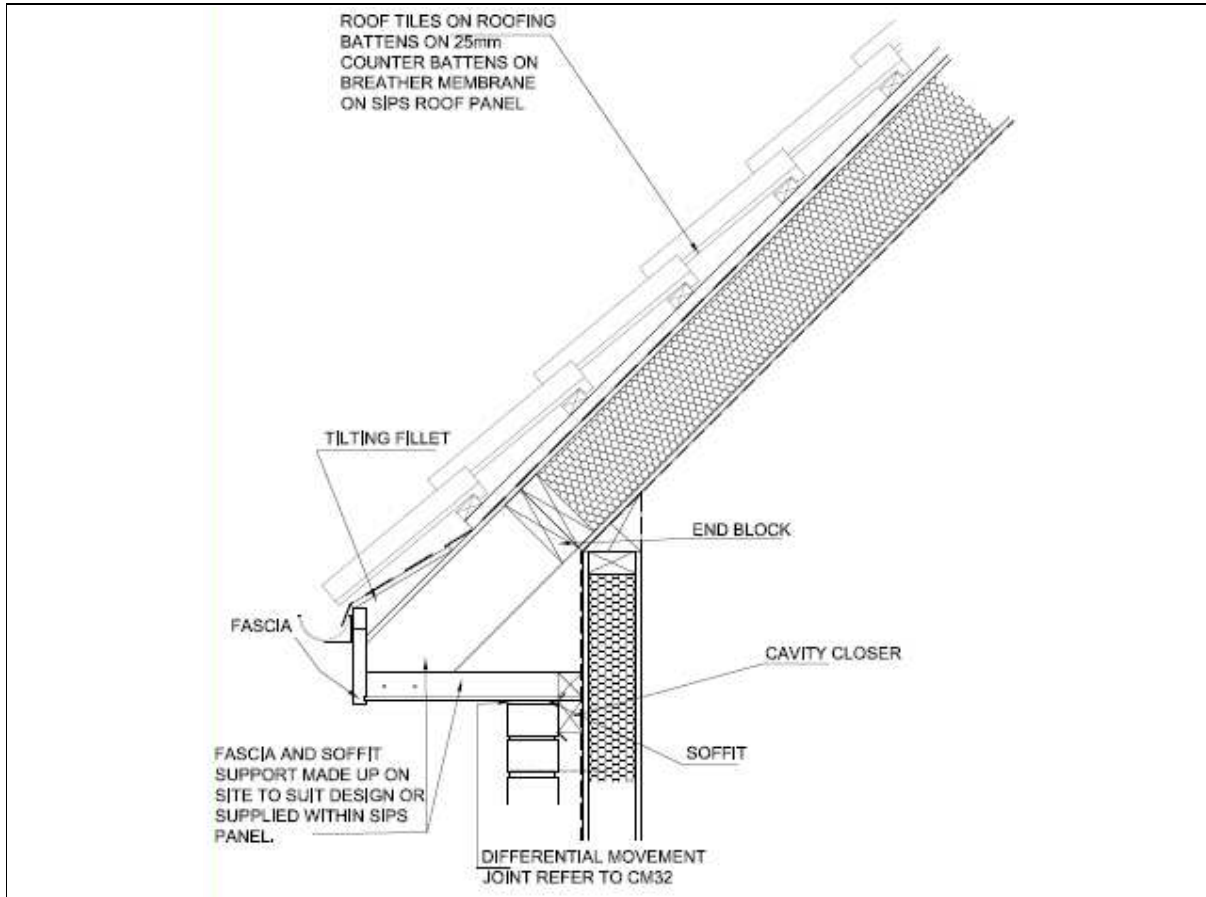


*ROBUST DETAIL refers to the 'Sips eco panel Robust Details manual' and should not be confused with Robust Details Ltd. Refer to the above mentioned manual for clarification.

ANNEX 4 ROOF

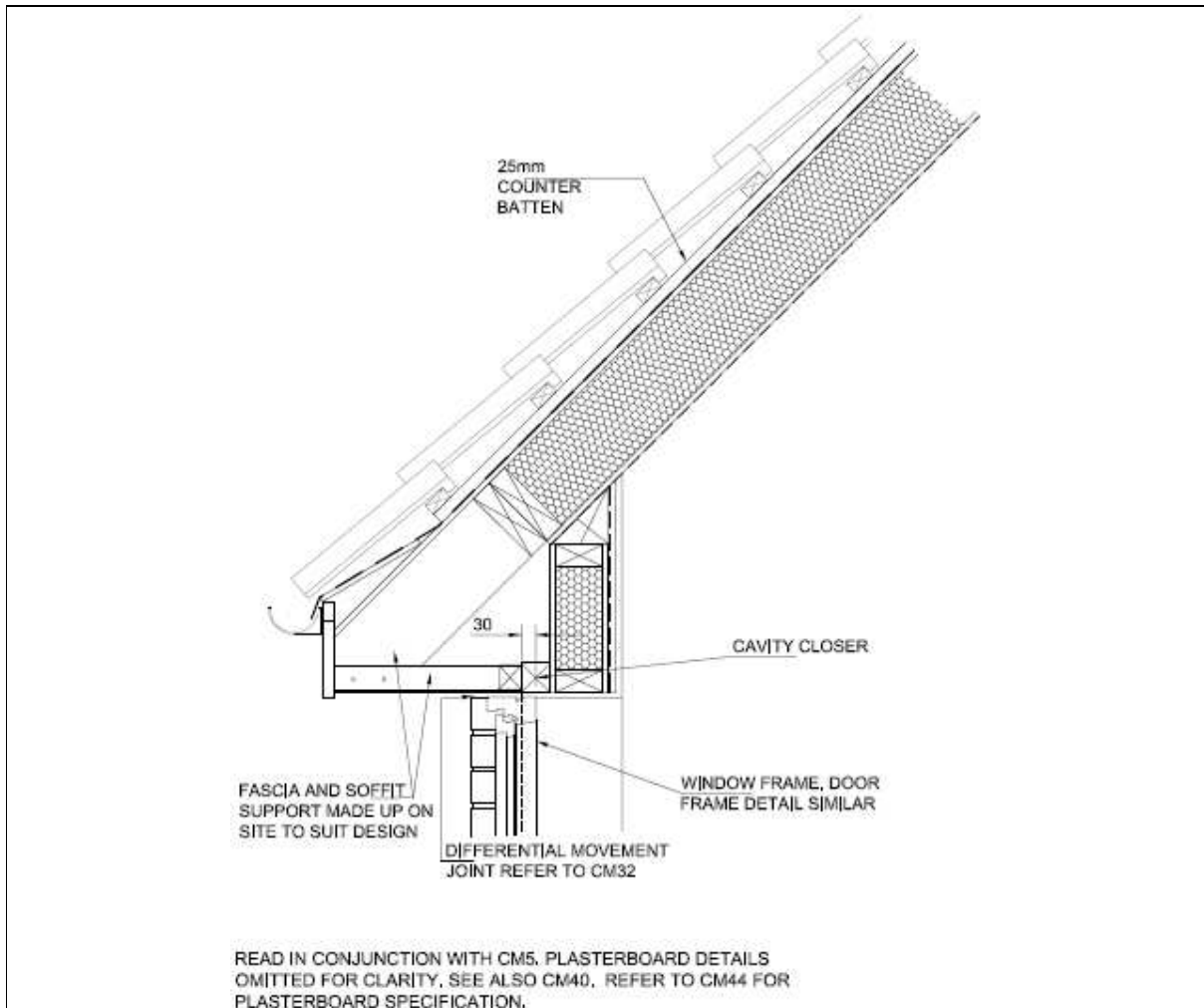
A4.1 Detail of Roof - Closed Eaves

Drawing Ref. CM40, ISSUE 4 31.01.09



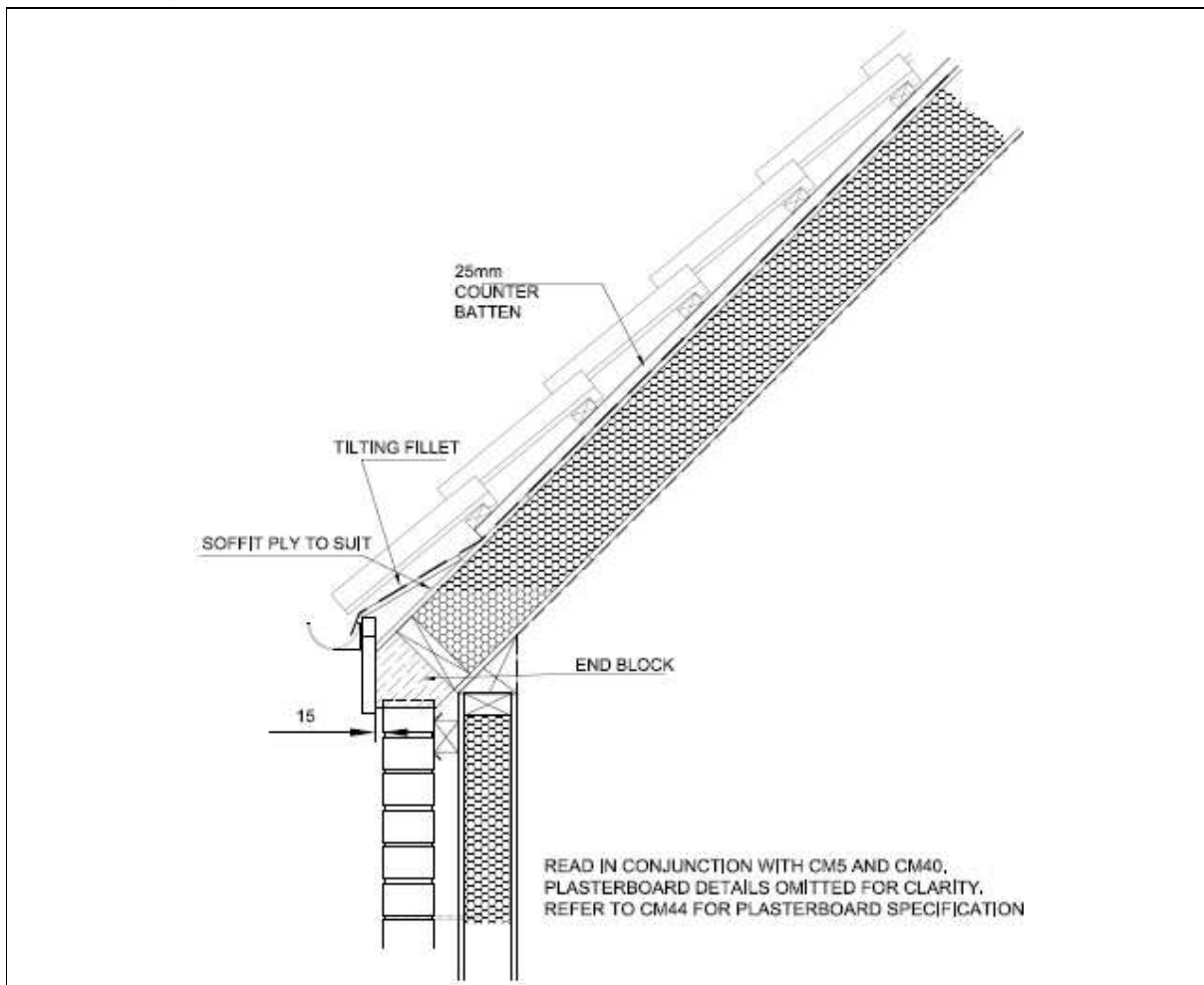
A4.2 Detail of Roof - Closed Eaves at Window Head

Drawing Ref. CM41, ISSUE 4 31.01.09



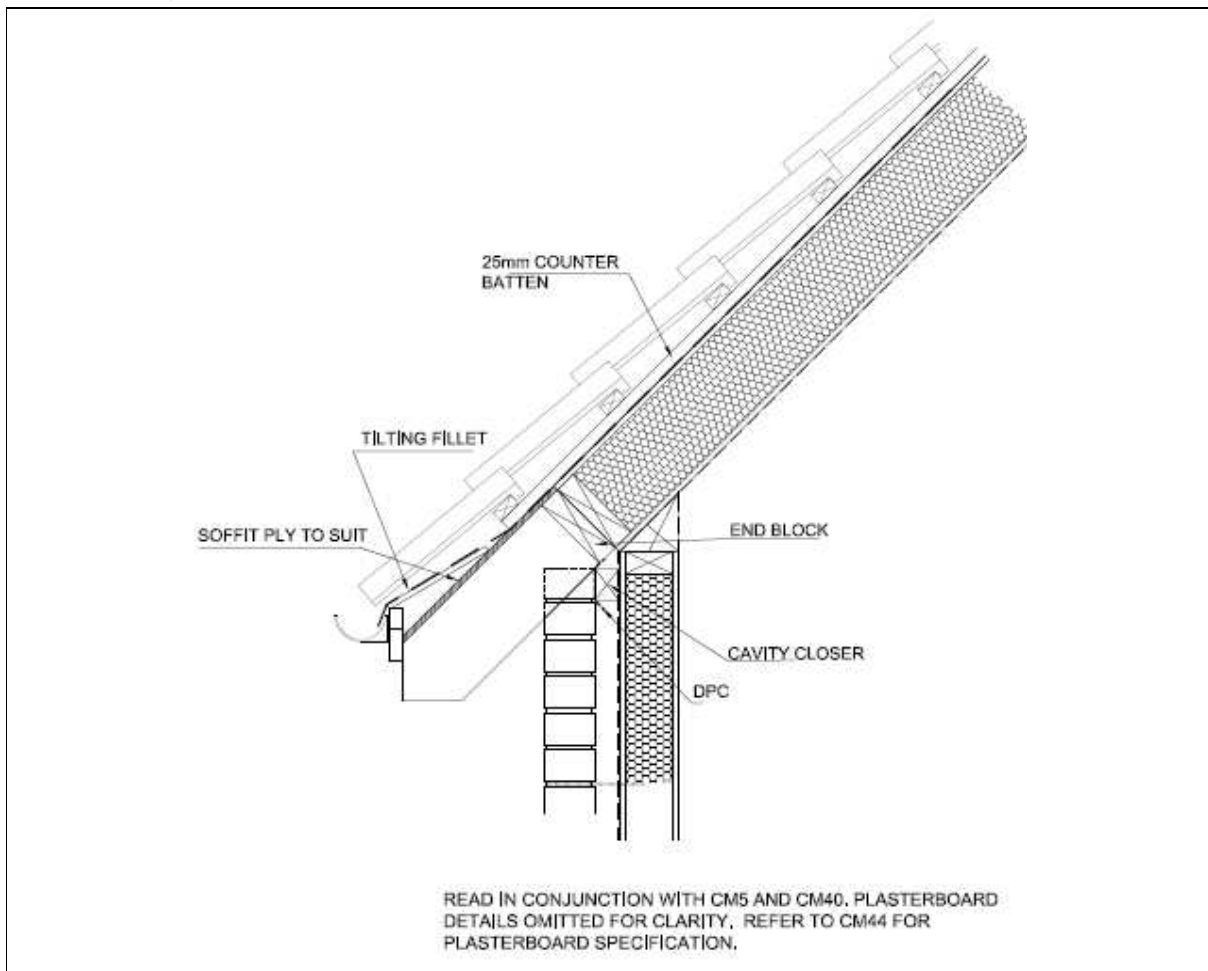
A4.3 Detail of Roof – Flush Eaves

Drawing Ref. CM42, ISSUE 4 31.01.09



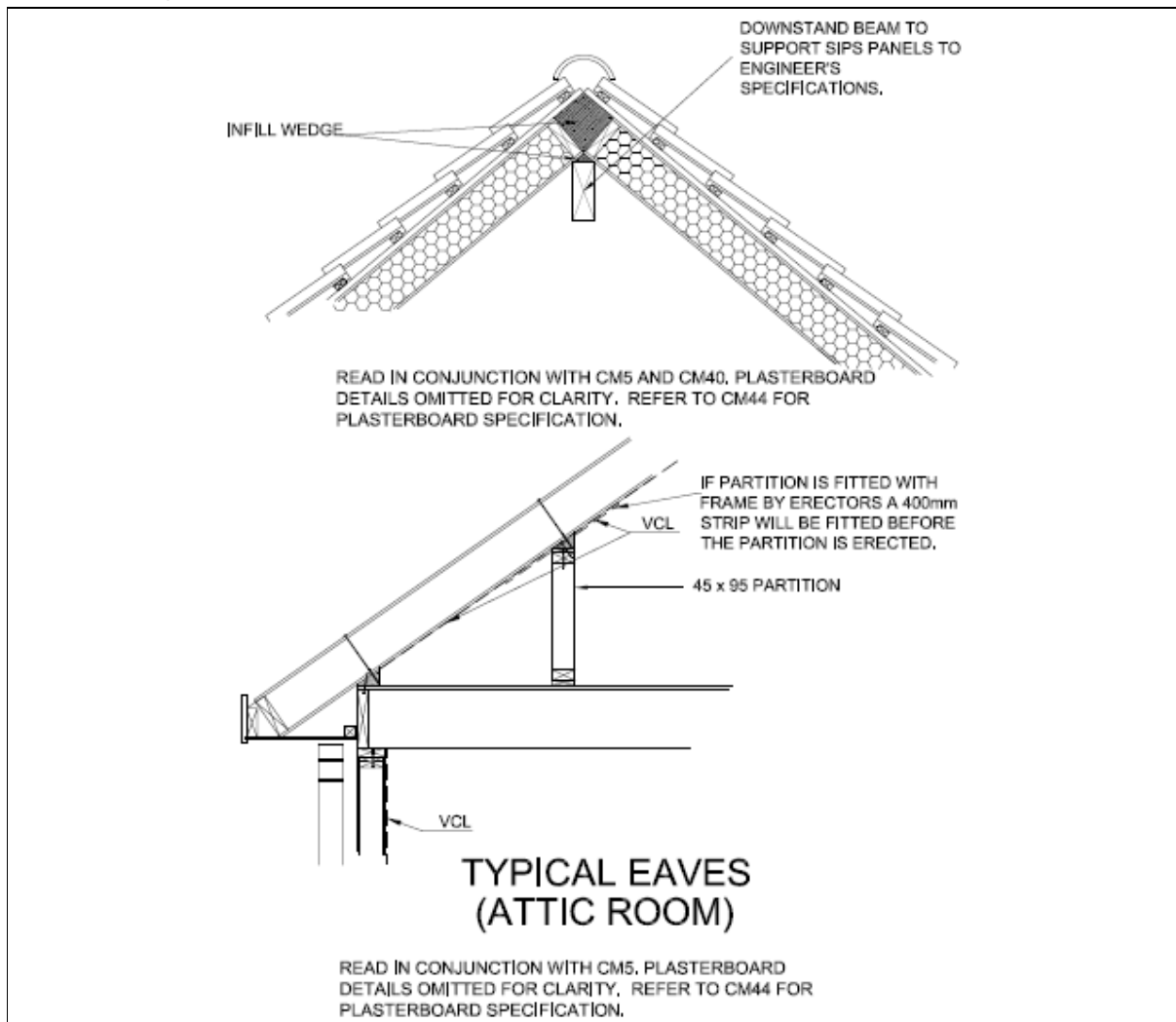
A4.4 Detail of Roof – Open Eaves

Drawing Ref. CM43, ISSUE 4 31.01.09



A4.5 Detail of Roof – Typical Ridge and Attic Room Detail

Drawing Ref. CM43.1, ISSUE 4 31.01.09

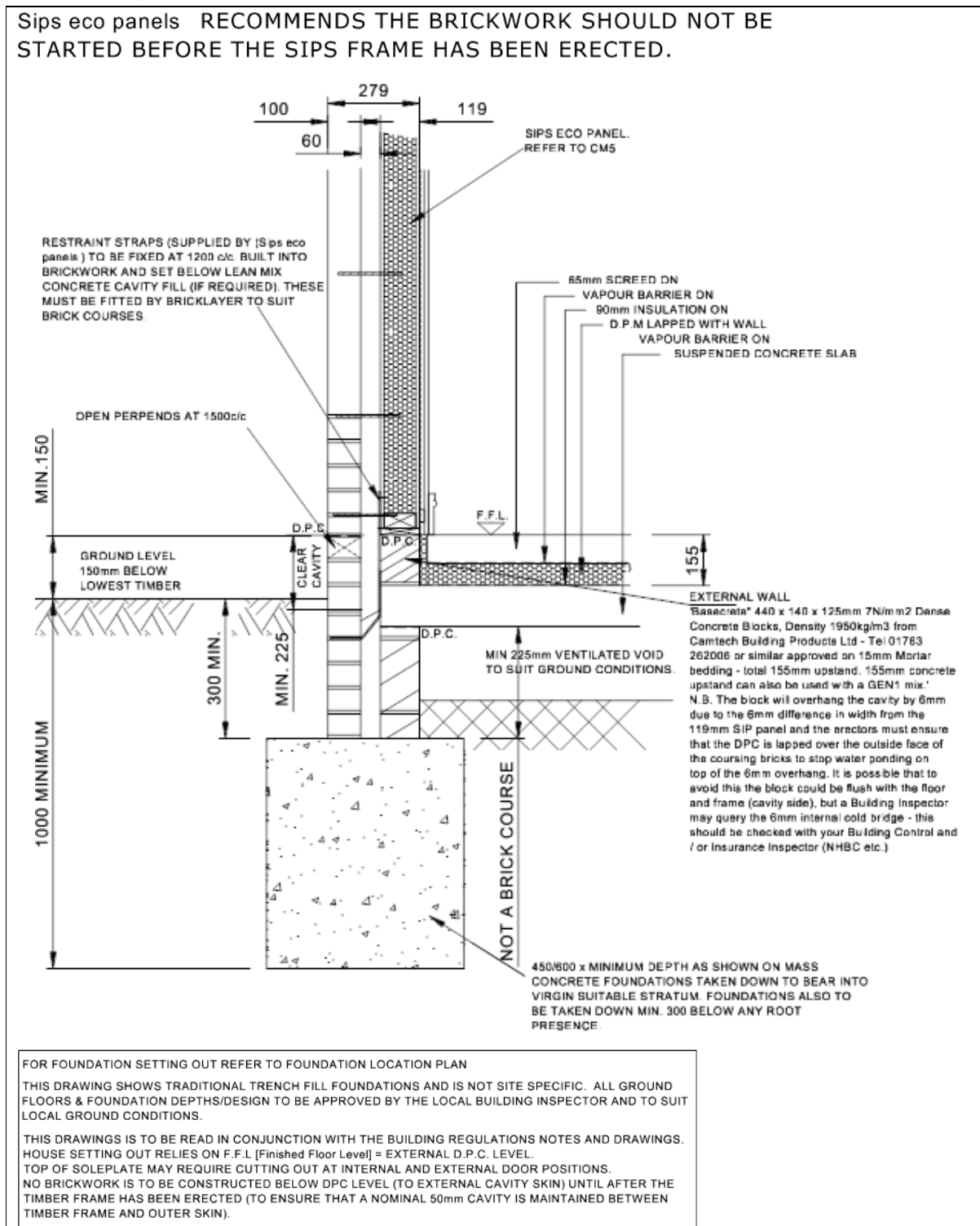


ANNEX 5 GROUND FLOOR

A5.1 Detail of Ground Floor – DPC Relationship With Screeded Floor

Drawing Ref. CM11, ISSUE 4 31.01.09

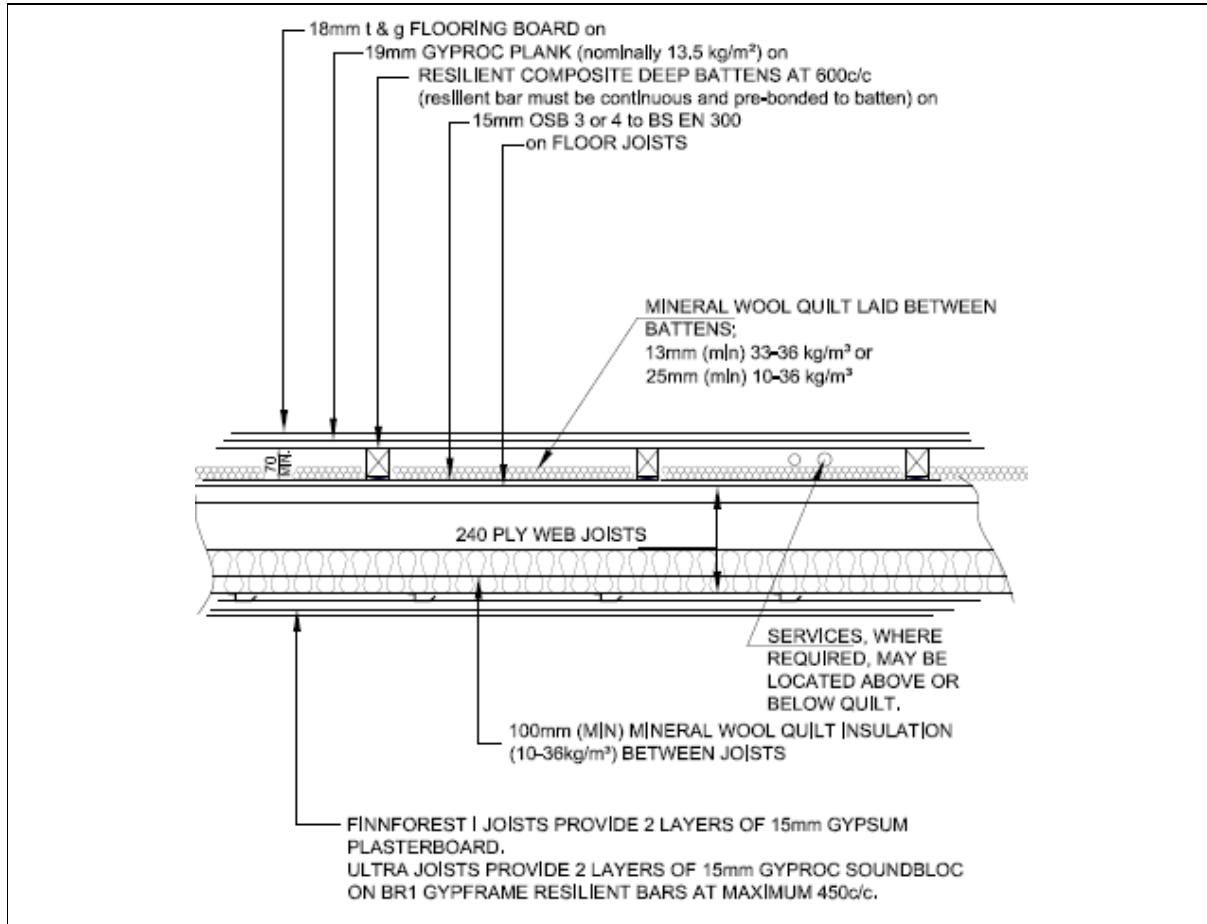
Sips eco panels RECOMMENDS THE BRICKWORK SHOULD NOT BE STARTED BEFORE THE SIPS FRAME HAS BEEN ERECTED.



ANNEX 6 PARTY FLOOR

A6.1 Detail of Party Floor – Separating Floor Construction 2

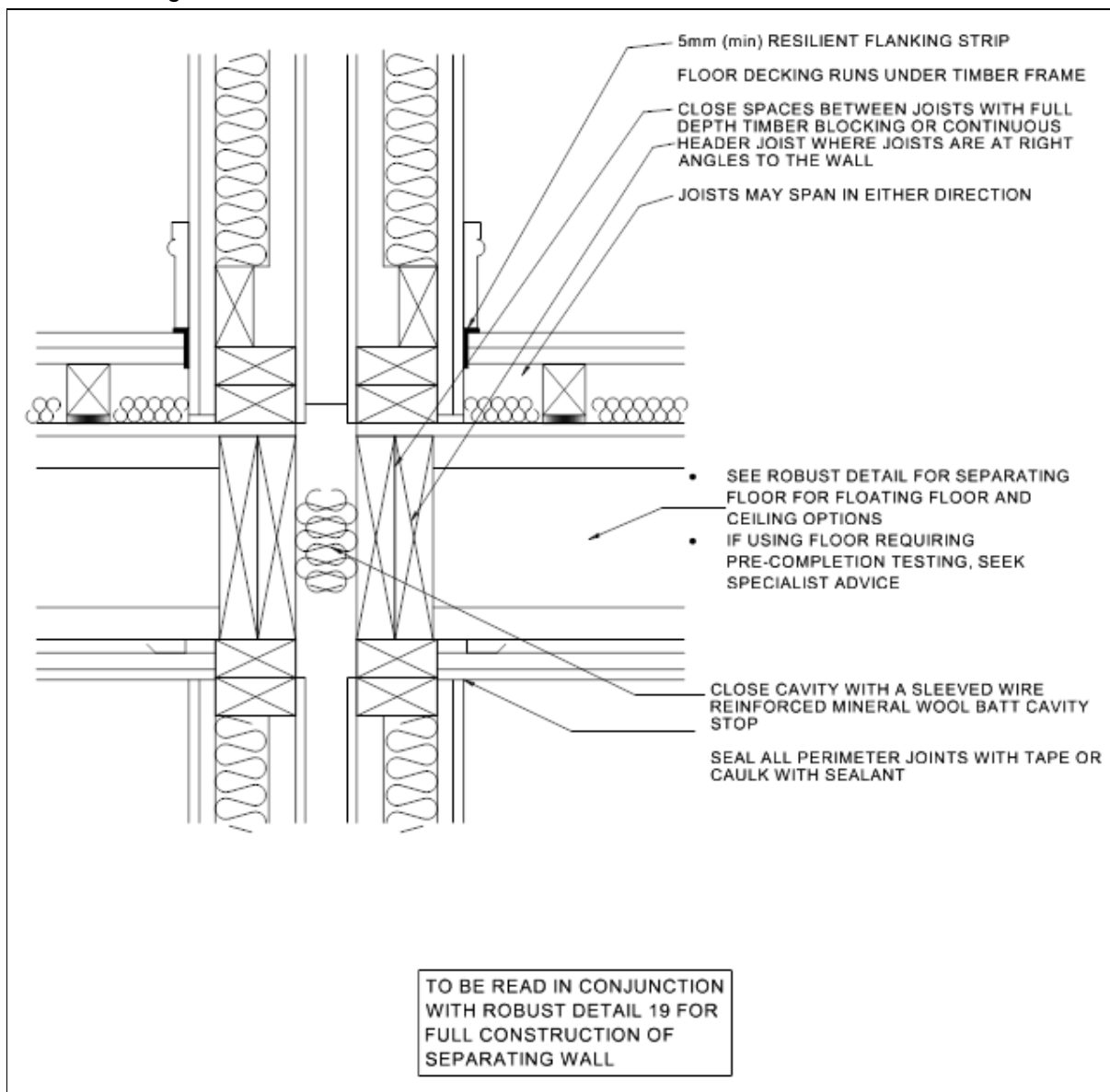
Drawing Ref. *ROBUST DETAIL 16, ISSUE 4 31.01.09



*ROBUST DETAIL refers to the 'Sips eco panel Robust Details manual' and should not be confused with Robust Details Ltd. Refer to the above mentioned manual for clarification.

A6.2 Detail of Party Floor – Separating Floor Junction - Flats

Drawing Ref. *ROBUST DETAIL 18, ISSUE 4 31.01.09



**ROBUST DETAIL refers to the 'Sips eco panel Robust Details manual' and should not be confused with Robust Details Ltd. Refer to the above mentioned manual for clarification.*

ANNEX 7 MATERIALS, DIMENSIONS AND TOLERANCES

A7.1 Frame Components

Table 16 Frame component dimensions (Design alterations may apply)

Component	Dimensions (mm)
SIP Wall Panels	119 (d) × 2400 (h) 194 (d) × 2400 (h)
SIP Roof Panels	194 (d) × 2400 (h)
Floor Joists	180-245 × 38-45
Ceiling Joists	180-245 × 38-45
Wall Studs	95 × 45
Columns	Use of these components is subject to design. Suitability of components to be supported by structural calculations.
Rafters	
Ridge Beams	
Purlins	
Collars	

A7.2 Timber Properties

Table 17 Properties of timber used in Building System

Property	Specification
Species	European Whitewood (Picea abies)
Strength Class	C16, C24 & C30 (In accordance with EN 338)
Moisture Content	≤ 20%
Dimensional Tolerance	±2mm
Timber Treatment	Vacsol Aqua or Protim Solignum E415 by VAC VAC process

Note: Dimensional tolerances of timber used with the Sips eco panels during wall and roof assembly should be sought from BM TRADA Q-Mark certificate EWP-021 and the associated Q-Mark Schedule.

A7.3 Ancillary Components

Table 18 Ancillary component dimensions

Component	Specification
Plasterboard	12.5 Lafarge E Board 15 Lafarge GTEC Fire Board
Insulation	Mineral Wool ($\lambda = 0.04$)
Flooring	Chipboard (22mm T&G Flooring Grade type C4)
Breather Membrane	Tyvek Pro

A7.4 Manufacturing Tolerances

Table 19 *Manufacturing Tolerances*

Element / Material	Tolerance
Floor beam	Refer to Table 17 in section A7.2
Roof beam	
Floor tie beam	
Wall studs	Refer to Table 17 in section A7.2
Floor joists	
Ceiling joists	

ANNEX 8 EVIDENCE/DOCUMENTS USED IN THIS ASSESSMENT

The following documents were used as part of the assessment, copies of all documentation are held on file with BM TRADA.

A8.1 Sips Eco Panels Manual

Table 20 Sips eco panel Manual Drawings Assessed

Drawing No.	Revision	Detail	
External Walls			
CM5	ISSUE 4	Typical External Wall	
CM12	31.01.09	Restraint Strap Fixing	
CM14	ISSUE 4	Soleplate Fixing	
CM18	ISSUE 4	External Wall and Cold Roof Ceiling, Gable End	
CM19	18.02.09	Rim Beam	
CM30	ISSUE 4 31.01.09	External Wall Corner	
Internal Walls			
CM15	ISSUE 4 31.01.09	Internal Load Bearing Wall Foundations	
CM20	ISSUE 4 18.02.09	Junction of External and Internal Wall	
CM31	ISSUE 4	Noggings and Panel Connection	
CM34	ISSUE 4 31.01.09	Sound Insulation	
CM35		Junction of Internal Load Bearing Wall	
CM36		Internal Wall to Wall Junction	
CM37		Non Loadbearing Wall and Floor	
CM38		Internal Walls Junction in Four Directions	
CM39		Non Load Bearing Wall Parallel to Joists	
Floors			
CM10		ISSUE 4 31.01.09	DPC Relationship With Chipboard Floor
CM11	DPC Relationship With Screeded Floor		
CM33	Mid Floor Sound Insulation		
Roofs			
CM40	ISSUE 4 31.01.09	Closed Eaves	
CM41		Closed Eaves at Window Head	
CM42		Flush Eaves	
CM43		Open Eaves	
CM43.1		Typical Ridge and Attic Room Detail	

Table 20 Continued.

Drawing No.	Revision	Detail
Doors/Windows		
CM16	ISSUE 4 31.01.09	Mobility Door Frame and Screed
CM17		Mobility Door Frame and Chipboard
CM21		Door/Window Fixing 1
CM22		Door/Window Fixing 2
CM26	ISSUE 4	External Single Door Opening
CM44.1	ISSUE 4 31.01.09	Internal Door Lining
Cladding		
CM27	ISSUE 4 31.01.09	Cladding - Timber
CM28		Cladding – Render Sheet 1
CM28.1		Cladding – Render Sheet 2
CM29		Cladding – Tile Hanging
Boiler		
CM46	ISSUE 4 31.01.09	Flue Detail
CM48	ISSUE 4 31.01.09	Chimney Details
CM49	ISSUE 4	Chimney Section
Additional Details		
CM32	ISSUE 4 31.01.09	Allowance for Vertical Shrinkage when using Masonry Construction
CM44	ISSUE 4 18.02.09	Plasterboard Specification
CM45	ISSUE 4 31.01.09	Meter Box
CM50	ISSUE 4	Water Tank Support
CM52		Drilling Holes in I-Joists
CM52.1		Drilling Holes in Ultra Joists
CM53	ISSUE 4 31.01.09	Drilling Holes in Walls

A8.2 *Robust Details Manual

Table 21 'Sips eco panels Robust Details' Drawings Assessed

Drawing No.	Revision	Detail
External Walls		
ROBUST DETAIL 4	ISSUE 4 31.01.09	External Flanking Wall Junction
ROBUST DETAIL 5		External Flanking Wall – Wall Junction
ROBUST DETAIL 6		Staggered Party Wall Timber Frame
ROBUST DETAIL 6.1		Staggered Party Wall Setting Out
ROBUST DETAIL 19		Typical Separating Wall Construction
Internal Walls		
ROBUST DETAIL 9	ISSUE 4	Internal – Separating Wall Junction
ROBUST DETAIL 10		Loadbearing Internal Wall Parallel to Joists
ROBUST DETAIL 11		Loadbearing Internal Wall Perpendicular to Joists
ROBUST DETAIL 12		Non Loadbearing Internal Wall Parallel to Joists
ROBUST DETAIL 13		Non Loadbearing Internal Wall Perpendicular to Joists
ROBUST DETAIL 22		Internal Wall – Floor and Ceiling
ROBUST DETAIL 23		Separating Wall – Socket and Services
Floors		
ROBUST DETAIL 1	ISSUE 4 31.01.09	Ground Floor Junction
ROBUST DETAIL 2		Ground Floor Raft
ROBUST DETAIL 3	ISSUE 4	Staggered Ground Floor
ROBUST DETAIL 7	ISSUE 4 31.01.09	External Wall – Floor Junction
ROBUST DETAIL 8		External Wall – Floor (Top Chord Supported)
ROBUST DETAIL 14	ISSUE 4	Floating Floor Treatment
ROBUST DETAIL 15	ISSUE 4 31.01.09	Separating Floor Construction 1
ROBUST DETAIL 16		Separating Floor Construction 2
ROBUST DETAIL 17		Intermediate Floor Junction - House
ROBUST DETAIL 18		Separating Floor Junction - Flats
ROBUST DETAIL 20		Separating Wall Floor Junction 1
ROBUST DETAIL 21		Separating Wall Floor Junction 2
ROBUST DETAIL 24	ISSUE 4	Separating Floor – Pipes Through
Roofs		
ROBUST DETAIL 26	ISSUE 4 31.01.09	Roof Junction
Ceilings		
ROBUST DETAIL 25	ISSUE 4 31.01.09	Ceiling Treatment

**ROBUST DETAIL refers to the 'Sips eco panel Robust Details manual' and should not be confused with Robust Details Ltd. Refer to the above mentioned manual for clarification.*

A8.3 Erection Manual

Table 21 Sips eco panels Erection Manual Drawings Assessed

Drawing No.	Revision	Detail
External Walls		
4	ISSUE 4	Soleplate Fixings
5		First Floor Soleplate Detail
7		Sips to Sips Panel Fixing
13		Internal to External Junction
13.1		External Corner and Internal Junction
Internal Walls		
14	ISSUE 4 31.01.09	Internal Wall Junctions
21	ISSUE 4	Loadbearing wall to Floor
22		Non Loadbearing Wall Perpendicular to Joists
Floors		
15	ISSUE 4	Deck Installation
16		Rimbeam Perpendicular to Joists
17		Rimbeam Parallel to Joists
18		Cantilevered Joists
19		Joist Nailing Detail
20		Joist Parallel to Non Loadbearing Wall
23		High Loaded Joist to Joist Connection
24		I Joist to I Joist Connection
25		Party Wall at Floor Junction
32		I Joist Detail 1
33		I Joist Detail 2
34		I Joist Detail 3
35		I Joist Detail 4
36		I Joist Detail 5
37	I Joist Detail 6	
38	I Joist Detail 7	
Roofs		
26	ISSUE 4	Roof Panel Fixing
27		Typical Roof Details
28	ISSUE 4 31.01.09	Eaves Details Sheet 1
29	ISSUE 4	Roof Details Sheet 1
30		Ridge Details Sheet 1
31	ISSUE 4 31.01.09	Truss Fixing Details

Table 21 Continued.

Doors/Windows		
8	ISSUE 4	Typical Window Components and Assembly
9		Typical Single Door Components and Arrangement

A8.4 Structural Calculations for Sips eco panels Building System

Table 22 Documentation for Structural Calculations

No.	Section/Detail	Document Reference
1	Design Summary	SIPS Eco-Panels Structural Design Manual (Issue 3)
2	Key Plans	Fabrication Drawing 26 Hill House Drive site
3	Design Loads (Roof, Floor, Wind)	Example Structural Calculations For A Timber Framed House From Structural Insulated Panels
4	Roof Calculations	
5	Floor Calculations	
6	Wall Calculations	
7	Lateral Stability	
8	Stiffness Against Floor Vibrations	

A8.5 Fire Performance for Sips eco panels Building System

Table 23 Documentation for Fire Assessment

No.	Component	Document Reference
1	Sip Panel 30 minute test	The Building Test Centre report number: BTC 11883F
2	Sip Panel 90 minute test	Warrington Fire Research Centre report number: 174591
3	Finnjoist FJI Joist 30 minute test	Warrington Fire Research Centre report number: C118470
4	Finnjoist FJI Joist 60 minute test	Warrington Fire Research Centre report number: C118649
5	Ultrajoist 30 minute test	Warrington Fire Research Centre report number: 110311
6	Ultrajoist 60 minute test	The Building Test Centre report number: BTC 12487F
7	Load Bearing Wall Plasterboard (Timber Frame) 30 minute test	Chiltern International Fire report number: Chilt/RF07079
8	Load Bearing Wall Plasterboard (Timber Frame) 60 minute test	Warrington Fire Research Centre report number: Warres 45212
9	Party Wall Plasterboard (Timber Frame) 60 minute test	British Gypsum test report number: BGSI-1470

A8.6 Additional Documentation

Table 24 *Additional Documentation used in Assessment*

No.	Component	Document Reference
1	Airbourne sound test for separating walls	H&H Acoustic Consultancy Division report – HHACY/10695/02R/JB
2	Q-Mark Registration Schedule for SIPs Eco Panels Ltd - OSB-Structural Insulated Panels	BM TRADA certificate EWP-021 and accompanying Schedule

APPENDIX 1 NORMATIVE DOCUMENTS

BS 5268-2:	Code of Practice for permissible stress design, materials and workmanship.
BS EN ISO/IEC 17025:	General requirements for the competence of testing and calibration laboratories.
BS EN 1990:	Eurocode - Basis of structural design.
BS EN 45011:	General requirements for bodies operating product certification systems
BS EN 45012:	General requirements for bodies operating assessment and certification/registration of quality systems.
EN ISO 9001:	Quality management systems. Requirements.
ETAG 007:	European Technical Approval Guideline 007 'Timber Frame Building Kits'.
BS EN13986:	Wood based panels for use in construction – Characteristics, evaluation of conformity and marking.
ISO Guide 65	General requirements for bodies operating product certification systems
ISO Guide 62	General requirements for bodies operating assessment and certification/registration of quality systems
BS 6399-1:	Loading for Buildings. Code of practice for dead and imposed loads.
BS 6399-2	Loading for Buildings. Code of practice for wind loads.
BS 6399-3	Loading for Buildings. Code of practice for imposed roof loads.
BS EN 120:	Wood based panels. Determination of formaldehyde content. Extraction method called the perforator method.
BS 5234-1	Partitions (including matching linings) Specification for performance requirements for strength and robustness including methods of test.
BS EN ISO 140-4	Acoustics. Measurement of sound insulation in buildings and of building elements. Part 4 Field measurements of airborne sound insulation between rooms.
BS EN ISO 140-7	Acoustics. Measurement of sound insulation in buildings and of building elements. Part 7 Field measurements of impact sound insulation of floors.
CIBSE TM23	Technical Memorandum 23. Testing Buildings for air leakage.
BS 476	Fire tests on building materials and structures.
BS EN 12944	Fertilizers and liming materials. Vocabulary. Terms relating to liming materials.
BS EN ISO 6946	Building components and building elements. Thermal resistance and thermal transmittance. calculation method.