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BRE Global Classification Report

Classification of fire performance in accordance with BR 135: 2013 Annex A

Prepared for: Kingspan Insulation

Report Number: P114679-1001 Issue: 1

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1 Introduction

This report presents the classification of the system detailed in section 2. The classification is carried out in accordance with the procedures given in BR 135 – 'Fire performance of external thermal insulation for walls of multi-storey buildings', Third edition, Annex A 2013. This classification should be read in conjunction with this document and the associated test reports referenced in section 4.

2 Details of the Classified Product

2.1 Description of substrate

The product was installed on to wall number 3 of the BRE Global cladding test facility.

This apparatus is representative of the face of a building and consists of a masonry structure with a vertical main test wall and a vertical return wall at a 90º angle to and at one side of the main test wall.

2.2 Description of product

Table 1. List of component parts used in the construction of the system.

Item	Description
1	Aluminium 'L'-shaped bracket with thermal pad A. Single - (80mm-deep×50mm-wide×75mm-high×2mm-thick) B. Double - (80mm-deep×50mm-wide×150mm-high×2mm-thick)
2	Aluminium combustion chamber surround pod (107mm-deep×50mm-wide×5mm-thick)
3	Siderise B65 galvanised skewer (225mm-long×25mm-wide×1mm-thick)
4	Siderise RVG-090/030/100-102 vertical cavity barrier (75mm-wide×110mm-deep)
5	Siderise RS350G galvanised skewer (cut to 180mm-long×25mm-wide×1mm-thick)
6	Siderise RH25G-090/30/098-102 horizontal open state cavity barrier with intumescent strip (75mm-high×75mm-deep)
7	Kingspan K15 insulation (60mm-thick) Batch nr: 8100325903
8	Aluminium rails A. 'L'-shaped (60mm-deep×40mm-wide×2mm-thick) B. 'T'-shaped (40mm-deep×125mm-wide×2mm-thick)
9	Foam tape (9mm-wide×6mm-thick compressible)
10	Eternit Equitone Natura panels (8mm-thick)
11	Aluminium horizontal panel joint flashing (50mm-high×1mm-thick with 6mm 'bird beak' profile at mid-height)

12	Aluminium capping (130mm-deep×85mm-high×3mm-thick)

2.3 Installation sequence

Aluminium 'L'-shaped brackets with thermal pad (Item 1A & 1B) were fixed to the substrate with EJOT T40/SW13 SDF-KB 10V×60 E screws with plastic anchors. The brackets were fixed in sequence of a single, double, single vertically.

Aluminium combustion chamber surround pod (Item 2) was fixed flush to the combustion chamber surround, with EJOT T40/SW13 SDF-KB 10V×60 E screws with plastic anchors at 480mm centres.

Siderise B65 galvanised skewers (Item 3) were folded to 90mm-deep and fixed at nominal 500mm vertical centres with TufFast HTF-SS-6.3×57mm screws, in three columns located at: 385mm (main wall), 2485mm (main wall) and 1250mm (wing wall) all measured from the main-wing wall junctions.

Siderise RVG-090/030/100-102 vertical cavity barrier (Item 4) was pressed onto skewers in three columns. The barriers were sized to allow 10mm compression fit. Aluminium tape was applied to the joints.

Siderise RS350G galvanised skewers (Item 5) were cut to 180mm-long and folded to protrude from the wall 85mm. The skewers were fixed at nominal 500mm horizontal centres with TufFast HTF-SS-6.3×57mm screws in 4 rows located: 2065mm, 4390mm, 6695mm and 8430mm from ground.

Siderise RH25G-090/30/098-102 horizontal open state cavity barriers with intumescent strip (Item 6) were pressed onto the skewers in four rows and were bisected by the vertical cavity barriers. Aluminium tape was applied to the joints over the foil face.

Kingspan K15 insulation (Item 7) were fixed as horizontal boards between the aluminium 'L'-shaped brackets leaving a 5-10mm gap between boards. The insulation was fixed with two EJOT DH Ø9mm plastic discs and EJOT DH Ø60mm insulation support anchor and one EJOT Ø75mm metal disc and DMH 8×110 V metal insulation plug at centre of board at nominal 500mm horizontal and 1100mm vertical centres. Aluminium tape was applied over the fixings.

Aluminium rails (Item 8A & 8B) were fixed to the aluminium brackets on the main wall in an alternating fashion with two or four AX Ø4.8mm×19mm-long self-drilling screws, depending on the size of the brackets. On the wing wall only 'L'-shaped rails (Item 8A) were used. 'L'-shaped rails (Item 8A) were fixed either side of the combustion chamber surround pod with Mainline SSSS Ø4mm×18mm-long rivets at nominal 500mm vertical centres. Aluminium tape was applied to the joint between the aluminium rails and Kingspan K15 insulation.

Foam tape (Item 9) was applied to the vertical faces of the aluminium rails, in line with the panel locations.

Eternit Equitone Natura panels (Item 10) were fixed to the aluminium rails with Mainline SSSS Ø4mm×18mm-long rivets at 345-440mm vertical and 500-600mm horizontal centres. Aluminium horizontal panel joint flashings (Item 11) were placed between horizontal panel gaps. Panel gaps were measured to be 9-12mm vertical and 5-7mm horizontal.

Aluminium capping (Item 12) was fixed at the top of the system with EJOT T40/SW13 SDF-KB 10V×60 E screws with plastic anchors at 400mm horizontal centres.

2.4 Installation of specimen

All test materials were supplied and installed by the Test Sponsor. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market.

3 Product Specification

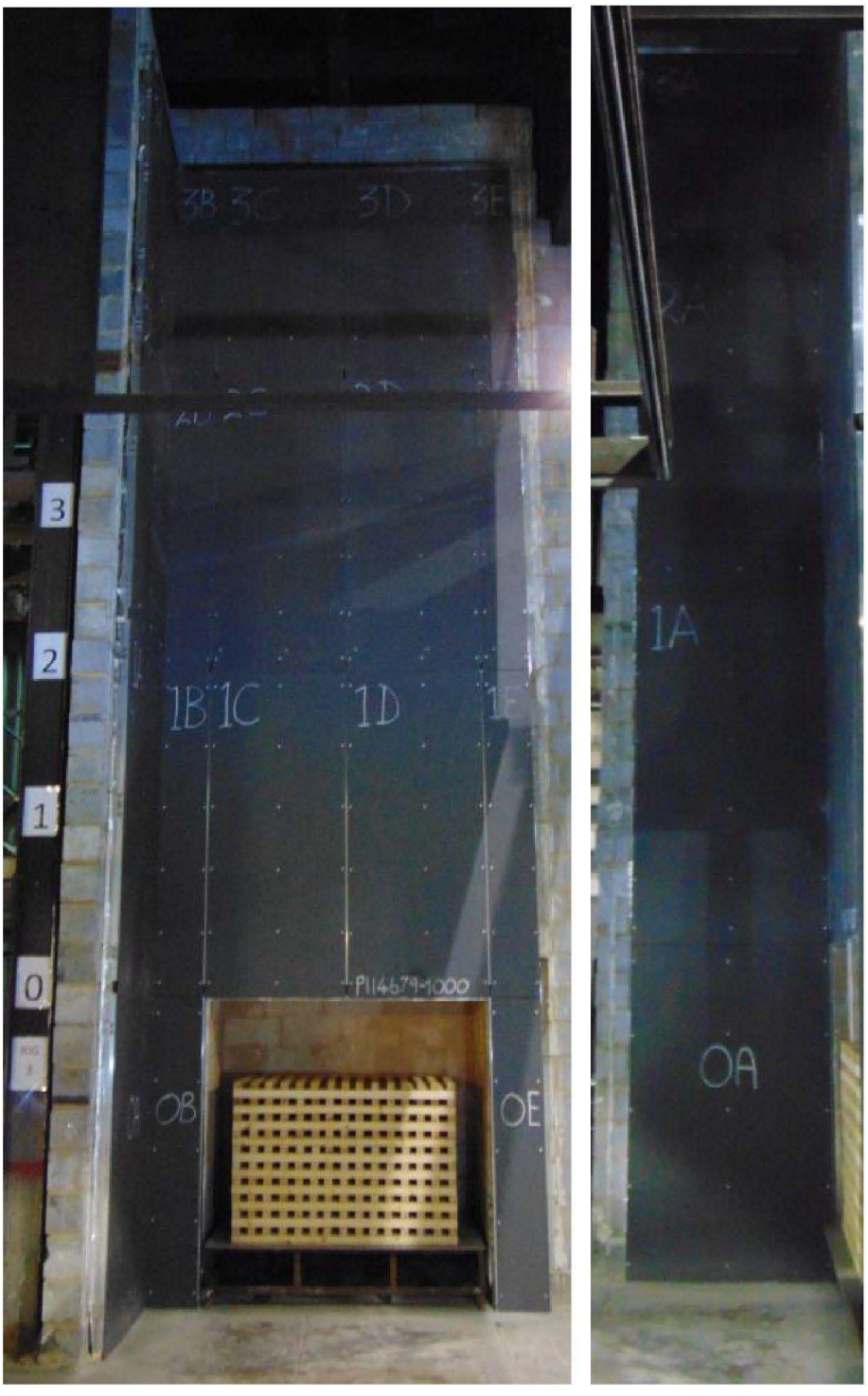

Figure 1. Completed installation prior to test.

Product names and system drawings were supplied by the customer and were not independently verified by BRE. The validity of the results is conditional on the accuracy of the data.

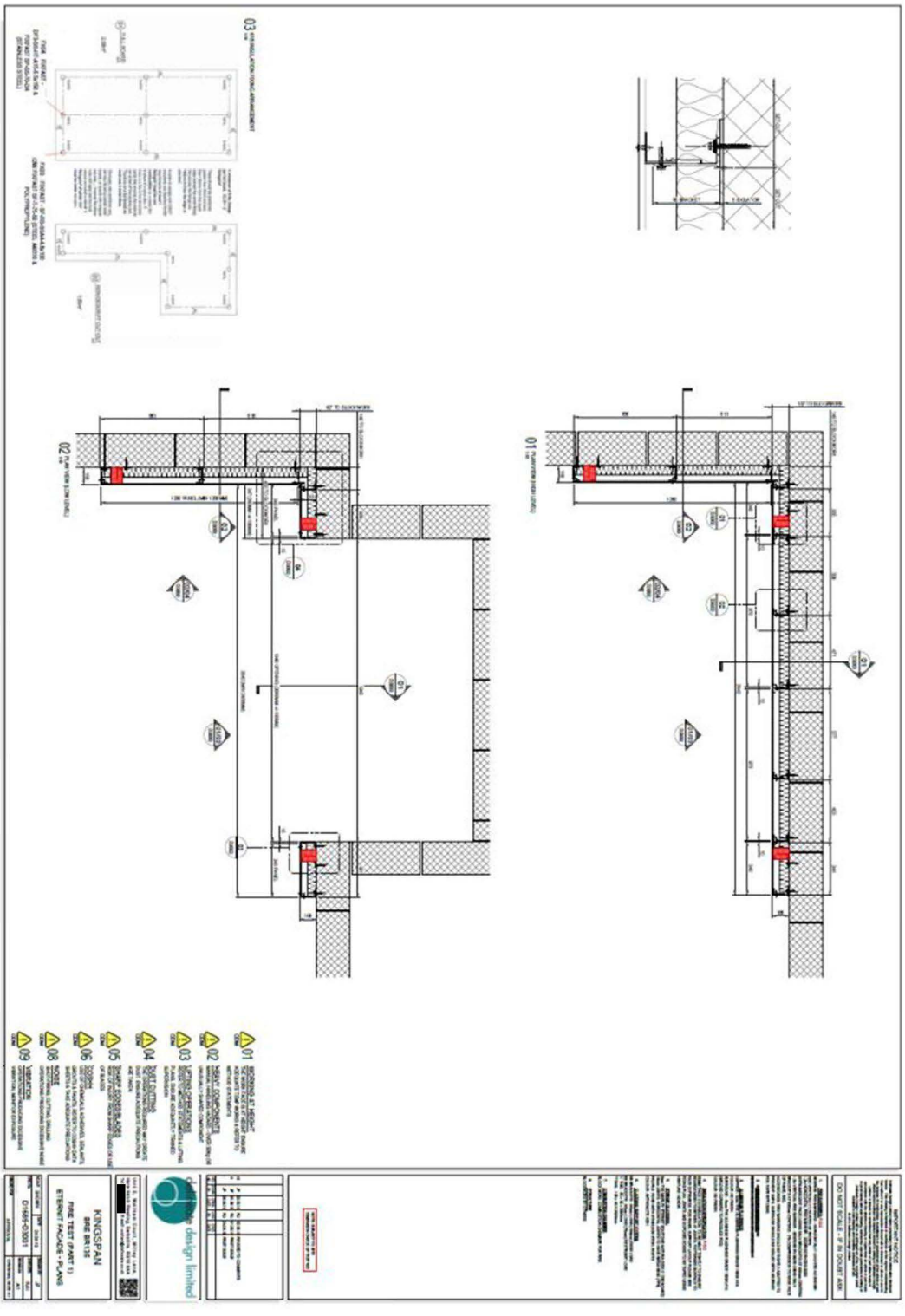

Figure 2. System plan view (supplied by Test Sponsor).

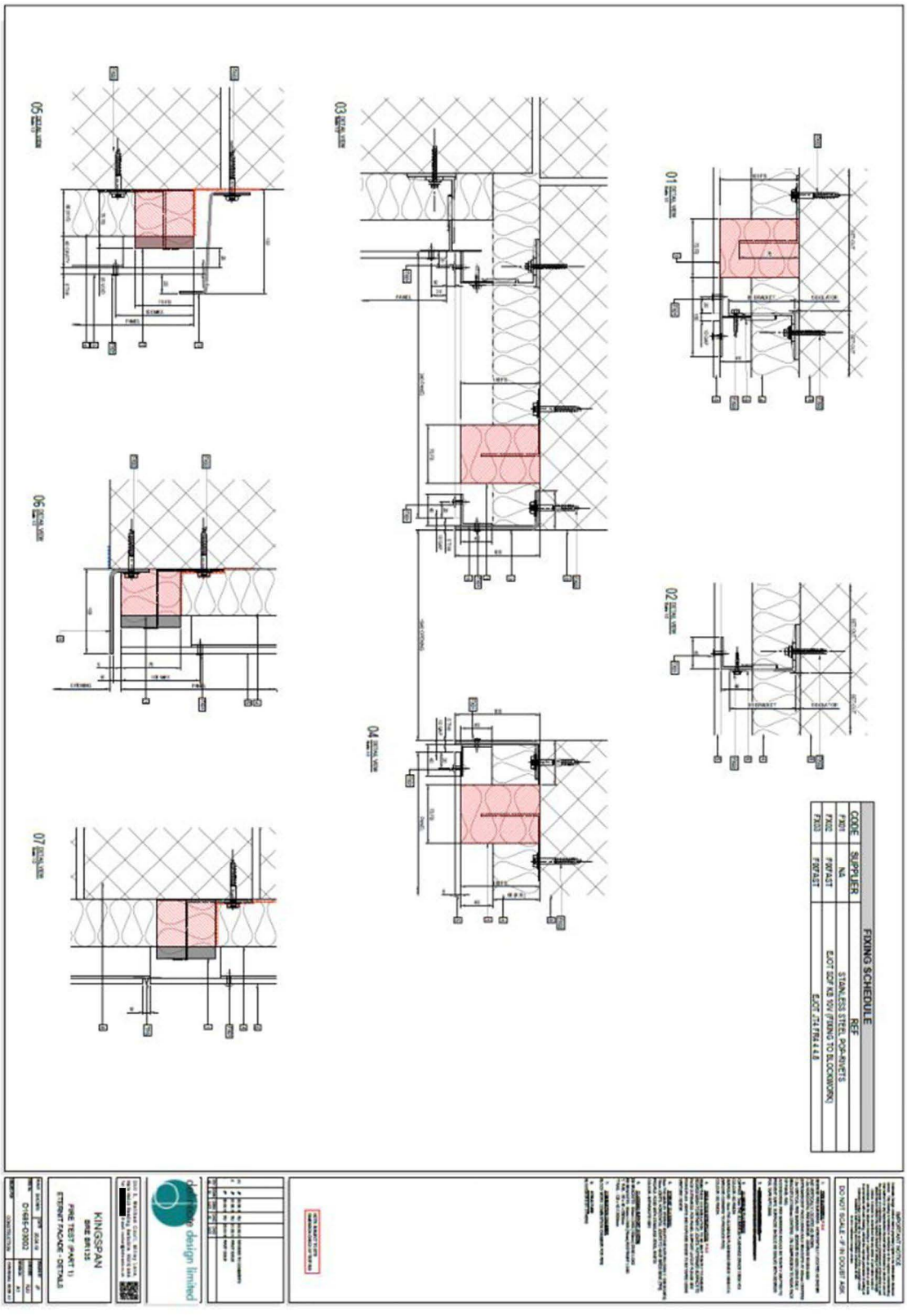

Figure 3. System details (supplied by Test Sponsor).

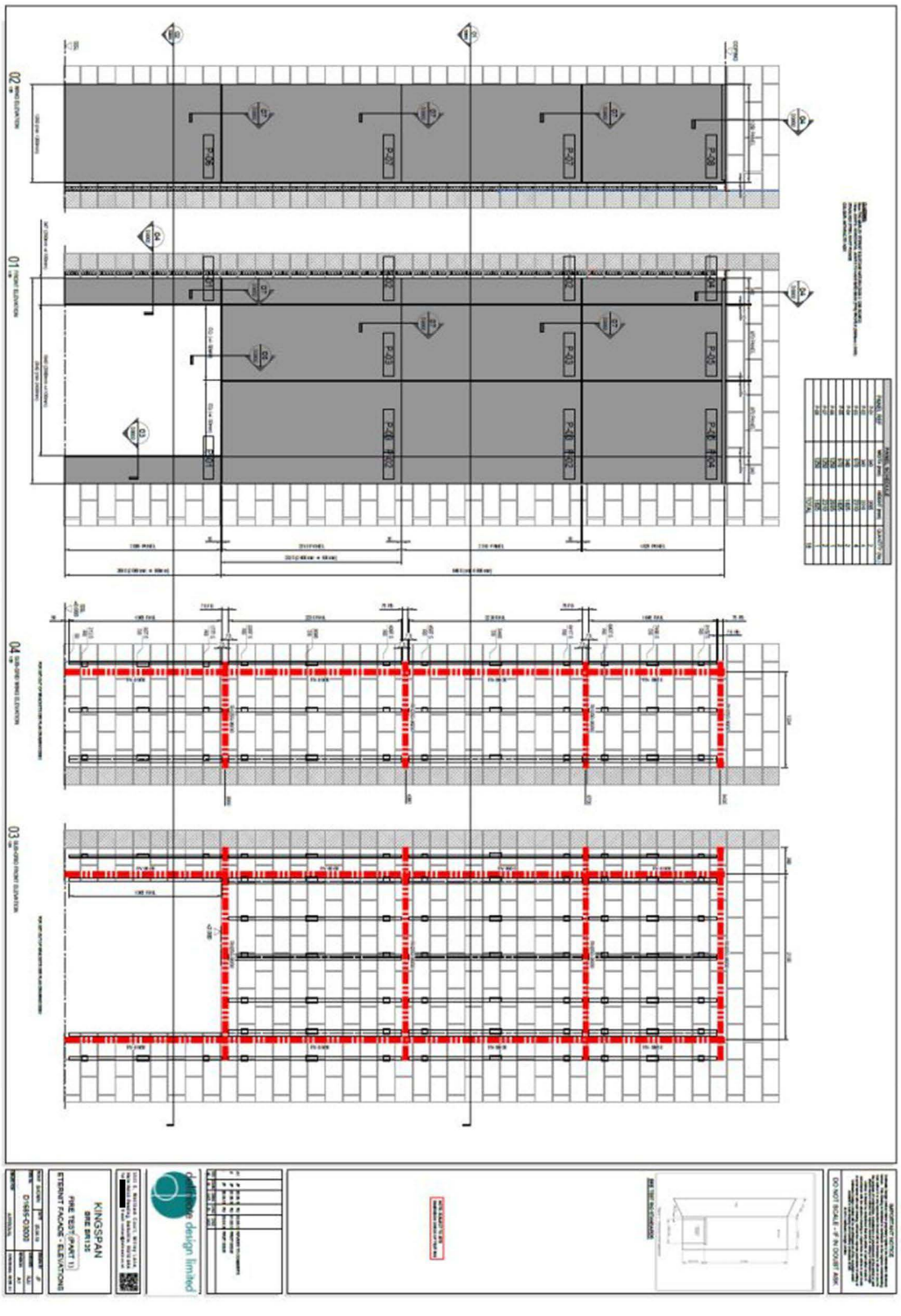

Figure 4. System overview (supplied by Test Sponsor).

4 Supporting Evidence

4.1 Test reports

Name of Laboratory	Name of sponsor	Test reports/extended application report Nos.	Test method / extended application rules & date
BRE Global, BRE	Kingspan Insulation	P114679-1000 Issue 1	BS 8414-1:2015 + A1:2017

4.2 Test results

Test method	**Parameter**	**No. tests**	**Results**	
			Fire spread test result time, t_s (min)	**Compliance with parameters in Annex A BR135:2013**
BS 8414-1:2015 + A1:2017	External fire spread	1	>15 minutes	Compliant
	Internal fire spread (Cavity layer)		>15 minutes	Compliant
	Internal fire spread (Insulation layer)		>15 minutes	Compliant

4.3 Mechanical performance

Cracking of the surface of the panels was observed at 08:20 (mm:ss) until 20:00 (mm:ss) Falling debris was observed from 11:55 (mm:ss) until 46:50 (mm:ss). Flaming debris was observed from 13:00 (mm:ss) until 16:00 (mm:ss).

Following extinguishing of the ignition source ongoing system combustion was observed until 60 minutes.

4.4 System damage

4.4.1 Panels

On the main wall, the panels had fallen/burnt away exposing an area of approx. 1.2m-wide×3.9m-high (approx. 4.7m^2) above the combustion chamber opening. The surfaces of the panels were cracked up to 4.6m and discoloured up to 5.5m above the combustion chamber opening.

On the wing wall, the panels had fallen/burnt away exposing an area of approx. 0.9m-wide×4.4m-high (approx. 4.0m^2) from ground. The panels were discoloured up to approx. 3.5m-high covering the full width of the panels from ground with panels discoloured further along the main-wing wall up to approx. 6.6m.

4.4.2 Capping & combustion chamber surround pod

On the main wall, the capping was discoloured to full width. On the wing wall, the capping was discoloured on main-wing junction.

The combustion chamber surround pod top edge was consumed approx. 1.5m-wide. The vertical edges were distorted and discoloured.

4.4.3 Aluminium rails

On the main wall, the rail in line with the combustion chamber centre line was consumed to 6.7 from ground. The rails either side of the centre rail were consumed up to 5m and 4.m respectively. All rails up to 7m from ground were distorted between both vertical cavity barriers. The rails were discoloured between both vertical cavity barriers up to the top of the system.

On the wing wall, the central rail had consumed sections up to 2.8m. The rails were distorted to 4.4m and discoloured to 7m from ground.

4.4.4 Insulation

On the main wall, the insulation had burnt/fallen away to approx. 2m-wide×6.7m-high from ground, in a tapering fashion reducing to 0.5m-wide. The insulation was discoloured between the combustion chamber opening to top of system, to a width of 2.5m measured from the main-wing wall junction.

On the wing wall, the insulation had burnt/fallen away to approx. 1.2m-wide×4.8m-high. The insulation was discoloured to the top of the system.

4.4.5 Horizontal cavity barriers

On the main wall, a 1m-wide section of horizontal cavity barrier had detached from the horizontal cavity barriers located at 2065mm and 4390mm from ground. The intumescent strip on the remaining sections and horizonal cavity barriers located at 6695mm and 8430mm from ground had activated.

On the wing wall, the horizontal cavity barriers located at 2065mm and 4390mm from ground were intact and activated. The horizontal cavity barriers located at 6695mm and 8430mm from ground had not fully activated.

4.4.6 Vertical cavity barriers

On the main wall, both vertical cavity barriers were intact and discoloured up to approx. 7.m from ground. On the wing wall, the vertical cavity barrier surface had detached sections up to approx. 4m and discoloured up to 5.5m from ground.

4.4.7 Aluminium brackets

On the main wall, the three central columns of brackets were consumed in line with the combustion chamber opening to approx. 4m. The brackets were discoloured to of system, measured from the main-wing wall junction to 2.5m-wide.

On the wing wall, the column of brackets located at centre and the main-wing wall junction were consumed between 1m-2m from ground. The brackets were distorted up 4m

5 Classification and Field of Application

5.1 Reference of classification

This classification has been carried out in accordance with Annex A of BR 135 – 'Fire performance of external thermal insulation for walls of multi-storey buildings.' Third Edition 2013.

5.2 Classification

The system described in this classification report has been tested and met the performance criteria set in Annex A of BR 135:2013.

5.3 Field of application

This classification is valid only for the system as installed and detailed in Section 2 of this classification report and the associated details found in the related test reports, referenced in Section 4.

6 Limitations

This classification document does not represent type approval or certification of the product.

The classification applies only to the system as tested and detailed in the classification report. The classification report can only cover the details of the system as tested. It cannot state what is not covered. When specifying or checking a system it is important to check that the classification documents cover the end-use application.

Report Ends