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BRE Global Classification Report

Kingspan K15 insulated system with a ventilated Terracota tile rainscreen. Classification of fire performance in accordance with BR 135: 2013 Annex B

Prepared for: Kingspan Insulation Ltd

Date: 21 September 2015

Report Number: 297211 Issue 1

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CLASSIFICATION OF FIRE PERFORMANCE IN ACCORDANCE WITH BR 135:2013 Annex B

Sponsor: Kingspan Insulation Ltd, Pembridge, Leominster, Herefordshire HR6 9LA

Prepared by: BRE Global Ltd, BRE, Bucknalls Lane, Garston, Watford, WD25 9XX, England

Product name: Kingspan K15 insulated system with a ventilated terracotta rain screen

Classification report No.: 297211

Issue number: 1

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This classification report consists of 16 pages and may only be used or reproduced in its entirety.

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 B 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 test specimen was installed onto face 1 of the BRE Global External Cladding Test Facility. This is a multi-faced test facility constructed from steel, the outside to which the cladding system was affixed.

2.2 Description of product

Full details of the system specification and installation details have been provided by the client and are summarised in the following section. The system, as built, comprised of:

Double layer of 12.5mm Gyproc plasterboard
150mm steel frame
12mm cement particle board (Versapanel manufactured by Euroform products)
Aluminium top hat supports
Aluminium helping hand brackets
1000mm x 150mm x 195mm Acoustic and Insulation Manufacturing Ltd (AIM) vertical fire barriers and horizontal fire barriers with intumescent strips
2400mm x 1200mm x 140mm Kingspan K15 Insulation Board
275mm x 250mm x 30mm Taylor Maxwell Tampa terracotta tiles.

Further detail of the composition of the wall is given below:

A sectional steel frame system (SFS) was installed between the floor slab hangers on the main cladding wall 1, with horizontal base and head tracks fixed to the steel substrate. Vertical rails were installed at nominal 600mm centres to the steel frame. A double layer of 12.5mm plasterboard was installed on the rear of the SFS and a single layer of cement particle board was fixed to the front of the SFS. The build-up of the cladding system is shown in Figures 1 to 5, drawings supplied by the sponsor.

An array of aluminium helping hand brackets were manually fixed to the aluminium top hats using self-drilling fixfast DF3-SS5.5x35 Grade A2 (see Figure 3). A single layer of 140mm Kingspan K15 insulation board was mechanically attached to the sheathing board with metal (197mm long) and plastic (160mm long) EJOT insulation screws. The insulation board was pushed over the helping hand brackets through pre-cut slots in the insulation boards.

Three horizontal AIM 1000mm x 150mm x 195mm ventilated fire breaks (AIM reference 4121) were sealed against sheathing board in a continuous strip and any gaps sealed between then and the insulation board with "UF" jointing tape.

Vertical barriers of the same type were installed at the outer edges of the cladding system and around the hearth opening. A horizontal fire barrier section was installed across the top of the hearth.

An array of back to back stainless steel angles (T) bolted together (vertical carrier rails) were fixed to the helping hand brackets with both L and T aluminium brackets used. A single layer of Taylor Maxwell Tampa terracotta tiling was attached to the carrier rails using Taylor Maxwell Tampa clips and the helping hand brackets.

2.3 Installation of Specimen

All test materials were supplied and installed by the sponsor. BRE 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

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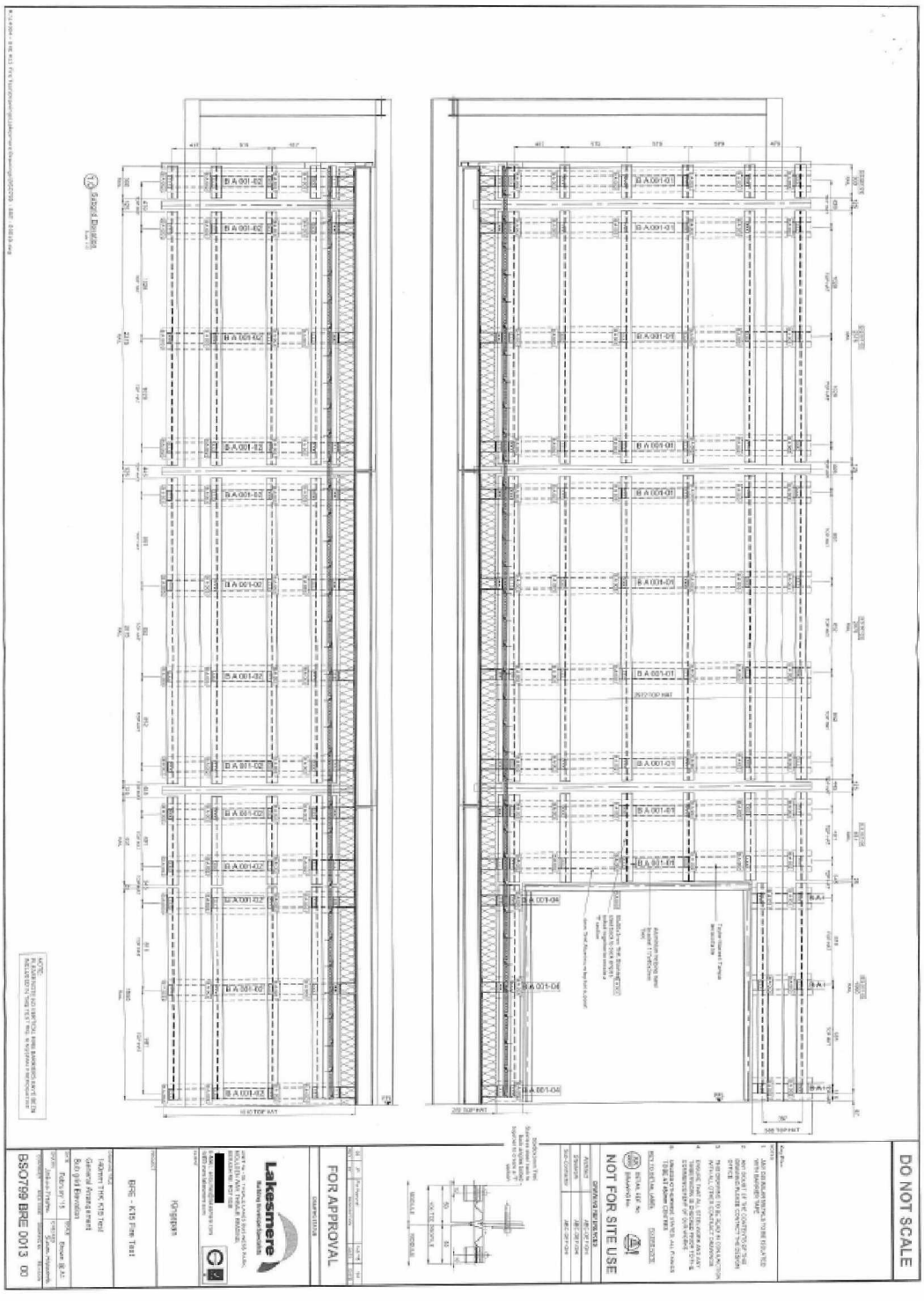

Figure 1. Construction of the System showing the layout of the structural steel frame

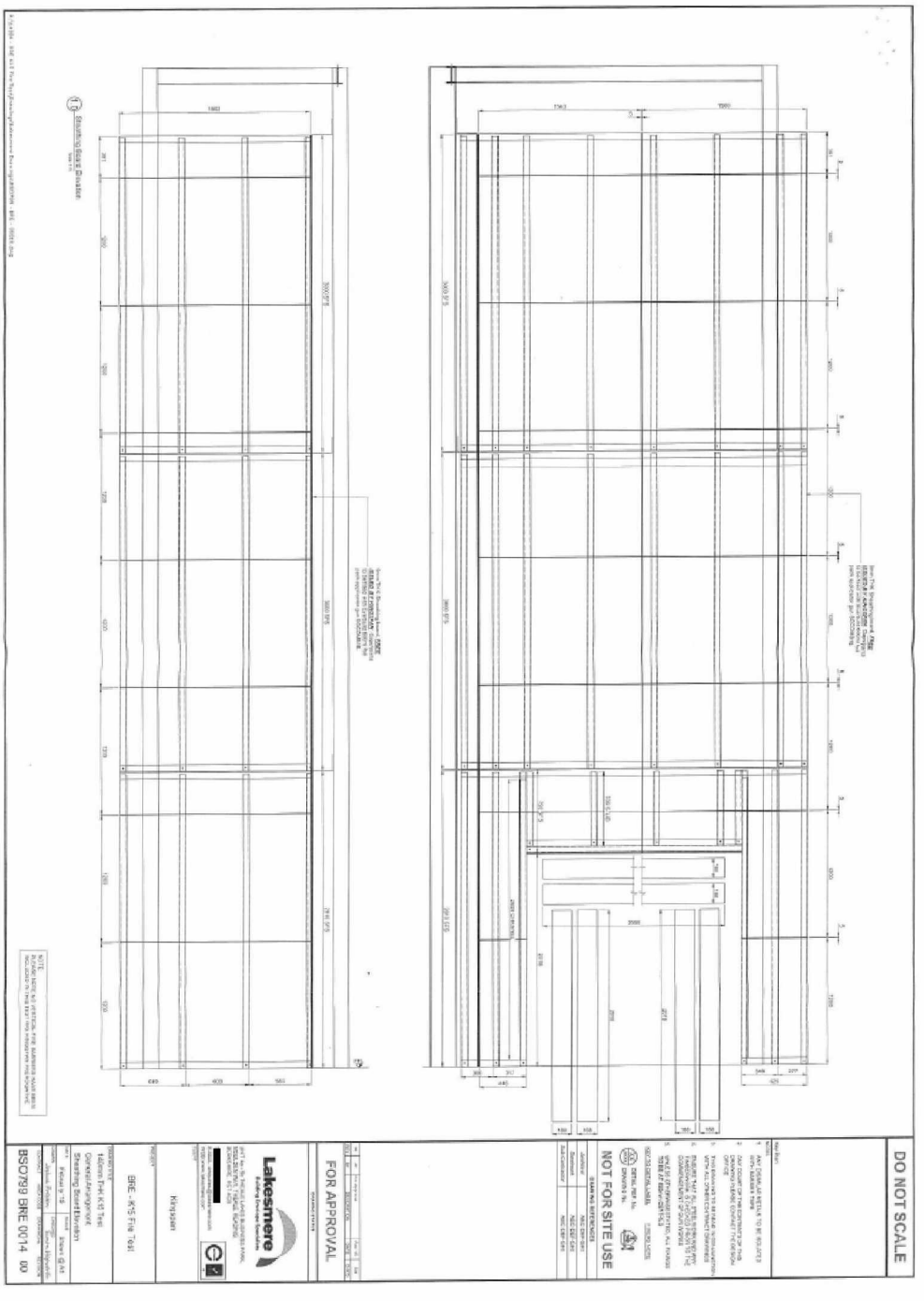

Figure 2. Construction of the System showing the layout of the cement particle sheathing board

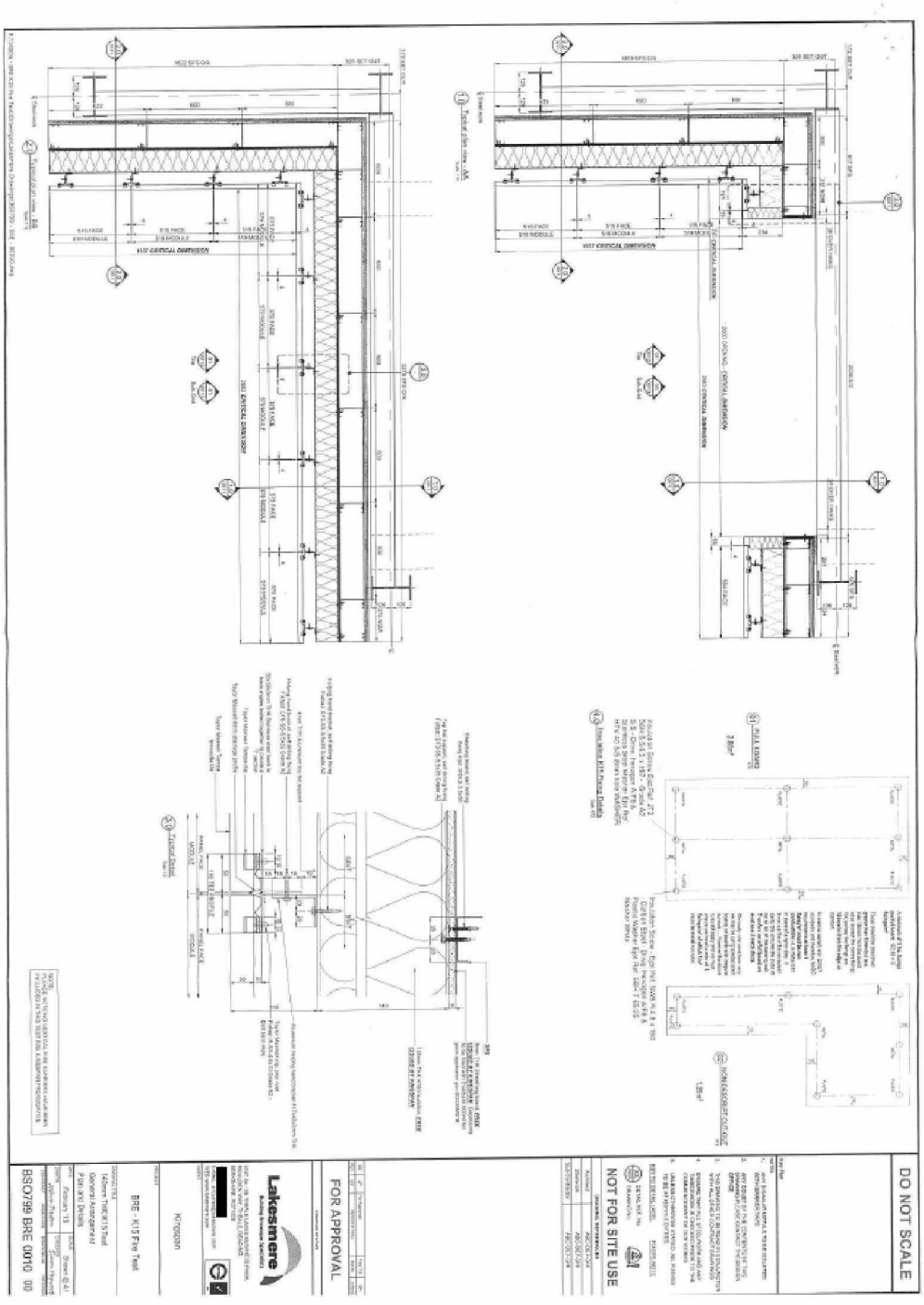

Figure 3. Plan section of the System showing the key layers of the cladding system

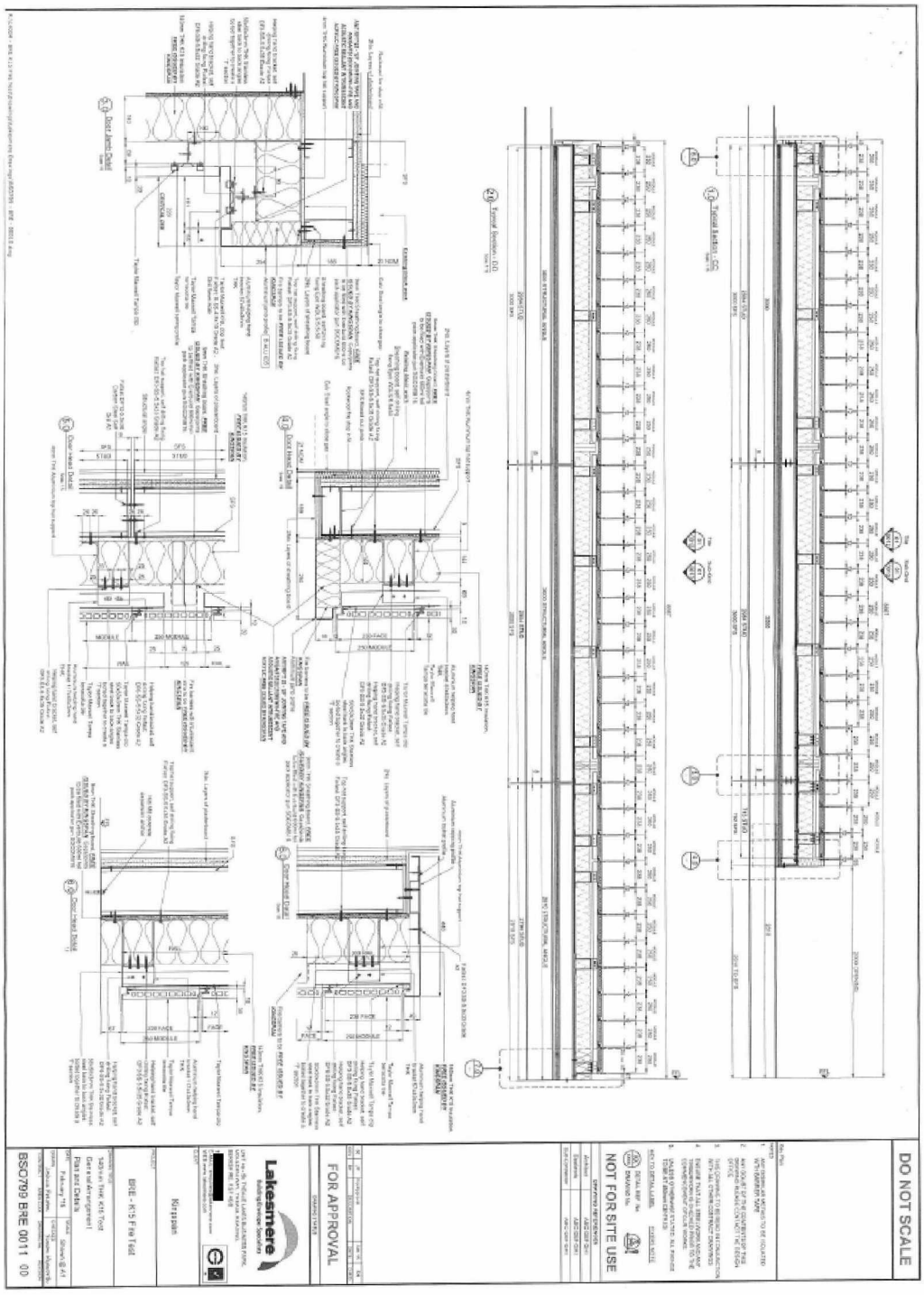

Figure 4. Vertical section of the System showing the key layers of the cladding system

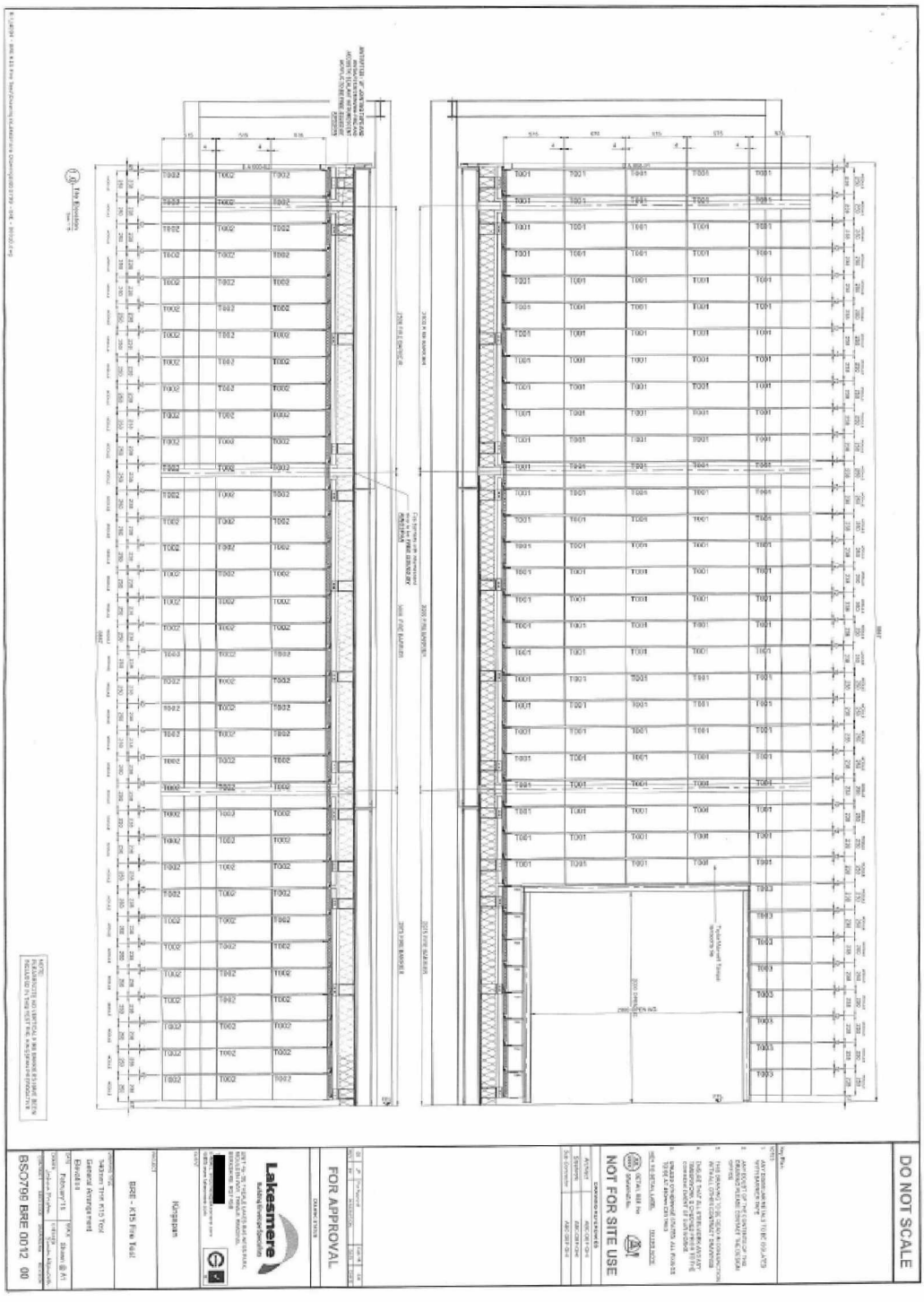

Figure 5. Construction of the System showing the layout of the Terracotta tiles

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 Limited	Test report 303930 issue 2	BS 8414-2: 2005

4.2 Test results

Test method & test number	Parameter	No. tests	Results	
			Fire spread test result time, t_s (min)	Compliance with parameters in Annex B BR135:2013
BS 8414-2: 2005	External fire spread	1	>15 minutes	Compliant
	Cavity behind rainscreen (cavity 1)		>15 minutes	Compliant
	Internal fire spread Insulation layer		>15 minutes	Compliant
	Cavity formed by Steel frame (cavity 2)		>15 minutes	Compliant
	Internal fire spread Burn through		>15 minutes	Compliant

4.3 Mechanical Performance

The system was tested for the full 60 minute test duration.

Flaming was observed within the insulation at approximately 3.5m above the top of the hearth after the crib was extinguished. It was noted that the rain screen layer continued to burn past the 30 minute mark with flaming combustion reaching the fire barrier at the second level of the System.

There was heat damage to the majority of the tiles between the first and second level fire breaks on the main face of the wall, as can be seen in the figure, and there was slight damage to the tiles above the second level fire break. It was noted that the insulation layer continued to burn past the 30 minute mark with glowing combustion reaching the fire barrier at the second level of the construction.

Collapse of Taylor Maxwell Terracotta rain screen panels was observed from 18 minutes after ignition and throughout the remainder of the test period.

The hearth surround detached from the sample at 7:55(minutes/seconds) after igniting of the crib.

Tiles began to detach from the sample (main face) at 15:27 (minutes/seconds) and this continued until 28:22 (minutes/seconds) from ignition of crib.

5 Classification and field of application

5.1 Reference of classification

This classification has been carried out in accordance with Annex B 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 B 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 specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons, it is recommended that the relevance of test and classification reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test or classification to ensure that they are consistent with current practices, and if required may endorse the report.

This classification report is issue 1 of report 297211. This report contains up issued drawings included at the client's request.

Report Ends