

BRE Global Assessment Report

An assessment of the fire performance of an Eternit Equitone Natura panel ventilated rainscreen system with Kingspan Kooltherm K15 insulation against the criteria of BR 135, Third Edition when evaluated in accordance with BS 9414:2019

Prepared for: Kingspan Insulation Limited

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BRE Global Ltd
Watford, Herts
WD25 9XX

Customer Services 0333 321 8811

From outside the UK:
T + 44 (0) 1923 664000
F + 44 (0) 1923 664010
E enquiries@bre.co.uk
www.bre.co.uk

Prepared for:
Kingspan Insulation Limited
Pembridge
Leominster
Herefordshire
HR6 9LA



Prepared by

Name	Andy Russell
Position	Principal Consultant
Date	30 September 2020
Signature	

Authorised by

Name	Tony Baker
Position	Laboratory Manager – Fire Resistance
Date	30 September 2020
Signature	

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1 Introduction

A fire test in accordance with BS 8414-1:2015+A1:2017 has been carried out on an Eternit Equitone Natura panel ventilated rainscreen system with Kingspan Kooltherm K15 insulation. This assessment report considers the fire performance of this system where the facings on the Kingspan Kooltherm K15 insulation incorporate an alternative adhesive.

2 Scope

This assessment report considers the fire performance of an Eternit Equitone Natura panel ventilated rainscreen system with Kingspan Kooltherm K15 insulation against the criteria of BR 135, Third Edition. The evaluation has been carried out in accordance with BS 9414:2019.

3 Supporting data

3.1 BRE Global test report no. P114679-1000 Issue 1

3.1.1 General

A fire test in accordance with BS 8414-1:2015+A1:2017 was carried out on an external wall system incorporating Kingspan Kooltherm K15 insulation with rainscreen cladding comprising Eternit Equitone Natura panels. The test was carried out on 06 June 2019.

3.1.2 Details of test apparatus

The product was installed on to wall number 3 of the BRE Global 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 90° angle to and at one side of the main test wall (see figure 1). The main wall includes the combustion chamber.



3.1.3 Description of the system

3.1.3.1 Summary

Generic cladding type	Ventilated rainscreen
Relevant test method	BS 8414-1:2015+A1:2017
Substrate	Masonry
Insulation	Kingspan Kooltherm K15 (60mm thick)
Cavity depth	40mm
Vertical cavity barriers	Siderise RVG-090/030/100-102 vertical cavity barrier (75mm wide x 110mm deep)
Horizontal cavity barriers	Siderise RH25G-090/30/098-102 horizontal open state cavity barrier with intumescent strip (75mm high x 75mm deep)
External finish	Eternit Equitone Natura panels (8mm thick)

Details of the tested system are shown in figures 2 to 4.

3.1.3.2 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 x 50mm wide x 75mm high x 2mm thick) B. Double - (80mm deep x 50mm wide x 150mm high x 2mm thick)
2	Aluminium combustion chamber surround pod (107mm deep x 50mm wide x 5mm thick)
3	Siderise B65 galvanised skewer (225mm long x 25mm wide x 1mm thick)
4	Siderise RVG-090/030/100-102 vertical cavity barrier (75mm wide x 110mm deep)
5	Siderise RS350G galvanised skewer (cut to 180mm long x 25mm wide x 1mm thick)
6	Siderise RH25G-090/30/098-102 horizontal open state cavity barrier with intumescent strip (75mm high x 75mm deep)
7	Kingspan Kooltherm K15 insulation (60mm thick)



Item	Description
8	Aluminium rails A. 'L'-shaped (60mm deep x 40mm wide x 2mm thick) B. 'T'-shaped (40mm deep x 125mm wide x 2mm thick)
9	Foam tape (9mm wide x 6mm thick compressible)
10	Eternit Equitone Natura panels (8mm thick)
11	Aluminium horizontal panel joint flashing (50mm high x 1mm thick with 6mm 'bird beak' profile at mid-height)
12	Aluminium capping (130mm deep x 85mm high x 3mm thick)

3.1.3.3 Installation sequence

Aluminium 'L'-shaped brackets with thermal pad (item 1A & 1B) were fixed to the substrate with EJOT T40/SW13 SDF-KB 10V x 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 x 60 E screws with plastic anchors at 480mm centres **Error! Reference source not found.**

Siderise B65 galvanised skewers (item 3) were folded to 90mm deep and fixed at nominal 500mm vertical centres with TuffFast HTF-SS-6.3 x 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 TuffFast HTF-SS-6.3 x 57mm screws in 4 rows located: 2065mm, 4390mm, 6695mm and 8430mm from the 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 Kooltherm K15 insulation (item 7) was 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 x 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 x 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 x 18mm-long rivets



at nominal 500mm vertical centres. Aluminium tape was applied to the joint between the aluminium rails and Kingspan Kooltherm 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 x 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 x 60 E screws with plastic anchors at 400mm horizontal centres.

The cladding system measured:

Requirement	Actual measurement
≥6000mm above the top of the combustion chamber	6510mm
≥2400mm width across the main wall	2650mm
≥1200mm width across the wing wall	1258mm
260mm (±100mm) wing wall-combustion chamber opening	350mm
2000mm x 2000mm (±100mm) combustion chamber opening	1945mm wide x 1995mm high
Horizontal joint (if present) placed 2400 (±100mm) above combustion chamber opening	2325mm
Vertical joint (if present) located on centre line of combustion chamber (±100mm)	On the centre line

3.2 BRE classification report no. P114679-1001 Issue: 1

This report presents the classification of an external wall system incorporating Kingspan Kooltherm K15 insulation with rainscreen cladding comprising Eternit Equitone Natura panels. 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.

The system, as tested, satisfied the criteria as follows:

Test method & test number	Parameter	No. of 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



Test method & test number	Parameter	No. of tests	Results	
			Fire spread test result time, t_s (min)	Compliance with parameters in Annex A BR135:2013
P114679-1000 Issue 1	Internal fire spread (cavity layer)		>15 minutes	Compliant
BS 8414-1:2015+A1:2017/ P114679-1000 Issue 1	Internal fire spread (Insulation layer)	1	>15 minutes	Compliant

The system described in this classification report was deemed to meet the performance criteria set in Annex A of BR 135:2013.

3.3 Warringtonfire test report no. 414280

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “Low Smoke Adhesive”, comprising synthetic rubber, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.

Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
24.1034	0.6990

3.4 Warringtonfire test report no. 414281

A test in accordance with EN ISO 1716:2018 was carried out on a sample of “FR Adhesive”, comprising synthetic rubber, to determine its heat of combustion on 21 May 2019.

For the product tested, the following results relating to the gross calorific potential were obtained.

Gross calorific value per unit mass (MJ/kg)	Gross calorific value per unit area (MJ/m ²)
13.4048	0.3887

4 Description of the proposed systems

The proposed external wall system has the same construction as that tested. The only difference is that facings on the Kingspan Kooltherm K15 insulation incorporate an alternative adhesive.



5 Assessment

5.1 Applicable rule from BS 9414:2019

Parameter 1: INSULATION LAYER(S)

Tested component/product	Variation proposed	Sub-groups	Option for change	Additional evidence required (of tested and alternative/modified products)	For rule, see clause reference
Facing layer (if applicable), including any adhesive	Alternative facing layer and/or adhesive	All insulation products	Permissible – see note to rule	Reaction-to-fire test data	5.4.10



5.2 Applicable clause from BS 9414:2019 (Clause 5.4.10)

The test result shall be deemed to be valid if the tested facing is replaced with an alternative facing (including the adhesive) with a gross heat of combustion in MJ/m² equal to or less than the tested product.

NOTE If the membrane is used for the purpose of protecting the insulation from the effects of fire, either as a separate membrane or encapsulation of the insulation product, it is not permitted to remove it or replace it with an alternative product.

5.3 Evaluation

5.3.1 General

In this instance, the membrane is not considered to be for the purpose of protecting the insulation from the effects of the fire, so it is permitted to replace it with an alternative product.

5.3.2 Adhesive

The gross heat of combustion for the “Low Smoke Adhesive”, which was used in BRE Global report no. P114679-1000 Issue 1, was found to be 0.6990MJ/m² (see Warringtonfire report no. 414280) and that for the alternative “FR Adhesive” was found to be 0.3887MJ/m² (see Warringtonfire report no. 414281). The latter is therefore considered a suitable alternative.

6 Conclusion

Therefore, it is our opinion that the Eternit Equitone Natura panel ventilated rainscreen system with Kingspan Kooltherm K15 insulation, where the facings on the Kingspan Kooltherm K15 insulation incorporate an alternative adhesive, as described in section 4, will satisfy the criteria of BR 135, Third Edition, if tested to BS 8414-1:2015+A1:2017.

This evaluation has been carried out in accordance with BS 9414:2019.



7 Figures

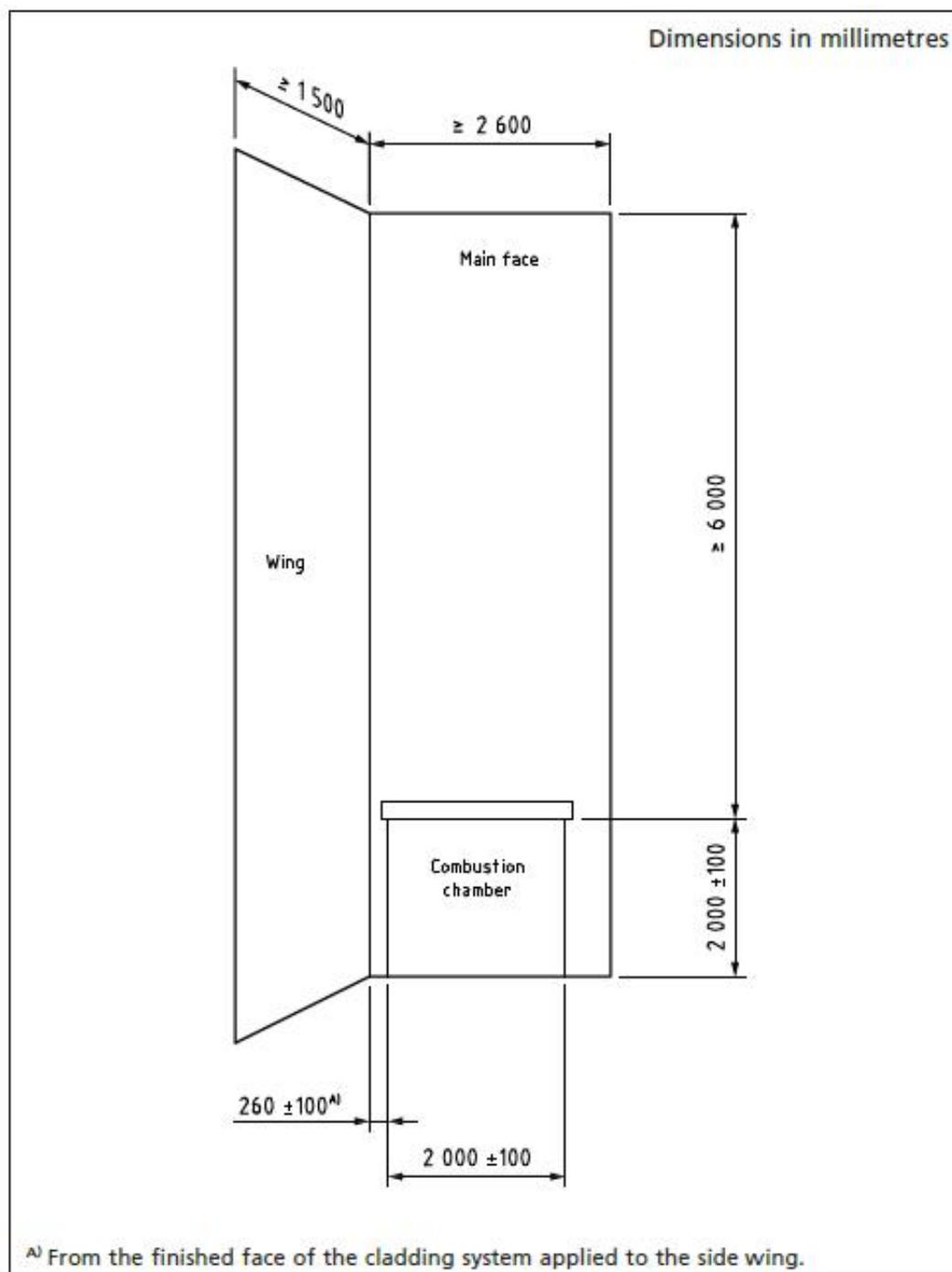


Figure 1 Test apparatus dimensions as specified by test standard

Note: The test apparatus may be constructed left- or right-handed

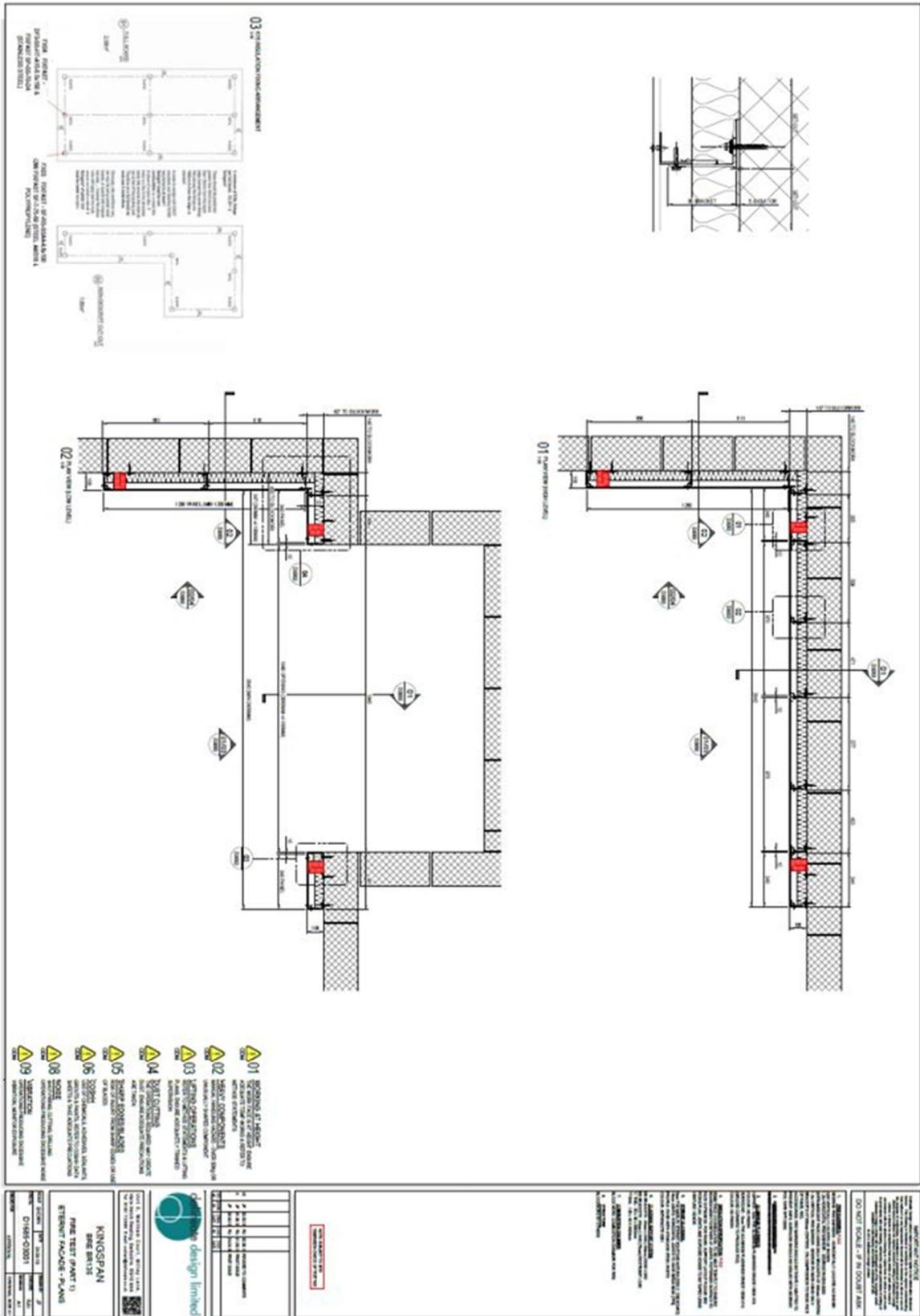


Figure 2 System plan view

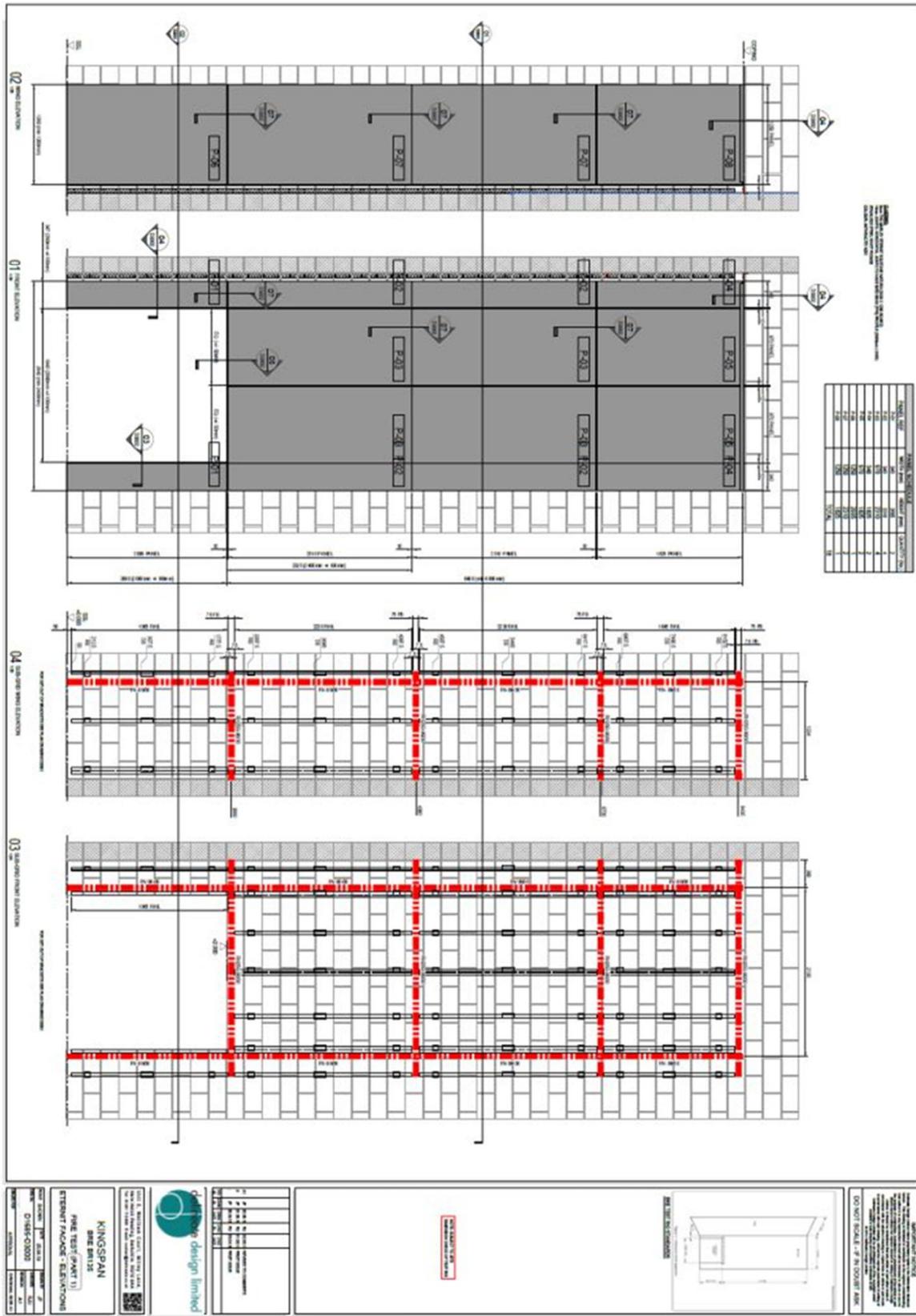


Figure 4 System overview



8 Validity of the assessment

8.1 Declaration by applicant

We the undersigned confirm that we have read and complied with the obligations placed on us by the PFPF Guide to Undertaking Assessments in Lieu of Fire Tests.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which this assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information, we agree to cease using the assessment and ask BRE Global to withdraw the assessment.

Signed:

For and on behalf of:

8.2 BRE Global declaration

This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to BRE Global the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence over an expressed opinion. The assessment is valid for a period of five years after which it should be returned for review to consider any additional data which has become available or any changes in the fire test procedures. Any changes in the specification of the product will invalidate this assessment.

This assessment has been carried out in accordance with Fire Test Study Group Resolution No. 82. It relates to the fire performance of the product and does not cover aspects of quality, durability, maintenance nor service requirements. This assessment relates only to the specimen(s) assessed and does not by itself imply that the product is approved under any Loss Prevention Certification Board approval or certification scheme or any other endorsements, approval or certification scheme.

Next review date: 30 September 2025