



CONFIDENTIAL

Report: Chilt/IF12003 Revision A

A horizontally orientated ad-hoc fire resistance test performed on 2No intumescent air transfer grills installed within an ablative coated rock mineral fibre fire barrier

Test conducted to the temperature and pressure conditions of BSEN 1363-1: 1999 and using the methodology in draft EGOLF agreement EAXXX: 2011 – fire resistance test of air transfer grills

Test date: 27 January 2012



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www.chilternfire.co.uk

www.chilterndynamics.co.uk

www.qmark.info

Primary sponsor:

**Complete Fire Protection Ltd
Unit 2 Ferry Steps Industrial Road
Albert Road
Bristol BS2 0XW**

Secondary sponsor:

**Park West Fire Protection Ltd
Park West Enterprise Centre
Dublin 12
Ireland**

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1 Introduction

Two air transfer grills installed within an ablative coated rock mineral fibre fire barrier and a ventilated cavity fire seal were installed within an aerated autoclaved concrete floor slab and tested to evaluate their fire resistance. The air transfer grills only are subject to this report.

2 Specimen verification

The specimens were delivered to Chiltern International Fire Ltd (CIFL) during January 2012. CIFL fabricated the supporting construction, and installed the specimens into the supporting construction to the clients specifications.

3 Description of supporting constructions

The supporting construction comprised a lightweight aerated autoclaved concrete floor slab, including a 150mm deep x 1000mm long x 600mm wide aperture.

A 50mm thick ablative coated rock mineral fibre batt (referenced CFP Ltd Fireplug FPS, density 140kg/m³) fire barrier was friction fitted at mid depth in the aperture. The top unexposed edges of the batt were sealed to the aperture with fire rated intumescent mastic. No mastic was on the exposed face batt edges.

The ablative coated rock mineral fibre batt fire barrier included a 300mm wide x 300mm long aperture and a 150 wide x 150mm long aperture into which the air transfer grills were installed.

4 Description of specimen

Details of the specimens are shown in the Appendix. All measurements are in mm and the descriptions are written viewing the specimens from the unexposed face unless stated otherwise.

4.1 Air transfer grills

Each air transfer grill was installed into its corresponding aperture within the supporting construction, with the top edge of each grill fitted flush to the unexposed face of the batt.

Air transfer grill A was referenced Fireplug FPG300 x 300 (intumescent ventilation grill) and measured 290mm wide x 290mm long x 38mm thick. The air transfer grill block comprised a profiled steel 'C' section framework, 1mm thick x 38mm wide with 10mm upstands, supporting Fireplug intumescent material, 2.3mm thick. The intumescent sheet strips were slotted and pressed together at right angles to form an orthogonal grid.

Air transfer grill B was referenced Fireplug FPG150 x 150 (intumescent ventilation grill) and measured 150mm wide x 150mm long x 25mm thick. The air transfer grill block comprised a profiled steel 'C' section framework, 1mm thick x 25mm wide with 10mm upstands, supporting Fireplug intumescent material, 2.3mm thick. The intumescent sheet strips were slotted and pressed together at right angles to form an orthogonal grid.

A 20mm wide x 0.5mm thick strip of Fireplug intumescent was fitted between the Grill block and batt.

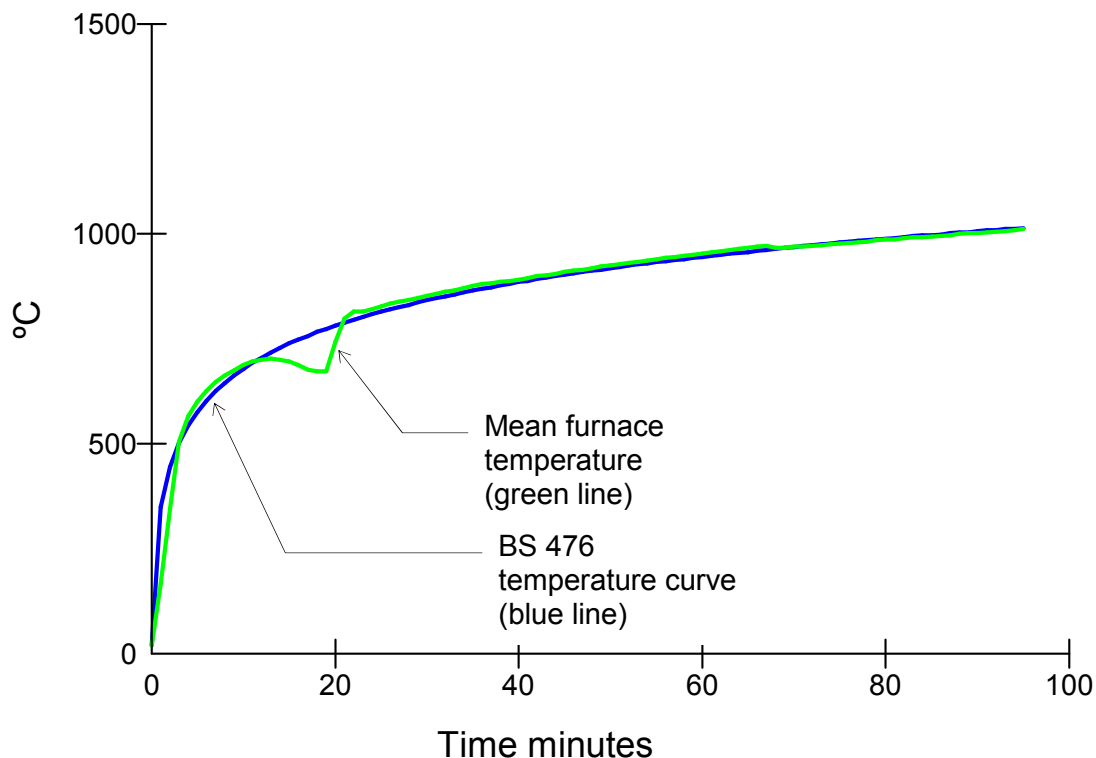
5 Test conditions

5.1 Ambient temperature

The ambient temperature of the test area at commencement of test was 10°C.

5.2 Furnace temperature

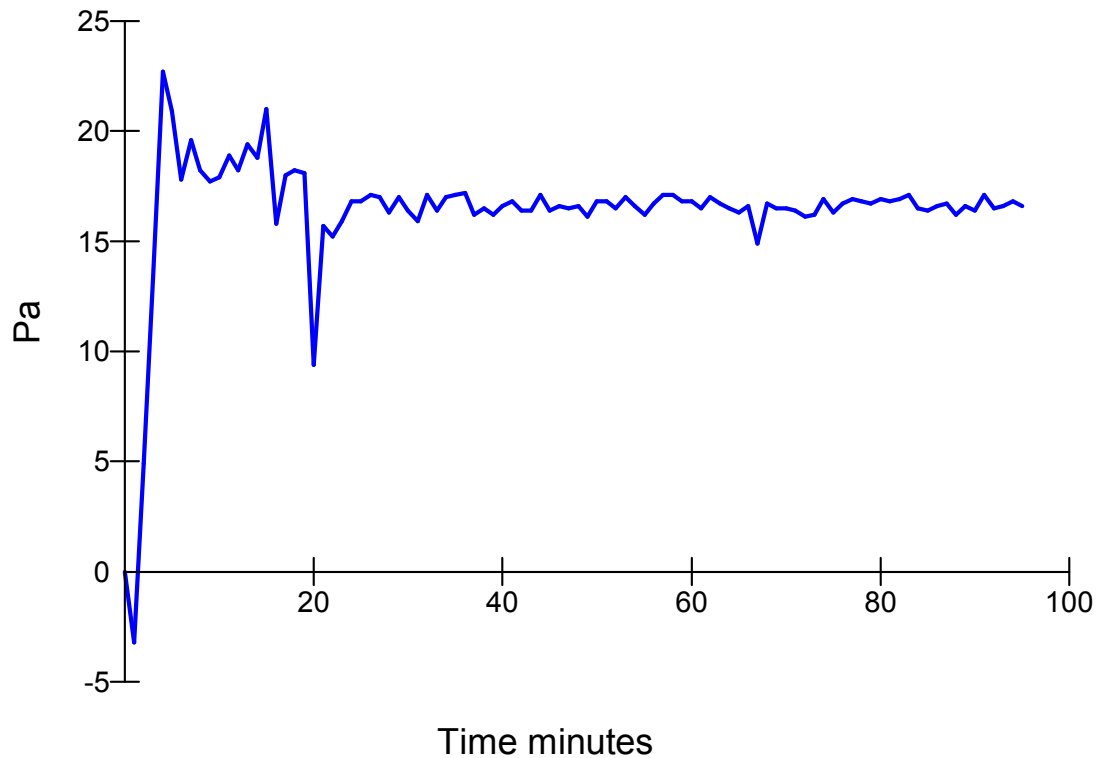
The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 22: 1987, as closely as possible, using the average of four thermocouples suitably distributed within the furnace. The furnace temperatures for the duration of the test are shown graphically below:



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5.3 Pressure readings

After the first 5 minutes of the test, the furnace pressure was maintained at 16.5 ± 5 Pa and after 10 minutes was maintained at 16.5 ± 3 Pa with respect to atmosphere, equating to 20Pa at the bottom of the bottom vents. The pressure readings are shown graphically below:

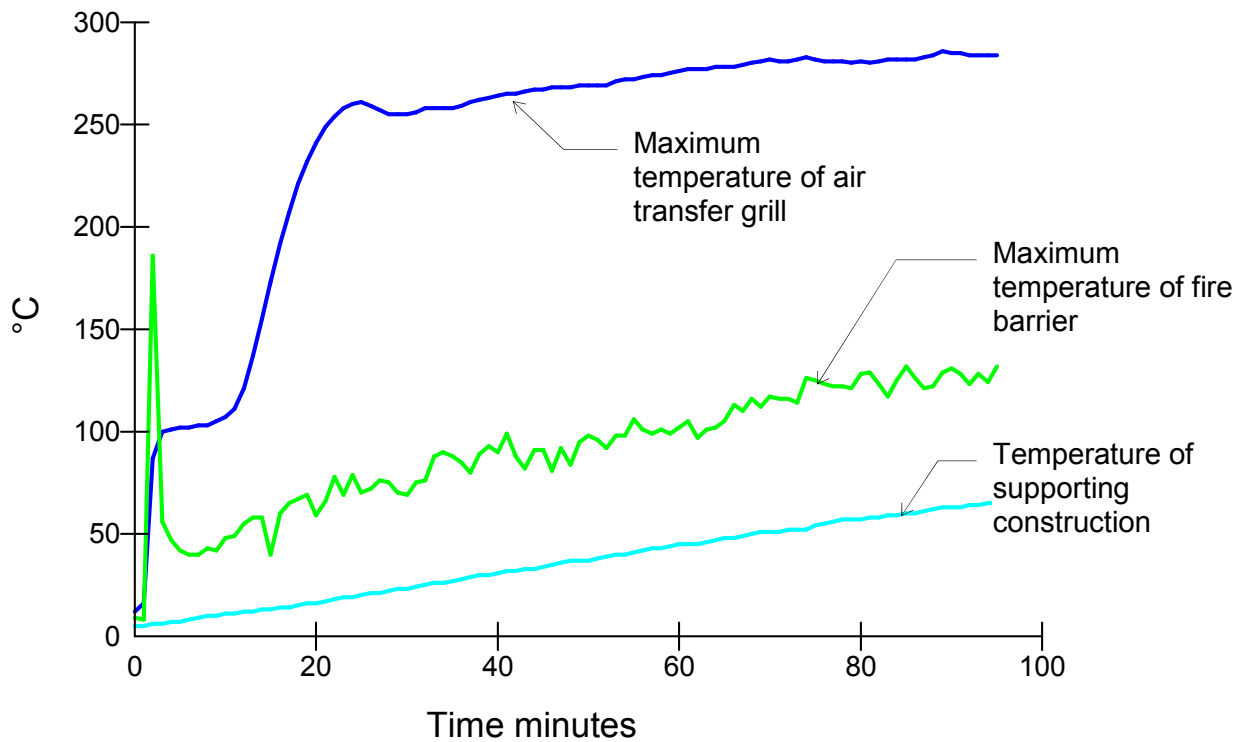


5.4 Thermocouple positions

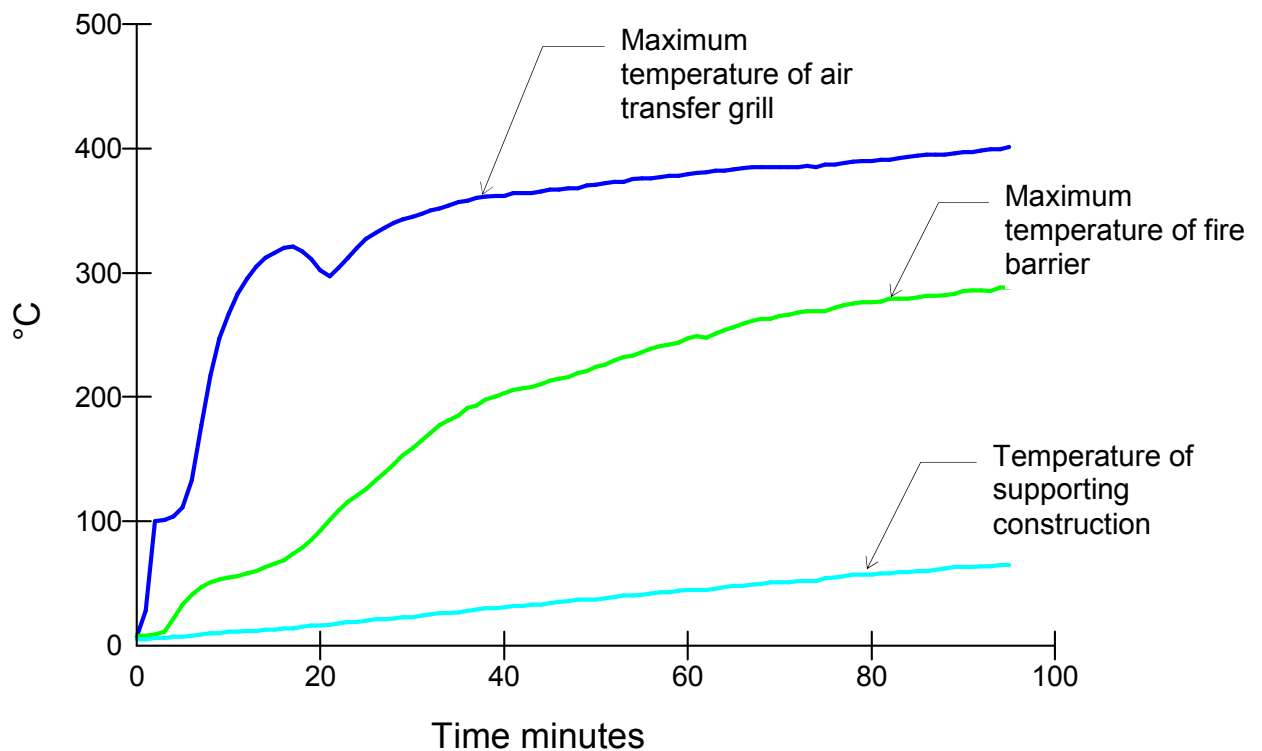
The temperature of the unexposed face was monitored by means of two thermocouples fixed to each air transfer grill, three thermocouples fixed to the fire barrier and one thermocouple fixed to the supporting construction. (see Appendix figure 3).

5.5 Unexposed face temperatures

Air transfer grill A



Air transfer grill B



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6 Observations

All observations relate to the unexposed face unless otherwise stated.

Time (minutes)	Comments
0.00	Test started.
01.30	There is smoke issuing from both air transfer grills.
07.00	The intumescent in both air transfer grills has reacted and sealed.
26.00	There is discolouration to the fire barrier batt ablative coating around the perimeter of the air transfer grills.
31.40	Air transfer grill A, a cotton pad integrity test was performed at the centre of the grill, no failure.
32.30	Air transfer grill B, a cotton pad integrity test was performed at the centre of the grill, no failure.
36.00	No change.
60.00	No change.
75.00	There is discolouration to the batt around the perimeter of the fire barrier.
91.30	Air transfer grill A, there is a glow visible from the far right hand corner of the specimen.
95.44	The fire barrier batt has fallen into the furnace, thereby constituting integrity failure .
96.00	Test terminated.

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7 Expression of results

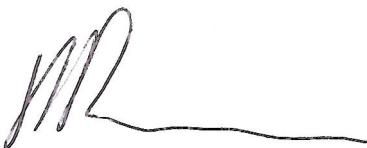
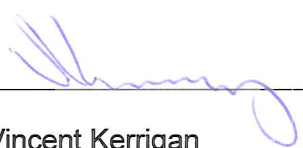
	Integrity			Insulation
	Cotton pad	Gap gauge	Continuous flaming	
Air transfer grill A	95 (ninety five) minutes	95 (ninety five) minutes	95 (ninety five) minutes	15 (fifteen) minutes
Air transfer grill B	95 (ninety five) minutes	95 (ninety five) minutes	95 (ninety five) minutes	7 (seven) minutes

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8 Limitations

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

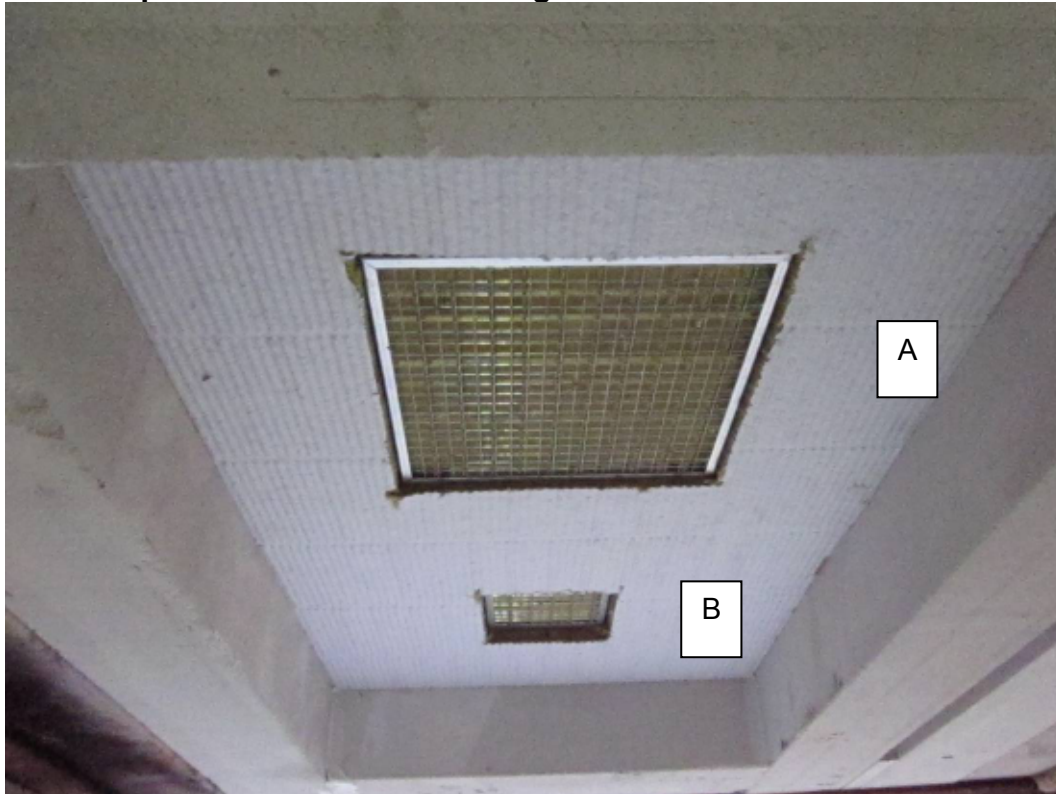
This report covers a test which was conducted to an Ad-hoc procedure which is not the subject of any British or European standard specification, but the test utilised the general principles of fire resistance testing given in BSEN 1363-1: 1999 and the methodology in draft EGOLF agreement EA XXX: 2011, fire resistance of air transfer grills. Since fire tests are the subject of continuing Standardisation process, and because existing standards are the subject of review and possible amendment and new interpretations, it is recommended that the report be referred back to the test laboratory to ensure that the methodology adopted and the results obtained remain valid in the light of the situation prevailing at that time

Signature:		
Name:	Ross Newman	Vincent Kerrigan
Title:	Principal Test Engineer	Technical Manager
Date of issue:	17-01-2013	17-01-2013

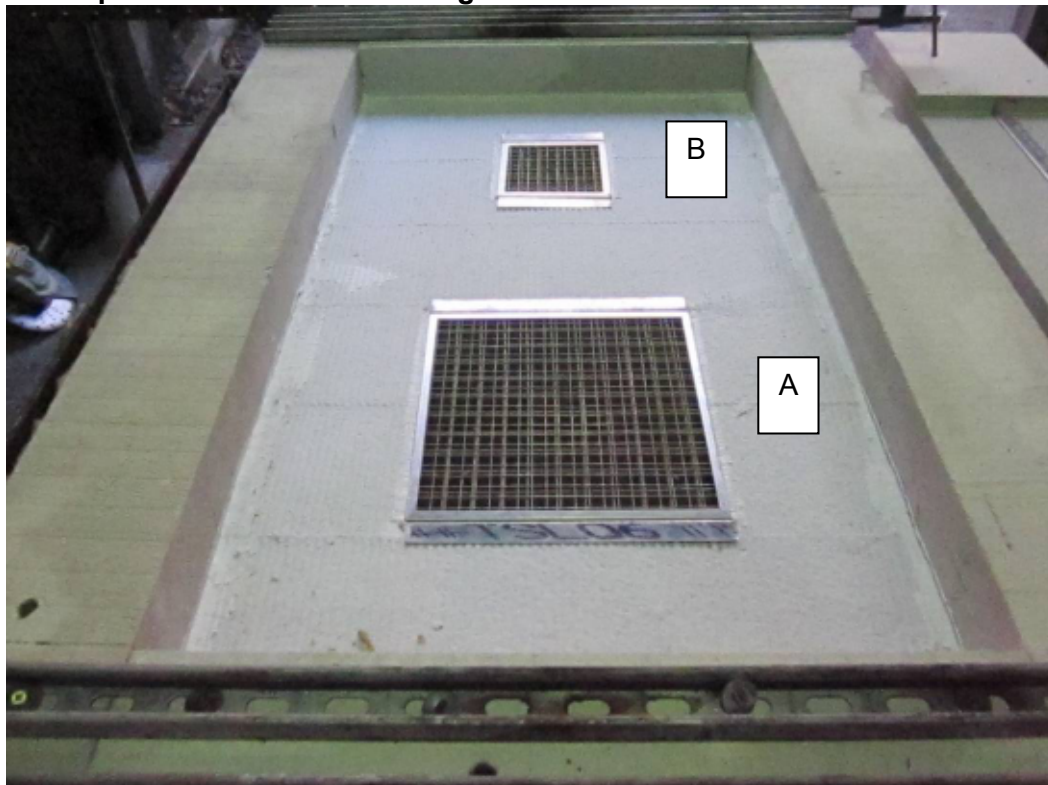
Revision A – January 2013 – Correction in test date – front cover.

9 Photographs

Exposed face of air transfer grills



Unexposed face of air transfer grills at start of test



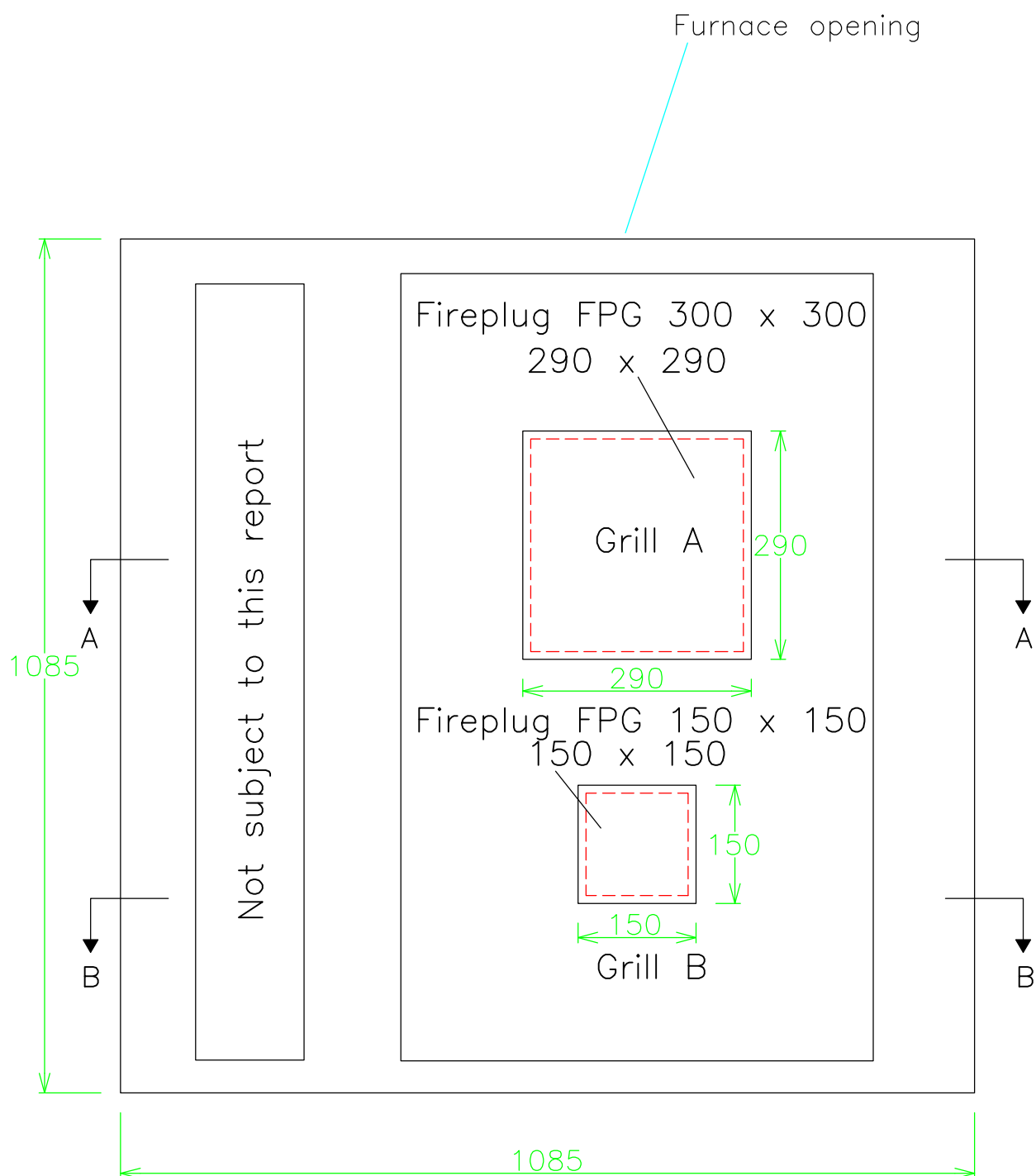
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After 90 minutes



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Appendix – figures 1 - 3



Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Title

Unexposed face elevation

(All dimensions in mm)

Date Drawn

20/01/12

Drawn By

ARD

Scale

NTS

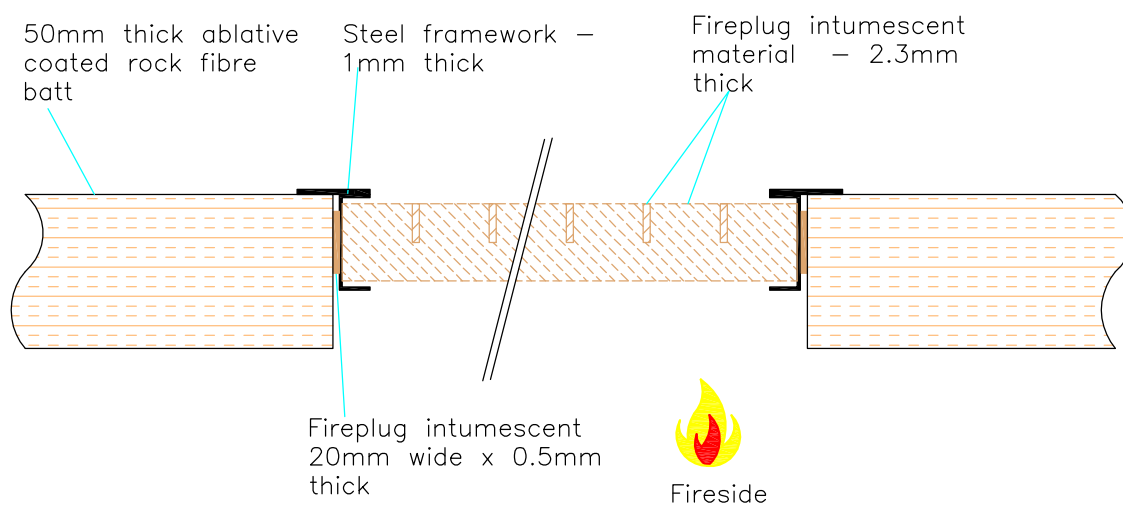
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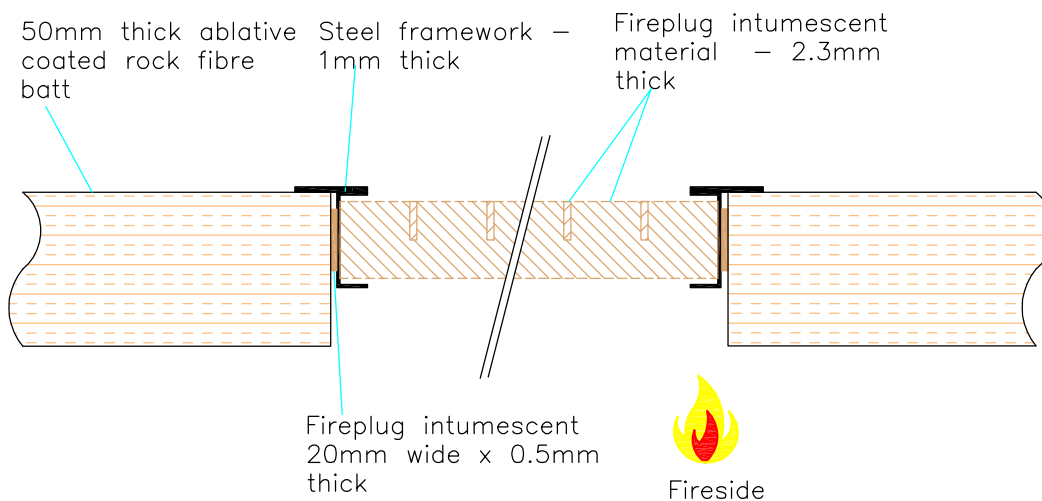
Section A-A

Grille A



Section B-B

Grille B



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High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Title

Cross section of air transfer
grills and ablative coated batt

Date Drawn

20/02/12

Drawn By

ARD

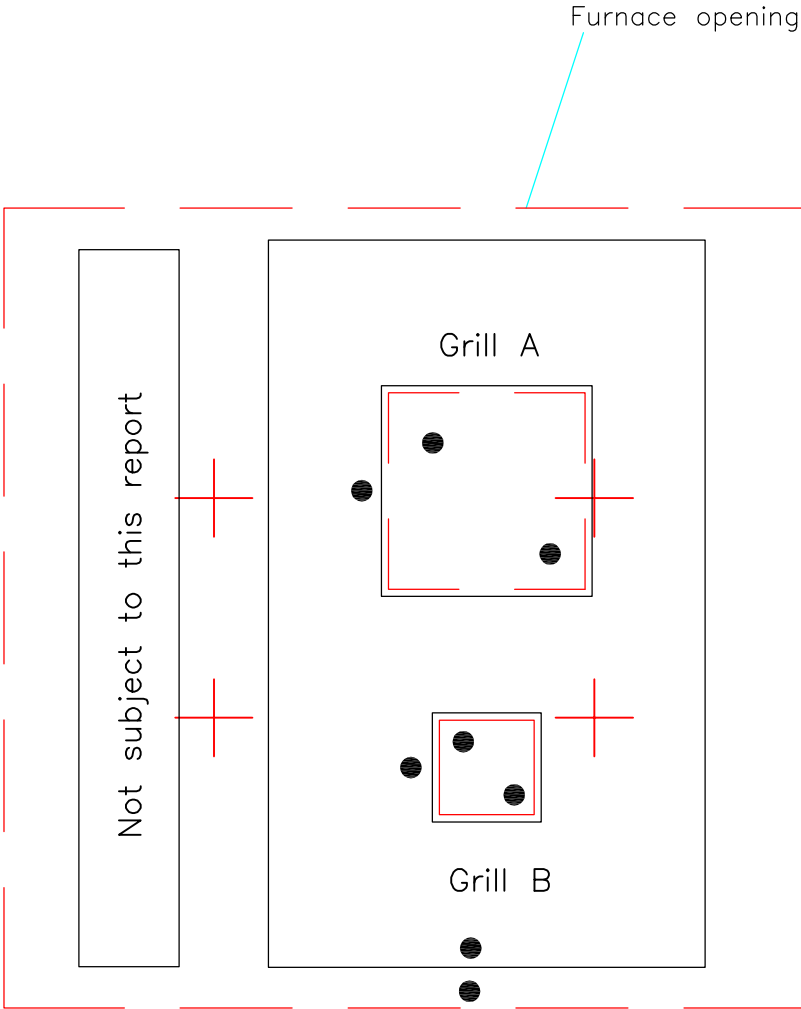
Scale

NTS

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Appendix



- + : Furnace Thermocouples
- : Unexposed Face Thermocouples



Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.
Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Title
Thermocouple positions

Date Drawn 20/02/12	Drawn By ARD	Scale NTS
Project No. Chilt/IF12003 Rev A		Appendix