

Fire Resistance Testing

CONFIDENTIAL

Report: BMT/FEI/F15014

Sponsor:

Fire Proofing Services Ltd
49-61 Jodrell Street
Nuneaton
Warwickshire
CV11 5EG

Ad hoc fire resistance test performed on two steel access hatches fitted within a British Gypsum 120 minute specification ceiling membrane section

Test conducted to the temperature and pressure conditions of BS 476: Part 20: 1987 and utilising the principles of BS 476: Part 22: 1987 where appropriate

Test date: 9th February 2015

Page 1 of 17



Contents

| | Page No |
|--|-----------|
| 1 Introduction | 3 |
| 2 Specimen verification | 3 |
| 3 Description of supporting construction | 3 |
| 4 Description of the ceiling membrane construction..... | 4 |
| 5 Description of test specimens..... | 5 |
| 6 Test conditions..... | 7 |
| 7 Observations | 9 |
| 8 Primary observations..... | 10 |
| 9 Limitations | 10 |
| 10 Photographs | 11 |
| Appendix – client drawings..... | 16 |

The legal validity of this report can only be claimed on presentation of the complete report.

1 Introduction

Two access hatches were installed into ceiling membrane section fixed within a refractory lined steel restraint frame above a 1.5m x 1.5m furnace. The access hatches were fitted opening in towards the furnace.

2 Specimen verification

The steel access hatches were manufactured and supplied for test by the client and delivered during February 2015.

3 Description of supporting construction

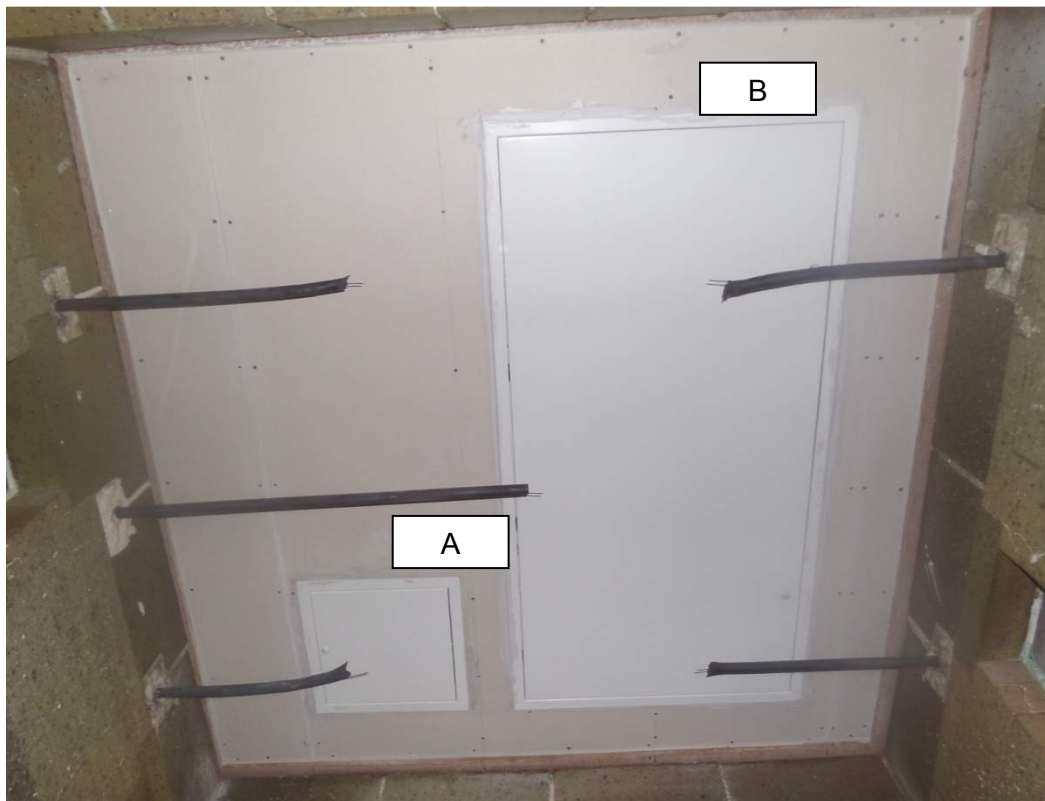
BM TRADA constructed a section of British Gypsum (BG) CasoLine MF 120 minute ceiling membrane within a refractory lined steel restraint frame. The ceiling included 2No. apertures:-

Hatch test reference A - 305mm x 305mm (aperture size)

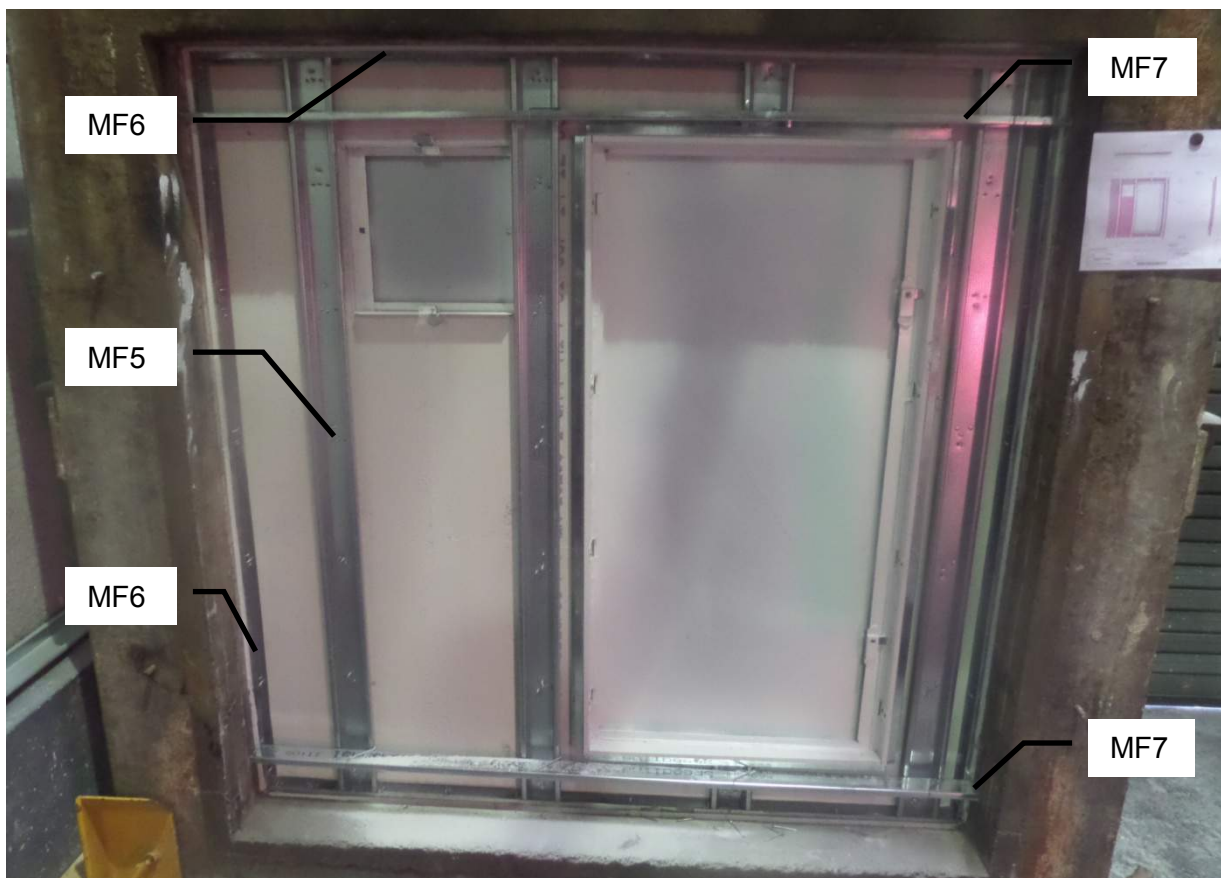
Hatch test reference B - 607mm x 1207mm (aperture size)

The client installed the access hatches into the created apertures.

Exposed face prior to testing



The legal validity of this report can only be claimed on presentation of the complete report.

Unexposed face prior to testing**4 Description of the ceiling membrane construction****Reference British Gypsum CasoLine MF 60 minute system ref. C106003**

The 1500mm x 1500mm ceiling construction comprised BG Gypframe MF6 Primary Support Channel around the ring beam and BG Gypframe MF5 Ceiling Section fitted within the MF6 Primary Support Channel profile at 400mm centres. 2No. sections of BG Gypframe MF7 Primary Support Channel were fitted one to each side of the hatch apertures, at 90° to the MF5 ceiling section, extending to the MF6 Support Channel around the ceiling section. The ceiling system was clad with 3No. layers of 10mm thick BG Glasroc F (GRG) multiboard, the first layer fixed with 25mm long Drywall screws, the second layer with 32mm long Drywall screws and the third layer with 42mm long Drywall screws, all fitted at maximum 230mm centres.

No insulation was fitted to the top of the ceiling section.

The access hatch B aperture was framed on all edges using MF6 Primary Support Channel and then subsequently lined on all edges with a 65mm deep section of 10mm thick BG Glasroc F multiboard on all edges. The lining board was fixed to the MF6 Primary support channel using 25mm long drywall screws at maximum 300mm centres. The access hatch A aperture was not framed nor lined.

No suspension fixings were used due to the 1500mm x 1500mm size of the test specimen ceiling section, which was supported on all four sides.

The legal validity of this report can only be claimed on presentation of the complete report.

5 Description of test specimens (refers to clients drawings in appendix 1)

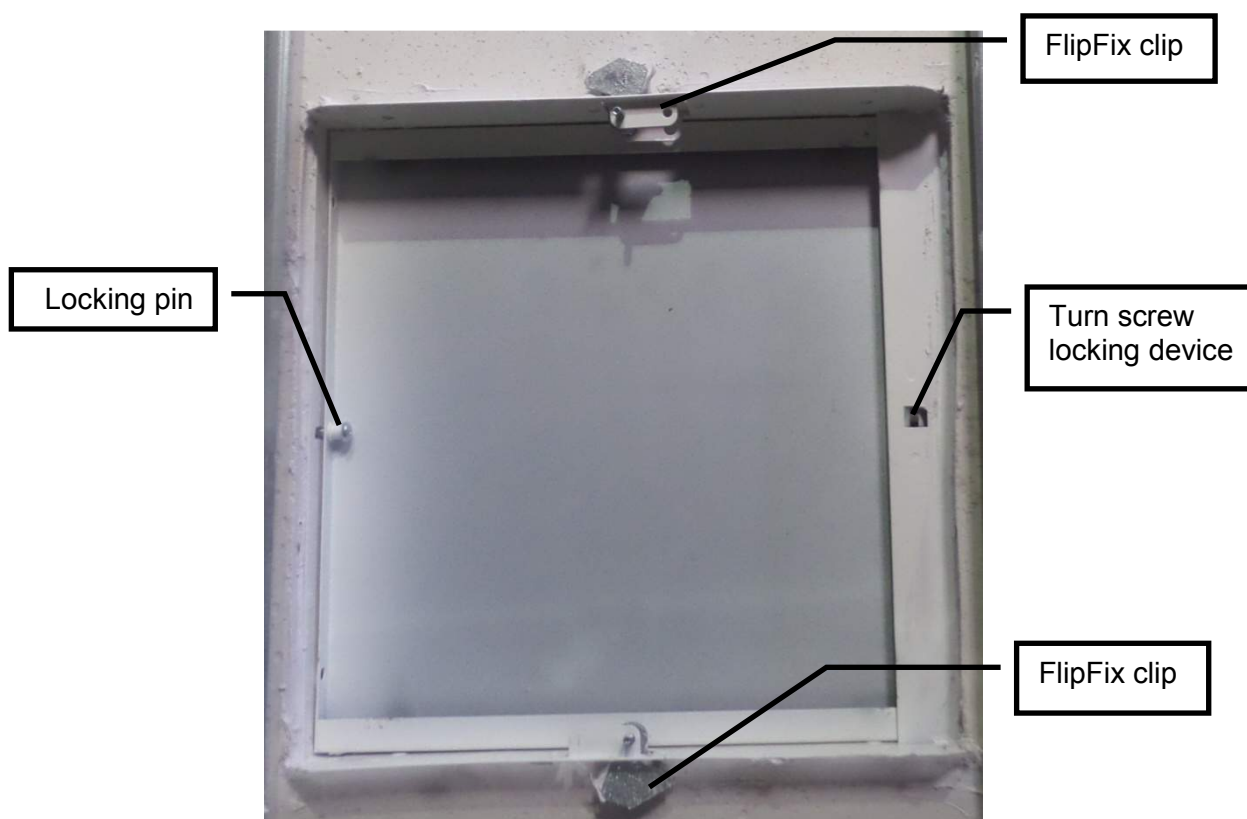
Access hatch A

The hatch panel (product referenced FlipFix with Turnscrew) measured 300mm x 300mm x 13mm thick overall with a 24mm wide platform on the closing edge and a 15mm wide platform on the side edges. The hatch panel comprised a 0.9mm thick profiled powder coated Zintec steel tray section, welded at the corners.

The frame comprised 1.2mm thick profiled powder coated Zintec steel 'L' section, 26mm high x 26mm wide on the hinged and end sides, and 'Z' section 30mm – 14mm – 26mm on the closing edge, welded at the corners.

The frame was fixed into the aperture with 2No. FlipFix fitting devices, one centrally fitted on each hinged edge.

The leaf was hinged on two steel screws, and was secured closed with a turn screw centrally fitted on the closing edge and a locking pin centrally fitted on the opposite edge.



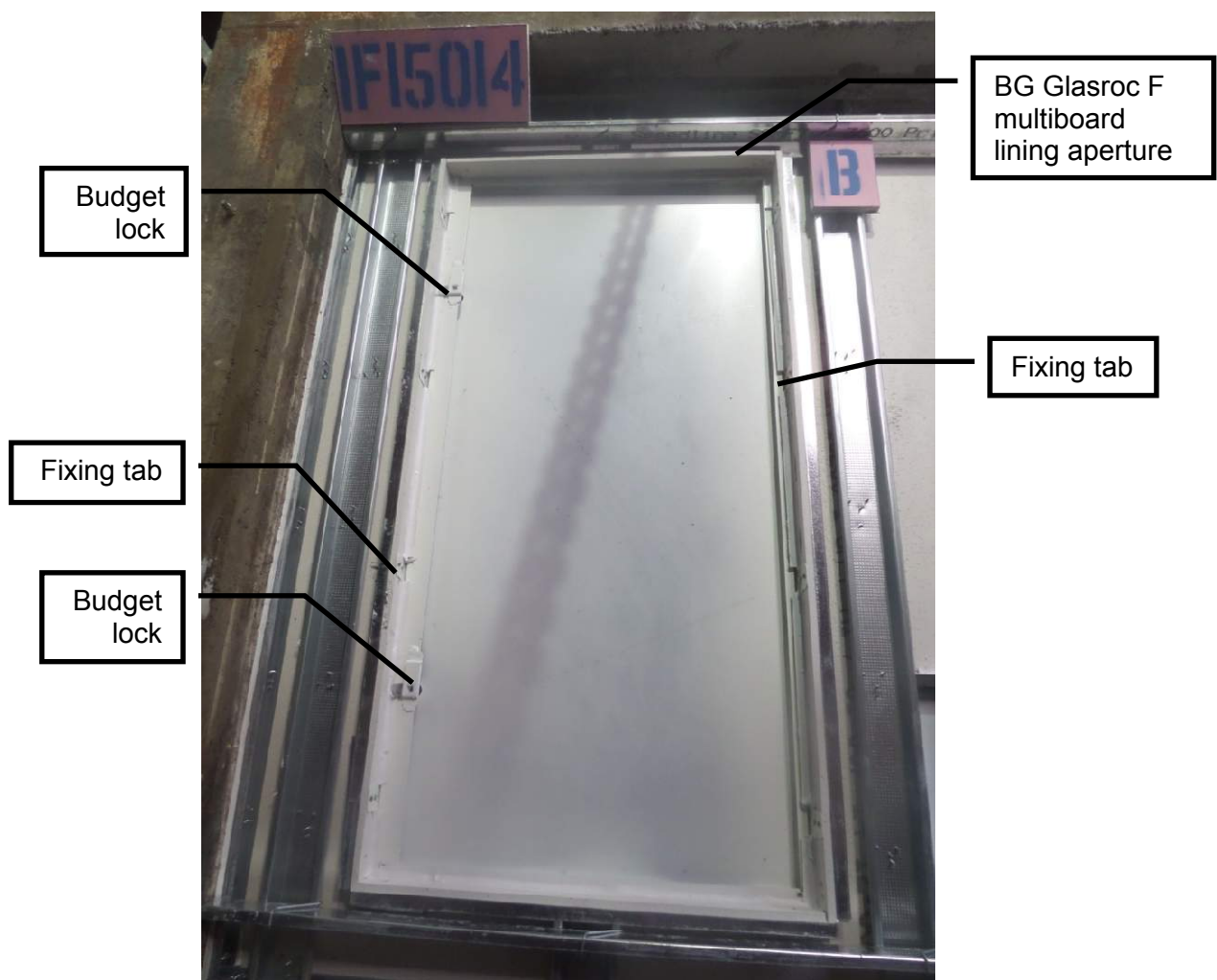
Access hatch B

The access panel leaf measured 1200mm long x 600mm wide x 25mm thick comprising powder coated 0.9mm thick steel tray profile, with a 14mm wide platform on the side and hanging edges, and a 38mm wide platform on the closing edge. The leaf was welded at the corners.

The frame comprised 1.2mm thick powder coated steel 'Z' section, 26mm high x 38mm wide overall with a 13mm wide integral stop on the exposed face and a 25mm wide integral architrave on the unexposed face. The frame was welded at the corners.

The frame was fixed into the aperture with 4 No. steel tabs on each long edge, fitted at 100mm, 435mm, 770mm and 1100mm measured from one edge, fixed with 2No. 40mm long screws per tab.

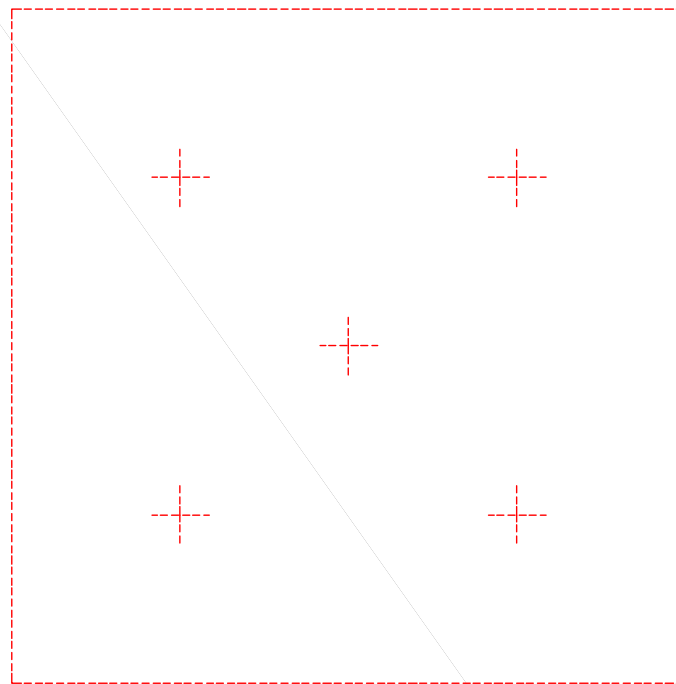
The access panel was hinged on two Ø5mm steel bolts on one edge, with a Ø5mm steel bolt and threaded insert engaging into a hole in the frame. Two engaged budget type locks (79mm x 22mm) were welded 250mm and 950mm on the platform of the opposite edge.



The legal validity of this report can only be claimed on presentation of the complete report.

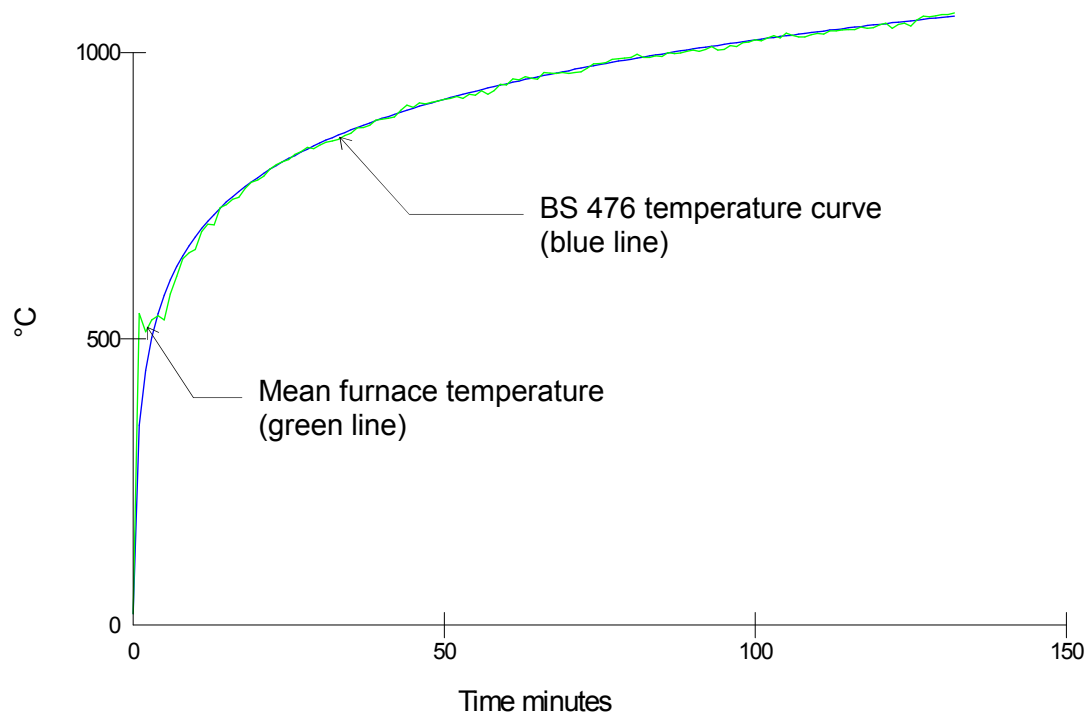
6 Test conditions

- 6.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 70, 71 and 72 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 6.2 The ambient temperature of the test area at commencement of test was 10°C.
- 6.3 After the first 5 minutes of the test, the furnace pressure was maintained at 13.2 ± 5 Pa and after 10 minutes was maintained at 13.2 ± 3 Pa, equating to 20Pa at the underside of the ceiling soffit. The pressure readings have been tabulated in Appendix 2.
- 6.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of five thermocouples suitably distributed within the furnace in the horizontal plane. The temperatures recorded are shown graphically below:



+ : Furnace Thermocouples

Furnace Temperature



- 6.5 The specimens were declared uninsulated, so no thermocouples were fitted to the unexposed face.

7 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)

| | |
|--------|---|
| 01.00 | There is smoke issuing from the perimeter of B. |
| 01.40 | There is smoke issuing from the perimeter of A. |
| 03.00 | There is discolouration to the face of B. |
| 06.30 | There is an increase in smoke issuing from the perimeter of B. |
| 07.20 | There is discolouration to the face of A. |
| 09.30 | The paint on the face of B is bubbling. |
| 30.00 | No change to either panel. |
| 34.30 | The centre of the closing edge of B is deflecting into the furnace by approximately 2-3mm. |
| 35.00 | The top closing corner of A is deflecting into the furnace by approximately 5mm. |
| 39.00 | The closing edge of B is glowing. |
| 41.00 | The perimeter of A is glowing. |
| 52.00 | The closing edge of B is further deflecting by approximately 6-7mm. |
| 55.30 | The centre of the hanging edge of B is deflecting into the furnace by approximately 5-6mm. |
| 64.00 | The entire face of A is glowing. |
| 80.00 | The centre of the closing edge of B has deflected to approximately 10mm in towards the furnace. |
| 81.20 | The entire face of B is glowing. |
| 90.00 | No change to either panel. |
| 105.00 | No change to either panel. |
| 120.00 | No change to either panel. |
| 132.00 | Test terminated. |

The legal validity of this report can only be claimed on presentation of the complete report.


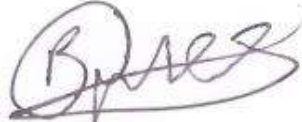
8 Primary observations

Time (minutes)

| | |
|--------|---|
| 00.00 | Test started. |
| 64.00 | The entire face of A is glowing. |
| 80.00 | The centre of the closing edge of B has deflected to approximately 10mm in towards the furnace. |
| 81.20 | The entire face of B is glowing. |
| 90.00 | No change to either panel. |
| 105.00 | No change to either panel. |
| 120.00 | No change to either panel. |
| 132.00 | Test terminated. |

9 Limitations

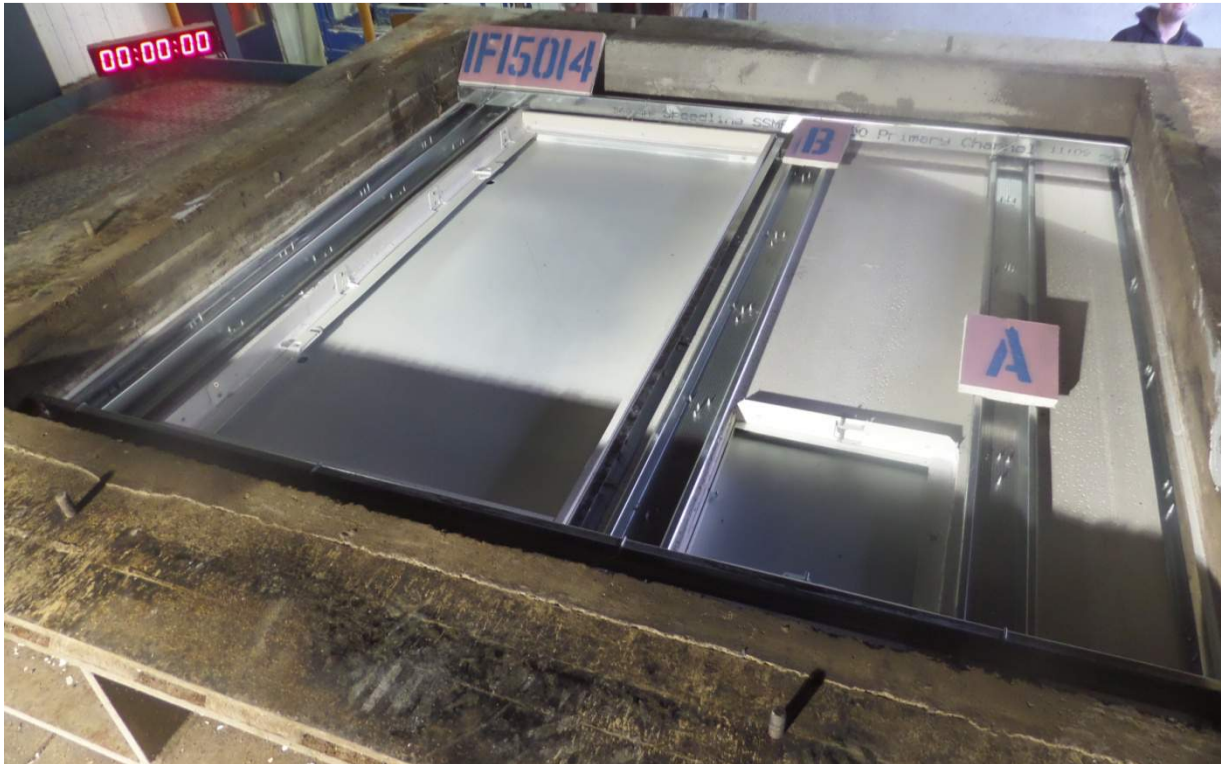
This test report relates to an investigation which utilised the test methodology given in BS 476 Part 20: 1987; the full requirements of the Standard were not, however, complied with. The information is provided for the test sponsor's information only and should not be used to demonstrate performance against the Standard nor compliance with a regulatory requirement. The test was not conducted under the requirements of UKAS accreditation.

| | Written and checked by: | Authorised by: |
|-----------------------|---|---|
| Signature: |  |  |
| Name: | Ashley Babb | Robert Axe |
| Title: | Senior Technical Officer | Lead Technical Officer |
| Date of issue: | 20 th July 2015 | 20 th July 2015 |

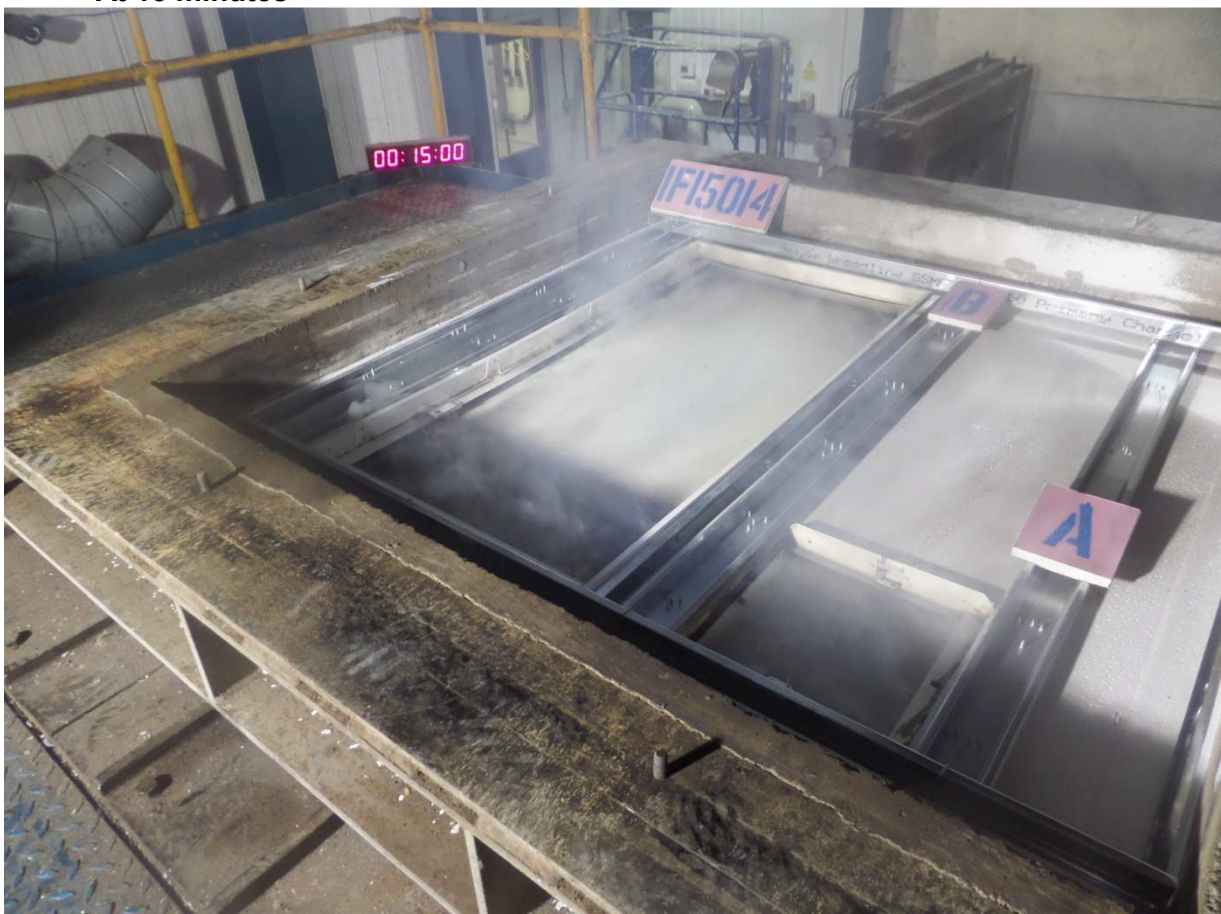
The legal validity of this report can only be claimed on presentation of the complete report.

10 Photographs

At start of test



At 15 minutes

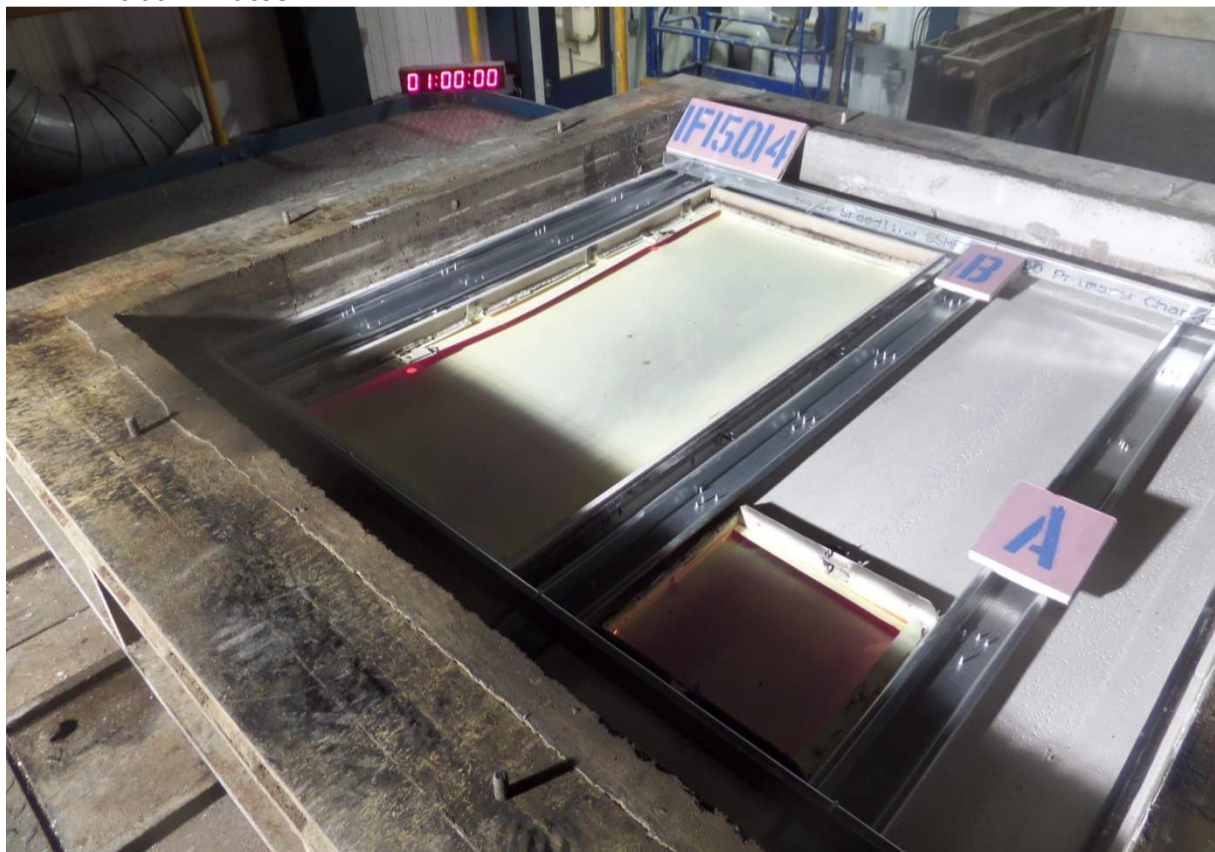


The legal validity of this report can only be claimed on presentation of the complete report.

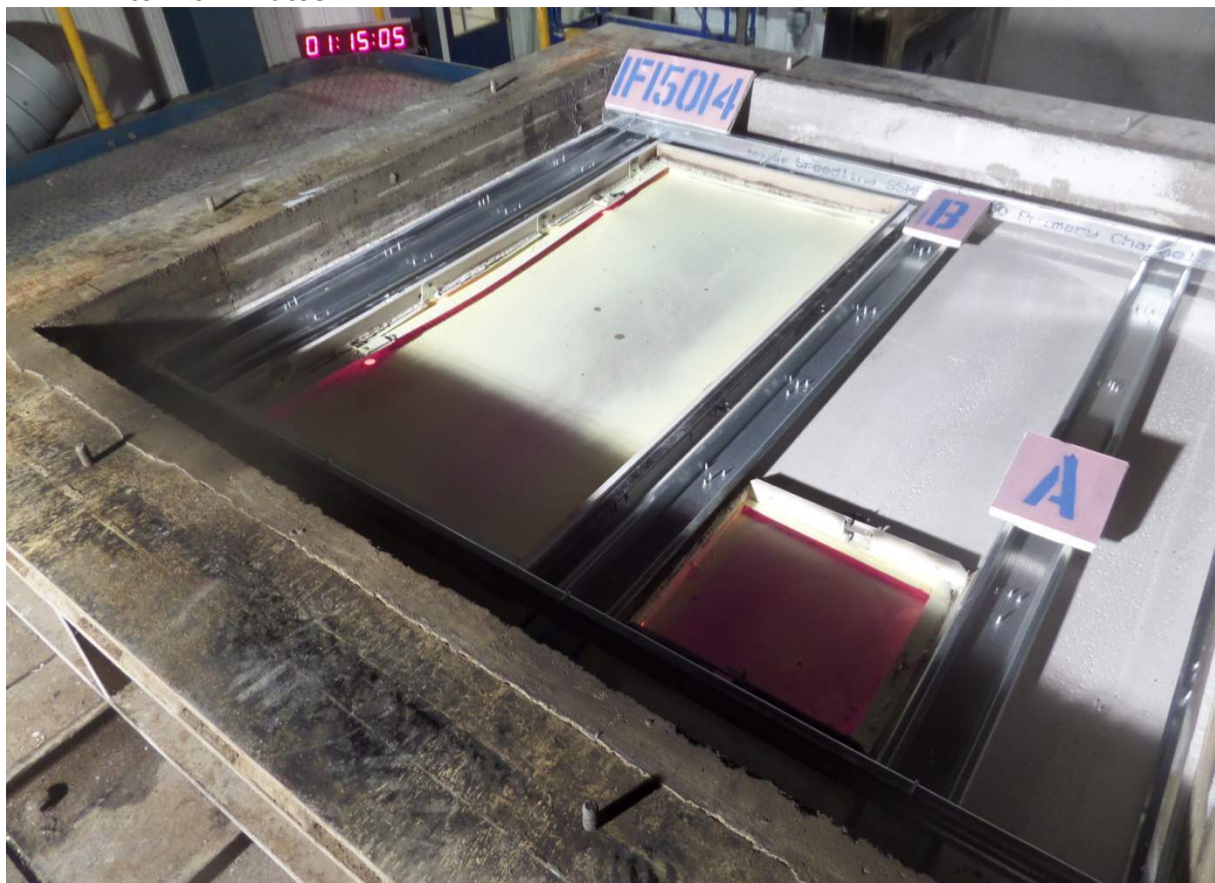
After 30 minutes**After 45 minutes**

The legal validity of this report can only be claimed on presentation of the complete report.

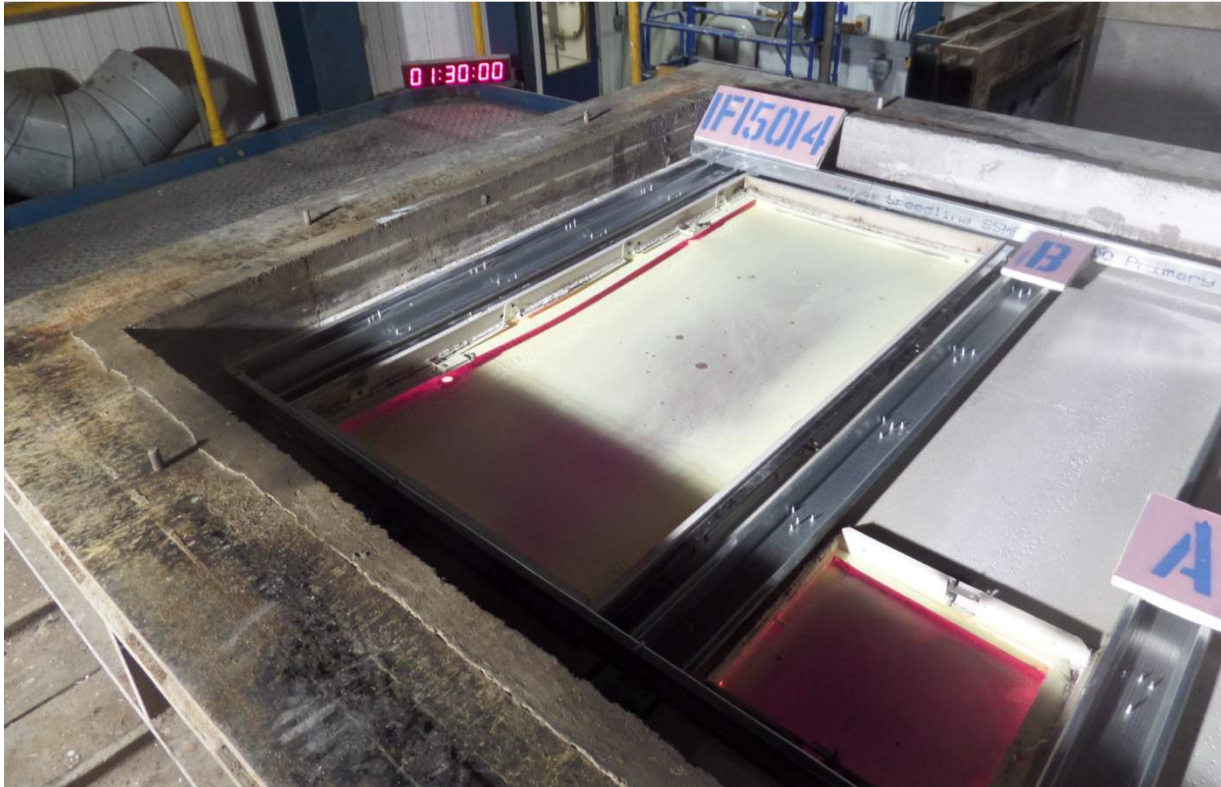
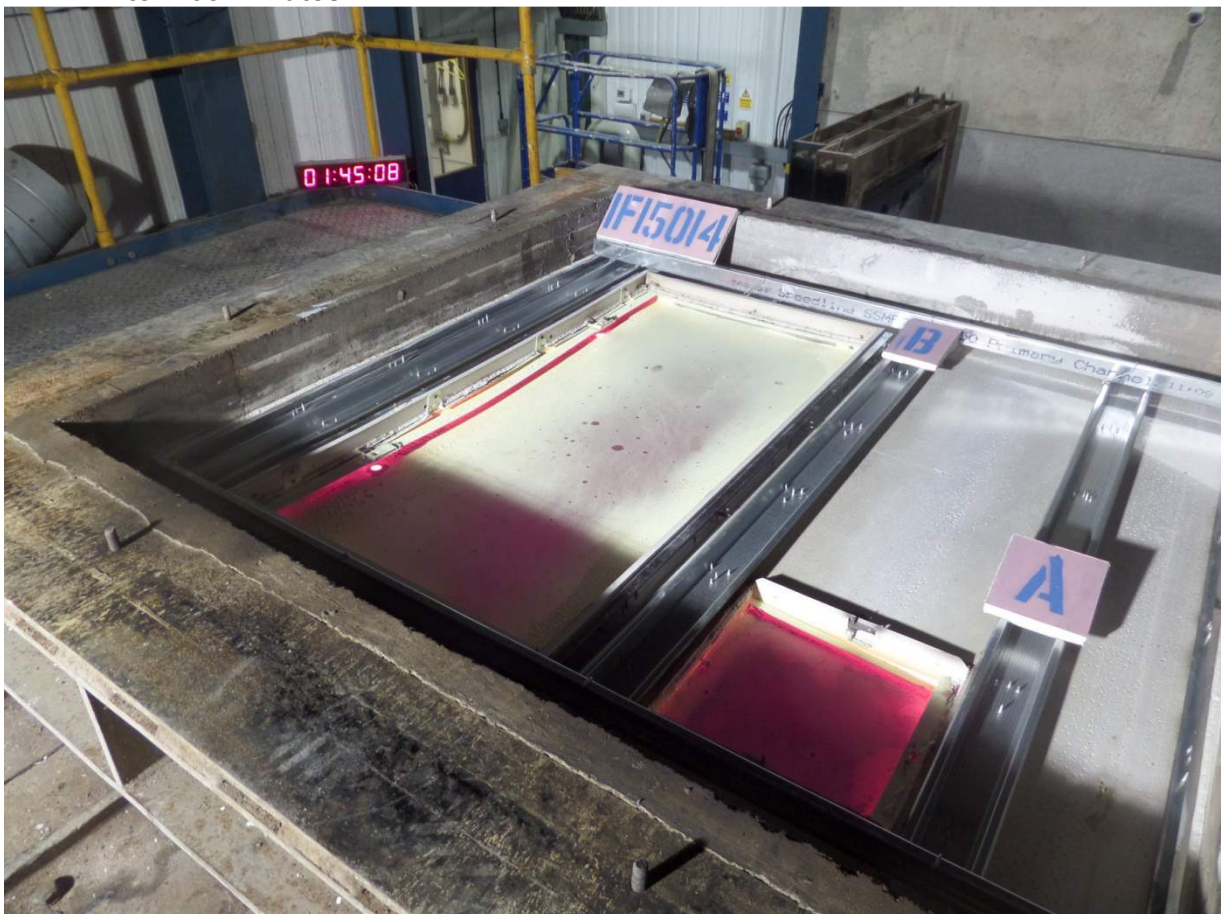
At 60 minutes



After 75 minutes

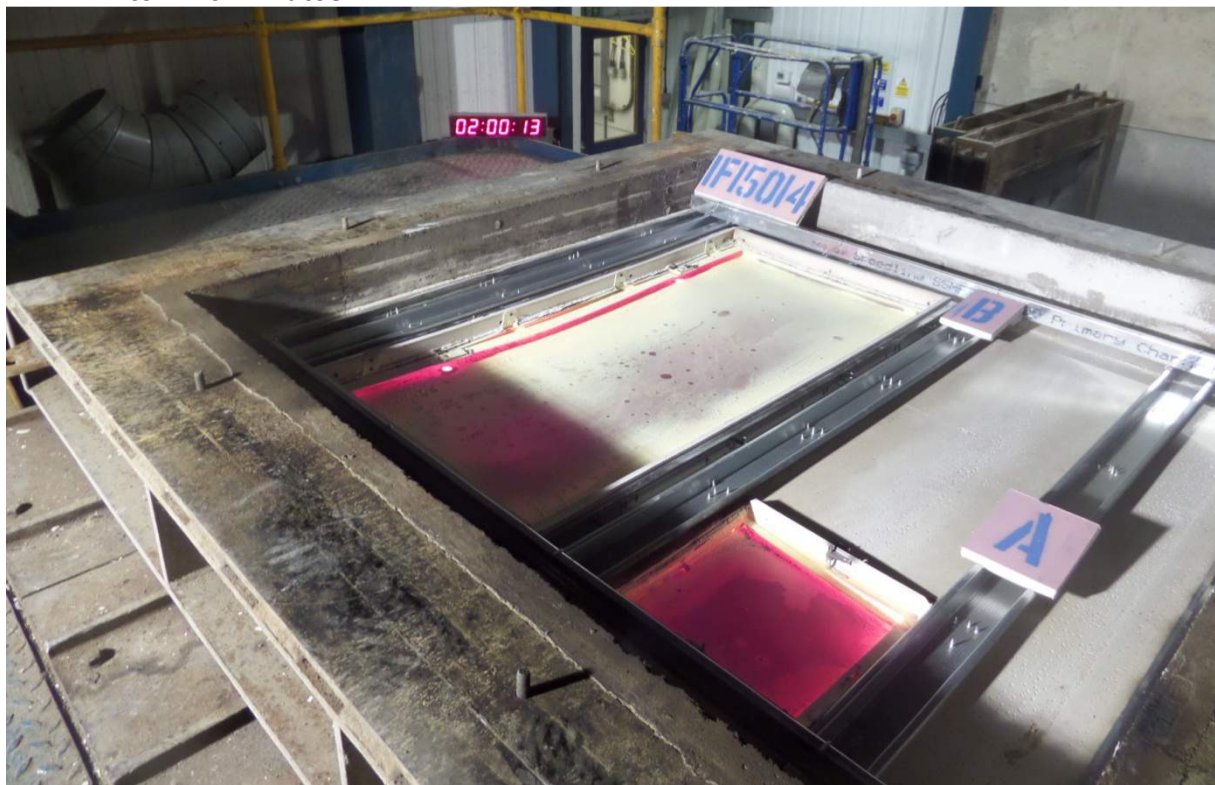


The legal validity of this report can only be claimed on presentation of the complete report.

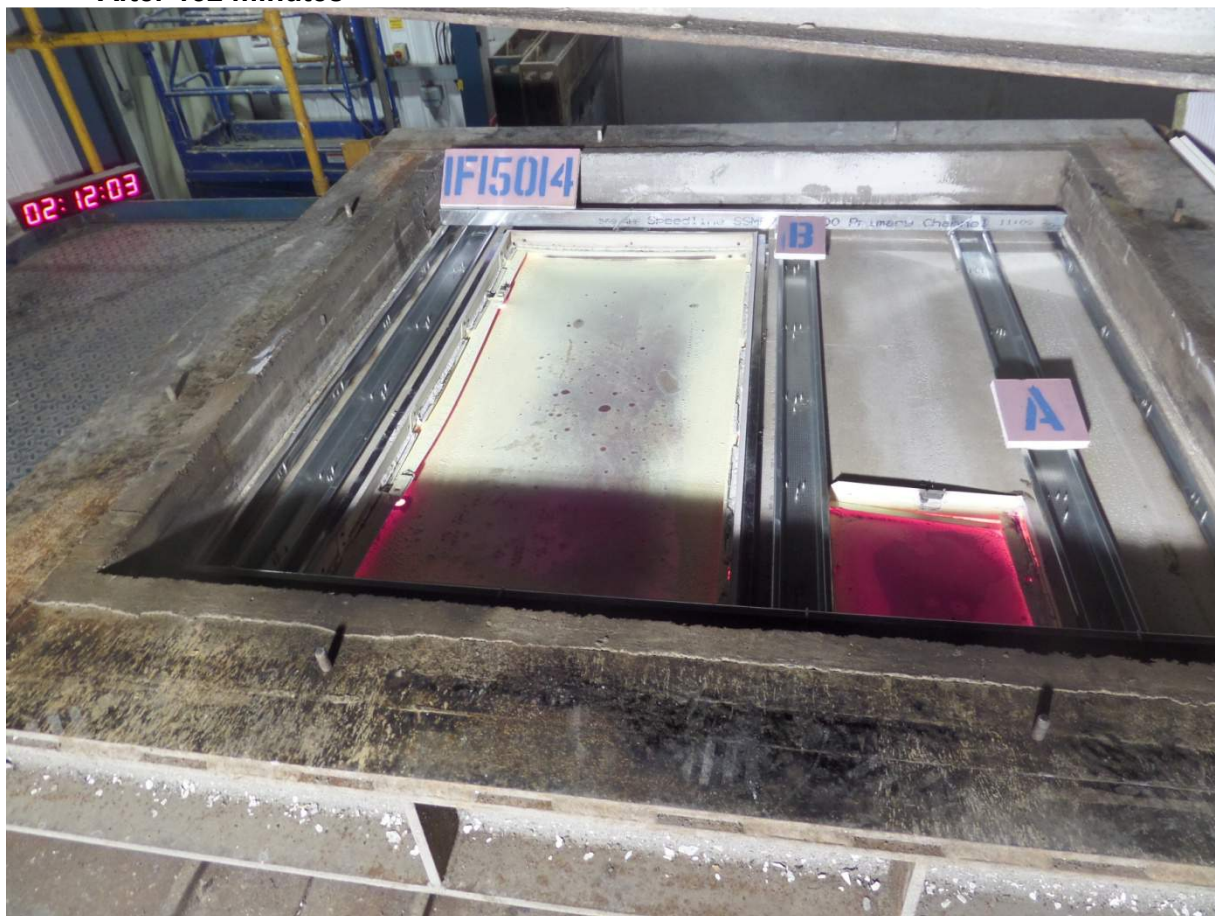
At 90 minutes**After 105 minutes**

The legal validity of this report can only be claimed on presentation of the complete report.

After 120 minutes



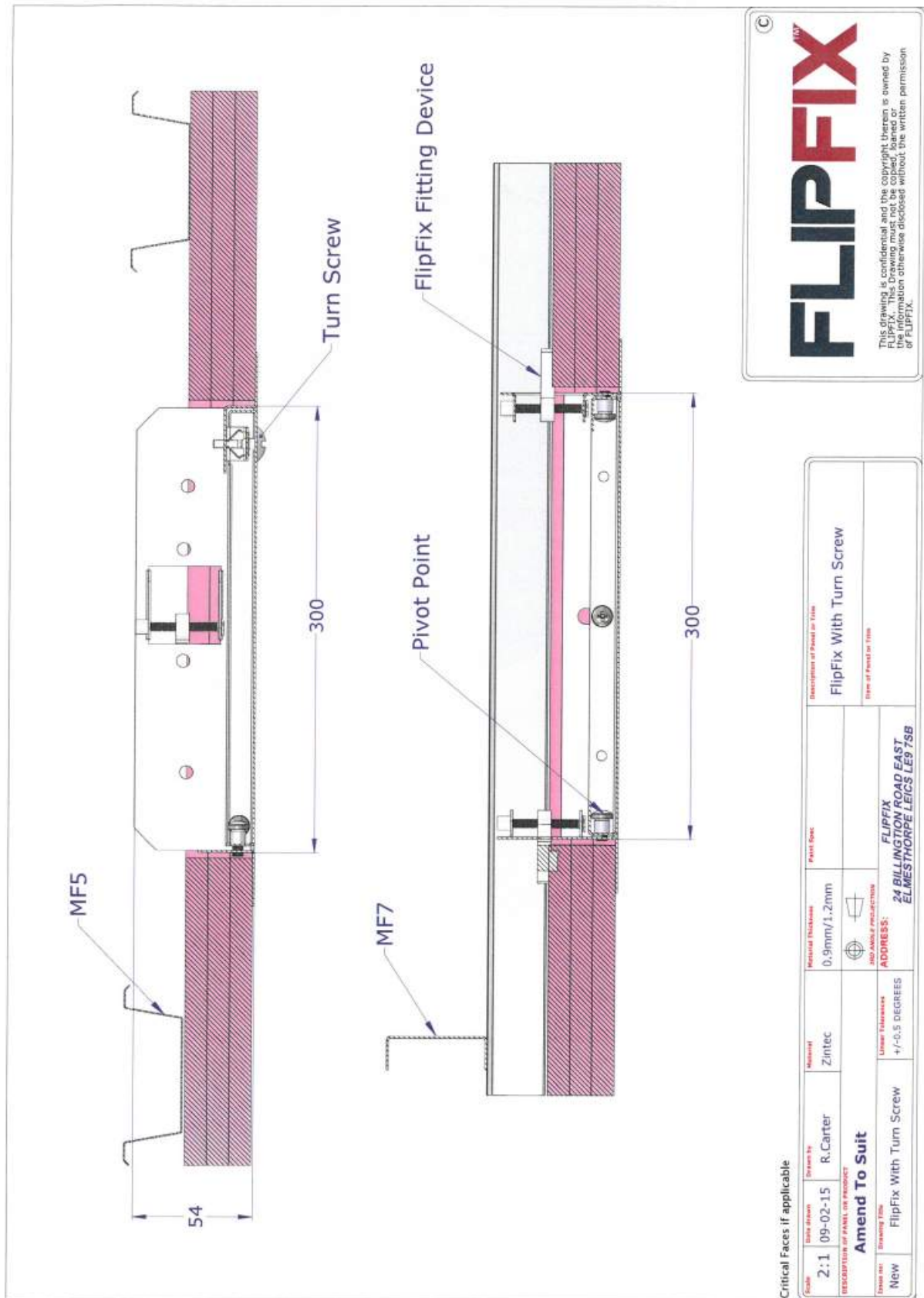
After 132 minutes



The legal validity of this report can only be claimed on presentation of the complete report.

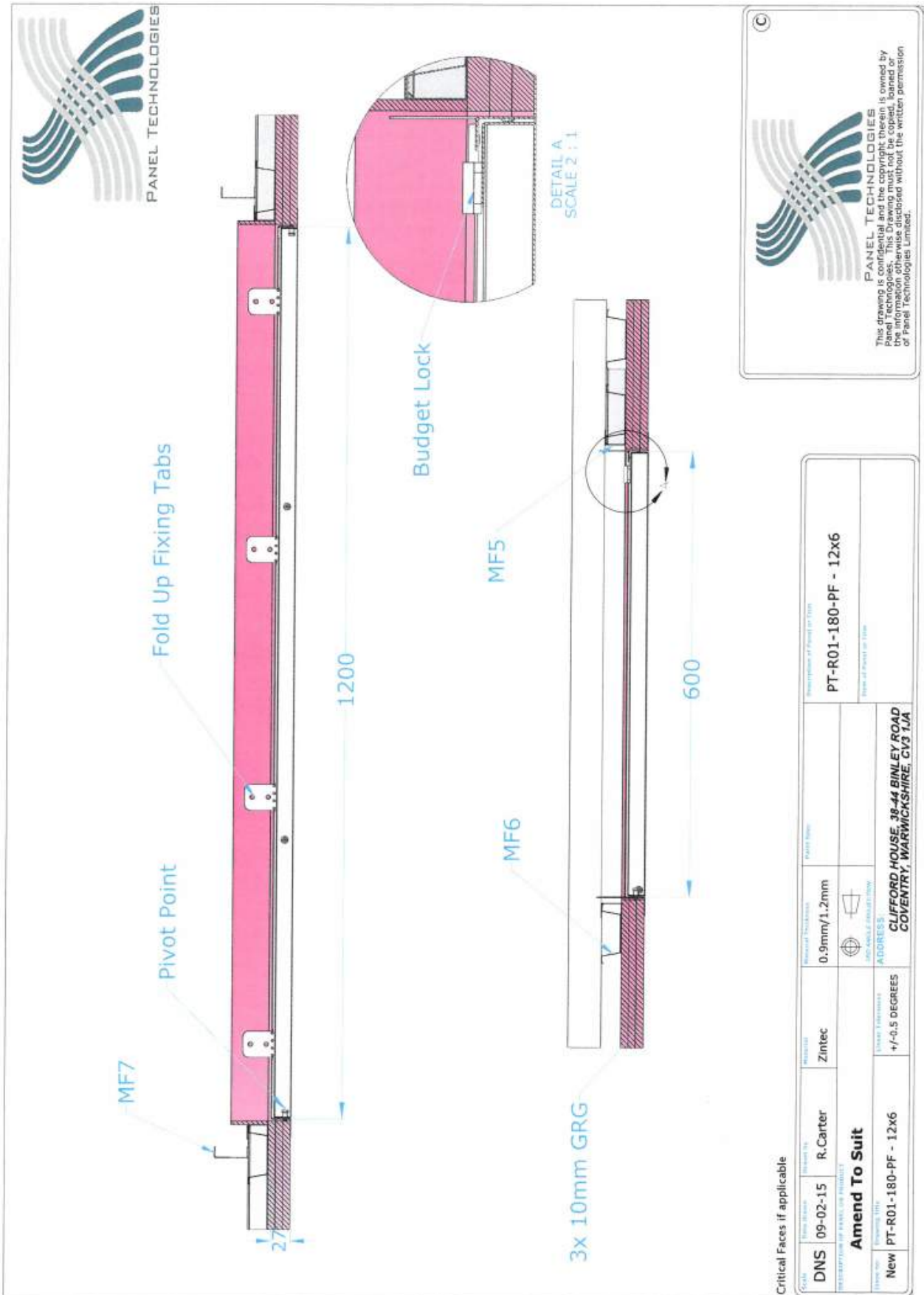
Appendix – client drawings and figure 1

Access hatch A

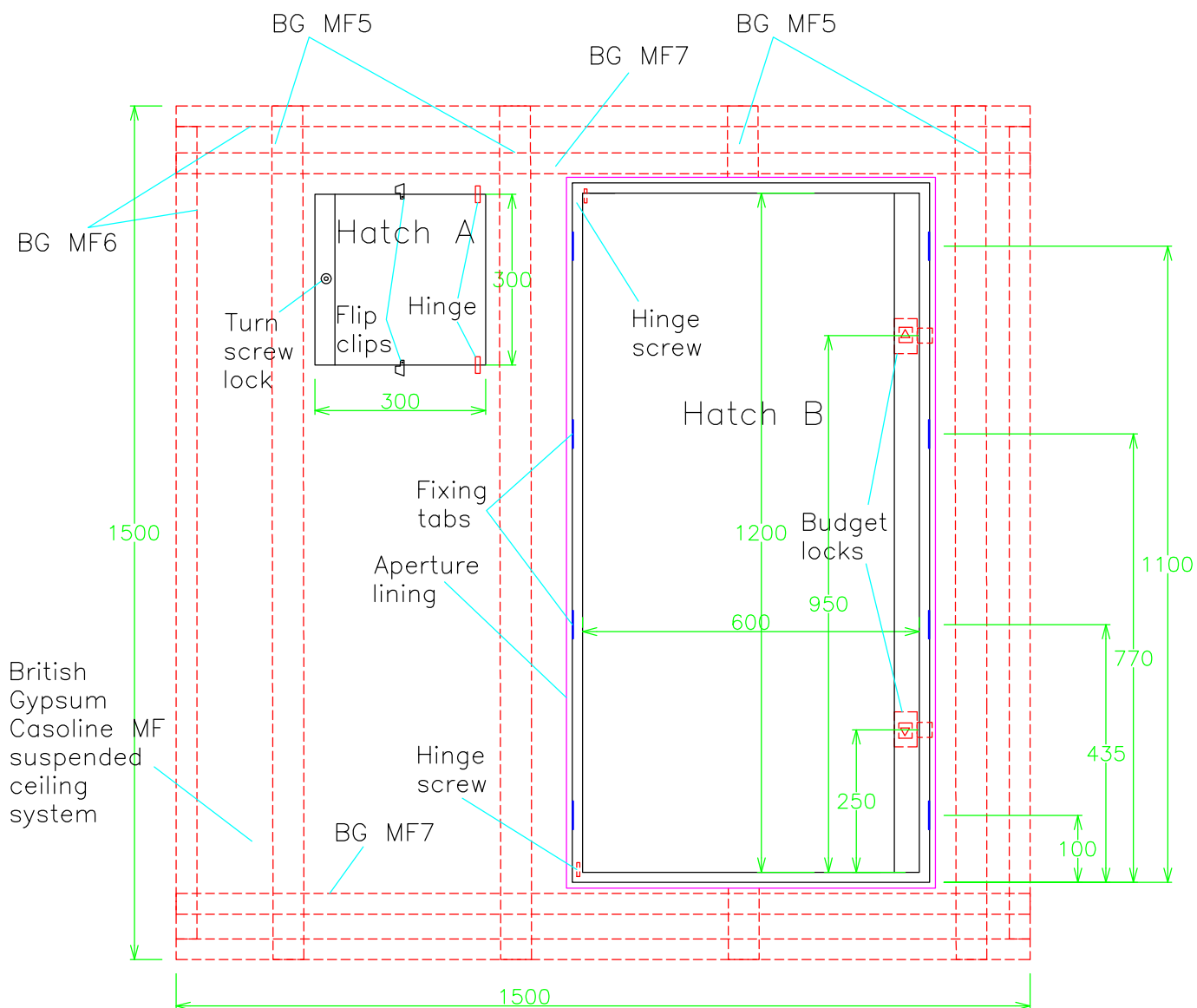


The legal validity of this report can only be claimed on presentation of the complete report.

Access hatch B



The legal validity of this report can only be claimed on presentation of the complete report.



Front of furnace

BM TRADA

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 plan view
and hardware positions
(All dimensions in mm)

Date Drawn

19/02/15

Drawn By

ARD

Scale

NTS

Project No.

BMT/FEI/F15014

Appendix

BM TRADA provides independent certification, testing, inspection, training and technical services around the world. We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.



testing@bmtrada.com



bmtradagroup.com



+44 (0) 1494 569800