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# BRE Global Classification Report

**Classification of fire performance in accordance with BR 135: 2013 Annex A for d+b facades rain screen cladding system.**

**Prepared for:** d+b facades (UK) Ltd.

**Date:** 5th December 2017

**Report Number:** P109241-1001 Issue 1


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

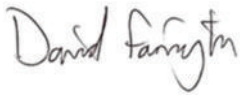

Prepared for:
d+b facades (UK) Ltd.
The Packway
Larkhill
Salisbury
SP4 8PY

## Prepared by

Name David Farrington

Position Fire Testing Manager

Date 5 December 2017

Signature 

## Authorised by

Name Stephen Howard

Position Director of Fire Testing and Certification

Date 5 December 2017

Signature 

## Table of Contents

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

**Sponsor:** d+b facades (UK) Limited, The Packway, Larkhill, Salisbury, SP4 8PY

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

**Product name:** d+b facades System Panel

**Classification report No.:** P109241-1001

**Issue number:** 1

**Date of issue:** 5th December 2017

This classification report consists of 18 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 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 test specimen was fitted onto wall 2 of BRE Global Cladding Test Facility - a multi-faced test rig constructed from steel with a masonry finish onto which the cladding system was applied.

## 2.2 Description of product

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

| Item | Description |
|---|---|
| 1 | 115mm-deep by 65mm-wide by 5mm-thick aluminium 'U'-shaped brackets fixed with a single M12 by 150mm-long HILTI anchor bolt. |
| 2 | 120mm-deep by 55mm-wide (with flanges extending width to 115mm) by 7mm-thick top hat channel section aluminium rail with Ø13.5mm rods welded internally within the channel at 290mm-centres. |
| 3 | 100mm-thick Rockwool RWA45 insulation board (supplied 1200mm by 600mm and cut to size). |
| 4 | 300mm-long by 30mm-wide 'L'-shaped steel skewers. |
| 5 | 100mm-thick by 250mm-deep horizontal and vertical cavity barriers cut from Firetherm Spanatherm foil-faced stone wool insulation boards (supplied 1200mm by 600mm). |
| 6 | 3mm-thick aluminium cassette panels with edges folded back and incorporating 'L'-shaped cut-outs with rounded edges at 290mm-centres on the vertical edges of the panel. |

## 2.3 Installation sequence

The aluminium 'U'-shaped brackets were fixed to the masonry support structure with one M12 by 150mm-long HILTI anchor bolt per bracket, the brackets were fixed nominally at 1160mm/1240mm-horizontal (main/wing wall) and 2100mm-vertical centres.

Each top hat channel section was slotted between three vertically aligned 'U'-shaped brackets (located approximately 300mm from the top/bottom and at the centre of the channel section) and fixed through pre-drilled holes with one Ø10mm by 80mm-long bolt per 'U'-shaped bracket.

The Rockwool RWA145 insulation boards were cut to size and fixed to the supporting masonry structure between the top hat channel sections with: four Ø10mm by 130mm-long polypropylene insulation anchors (located at 750mm-horizontal and 220mm-vertical centres) and one Ø8mm by 140mm-long stainless steel insulation anchor (fixed at the centre of each insulation board).

Strips of the Rockwool insulation were cut to pack the space between the top hat channel section and the masonry support structure.

The system included one vertical and two horizontal cavity barriers cut from Firetherm Spanatherm foil-faced insulation boards. The 100mm-wide by 250mm-deep Firetherm horizontal cavity barriers were located approximately 750mm and 4000mm above the top of the combustion chamber opening. The

barriers were skewered to approximately ¾-depth on steel brackets fixed into the masonry wall. Self-adhesive aluminium tape was used to create a close connection with the top hat channel sections.

One 100mm-wide by 250mm-deep Firetherm Spanatherm vertical cavity barrier was installed onto the main wall, fixed in line with the vertical edge of the combustion chamber adjacent to the wing wall with steel bracket skewers at approximately 400mm-centres. A slot was cut into the vertical cavity barrier for close interaction with the top hat channel.

100mm-wide by 250mm-deep Firetherm Spanatherm cavity barriers surrounded the combustion chamber opening.

The aluminium panels were slotted onto the vertical top hat channel sections using the 'L'-shaped cutouts to hook on at 290mm-vertical centres.

## 2.4 Installation of Specimen

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

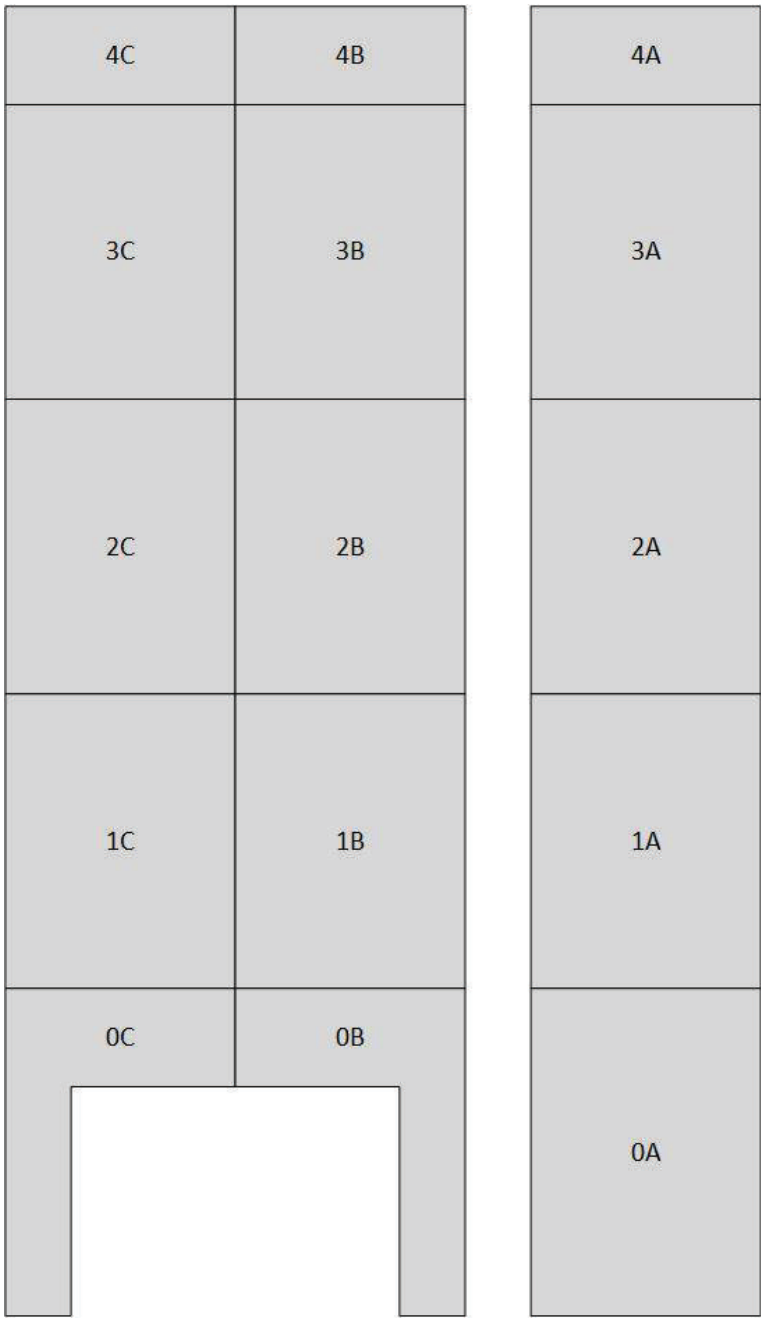



Figure 1. Layout of panels and numbering system used for reporting in Section 4.3. Not to scale.

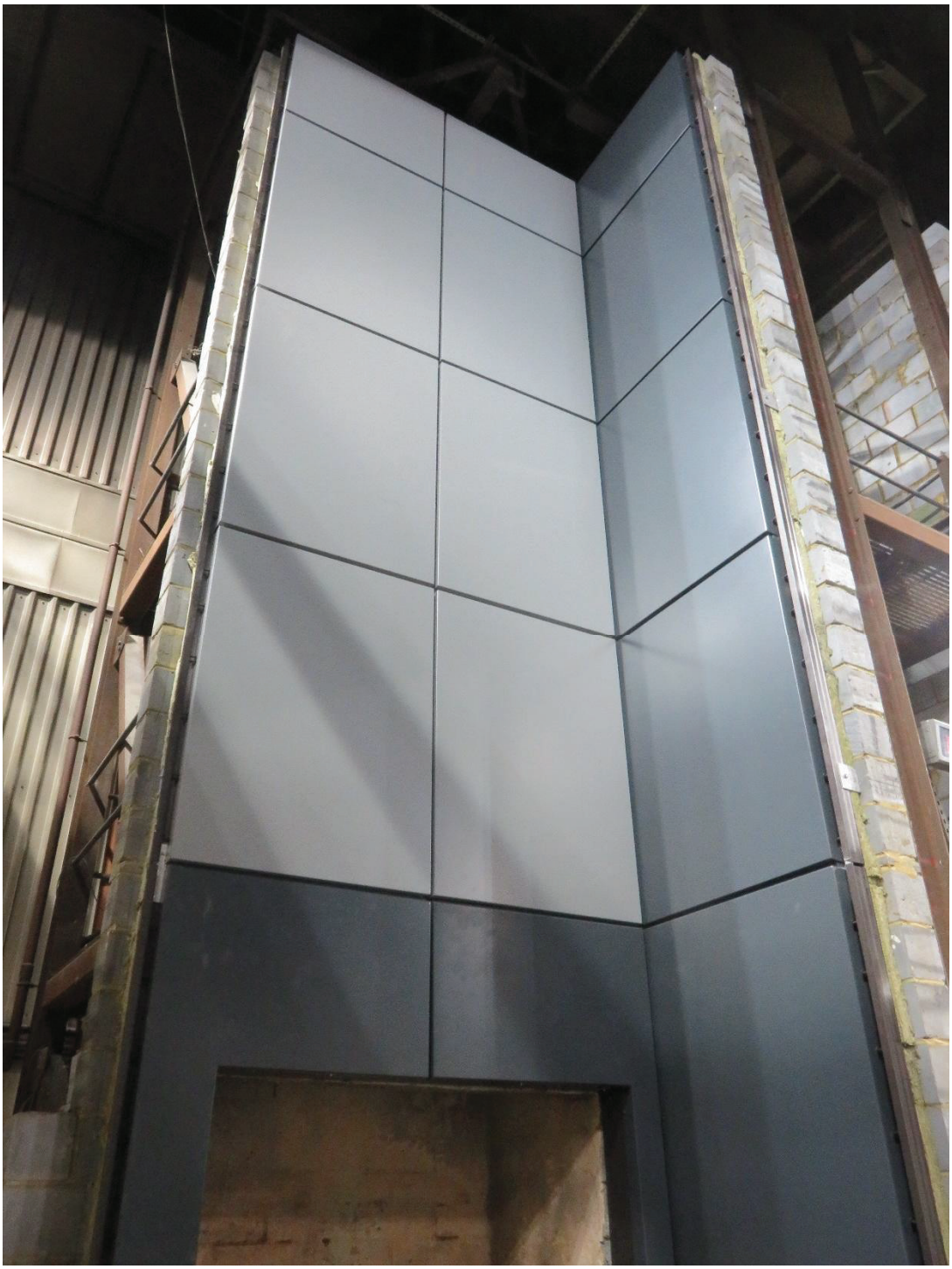


Figure 2. Completed installation prior to test.

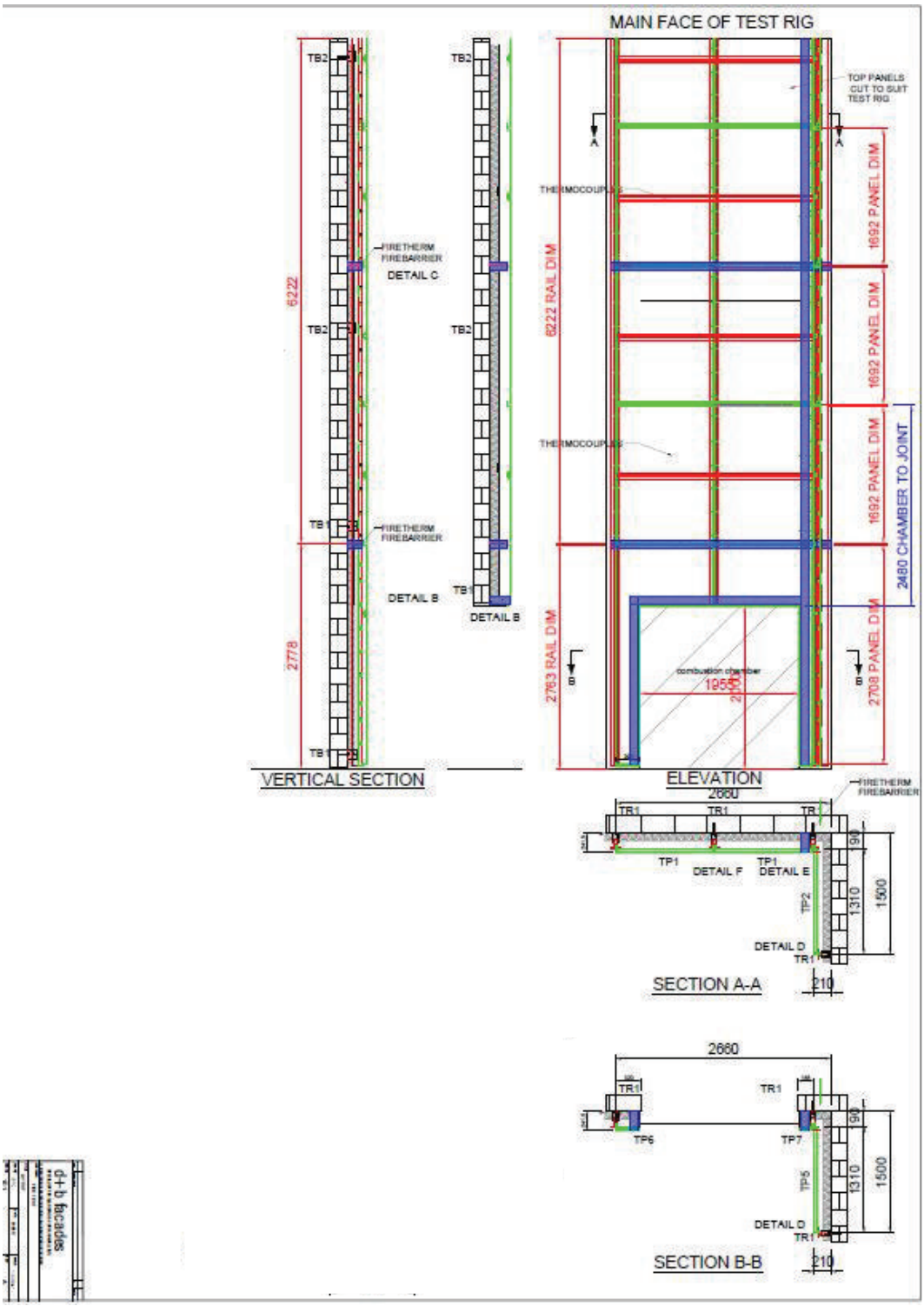



Figure 3. Drawing of tested system (supplied by the Test Sponsor).

# 4 Supporting Evidence

## 4.1 Test reports

| Name of Laboratory | Name of sponsor | Test reports/extended application report Nos. | Test method |
|---|---|---|---|
| BRE Global, BRE | d+b facades (UK) Ltd | P109241-1000 | BS 8414-1:2005 + A1:2017 |

## 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 A BR135:2013** |
| BS 8414-1:2005 + A1:2017 | External fire spread | 1 | >15 minutes | Compliant |
| | Internal fire spread (cavity/insulation) | | >15 minutes | Compliant |

## 4.3 Mechanical Performance

There was no visible ongoing combustion of the system following extinguishing of the ignition source.

There was no system collapse, spalling, delamination, flaming debris or pool fires.

A small pile of debris (melted aluminium and some cavity barrier) collected at the base of the system but did not contribute any flaming.

### 4.3.1 Aluminium panels

With reference to *Figure 2,* the damage observed to the aluminium panels was as follows:

- Panel 0A showed significant distortion with 50% dark discolouration and 50% white discolouration tapering from the top of the panel across approximately 75% of the height.
- Panel 0B was 90% consumed. The remaining panel was discoloured.
- Panel 0C was 30% consumed. Approximately 25% of the panel was discoloured white, the remaining 55% was undamaged.

- Panel 1A was discoloured white across 90% of the surface area and dark discolouration on the rest of the panel. Slight distortion.
- Panel 1B was 90% consumed and discoloured white on the remaining panel.
- Panel 1C was 20% consumed and distorted such that the right-hand edge of the panel tended away from the insulation.
- Panel 2A remained intact but was distorted and discoloured.
- Panel 2B was <10% consumed at the base and with approximately 85% discoloured white and the top right-hand corner discoloured black.
- Panel 2C was <5% consumed at the base (along the centre line of the combustion chamber) with 60% discoloured white where exposed to direct flame impingement and discoloured black at the outside edge.
- Panel 3A was intact with minimal signs of damage.
- Panels 3B&3C was 5% discoloured black at the base (along the centre line of the combustion chamber)
- Panels 4A-4C were intact with no visible signs of damage.

### 4.3.2 Top hat section rail

The rail at the outside edge of the main wall was discoloured white in patches from the top of the combustion chamber up to the height of the second horizontal cavity barrier, the rest of the rail remained undamaged.

The central rail on the main wall was consumed to the depth of the insulation for approximately 3200mm from the top of the combustion chamber. The remaining section of the central rail was discoloured with a rust-like hue up to the height of the second horizontal cavity barrier. Above the second horizontal cavity barrier the rail was mostly undamaged with a small area which was discoloured white adjacent to the cavity barrier.

The rail adjacent to the wing wall was discoloured white in patches from the top of the combustion chamber up to the height of the second horizontal cavity barrier with no sign of consumption.

The rail at the outside edge of the wing wall was darkly discoloured at a height of approximately 1.5m above the combustion chamber with a small section of partial consumption. A small section was discoloured white directly above the second horizontal cavity barrier.

### 4.3.3 Mineral wool insulation

All Rockwool insulation boards remained intact and in place.

On the main wall, the insulation was discoloured up to the height of the second horizontal cavity barrier with some white discolouration visible on the boards below the second horizontal cavity barrier adjacent to the vertical cavity barrier. Above the second horizontal cavity barrier some insulation to the right of the central rail was discoloured brown. All plastic insulation fixings were consumed below the height of the second horizontal cavity barrier (approximately 4000mm above the combustion chamber opening).

On the wing wall, the insulation boards below the first horizontal cavity barrier were discoloured. There were three localised areas that were darkly discoloured, each tapering up approximately 200mm at the outside edge of the wing wall, from the combustion of the polypropylene insulation anchors. Above the first horizontal cavity barriers the Rockwool insulation boards were similarly discoloured with six dark areas of localised discolouration at approximately 1500-3000mm above the combustion chamber. All plastic insulation fixings were consumed below an approximate height of 3200mm above the combustion chamber opening).

Above the second horizontal cavity barrier, the Rockwool insulation boards on the wing wall sustained minimal visible damage.

### 4.3.4 Horizontal (compression) cavity barriers

Approximately 25% of the first row horizontal cavity barrier had detached from the main wall. There was aluminium deposited on the cavity barrier from the top hat section rail. On the wing wall a small amount of detachment was observed at the outside edge of the wall.

The second row horizontal cavity barrier was severely damaged. On the main wall, along the centre line of the combustion chamber, there was significant detachment and localised areas of dark discolouration. The significant section of horizontal cavity barrier on the wing wall also detached and was darkly discoloured.

### 4.3.5 Vertical (compression) cavity barrier

Below the first horizontal cavity barrier the vertical cavity barrier was mostly intact with some discolouration.

A substantial proportion of the vertical cavity barrier had detached from an approximately 300mm-long section directly above the height of the first horizontal cavity barrier. Another, approximately 500mm-long section, had detached, 400mm below the height of the second horizontal cavity barrier with additional, small areas of detachment in between.

Directly above the second horizontal cavity barrier the vertical cavity barrier was discoloured for approximately 300mm and slightly distorted at the top and base creating a curved profile.

## 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 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.





Report Ends