

Date 28 August 2026
Your Ref
Our Ref 11792

Enquiries to Richard Mutch
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Direct Line 0131 465 5687
loth.freedomofinformation@nhs.scot
richard.mutch@nhs.scot

Dear

ENVIRONMENTAL INFORMATION – CLADDING

I write in response to your request for information in relation to cladding at the Royal Hospital for Children and Young People.

Question:

1. I understand that a team of consultants were tasked with assessing the cladding on the new Royal Hospital for Children and Young People in the wake of the Grenfell Tower disaster. Can I get a copy of their final report which was submitted to NHS Lothian health board please? I think this was submitted to the board in or around January 2022.

Answer:

Please see enclosed report.

Question:

2. Can I also ask whether the 3% daylight factor required by the contract for the childrens bedrooms was achieved for any of the 4 bedroom wards in the Royal Hospital for Children and Young People?

Answer:

I am advised that the Project has met the BREEAM "Very good score" (61%) and the certificate is attached. The BREEAM certificate number is BREEAM-0079-2267 meeting project BREEAM criteria.

I hope the information provided helps with your request.

If you are unhappy with our response to your request, you do have the right to request us to review it. Your request should be made within 40 working days of receipt of this letter, and we will reply within 20 working days of receipt. If our decision is unchanged following a review and you remain dissatisfied with this, you then have the right to make a formal complaint to the Scottish Information Commissioner within 6 months of receipt of our review response. You can do this by using the Scottish Information Commissioner's Office online appeals service at

www.itspublicknowledge.info/Appeal. If you remain dissatisfied with the Commissioner's response you then have the option to appeal to the Court of Session on a point of law.

If you require a review of our decision to be carried out, please write to the FOI Reviewer at the email address at the head of this letter. The review will be undertaken by a Reviewer who was not involved in the original decision-making process.

FOI responses (subject to redaction of personal information) may appear on NHS Lothian's Freedom of Information website at: <https://org.nhslothian.scot/FOI/Pages/default.aspx>

Yours sincerely

ALISON MACDONALD
Executive Director, Nursing
Cc: Chief Executive
Enc.

Final Certificate

The assessment of:

Royal Hospital for Sick Children and DCN
Little France Crescent
Old Dalkeith Road
Edinburgh
Lothian
EH16 4SA

has been carried out according to Technical Manual:

BREEAM New Construction 2011

Healthcare

New Construction (Fully Fitted)

and based on the Assessment Report produced by:

TUV SUD Limited

has achieved a score of **61.0%**

Very Good



Certificate Number: **BREEAM-0079-2267**

Issue: **01**

BRE Global Limited is accredited by UKAS. The assessment process is certified by BRE Global Limited in accordance with the requirements of Scheme Document SD123

23 August 2019

Date of Issue

Signed for BRE Global Ltd., Jonny Gault

HLM

Architect

NHS Lothian

Developer

TUV SUD

Building Services

Robert Bird Group

Structural Engineer

NHS Lothian

Client for the Assessment

Beverly Quinn

Licensed Assessor

BQ01

Assessor Number

Brookfield Multiplex

Principal Contractor

Acoustic Logic

Acoustician

Nigel Rudd Ecology

Ecologist



SD123 Cert. No. BREEAM-0079-2267

This certificate is issued to the Licensed Assessor Organisation named above based on their application of the assessment process in accordance with Scheme Document SD123.

This certificate is valid on the date of issue on the basis of the data provided by the client and verified by the Assessor Organisation. To check the authenticity of this certificate visit www.greenbooklive.com/check, scan the QR Tag or contact us: E: bream@bre.co.uk T: +44 (0)333 321 8811

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Final Certificate Number: BREEAM-0079-2267

Issue: 01

**Royal Hospital for Sick Children and DCN
Little France Crescent
Old Dalkeith Road
Edinburgh
Lothian
EH16 4SA**

Assessed for: NHS Lothian

by: TUV SUD Limited

Assessor Company

Beverly Quinn

BQ01

Assessor Number

Licensed Assessor

BREEAM New Construction 2011

Healthcare

New Construction (Fully Fitted)

Overall Score: 61.0%

Rating: Very Good



Category Scores

	0	10	20	30	40	50	60	70	80	90	100
Management	77										
Health and Wellbeing	44										
Energy	60										
Transport	60										
Water	44										
Materials	69										
Waste	50										
Land Use and Ecology	80										
Pollution	38										
Innovation	20										

Signed for BRE Global Ltd., Jonny Gault

23 August 2019

Date of Issue



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**Expert Advisory Report for Multiplex Construction (Europe)
Limited (“RHSC”) in relation to Cladding at Royal Hospital for
Sick Children (“RHSC”) in Edinburgh**

Document Number:	MT19689R
Date:	28/10/2021
Project No:	304950
Issue Number:	02

Report of Andrew McCracken for MPX

Address of the Property:	Royal Hospital for Sick Children ("RHSC") 50 Little France Crescent Edinburgh bio Quarter Edinburgh EH16 4TJ
Specialist field:	Fire Safety 
Assisted by:	Beth Dean
On instructions of:	Brodies LLP Solicitors, 15 Atholl Crescent, Edinburgh, EH3 8HA.
On behalf of:	Multiplex Construction (Europe) Limited ('MPX')
Subject matter:	Report to provide expert opinion on materials used, and the installed external walling systems, at Royal Hospital for Sick Children ("RHSC") in Edinburgh, the Property.
Dated:	28/10/2021

Revision History

Revision	Date	Reason for Issue	Prepared By	Reviewed By
			<i>For and on behalf of Warringtonfire Consulting Limited</i>	
01	15/09/2021	Issue 01	Andrew McCracken General Manager Head of Fire Engineering (UK)	David Harries Division Director Europe Consulting
02	28/10/2021	Issue 02, comments from client addressed	 Andrew McCracken General Manager Head of Fire Engineering (UK)	 David Harries Division Director Europe Consulting

VALIDITY

This report is formulated on the basis of the information and experience available at the time of preparation. It is applicable to the above-mentioned project only in accordance with the client's instructions. It is only valid provided no other modifications are made other than those for which a formal opinion has been sought and given by Warringtonfire.

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Contents

1	INTRODUCTION	6
1.1	Expert Qualifications	6
1.2	Summary of Query	6
1.2.1	Background to the query – The Parties	6
1.2.2	Background to the query – The Property and the Works	6
1.2.3	Background to the Query – Matter for Review	7
1.3	Report Purpose	7
2	INSTRUCTION	8
2.1	Statement of Instruction	8
2.2	Key Questions	8
3	RESPONSE TO KEY QUESTION 1	9
3.1	Applicable Regulations and Guidance Documents	9
3.1.1	Building Regulations Requirements	9
3.1.2	Technical Handbook – Non-Domestic (NDTH)	9
3.1.3	Scottish Health Technical Memorandum 81 Part 1 (SHTM 81-1)	10
3.1.4	Demonstrating Compliance with the Building Standards	10
3.2	Recommendations in the NDTH	11
3.2.1	Combustibility of External Surface	11
3.2.2	Combustibility of Insulation	12
3.2.3	Provision of Cavity Barriers	12
3.2.3.1	Cavity Barriers at Defined Positions	13
3.2.3.2	Cavity Barriers to Divide Cavities	13
3.3	Description of Cladding Systems Installed at RHSC	13
3.4	Did the Cladding Align with NDTH Recommendations?	14
3.4.1	Combustibility of the External Wall Cladding	14
3.4.2	Combustibility of the Insulation	15
3.4.3	Provision of Cavity Barriers	15
3.4.3.1	Cavity Barriers at Defined Positions	15
3.4.3.2	Cavity Barriers to Divide Cavities	16
3.4.3.2.1	Cladding with K15 Insulation Facing into Cavity (Systems A to D)	16
3.4.3.2.2	Cladding with Plywood Facing into Cavity (System D)	17

3.4.3.2.3. Cladding with EPS Insulation Facing into Cavity (System E).....	18
3.4.1 Summary.....	18
4 RESPONSE TO KEY QUESTION 2.....	20
4.1 Desktop Assessment.....	20
4.2 Reference to BR 135 in NDTH.....	20
4.3 Applicability of BR 135 to RHSC Cladding	20
4.4 Potential Method to Comply with the Building Regulations Applicable at the Time of Construction	20
4.5 Requirements Applying to Existing Buildings.....	21
5 CONCLUSIONS	22
5.1 Key Question 1	22
5.2 Key Question 2.....	23
6 DECLARATION BRODIES TO ADVISE ON DECLARATION REQUIREMENTS	24
APPENDIX A – CURRICULUM VITAE.....	25

1 Introduction

1.1 Expert Qualifications

Name: Andrew McCracken

Position: General Manager – Head of Fire Engineering UK

Qualifications:

- BSc, Building Legislation and Technology. (Manchester).
- BEng (Hons), Fire Engineering. (First Class (Preston)).
- MRICS, The Royal Institution of Chartered Surveyors. (Chartered Building Control Surveyor)
- MIFireE, Member of the Institution of Fire Engineers.
- FBEng, The Chartered Association of Building Engineers. (Fellow Chartered Building Engineer)
- Diploma in Building Control (Stockport).
- Higher National Certificate in Building Studies (Preston)

I am Andrew McCracken, General Manager and Head of Fire Engineering of Warringtonfire UK.

Warringtonfire is an independent fire testing, certification and consultancy business that has been providing specialist fire safety related services since 1965

I have 35 years' experience in the construction industry, 31 of which as a Regulator and Fire Engineer. My experience over this time has focused on fire safety regulatory compliance.

I have been a full member of the Building Regulations Advisory Committee (BRAC), which is a Statutory Scientific Advisory Committee, which the Secretary of State for Housing, Communities and Local Government consults when changes to the Building Regulations are proposed.

I have provided a copy of my CV with further details of experience and qualifications in Appendix A of this report.

I was assisted by my colleague Beth Dean with collation of information and research, under my supervision (Senior Fire Consultant, BSc). Additionally, my colleague David Harries has reviewed this report.

1.2 Summary of Query

1.2.1 Background to the query – The Parties

Multiplex Construction (Europe) Limited ("MPX") were employed as the main contractor. IHS Lothian Limited ("IHSL") were Project Co on the RHSC Project and therefore MPX's employer.

1.2.2 Background to the query – The Property and the Works

The Royal Hospital for Sick Children ("RHSC") in Edinburgh, the Property, was a new build hospital. The date of the Construction Contract was 13 February 2015, the works were carried out throughout 2016 / 2017 and the works were agreed practically complete in February 2019.



Figure 1 – The Property, RHSC

I understand that all building work was to meet the functional requirements of the Building Standards that were in force at the time the Building Warrant application was submitted. The Building (Scotland) Regulations 2004¹ was the relevant legislation.

The RHSC is a five storey hospital building (ground + 4). I have been informed that the height to the top storey is less than 18m and my report is written on that basis. MPX have communicated to me that the height has been verified and confirmed through measurements taken from site, measuring the height of the top storey using the method detailed in Schedule 4 of The Building (Scotland) Regulations 2004.

1.2.3 [Background to the Query – Matter for Review](#)

Following the evidence arising from the Grenfell inquiry, IHSL were requested by NHS Lothian to review the cladding materials installed at RHSC and confirm the suitability of these materials.

I have been informed that there is concern regarding the presence of combustible insulation (Kingspan K15) in the external wall system, and whether the presence of the insulations identified prevent the systems aligning with the Building Standards guidance applicable to this project at the time of construction.

My report does not consider whether the systems meet the Scottish advice note on external wall systems published in August 2021. This guidance applies to existing buildings to assist building owners / managers to determine the risk to life from the spread of fire on external wall systems. The advice note may apply more onerous requirements to those which applied at the time of construction (this may not be Multiplex's responsibility, but it would be imprudent of me not to note this needs to be addressed by the responsible person).

1.3 [Report Purpose](#)

The purpose of this report is to provide expert opinion in respect to questions raised by Brodies LLP Solicitors. I have been asked to review the systems against the requirements of the Building Standards guidance that applied at the following dates:

- 13 February 2015 (the date of the Construction Contract).
- 2016/2017 when the works were carried out; and
- February 2019 (when the works were agreed as practically complete).

Note. My field of expertise does not extend to contractual interpretation and therefore my opinions in this report are on the basis that MPX were contractually obliged to comply with the applicable Building Standards in respect to fire safety, as indicated by Brodies LLP.

I understand that the report could be used by MPX in connection with possible future dispute proceedings.

¹ The Building (Scotland) Regulations 2004

2 Instruction

2.1 Statement of Instruction

To advise in relation to the possible dispute between (1) Multiplex Construction (Europe) Limited ('MPX') and (2) IHS Lothian Limited ("IHSL") in relation to Royal Hospital Sick Children Edinburgh ('the Property')

I confirm that I, Andrew McCracken, of Warringtonfire have been instructed by Brodies LLP to act as an independent Expert Advisor for their client Multiplex Construction (Europe) Limited ('MPX').

I confirm that there are no circumstances which give rise to a conflict of interest in accepting these instructions.

2.2 Key Questions

The substance of my instructions, written and oral, which I have received in the preparation of this report, is to advise on:

1. Do you consider that the materials used, and the installed external walling systems, at RHSC were compliant with all relevant fire safety regulations? Please consider this question and provide your opinion on the position as at the following dates:
 - 13 February 2015 (the date of the Construction Contract);
 - 2016/2017 when the works were carried out; and
 - February 2019 (when the works were agreed as practically complete).
2. Do you consider that, in respect of each of the dates notes above, each of the installed external walling systems would have been capable of passing a desk-top assessment based on the criteria which were applicable at the time?

3 Response to Key Question 1

The first question I have been asked is:

1. Do you consider that the materials used, and the installed external walling systems, at RHSC were compliant with all relevant fire safety regulations? Please consider this question and provide your opinion on the position as at the following dates:
 - 1.1. 13 February 2015 (the date of the Construction Contract);
 - 1.2. 2016/2017 when the works were carried out; and
 - 1.3. February 2019 (when the works were agreed as practically complete).

In answering this I have considered what the requirements were and whether the systems described to me would meet those requirements.

However, my review has only been of the design information and therefore the opinions given below are based on that information only. I am unable to provide opinion on whether the as installed systems replicate the design information. I have not visited the site or surveyed works on the site.

3.1 Applicable Regulations and Guidance Documents

3.1.1 Building Regulations Requirements

The relevant statutory requirements applying to the design and construction of the external walls was the Building (Scotland) Regulations 2004, these regulations applied at all three of the dates I have been asked to consider. Schedule 5 to regulation 9 of the Building (Scotland) Regulations 2004 defines 'Building Standards' which must be achieved in relation to fire safety. The Building Standards set out the broad objectives or functions that the individual aspects of the building design and construction must set out to achieve. They are therefore often referred to as 'functional requirements' and are expressed in terms of what is 'reasonable', 'adequate', or 'appropriate'.

3.1.2 Technical Handbook – Non-Domestic (NDTH)

The Scottish Ministers have issued Technical Handbooks to provide practical guidance to comply with the Building Standards. Importantly the Technical Handbooks provide quantifiable criteria where the Building Standards may describe only qualitative requirements.

The Technical Handbook – Non-Domestic (NDTH) is the primary guidance document for fire safety in non-domestic buildings that are designed and constructed in Scotland.

NB. Alternative methods to prove compliance may be used.

The Technical Handbook states that if the guidance is followed in full then this should be accepted by the verifier as indicating that the Building Regulations have been complied with. The technical handbook goes on to state that proof of compliance with the guidance may be relied on in any proceedings as tending to negative liability for an alleged contravention of the building regulations. Following the advice in the Technical Handbooks is therefore the normal way of complying with Building Regulations.

I have been informed that the first warrant stage was submitted on 24th October 2014, on this basis the applicable edition of the NDTH was the Technical Handbook – Non-Domestic: 2013². I have been asked to consider compliance at three specific project dates. Whilst later editions the NDTH had been published by some of these dates, these do not apply to this project because the edition that applies is dictated by the Building Warrant application date. This is summarised in Table 1 below.

² Scottish Government (2013). Technical Handbook – Non-Domestic.

Project Dates	Latest Edition of NDTH Published at Specified Date	Applicable Edition of NDTH to the Project
13 February 2015 (the date of the Construction Contract)	Technical Handbook – Non-Domestic: 2013	Technical Handbook – Non-Domestic: 2013
2016/2017 (when the works were carried out)	Technical Handbook – Non-Domestic: 2015 ³ until 30/06/16 Technical Handbook – Non-Domestic: 2016 ⁴ from 01/07/16 until 30/06/17 Technical Handbook – Non-Domestic: 2017 ⁵ from 01/07/17	Technical Handbook – Non-Domestic: 2013
February 2019 (when the works were agreed as practically complete)	Technical Handbook – Non-Domestic: 2017	Technical Handbook – Non-Domestic: 2013
Note. The edition of the NDTH that applies to the project is dictated by the Building Warrant application date.		

Table 1 – Project Dates, Latest Editions of NDTH and Applicable Edition of NDTH

Although the Technical Handbook – Non-Domestic: 2013 was the applicable guidance, it is noted that the recommendations detailed in the various editions of the Technical Handbook referenced in Table 1 are common with respect to the external walls.

I note that the NDTH: 2019, which applies to warrant applications after 1st October 2019, introduced significant changes to the requirements for external walls in buildings above 11m and / or hospitals of any height. The changes prevent the use of combustible products in the construction of the external wall systems, however, this did not apply to RHSC at the time of construction.

3.1.3 [Scottish Health Technical Memorandum 81 Part 1 \(SHTM 81-1\)](#)

The protection of patients from fire in the in-patient care areas of hospitals introduces specific considerations. The NHS Scotland's Firecode, SHTM 81 Part 1, provides recommendations and guidance additional to the statutory requirements of the Building (Scotland) Regulations 2004 for new healthcare premises.

The edition which applied at all three of the dates I have been asked to consider was SHTM 81 Part 1: 2009⁶ (SHTM 81-1). The Firecode recognises that whilst the incidence of fire in hospitals is low compared to that in other occupancy types, the consequences of fire in a hospital may be especially serious because of the difficulties and dangers associated with the emergency evacuation of patients, some of who may be highly dependent on life support equipment and staff assistance etc. As a result, SHTM 81-1 introduces a higher standard of fire safety for the protection of patients from fire in the in-patient care areas of hospitals, and other treatment facilities. The guidance in SHTM 81-1 is supplementary to, and must be read in conjunction with, the NDTH.

With respect to external walls, SHTM 81-1 does not introduce any additional requirements and refers the reader to the recommendations specified in the 'Technical Handbook – Non-Domestic' (referred to as NDTH throughout this document).

3.1.4 [Demonstrating Compliance with the Building Standards](#)

SHTM 81-1 notes that its contents are provided by way of guidance only. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application. I consider that it was reasonable for a competent contractor to consider that designing external walls at RHSC

³ Scottish Government (2015). Technical Handbook – Non-Domestic.

⁴ Scottish Government (2016). Technical Handbook – Non-Domestic.

⁵ Scottish Government (2017). Technical Handbook – Non-Domestic.

⁶ Health Facilities Scotland (2009). NHSScotland's Firecode, SHTM 81 Part 1.

to comply with the guidance detailed in the NDTH, thus SHTM 81-1, would meet the Building Standards.

3.2 Recommendations in the NDTH

Unless a building is within 1m of a boundary, then the requirements are primarily based on the height of the building. I have noted from the drawings (to be reconfirmed by MPX), that the boundary distance is greater than 1m when formulating this response, if it is within 1m the performance requirements would increase.

Paragraph 0.7.2 of the NDTH provides the method of measurement of building height and storey height. The methods are taken from Schedule 4 to regulation 7 of The Building Regulations.

Height and depth
4. The height of:
a. a building shall be taken to be the height from the surface of the ground to the underside of the ceiling of the topmost storey or, if the topmost storey has no ceiling, one-half of the height of the roof above its lowest part, and
b. a storey above the ground or the depth of a storey below the ground shall be taken to be the vertical height or depth as the case may be from the ground to the upper surface of the floor of the storey, and the expressions "a storey at a height" and "a storey at a depth" shall be construed accordingly.

Figure 2 – Measurement method, extract from NDTH: 2013

The parameters that the NDTH may recommend controls for are:

- the combustibility of the external surface material,
- the combustibility of the insulation; and
- the provision of cavity barriers.

Where the boundary distance is $\geq 1\text{m}$, at the time of construction the recommendations for the external walls for hospitals were primarily governed by the building height. I have been informed that the height to the top storey is less than 18m and my report is written on that basis (more stringent requirements would have applied to the insulation if the building height was greater than 18m).

The recommendations that applied to external wall cladding at RHSC (being less than 18m in height) in relation to these parameters are detailed in Table 2 below.

Parameter	Recommendation for RHSC
Combustibility of the external surface material	Low risk
Combustibility of the insulation	None
Provision of cavity barriers	Provide cavity barriers, as per Section 2.4 of NDTH

Table 2 – Recommendations for External Wall at RHSC

3.2.1 Combustibility of External Surface

The NDTH recommends that the external surface of the wall should be low risk or better.

The definition of 'Low Risk' and 'Medium Risk' is provided in Annex 2.E of the Technical Handbook, the relevant extract is provided in Table 3 below.

Low risk	The surface material (or where it is bonded throughout to a substrate, the surface material combined with the substrate) has a surface of Class 1 and, when tested in accordance with BS 476: Part 6: 1981 or BS 476: Part 6: 1989 has an index of performance (I) not more than 12 and a sub-index (I ₁) not more than 6.	The material has achieved a classification of B-s3,d2 or better when tested in accordance with BS EN: 13823: 2002 and BS EN ISO: 11925-2: 2002.
Medium risk	The material of the wall or ceiling when tested to BS 476: Part 7: 1987 (1993), attains a Class 1 surface spread of flame.	The material has achieved a classification of C-s3,d2 or better when tested in accordance with BS EN: 13823: 2002 and BS EN ISO: 11925-2: 2002.

Table 3 – Definition of ‘Low Risk’ and ‘Medium Risk’, copied from NDTH: 2013

It is noted from the extract above that there are two routes to claim a product is ‘Low Risk’, either using National test methods or European classification methods.

3.2.2 Combustibility of Insulation

For buildings which were less than or equal to 18m, there were no restrictions placed on the combustibility of the insulation used in the external wall.

3.2.3 Provision of Cavity Barriers

Cavity barrier provision in the external wall enables a building to achieve a number of the functional requirements of the building regulations. The specific requirement is detailed within Standard 2.4 of Schedule 5 to Regulation 9 of the Building Regulations (Cavities), but the functional requirement in relation to Standard 2.7 (Spread on external walls) is particularly interdependent upon this requirement being met.

Standard 2.4 of Schedule 5 to Regulation 9 of the Building Regulations is reproduced in Figure 3 below.

Cavities 2.4. Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.
--

Figure 3 – Relevant extract from Building Regulations

It is noted that the term ‘inhibited’ within this requirement is unquantified. The NDTH clarifies the method to inhibit unseen spread of fire and smoke through such cavities, in order to comply with the functional requirement of the Building Regulations, is to seal and subdivide the cavity. This is the purpose of the cavity barriers.

The NDTH defines that in order to inhibit unseen spread of fire and smoke, cavity barriers must achieve at least a short fire resistance duration. A short fire resistance duration is defined in Annex 2.D of the NDTH as 30 minutes integrity (resistance to fire penetration when tested in accordance with one of the national or European methods detailed).

The extent to which any of these measures are necessary is dependent upon the use of the building and materials used in the construction.

3.2.3.1. Cavity Barriers at Defined Positions

The specific locations where cavity barriers are required for the RHSC is defined in Section 2.4 of the NDTH, this includes around openings and service penetrations that may be present in the external wall system. Cavity barriers are also generally required where a wall, floor or other part of a building with a fire resistance duration abuts a structure containing a cavity so as to extend the line of the structure.

3.2.3.2. Cavity Barriers to Divide Cavities

Clause 2.4.2 of the NDTH 2013 recommends that cavity barriers are provided to divide up cavities. The frequency of cavities is dependent upon the combustibility of materials facing into the cavity, with cavity barriers required every 20m if the materials facing the cavity were low risk or better, every 10m if materials facing cavity were not low risk. The relevant extract from the NDTH 2013 is provided in Figure 4 below.

Cavities should be measured either horizontally or vertically, as the case maybe, along the centre-line of the cavity and not diagonally.

Every cavity should be divided by cavity barriers so that the maximum distance between cavity barriers is not more than 20m where the cavity has exposed surfaces which achieve European Classification A1, A2 or B, or 10m where the cavity has exposed surfaces which achieve European Classification C, D or E. However for roof space cavities above an undivided space the guidance in clause 2.4.3 should be followed. Additional guidance for buildings containing a sleeping risk (other than residential care buildings and hospitals) is also provided in clause 2.4.4.

Figure 4 – Extract from clause 2.4.2 of NDTH 2013

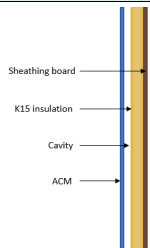
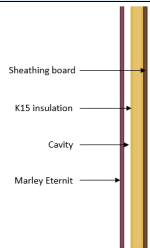
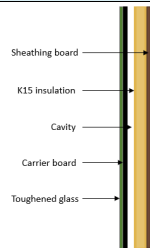
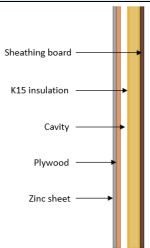
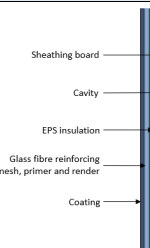
The definition of 'Low Risk' and 'Medium Risk' was provided in Table 3 above.

3.3 Description of Cladding Systems Installed at RHSC

I have been asked to consider five cladding systems:

- ACM
- Marley Eternit
- Sto Ventec Glass Rainscreen
- Zinc
- StoTherm Vario

These are summarised in Table 4 below:

System	A. ACM	B. Marley Eternit	C. Sto Ventec Glass Rainscreen	D. Zinc	E. StoTherm Vario
Basic arrangement (not to scale)					
External surface material(s)	4mm thick Alucobond Plus ACM cassette	Marley Eternit panel	StoVentec Toughened glass	0.8mm thick Rheinzinc Zinc sheet	Coating and reinforcing system over EPS
Materials facing into cavity	Alucobond Plus ACM and K15	Marley Eternit fibre cement panel and K15	Carrier board and K15	Plywood and K15	EPS and Sheathing board

Cavity barriers	CW-FS-60 Lamatherm	SP60 Rockwool, Envirograf Fast-fit	SP60 Rockwool, Envirograf Fast-fit	Specific details not provided, but stated to be 60 minutes	Sto Mineral Fibre Lamella (manufactured by Rockwool)
Positioned at compartment floor level, compartment wall, surrounding windows & doors, aligned with walls to hazard rooms and at no more than 20m distance within cavities.					

Table 4 – Overview of Cladding Systems Reviewed

The positions of cavity barriers within the external wall, as indicated above, is indicated on the elevation drawings, an example is provided in Figure 5 below.



Figure 5 – Extract from drawing number HLM-SZ-SL-EL-572-001 showing cavity barrier provision

3.4 Did the Cladding Align with NDTH Recommendations?

As I have not inspected the cladding, my responses are based on a review of the design information only. The review has been completed upon the assumption that the as built detail is as detailed within the information I have received. Furthermore, my review is on the basis that the building work has been completed in a workmanlike manner such that the systems behave as intended (as an example, cavity barrier installation aligns with approved details such that they can adequately perform their function inhibiting the spread of fire and smoke).

3.4.1 Combustibility of the External Wall Cladding

In accordance with the Annex 2.E of the NDTH, the external wall finishes would have been considered to meet the Low Risk fire rating or better. This is evidenced below, where the documents indicated cover the three dates I have been asked to consider (13 February 2015, 2016/2017 and February 2019).

- ACM system - BBA certificate 05/4214 Product Sheet 1 dated 23 July 2013⁷ and 4 August 2017⁸ indicated Alucobond Plus achieved a Euroclass B, as such the external surface was designated as Low Risk. Additionally the panels were also noted to achieve a Class 0 when tested against the national classification scheme, which would also support the Low Risk designation. See warning note 1 below.
- Marley Eternit system - BBA certificate 06/4355 Product sheet 3 dated 23 January 2014⁹ indicates the panel achieves a Euroclass A2, as such the external surface was designated as Non-Combustible which exceeded the recommendation in the NDTH.
- StoVentec Glass Rainscreen system - BBA certificate 10/4792 Product Sheet 2 dated 28 June 2012¹⁰ and 13 January 2020¹¹ indicates the external glass is classified as non-combustible which exceeds the recommendation in the NDTH.
- Zinc system – I have not been provided evidence that the decorative Zinc sheet product used over plywood achieves the required reaction to fire classification to enable it to be designated as low risk, however, from experience I would expect this product to achieve the required low risk rating (the test methods used to designate a material as low risk apply the heat source from the exposed face only, the zinc sheet would provide some protection to the plywood behind which can enable the low risk criteria to be achieved) This should be confirmed through existing test evidence or if required conductance of a test.
- StoTherm Vario system - The BBA certificate 95/3132 Product Sheet 2 dated 25 February 2013¹² and 8 August 2017¹³ indicates the system achieves a Euroclass B, as such the external surface was designated as Low Risk. See warning note 2 below.

External wall cladding systems achieving a low risk fire rating would align with the recommendations of the NDTH, as such it is my opinion that they could be considered to meet the Building Standards at the time of construction.

Note 1 – The current BBA certificate dated 13 January 2020¹⁴ states cassette systems would need reaction to fire classification to be confirmed.

Note 2 – Current BBA certificate dated 30 April 2020¹⁵ states no reaction to fire performance is declared.

3.4.2 Combustibility of the Insulation

Not applicable because there are no performance requirements imposed for buildings with a height less than 18m (see notes above regarding confirming actual completed building heights).

3.4.3 Provision of Cavity Barriers

3.4.3.1 Cavity Barriers at Defined Positions

As detailed in Table 4 above, the elevation drawings and information provided indicate that cavity barriers were provided at compartment floor level, compartment wall, surrounding windows & doors and aligned with walls to hazard rooms. The inclusion of cavity barriers at these positions complies with the recommendations of NDTH.

The literature provided specifies that the cavity barriers provided are rated for 60 minutes which meets the recommendations of the NDTH. I would note that I have not confirmed the suitability of the cavity barriers installed because I understand this is not in question, the rating and locations are taken from the information provided to me.

⁷ BBA. (2013). BBA Certificate Number 05/4214 Product Sheet 1 Alucobond Cladding Systems.

⁸ BBA. (2017). BBA Certificate Number 05/4214 Product Sheet 1 Alucobond Cladding Systems.

⁹ BBA. (2014). BBA Certificate Number 06/4355 Product Sheet 3 Marley Eternit Façade Panels Equitone (Natura).

¹⁰ BBA. (2012). BBA Certificate Number 10/4792 Product Sheet 2 Sto Ventec Glass.

¹¹ BBA. (2020). BBA Certificate Number 10/4792 Product Sheet 2 Sto Ventec Glass.

¹² BBA. (2013). BBA Certificate Number 95/3132 Product Sheet 2 Sto Therm Vario.

¹³ BBA. (2017). BBA Certificate Number 95/3132 Product Sheet 2 Sto Therm Vario.

¹⁴ BBA. (2020). BBA Certificate Number 05/4214 Product Sheet 1 Alucobond Cladding Systems.

¹⁵ BBA. (2020). BBA Certificate Number 95/3132 Product Sheet 2 Sto Therm Vario.

3.4.3.2. Cavity Barriers to Divide Cavities

The literature provided specifies that the cavity barriers provided are rated for 60 minutes which meets the recommendations of the NDTH. As above, the rating and locations are taken from the information provided to me.

As detailed in Section 3.3 above, the elevation drawings provided indicate that the design intent was for cavity barriers to divide up cavities at maximum distances of 20m.

3.4.3.2.1. Cladding with K15 Insulation Facing into Cavity (Systems A to D)

Cladding system A (ACM), B (Marley Eternit), C (Sto Ventec Glass Rainscreen) and D (Zinc) all have Kingspan K15 insulation facing into the cavity. Whilst there were no restrictions on the combustibility of the insulation materials, it is recognised that as the K15 insulation faces into the cavity it impacts on the distance between cavity barriers to divide up large cavities.

The insulation facing into the cavity was Kingspan K15, this insulation would be required to achieve a Low Risk fire classification to justify 20m cavity barrier distances.

I have seen contradictory evidence which suggests Kingspan K15 insulation is either designated as Low Risk or Medium Risk. My colleague Beth Dean contacted Kingspan to obtain clarification regarding the reaction to fire classification. Kingspan have confirmed that they do not have evidence to confirm K15 was ever 'Low Risk', they have confirmed K15 was and is 'Medium Risk'.

Since K15 insulation is Medium Risk, additional cavity barriers should have been provided (every 10m). The key on the elevation drawings indicate the design intent, division every 20m, was not sufficient to meet the recommendations in the NDTH. In some cases compliance may still be achieved circumstantially, due to the location of cavity barriers around floor to floor windows, compartment walls / floors, etc. It is possible that this will apply to some areas of cladding, but not the complete cladding across the building. Where cavity barriers around windows are considered for this requirement, the cavity barriers would need to completely divide the cavity, as such it is likely this will only occur where windows run full floor to floor height. The detail would need to be checked in the as built drawings and/or on site.

I have considered whether the evidence which indicated the K15 insulation was Low Risk was relevant and should have been relied upon by MPX at the dates I have been asked to consider.

- K15 Reaction to Fire Designation at 13 February 2015

At the date of the Construction Contract, 13 February 2015, the British Board of Agreement (BBA) certificate stated that K15 insulation was 'Low Risk'. Specifically I have reviewed certificate 08/4582¹⁶ dated 27th October 2008, certificate 14/5134¹⁷ dated 8th October 2015 and iterations between these dates; all of which state K15 was 'Low Risk'.

KEY FACTORS ASSESSED		
Thermal performance — depending on the thickness, the product has a thermal conductivity* of between 0.021 W·m ⁻¹ ·K ⁻¹ and 0.020 W·m ⁻¹ ·K ⁻¹ (see section 6).		
Condensation risk — the product can contribute to reducing the risk of surface and interstitial condensation (see section 7).		
Behaviour in relation to fire — the product is classified as Class 0 or 'low risk' as defined in the national Building Regulations (see section 8).		
Durability — the product will have a life equivalent to that of the wall structure in which it is incorporated (see section 14).		
The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.		
On behalf of the British Board of Agrément		
Date of First issue: 8 October 2015	John Albon — Head of Approvals Construction Products	Claire Curtis-Thomas Chief Executive

Figure 6 – Extract from BBA Certificate 14/5134 dated 8th October 2015

¹⁶ BBA. (2008). BBA Certificate Number 08/4582 Product Sheet 1: Kooltherm K15 Rainscreen Insulation Board

¹⁷ BBA. (October 2015). BBA Certificate Number 14/5134 Product Sheet 7: Kooltherm K15 Rainscreen Insulation Board

The British Board of Agreement (BBA) is a member of the EOTA. As such the Technical approvals that it issues in the form of BBA Certificates are evidence to show that the requirements of the Building Regulations that are applicable to the material, product or system can be achieved.

Therefore it was reasonable and acceptable to rely on the BBA Certificate when selecting the appropriate system for a project and determining whether the system could meet the required performance standards required by the Building Standards. This led me to conclude Building Standards compliance was achieved at the date of the Construction Contract.

- K15 Reaction to Fire Designation at 2016 / 2017

When the works were carried out in 2016/2017, the BBA certificate referred to in Figure 6 above was no longer current. The BBA amended the certificate for this product in November 2015 (BBA certificate 14/5134¹⁸ dated 16th November 2015), at which time the reference to the product being 'Low Risk' was removed and the only reaction to fire classification detailed was Euroclass C. This Euroclass classification falls outside of 'Low Risk' performance requirements, Euroclass C products are designed at Medium Risk materials.

Although the BBA certificates which stated K15 was 'Low Risk' were not current at the time the RHSC was constructed, consideration may be given by others (legal team) as to the applicable standards based on the contract date and the submission for Building Warrant.

I note that whilst the K15 system was no longer stated to be Low Risk on the BBA certificate, the Kingspan Kooltherm K15 Rainscreen Board data sheet¹⁹ still specified that the product achieved a national Class 0 until September 2017. The term Class 0 was defined in Approved Document B²⁰, to achieve a National Class 0 test specimens need to achieve a Class 1 when tested against BS 476 Part 7²¹ and an index of performance (I) of not more than 12 and sub-index of not more than 6 when tested against BS 476 Part 6²². The tests methods and criteria applied to obtain a Class 0 fire rating are the same as those detailed in the Technical Handbook to obtain a 'Low Risk' designation.

Kingspan have confirmed that the wording within Approved Document B led to K15 being classified as Class 0 based on testing of the foil facing alone. For the K15 insulation to be classified as 'Low Risk' in accordance with the Technical Handbook these tests were required on the bonded composite, inclusive on phenolic insulation. As such, the National classification noted does not indicate that K15 is 'Low Risk'.

At the time of construction I would consider that a reasonably competent contractor may have understood that the Class 0 rating, as described on the datasheet, meant that the product could be designated as 'Low Risk' (although this was incorrect).

- K15 Reaction to Fire Designation at February 2019

When the works were agreed as practically complete in February 2019 it was known that K15 insulation was Medium Risk.

3.4.3.2.2. Cladding with Plywood Facing into Cavity (System D)

In addition to the Kingspan K15 insulation, cladding system D (Zinc) also has plywood facing into the cavity. Whilst there were no restrictions preventing the use of plywood in the cladding system, it's inclusion in this position impacts on the distance between cavity barriers to divide up large cavities.

The plywood facing into the cavity would be required to achieve a Low Risk fire classification to justify the 20m cavity barrier distances. For plywood to achieve a Low Risk designation, it would need to be treated with flame retardant additives and it's performance proven by test. MPX have informed me

¹⁸ BBA. (November 2015). BBA Certificate Number 14/5134: Product Sheet 7, Kooltherm K15 Rainscreen Insulation Board.

¹⁹ Kingspan (2016, 10th Issue). Kooltherm K15 Rainscreen Board.

²⁰ MHCLG (2013). Approved Document B Volume 2 2006 incorporating 2007, 2010 & 2013 amendments – Building Other than Dwellinghouses

²¹ BSI. (2014) BS 476 Part 7: 1997 + A1 + Corr 1 Fire Tests On Building Materials And Structures. Method Of Test To Determine The Classification Of The Surface Spread Of Flame Of Products.

²² BSI. (2014) BS 476 Part 6: 1989 + Corr 1 Fire tests on building materials and structures. Method of test for fire propagation for products.

that the reaction to fire classification of the plywood installed is unconfirmed, on this basis I must consider the requirements on the assumption that the plywood is not Low Risk and conclude that cavity barriers were required to divide up cavities at 10m intervals.

Since K15 insulation and plywood is not considered as Low Risk, additional cavity barriers should have been provided (every 10m). The key on the elevation drawings indicate the design intent, division every 20m, was not sufficient to meet the recommendations in the NDTH. In some cases compliance may still be achieved circumstantially, due to the location of cavity barriers around floor to floor windows, compartment walls / floors, etc. It is possible that this will apply to some areas of cladding, but not the complete cladding across the building. Where cavity barriers around windows are considered for this requirement, the cavity barriers would need to completely divide the cavity, as such it is likely this will only occur where windows run full floor to floor height. The detail would need to be checked in the as built drawings and/or on site..

3.4.3.2.3. Cladding with EPS Insulation Facing into Cavity (System E)

Cladding system E (StoTherm Vario) has EPS insulation facing into the cavity. Whilst there were no restrictions preventing the use of this EPS insulation in the cladding system, it's inclusion in this position impacts on the distance between cavity barriers to divide up large cavities.

The StoTherm Vario BBA certificates referenced in Section 3.4.1 of this report confirm that the EPS insulation cannot be considered as low risk. On this basis I conclude that cavity barriers were required to divide up cavities at 10m intervals.

The key on the elevation drawings indicate the design intent, division every 20m, was not sufficient to meet the recommendations in the NDTH and additional cavity barriers would be required. In some cases compliance may still be achieved circumstantially, due to the location of cavity barriers around floor to floor windows, compartment walls / floors, etc. It is possible that this will apply to some areas of cladding, but not the complete cladding across the building. Where cavity barriers around windows are considered for this requirement, the cavity barriers would need to completely divide the cavity, as such it is likely this will only occur where windows run full floor to floor height. The detail would need to be checked in the as built drawings and/or on site.

3.4.1 Summary

I have summarised my opinions in Table 5 below.

System	Parameter	NDTH Recommendation for RHSC	Was there sufficient evidence to conclude Building Standards had been Met?		
			13 February 2015	2016/2017	February 2019
A (ACM); B (Marley Eternit); and C (Sto Ventec Glass Rainscreen)	Combustibility of the external surface material	Low risk	Yes	Yes	Yes
	Combustibility of the insulation	None	Yes	Yes	Yes
	Provision of cavity barriers	At positions detailed in section 2.4 of NDTH	Yes	Yes	Yes
		At recommended distances to divide up cavities	Yes	No*	No*
D (Zinc)	Combustibility of the external surface material	Low risk	Yes	Yes	Yes
	Combustibility of the insulation	None	Yes	Yes	Yes
	Provision of cavity barriers	At positions detailed in section 2.4 of NDTH	Yes	Yes	Yes

System	Parameter	NDTH Recommendation for RHSC	Was there sufficient evidence to conclude Building Standards had been Met?		
			13 February 2015	2016/2017	February 2019
		At recommended distances to divide up cavities	No*	No*	No*
E (StoTherm Vario)	Combustibility of the external surface material	Low risk	Yes	Yes	Yes
	Combustibility of the insulation	None	Yes	Yes	Yes
	Provision of cavity barriers	At positions detailed in section 2.4 of NDTH	Yes	Yes	Yes
		At recommended distances to divide up cavities	No*	No*	No*
* The key on the elevation drawings indicate the design intent was to provide cavity barriers at no more than 20m intervals which would not meet the NDTH recommendation, however, in some cases compliance may still be achieved circumstantially due to the location of cavity barriers around floor to floor windows, compartment walls / floors, etc.					

Table 5 – Summary of Review of Cladding at RHSC

4 Response to Key Question 2

The second question I have been asked is:

2. Do you consider that, in respect of each of the dates notes above, each of the installed external walling systems would have been capable of passing a desk-top fire assessment based on the criteria which were applicable at the time?

4.1 Desktop Assessment

In this context, I understand a desktop assessment is referenced in relation to demonstrating compliance with the criteria detailed in BR 135: 2013 'Fire Performance of external thermal insulation for walls of multi-storey buildings'²³. The classification criteria defined in BR 135 relates to test data obtained during a BS 8414^{24 25} large scale test. A desktop assessment is a process whereby test data obtained on a system directly tested against BS 8414, is used to validate a 'similar' system. At the time of construction, there were no rules which defined the term 'similar'. The publication of BS 9414: 2019²⁶ introduced procedures and rules to evaluate variations and changes to products and systems which have been tested in accordance with BS 8414. Only minor variations are permitted by BS 9414, more significant variations which may previously been assessed via a desktop assessment would not be permitted by BS 9414.

4.2 Reference to BR 135 in NDTH

At the time of construction, the NDTH detailed reaction to fire requirements that materials used in the construction of an external wall should meet. Meeting the combustibility requirements detailed within Section 3.2.1 and 3.2.2 of my report is commonly known as the linear route to demonstrate compliance with the Building Standards. At the time of construction, an alternative method to demonstrate compliance with respect to the combustibility of materials was to demonstrate the cladding system could meet the criteria defined in BR 135.

The use of BR 135 was not detailed as a route to reduce the frequency of cavity barriers to divide up cavities. The classification criteria defined in BR 135 relates to test data obtained during a BS 8414 large scale test. Although the BS 8414 test is considered to be a large scale method, the width of the test rig is not sufficient to assess the impact of larger cavities running horizontally throughout the cladding system.

4.3 Applicability of BR 135 to RHSC Cladding

In isolation of the cavity barrier requirements, the combustibility of the materials used in the cladding systems met the linear route. The use of BR 135 as an alternative route to demonstrate compliance, with respect to material combustibility, was therefore not required.

The cavity barrier provision did not align with the recommendations detailed in the NDTH, further division of the cavity would be required to align with the guidance. Demonstrating the cladding system meets the performance criteria detailed in BR 135 would not negate the recommendation to further divide the cavity.

4.4 Potential Method to Comply with the Building Regulations Applicable at the Time of Construction

²³ BR 135: 2013. Fire Performance of external thermal insulation for walls of multi-storey buildings, Building Research Establishment Report.

²⁴ BSI (2005). BS 8414-1: 2002. Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems applied to the masonry face of a building.

²⁵ BSI (2005) BS 8414-2: 2005. Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a Structural Steel Frame.

²⁶ BSI (2019). BS 9414. Fire performance of external cladding systems. The application of results from BS 8414-1 and BS 8414-2 tests

The addition of cavity barriers to divide the cavities at a maximum of 10m intervals would enable the system to align with the recommendations detailed within the NDTH at the time of construction.

I am aware that at the time of construction some projects were using holistic fire engineering solutions (such as incorporating suppression systems) to mitigate the risks associated with variations in the cladding system. I have not been aware of any such approach on this project.

4.5 Requirements Applying to Existing Buildings

A fire safety risk assessment is a legal requirement for “relevant premises”. Determining the risk to life from the spread of fire on external wall systems is just one element which needs to be considered as part of a fire safety risk assessment. The Scottish advice note on external wall systems was published in August 2021 to assist building owners / managers determine the risk posed from the external wall systems. The advice note may apply more onerous requirements to those which applied at the time of construction (this may not be Multiplex’s responsibility, but it would be imprudent of me not to note this needs to be addressed by the responsible person).

5 Conclusions

5.1 Key Question 1

1. Do you consider that the materials used, and the installed external walling systems, at RHSC were compliant with all relevant fire safety regulations? Please consider this question and provide your opinion on the position as at the following dates:
 - 1.1. 13 February 2015 (the date of the Construction Contract);
 - 1.2. 2016/2017 when the works were carried out; and
 - 1.3. February 2019 (when the works were agreed as practically complete).

Typically, the critical date with respect to which regulations are applicable to building work, is the date the Building Warrant application is submitted. I have been informed that the first warrant stage was submitted on 24th October 2014, on this basis the applicable edition of the NDTH was the Technical Handbook – Non-Domestic: 2013.

I have been asked to consider the compliance of five external wall cladding systems, at three specific dates:

- At the date of the Construction Contract, 13 February 2015, I consider that:
 - The ACM, Marley Eternit and Sto Ventec Glass Rainscreen systems as described within this report met the Building Standards.
 - The Zinc and StoTherm Vario systems as described within this report met the Building Standards; with the exception of the division of cavities.
- During the period when the works were carried out, 2016 / 2017, I consider that:
 - The five systems I have been asked to review (ACM, Marley Eternit, Sto Ventec Glass Rainscreen, Zinc and StoTherm Vario as described within this report) met the Building Standards; with the exception of the division of cavities.
- At the date of the works were agreed as practically complete, February 2019, I consider that:
 - The five systems I have been asked to review (ACM, Marley Eternit, Sto Ventec Glass Rainscreen, Zinc and StoTherm Vario as described within this report) met the Building Standards; with the exception of the division of cavities.

Where I have concluded that the division of cavities did not meet the Building Standards, I consider that the cavities should have been divided every 10m. The key on the elevation drawings supplied to me indicate the design intent, division every 20m, was not sufficient to meet the recommendations in the NDTH. In some cases compliance may still be achieved circumstantially, due to the location of cavity barriers around floor to floor windows, compartment walls / floors, etc. It is possible that this will apply to some areas of cladding, but not the complete cladding across the building. Where cavity barriers around windows are considered for this requirement, the cavity barriers would need to completely divide the cavity, as such it is likely this will only occur where windows run full floor to floor height. The detail would need to be checked in the as built drawings and/or on site.

In the answer I give above I conclude that compliance in respect of the system materials was achieved (with the exception of cavity barrier issues) on the basis that the systems complied with requirements of the NDTH and the various information that the material manufactures produced at the time supported this conclusion. However, we now know that a number of pieces of information that were relied on at the time have subsequently been shown to be incorrect. Therefore there is a legal point that Brodies LLP may need to consider and advise on. This point, is whether it could be successfully argued that compliance with the regulations was not actually achieved because the supporting information was incorrect? Albeit that MPX would appear to have done what was required to demonstrate compliance at the time by complying with and following the guidance in the NDTH.

5.2 Key Question 2

2. Do you consider that, in respect of each of the dates notes above, each of the installed external walling systems would have been capable of passing a desk-top fire assessment based on the criteria which were applicable at the time?

In this context, I understand a desktop assessment is referenced in relation to demonstrating compliance with criteria detailed in BR 135. It is my opinion that the use of BR 135 would not have been beneficial with respect to demonstrating that the requirements of the Building Standards had been met at RHSC. My conclusion is on the basis that:

- The combustibility of the materials used in the cladding systems met the linear route. The use of BR 135 as an alternative route to demonstrate compliance, with respect to material combustibility, is therefore not required.
- The cavity barrier provision did not align with the recommendations detailed in the NDTH, further division of the cavity would be required to align with the guidance. Demonstrating the cladding system meets the performance criteria detailed in BR 135 would not negate the recommendation to further divide the cavity.

Note. The Scottish Government have published advice on their website, in various iterations of the Scottish advice note 'Determining the fire Risk posed by External Wall Systems in Existing Multi-Storey Residential Buildings for External Walls'²⁷ (draft editions published prior to publication in August 2021). Hospital buildings are within the scope of the advice, the advice introduced additional fire safety requirements for external wall systems which may have been considered as exceeding those requirements detailed in the Technical Handbook. This would be a matter for the building operators to consider.

²⁷ Scottish Government (2021). Scottish Advice Note. Determining the fire Risk posed by External Wall Systems in Existing Multi-Storey Residential Buildings for External Walls.

6 Declaration - Brodies to advise on declaration requirements

I, Andrew McCracken, Declare that:

1. I understand that my duty in providing written reports and giving evidence may be used in the future to help an Adjudicator or similar (TBA), and that this duty overrides any obligation to the party by whom I am engaged or the person who has paid or is liable to pay me. I confirm that I have complied and will continue to comply with my duty.
2. I confirm that I have not entered into any arrangement whereby the outcome of the case has any bearing on the amount or payment of my fees in any way.
3. I am not aware and have any knowledge of any conflict of interest of any kind relating to this instruction which affects my suitability as an expert witness on any issues on which I have given evidence.
4. I will make known to the party by whom I am instructed if, between the date of my report and any future the adjudication or similar, there is any change in circumstances which affect my answers above.
5. I have exercised reasonable care and skill in order to be accurate and complete in preparing this report.
6. I have not, without forming an independent view, included or excluded anything which has been suggested to me by others, including my instructing lawyers.
7. I will notify those instructing me immediately and confirm in writing if, for any reason, my existing report requires correction or qualification.
8. I understand that:
 - a) My report may form the evidence to be given potentially under oath or affirmation;
 - b) Questions may be put to me in writing for the purposes of clarifying my report and that my answers shall be treated as part of my report and covered by my statement of truth;
 - c) An Adjudicator or similar (TBA) may in the future direct a discussion to take place between experts for the purpose of identifying and discussing the expert issues in proceedings, where possible reaching an agreed opinion on those issues and identifying what action, if any, may be taken to resolve any of the outstanding issues between the parties;
 - d) An Adjudicator or similar (TBA) may in the future direct that, following a discussion between the experts, a statement should be prepared showing those issues which are agreed and those issues which are not agreed, together with a summary of the reasons for disagreeing;
 - e) I may be required to attend a hearing convened by an Adjudicator or similar (TBA) to be cross-examined on my report by a cross-examiner assisted by an expert;
 - f) I am likely to be the subject of adverse criticism by an Adjudicator or similar (TBA) if Adjudication or similar (TBA) concludes that I have not taken reasonable care in trying to meet the standards set out above.

STATEMENT OF TRUTH

I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.

Signature



Date

28 October 2021

Name in full

Andrew McCracken

Appendix A – Curriculum Vitae

Personal Details: Andrew McCracken

email: andrew.mccracken@warringtonfire.com



Current Position: General Manager – Head of Fire Engineering UK at Warringtonfire

Qualifications: B.Eng (Hons) BSc MRICS MIFireE FCABE C Build E APAEWE

Date of Birth: 02 June 1970

Security Clearance Level Government Developed Vetting (DV and SC)

Nationality: British

Career Summary:

I joined Warringtonfire in 2006 working as a Senior Consultant. I progressed to secure positions of Principal Consultant and later Associate and Technical Development Manager. As an Associate I played a key role in the Fire Engineering Senior Consultancy Team. I was promoted to the position of General Manager - Head of Fire Engineering for the UK Fire Engineering business in early 2017. I am now in my 15th year at Warringtonfire.

As Head of Fire Engineering at Warringtonfire, I am responsible for managing three UK offices (London, Warrington and Manchester) and overseeing the fire engineering activities carried out throughout the division. I am also part of the Senior Management Group for the Fire and Building Products Sector of Warringtonfire that directs and coordinates fire safety, fire testing and certification activities and strategy across the business.

I have been a full member of the Building Regulations Advisory Committee (BRAC) which is a Statutory Scientific Advisory Committee, which the Secretary of State for Housing, Communities and Local Government consults when changes to the Building Regulations are proposed.

I have a construction background, starting my career as an apprentice before progressing to a role in Local Authority Building Control. I gained extensive experience as a regulator and a Fire Engineer working for a number of Local Authorities. During my 17 years working in Building Control I became a Chartered Building Control Surveyor and then a Fellow Chartered Building Engineer. I also completed a number of Building Control qualifications and a degree in Building Legislation and Technology. As a regulator I specialised in fire safety and fire engineering, in particular the assessment of engineered solutions for regulatory compliance. These specialisms lead me to study for a second degree (in fire engineering) and to become a Fire Engineer in 2002 (First Class Honours at UCLAN). As a qualified regulator and Fire Engineer I am able to consider and solve complex regulatory fire safety issues that are not apparent to my peers. I have an excellent working knowledge of the Building Regulations and the supporting guidance along with the enabling legislation. I believe I am a specialist in my field of fire safety and Building Regulations.

I have experience in all aspects of fire safety engineering with particular emphasis on providing engineered strategies and solutions for a large range of iconic building projects across commercial, nuclear, public sector, residential and transport infrastructure sectors worldwide.

I am security cleared to a level of 'Developed Vetting' (DV) as I provide regulatory and fire safety advice to a number of government organisations at a number of sensitive sites in the UK.

In addition to fire engineering design and approvals work, I also assist in legal cases where compliance in respect to fire safety and the applicable legislation is brought into question.

This is undertaken as an Advisory Expert or Expert Witness in accordance with the Civil Procedures Part 35 Rules. I have undertaken specialist expert witness training and I am currently acting for a number of clients in major contractual disputes regarding regulatory compliance and fire safety.

Qualifications:

- BEng(Hons), Fire Engineering. (First Class (Preston)).
- BSc, Building Legislation and Technology. (Manchester).
- Advanced Professional Award in Expert Witness Evidence (APAEWE).
- MRICS, The Royal Institution of Chartered Surveyors. (Chartered Building Control Surveyor)
- MIFireE, Member of the Institution of Fire Engineers.
- FCABE The Chartered Association of Building Engineers. (Fellow Chartered Building Engineer)
- Diploma in Building Control (Stockport).
- Higher National Certificate in Building Studies (Preston)

Employment History:

Present – 2006 Exova Warringtonfire – General Manager – Head of Fire Engineering UK, Associate and Technical Development Manager, Principal Consultant, Senior Consultant.

1995 – 2006	Lancaster City Council – District Building Control Surveyor/Fire Engineer
1990 – 1995	Barrow Borough Council – Building Control Surveyor
1996 – 2000 (PT)	Lancaster and Morecambe College – Part time Lecturer
1990 –1996 (PT)	Furness College – Part time Lecturer
1986 – 1990	BAE Systems – Infrastructure, Apprentice Carpenter and Joiner