GRENFELL TOWER INQUIRY

PHASE 2, MODULE 1: OPENING SUBMISSIONS ON BEHALF OF THE BSR REPRESENTED BY BHATT MURPHY, BINDMANS, HICKMAN & ROSE, AND HODGE JONES & ALLEN

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I. PREFACE TO PHASE 2

1. Prologue

1.1. Included in the evidence provided to the Department of the Environment Transport and Regional Affairs Select Committee "*Potential Risk of Fire Spread in Buildings via External Cladding Systems"* in July 1999[1] were the words of an architect[2] who had reviewed the Scottish fire safety regulations:

> *"I would never advise a client to cut anything to do with fire to the bone because, when I look at the reports of actual fires, the most incredible things have happened… So far as fires are concerned it is really the unexpected that defeats us on many occasions. Indeed, it is usually when not just one thing goes wrong, but one, two or three things go wrong at the same time that all our defences are breached and disaster strikes."*

1.2. The overarching question for this Inquiry is how, despite these words, the level of knowledge communicated to the Select Committee in 1999, and knowledge acquired by Government in 2000,[3] the levels of complacency within Government and Industry were such as to allow the Grenfell Tower disaster to occur.

2. Context

2.1. Phase One was primarily concerned with the events on the night of the fire. That inevitably put considerable focus on the shortcomings of the LFB's response to the fire as described in the Phase One Report. Those shortcomings, systemic and highly significant as they are,[4] must now be put in the context of the condition of Grenfell which gave rise to intolerable risks to both residents and firefighters, leading to 72 deaths.

2.2. In his Phase One Report, the Chairman made the important finding that Grenfell was non-compliant with the Building Regulations in force at the time of the 2012-16 refurbishment (the "**Refurbishment**"). The purpose of Phase Two is to establish the full extent of its non-compliance with all relevant statutes and guidance and, just as importantly, how it came to be so. This exercise inevitably requires a long look backwards to the history of the construction of Grenfell and the many modifications and alterations falling outside the Refurbishment such as those to the lifts and doors.

3. The Seeds of the Disaster

3.1. The scale of the fire at Grenfell was the product of a toxic combination of years of neglect,

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[1] Memorandum by the Fire Safety Development Group (ROF 26) paragraph 6.4 https://publications.parliament.uk/pa/cm199899/cmselect/cmenvtra/741/9072003.htm

[2] Frith Hoehnke

[3] See section 7 below

[4] To be investigated further in Modules 5 (Firefighting) and 6 (Government)

followed by an ill-conceived and incompetently executed renovation, leading to a series of technical failures, predominantly in relation to the cladding. The principal products used in the cladding system, marketed as safe for use on buildings over 18m were (as their manufacturers knew whilst aggressively marketing them to the designers of Grenfell) highly combustible.

3.2. Underlying all this, Central Government has much to answer for, in failing to overhaul the Building Regulations, but particularly the guidance document Approved Document B ("**ADB**"). ADB is based on a 1946 post-war document, should have been overhauled in 2000 (as Government knew[5]) and is not fit for purpose. Though the guidance was in fact understood by many designers/contractors, product manufacturers deliberately exploited the ignorance of other designers and contractors, relying on their lack of understanding of ADB.

4. Overarching Themes: Incompetence, Arrogance and Wilful Non-Compliance

4.1. Although there is a complex web of causes underlying the disaster, its hallmark is an epidemic level of incompetence across the majority of the disciplines involved, including RBKC Building Control, TMO and its fire engineer, Exova and fire risk assessor, Carl Stokes. Exova failed to correctly identify and test the existing fire strategy for Grenfell for non-compliance, and then failed to formulate any fire strategy which took account of the cladding, the most complex element of the Refurbishment.[6] Stokes had an unerring ability to give the wrong advice on safety measures (see paragraph 5.6 below) and whilst fire extinguishers would not have helped and may even have posed a risk to residents had they tried to fight the fire, it is ironic that it was Stokes who was responsible for their removal.[7]

4.2. The other critical driving forces, corporate arrogance and greed, remain unchecked in some despite the disaster.

4.3. Arconic, now self-anonymised as "AAP SAS", but who shall remain "**Arconic**" to the BSR, still accepts no responsibility and blames others,[8] refusing to comment on the Phase 1 report which held its cladding panels non-compliant with Building Regulations and primarily responsible for the most rapid vertical and lateral flame spread. The rate of lateral flame spread at Grenfell was unprecedented.[9] Although Arconic asserted: "*The manufacturer/supplier of ACM cladding panels cannot, by itself, make any assessment as to the degree of compliance of the cladding system as a whole*",[10] it is now clear that Arconic (in particular those involved in

[5] Radar Report {**CLG00000949**}, {**CLG00000950**}, {**CLG00000951**}
[6] Hyett paragraph 2.11.1 {**PHYR0000002_0066**} and Dr Lane Fire Engineer report **{BLARP20000003}**
[7] **{CST00003079_005}**
[8] Arconic's Phase One Closing Submissions paragraph 7 {**INQ00000558_0002**}
[9] Phase 1 report paragraph 23.25
[10] Arconic's Phase One Closing Submissions, paragraph 107(iii) **{INQ00000558_0023}**

the supply to Grenfell) were aware that:

(1) UK guidance (NHBC and the BCA) suggested that the cladding panels were required to be of limited combustibility (or European Class A2).[11]

(2) If Class 0 was required for the external surfaces of walls, then the FR (not PE) cored Reynobond product was required.[12]

(3) Reynobond cassettes were Class E and this was the relevant criterion by which to measure their performance in fire.[13]

4.4. Likewise Rydon, now obliquely referring to itself as "RML", but "**Rydon**" to the BSR, seeks to absolve itself from blame by reference to lack of clarity in Regulations, the fact they seem to have been widely misunderstood, and critically, that although Rydon was a design and build Contractor, it had no involvement in key design decisions.[14] That overlooks the following:

(1) Rydon undertook to be responsible for the design of the works done either by Studio E ("**SE**") or Harley,[15] and that assumption of that responsibility required it, as a competent design and build contractor, to review the design and imposed on it a duty to warn of obvious flaws in the design. Given the finding of non-compliance, that should have been obvious to Rydon as a competent design and build contractor. It was in fact known to them, as they were copied in on and participated in email exchanges from which it was clear that the obvious fire risks posed by the cladding at Grenfell were known.

(2) Rydon in fact did by its management of its own package contractors expressly specify various obviously non-compliant elements of the cladding system, which contrary to Rydon's assertions, had not been selected prior to Rydon's involvement: Aluglaze, Kingspan TP10 and Celotex TB4000 to name a few.

(3) The choice of non-compliant Reynobond cladding panels (ultimately selected by TMO) was driven extremely hard by Rydon in conjunction with its sub-contractor Harley

4.5. The relevant corporates could and should have admitted non-compliance at the outset but failed to do so by position statements and submissions in Phase One. To the extent that the corporates are forced to admit fault now, they do so on the basis that the Building Regulations and guidance were confusing and/or these products were widely used. In fact, the Regulations/guidance in Approved Document B did not confuse the contractors and designers

[11] See Section 13 below and {**ARC00000701-2**}

[12] This despite its subsequent email on 14.12.15 that both PE and FR were Class 0. Email thread between Arconic and Genius Facades {**ARC00000672_0004**}

[13] Wehrle email to Genius Facades {**ARC00000699}**

[14] Rydon Company Statement, paragraph 5 {**RYD00094236_0012**}

[15] JCT D&B 2011 as amended clause 2.17 {**RYD00094235}.**

of Grenfell: they either did not attempt to understand relevant guidance, or they did understand. Either way, they knew the system was dangerous. Likewise, the manufacturers were in no way confused; instead they sought to profit from the confusion of others.

4.6. **Wilful non-compliance: "*...making an existing crap situation worse*".**[16] Although many corporates suggest non-compliance was a result of confusion as to the statutory regime and guidance, it is clear many understood it, or had the wherewithal to do so, but deliberately failed to comply. A prime example is Exova, a "*top tier*"[17] company, but some of whose staff appear to pride themselves on getting around the Building Control Officer: *"...what you've said highlights the non-compliance with codified guidance, but more importantly is debateable. Let's hope Paul Hanson doesn't pick up on it".*[18] Rydon's tender, Harley's offer, and email threads passing between Harley, Rydon sometimes also involving SE, demonstrate a clear understanding that the finished façade would be non-compliant:

(1) Cavity barriers: These would be ineffective because the metal rainscreen cladding would deflect, once heated, resulting in there being no surface for the cavity barriers to intumesce against. This would allow the free passage of hot smoke and flame within the cavity created by the cladding. Exova's advice to SE that fire-stopping would not stay in place "*...in the event of a fire where external flaming occurred as this would cause the zinc cladding to fail"* was met with Crawford's reply that he was well aware of this: *"...metal cladding always burns and falls off, hence fire stopping is usually to the back of the cladding line*".[19]

(2) Reynobond cladding panels: Harley's budget spreadsheet sent to SE in mid-October 2013 indicated *"no allowance for fire rated products*".[20] Harley's design team knew the polyethylene core of the panels was highly combustible (and therefore would not "*adequately resist the spread of fire"* as required by requirement B4(1) of the Building Regulations). As Daniel Anketell-Jones, leader of its design team, said: *"as we all know, ACM will be gone very quickly in the event of a fire*"[21] (emphasis added).

(3) Insulation: The insulation was not of limited combustibility. Rydon tendered against the NBS specification which included a combustible insulation, FR5000[22] and therefore

[16] Cooney (Exova) internal email re ventilation 17.8.12 **{EXO00001579}**
[17] Lane Fire Engineer Report **{BLARP20000003_0041}** at paragraph 4.3.22
[18] Ashton email 24.10.13{**EXO00001444**}
[19] {**EXO00001434**}
[20] Paragraph 5 *Exclusions* {**SEA00002275_0002}**
[21] {**HAR00006585}**
[22] The same product, in fact, as the ultimately specified RS5000.

knew, or should have known, that its 13.2.14 tender[23] was non-compliant, given that none of the other possible routes to compliance (BS8414 test, desktop study or engineered study) had been carried out. Furthermore, Rydon was made aware in June 2014 that only a Rockwool and Rockpanel cladding system would attract eco-grant funding and that both these materials had *"…superior fire ratings of Euroclass A1*".[24]

(4) The absence of cavity barriers around windows: The lack of cavity barriers around windows meant there was an obvious *"weak link so to speak in terms of fire and I think the [Building Control Officer] would have also noticed this"*.[25]

5. The Significance of RBKC Neglect

Background

5.1. The need to refurbish Grenfell arose because the Lancaster West Estate had fallen into decline. Built in 1974 without the originally planned community-forming shops and offices, it was not in fact designed to the architects'[26] original 1963 ambitions for it. In the decades after construction, the condition of the Estate deteriorated. By 2011, Grenfell Tower was sorely in need of investment. It had become one of TMO's "*worst property assets*".[27] By contrast to the conceptual planning consideration given by the 1960s architects, the approach to the regeneration of the Estate was reactive. In 2009, RBKC engaged consultants to examine the options for potential re-development of the entire Notting Barns Estate (of which Lancaster West formed part). The resulting report: *"Notting Barns South Draft Final Masterplan Report"*,[28] proposed the demolition of Grenfell Tower and Barandon Walk Finger Block.

5.2. Neither the redevelopment proposed in the *Masterplan Report*, nor any other cohesive plan for investment in the area was, in the event, adopted. Instead, RBKC appears only to have reacted at the last minute to pressing needs and funding opportunities as they arose:

(1) RBKC had a shortage of secondary school places and needed to construct a new academy. This had to be completed within five years (by 2013) to obtain funding as part of the Government's *Building Schools for the Future* programme. This was the origin of the Kensington Academy and Leisure Centre ("**KALC**") project.

(2) The possibility of investing in, rather than demolishing, Grenfell Tower was alighted upon in late 2011. The reasons for this investment are addressed further in Section 9

[23] {**ART00002087**}
[24] {**RYD00006697**}
[25] {**SIL00000013**}
[26] Clifford Wearden and Peter Deakins
[27] {**TMO10000965**}
[28] https://grenfellactiongroup.files.wordpress.com/2015/08/notting-barns-south-masterplan.pdf

below. However, the decision to invest was at least in part a reaction to:[29] (i) a concern that Grenfell would provide a poor-quality frontage, to the new facilities at KALC; and (ii) the need to "manage and mitigate" the impact of the KALC proposals on the residents of Grenfell Tower and Lancaster West.

5.3. That is not the only sense in which KALC dictated Grenfell's fate. Despite its £40m budget, KALC set the precedent for using a cladding panel which was not of the general quality of Proteus Honeycomb (European Class B1[30]) originally specified by SE in its 2013 specification for Grenfell Tower. Instead, it incorporates a highly combustible insulating core panel (class E)[31] and which Rydon knew to have an inferior service life even to the zinc composite panels specified as an alternative to Proteus by SE.[32]

<u>RBKC / TMO Failures to Maintain and Manage Grenfell</u>

5.4. Both RBKC and TMO's neglect of Grenfell were major contributing factors to the extent of the disaster. This neglect appears to have stemmed, in part, from a belief that the residents' views were unimportant and to be doubted[33] rather than providing a beneficial resource.

5.5. **RBKC/TMO failed to maintain essential fire protection measures:**

(1) RBKC/its Building Control department failed to maintain, or exercise sufficient supervision over TMO to ensure the maintenance of fire protection measures such as fire doors and lifts in accordance with relevant guidance/legislation (despite repeated contemporaneous complaints from residents (see section 17 below). As the Chairman said in the Phase One Report, one of "*the most pressing questions for Phase 2*"[34] is why the doors, so vital to compartmentation, were in the condition they were (lacking door closers/intumescent strips and of insufficient fire resistance) on the night of the fire.

(2) Historical neglect is evidenced by the fact that, prior to the Refurbishment, there was

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[29] {**TMO10000965**}

[30] {**SIG00000248_0009}**

[31] {**RBK00029935}**

[32] Rydon internal email 6.5.14 {**RYD00004142}** *"KALC…next door are using powder coated aluminium cladding. So not and [sic] inferior product. Precedent already set!"*. See also SE's email 15.5.14 {**SEA00010953}** *Reynobond's BBA certificate includes the following statement regarding service live* [sic] *"(The product) has an ultimate service life in excess of 30 years… can be expected to retain a good appearance for up to 20 years." VM Zinc (roof): "… will have minimum service life of 60 years…" (You would expect an even longer life when used as a façade cladding). Zinc and ACM are not equivalent in terms of service life.*" The revised Artelia minutes refer to the 30-year service life and 20 years good appearance of zinc (paragraph 1.2) but no comparison between zinc and ACM is made {**RYD00004609}.** Insulating core panels pose particular fire risks and are subject to an express set of warnings concerning their *"unique fire behaviour characteristics"* in Approved Document B.

[33] Councillor Blakeman's email of 11.5.16 {**MET00045750**} to various councillors giving 10 teachable points, including: "… *2. Respect residents' issues and deal with them fairly, quickly and suitably. … 7. Accept that sometimes the resident may be right and the TMO and/or contractor may have erred. Do not assume residents are not telling the truth when they complain and do not respond in a defensive / aggressive mode.*" See also Councillor Blakeman's statement that *"TMO treated the residents and ward councillors with a fair amount of disdain…*" {**MET00045751_0012**}

[34] Phase 1 Report, par 24.39

no existing fire strategy in place for Grenfell.[35] That is very telling: the purpose of a fire strategy is to ensure the building is compliant with legislation and ensure the safety of its occupants and those lawfully on the premises.[36] Neither RBKC/TMO had, prior to the Refurbishment, properly assessed the extent to which Grenfell complied, or might pose a threat. The lack of existing fire strategy undermines Carl Stokes' Fire Risk Assessments: how did they proceed if there was no existing fire strategy in place? [37]

5.6. **RBKC/TMO failed to procure suitable and sufficient Fire Risk Assessments ("FRAs").** As the Responsible Person defined by the RRO required by Article 9 of the Regulatory Reform Fire Safety Order 2005 ("**RRO**") to identify risks posed to anyone lawfully on the premises. The purpose of the FRAs is to advise the Responsible Person what *general fire precautions*[38] need to be taken. TMO and RBKC failed to procure that sufficient FRAs were obtained, despite having been made aware by LFB that:

(1) Carl Stokes its fire risk assessor was prone to making unjustified statements.[39] Examples of this were:

(i) Lifts: His statement that both lifts were firefighter lifts, even though it had been pointed out to him by the M&E engineer, Max Fordham, that this seemed not to be the case.[40] As we know, lives were lost due to residents entering the lift on the night, then falling out/exiting into smoke filled lobbies.[41] Others with restricted mobility or cognitive disorders may have lost their lives because they did not feel safe to use the lift to evacuate.

(ii) Premises Information Box: His advice not to provide a Premises Information Box ("**PIPs**"), sorely missed by LFB on the night of the fire: "*…fire officers asked about the providing of premises information packs, I would strongly recommend that these are not provided*"[42] (emphasis added).

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[35] DTM 5 18.7.12 **{SEA00005254}**

[36] Although fire strategies are usually prepared with the blueprints for a building or form the basis of drawings for refurbishment, it is recognised (PAS 911:2007) that a strategy should be prepared before specifying fire prevention and management practices as is required by RRO.

[37] There seems to have been no strategy whatsoever in place for TMO's properties. Following the realisation in July 2012 at DTM 5 (footnote 35 above) that there was no existing fire strategy for Grenfell, it seems this prompted the production of what appears to have been the first ever version of the "*TMO Fire Safety Strategy"* first produced (by Janice Wray) in draft in September 2012 and finalised in 2013: **{CST00001187}**, **{CST00001188}**.This document however is not a fire strategy for Grenfell itself, and such a standalone strategy should have existed (given TMO properties are not standardised) following the coming into force of the RRO on 1.10.06 in order to provide a meaningful basis for FRAs.

[38] Defined by Article 4 RRO as including: *(b) measures in relation to the means of escape…*

(c) measures for securing that, at all material times, the means of escape can be safely and effectively used

[39] {**LFB00000061_0003**}

[40] **{CST00000185_0003}**

[41] Ali Jafari, Mohamednur Tuccu and Khadija Khalloufi Phase 1 report, paragraph 10.221-10.225

[42] {**CST00000185_0004}**

(2) Much of RBKC/TMO's stock was non-compliant with the RRO and in 2009 LFB had required that it should be made compliant within 5 years.[43] This meant accurate risk assessment was doubly important.

5.7. **RBKC/TMO failed to prepare Personal Emergency Evacuation Plans ("PEEPs"):** Although these are not expressly required by RRO, on one view they are required by way of *General Fire Precaution*[44] given the Relevant Persons included residents whom RBKC/TMO knew to suffer from restricted mobility or cognitive disorders.[45] In any event, TMO/RBKC was well aware of the need to prepare PEEPs since it recognised this need for its staff.[46]

6. The Contribution of the Chosen Cladding System

6.1. The most immediate cause of the scale of the fire was the nature and design of the cladding system selected by TMO, on the advice of its Design Team. The system was not compliant with Building Regulations as found by the Phase One Report.[47]

Responsibility for Selection of the Cladding System

6.2. The Design Team – including SE, initially Exova, and latterly Rydon and its sub-contractor Harley – specified and designed the system. Individuals within each of these firms either understood the dangers of the Grenfell system, or ought to have, based on information available to them contemporaneously.

6.3. Some individuals were (during the currency of the Refurbishment) actively considering fire safety on other projects in ways which showed their awareness of the need and means by which to demonstrate compliance of insulation over 18m.[48]

Responsibility of the Manufacturers

6.4. The insulation and cladding panels' manufacturers, who became involved in actively promoting their products specifically for use at Grenfell, knew that some were ill-informed about the Building Regulations/guidance and exploited that lack of knowledge. The degree of contempt demonstrated by the manufacturers for safety is extraordinary, especially given both Arconic and Celotex understood that their products were combustible and indeed highly flammable.

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[43] {**TMO10037438_033}** et seq.

[44] We note GTI Phase One Report Recommendation 12 *Evacuation* paragraph 33.22 (e) that PEEPs should be required by law, reflecting GTI's view that the RRO does not necessarily require the preparation of PEEPs.

[45] Email 20.3.17 Lee Chapman (resident) to RBKC "*There are many people in this building who are immobile, very young or suffer from mental health issues, I would ask for your undivided help in getting this matter resolved for all interested parties.*" {**RBK00002094**}

[46] TMO's 2013 *Fire Safety Strategy* which purported to evidence compliance with RRO and by paragraph 24 and Appendix 10**:** {**TMO00830598_0014} & App 10 at {TMO00830598_0038}.** Later version dated June 2017 {**TMO10047404_0014}** was to like effect, except that the proforma PEEP was now said to be available from the H&S team rather than being at App 10

[47] Phase One Report, paragraph 26.1 – 26.7

[48] See e.g. {**CEL00000019_0002}**

6.5. **Kingspan:** Although less than 10% of Grenfell was covered in Kingspan's K15 insulation, nevertheless the role of Kingspan cannot be overstated in apparently obtaining a BS8414 test on dubious grounds in 2005,[49] prompting its competitor, Celotex, the manufacturer of the principal insulation at Grenfell, to seek to develop a product suitable for use above 18m.

6.6. **Arconic:** advertised the fact of a product being Class 0, tacitly presenting that as the UK equivalent of the European classification which concerns reaction to fire. Arconic's letter to Genius Facades in December 2015[50] indicated that whilst the product was class 0 that did not reflect its reaction when exposed to flame and gave the Reynobond PE panel as a Class E,[51] Arconic did not however explain the significance of this distinction.

6.7. **Celotex**: understood their product was most likely to be used if it had been specified at the outset, and therefore targeted specifiers and designers in addition to contractors. Celotex fully appreciated that its RS5000 product, would be more likely to be selected if advertised as Class 1 or Class 0 rather than Class D.[52] Celotex compounded the problem by advertising that the RS5000 had *"Class 0 fire performance throughout the entire product…"*[53] whereas in fact class 0 is defined by ADB as a classification for linings/surfaces only. Celotex did not obtain a Euroclass fire rating for RS5000 until April 2017, and even once they obtained it (Class D) were loath to advertise it.[54] Celotex's evident amusement at the deceit it was practising is best captured by its logo (a hot air balloon) and strap line: *"reaching new heights"*. Celotex's knowledge of the extent of its deceit is most succinctly summed up by its head of technical:

> *"We have only heard of one NHBC job where the inspector said that it was OK to use any insulation up to 18m and only above 18m did it have to be non-combustible or in line with the requirements of BR135. Clearly wrong.* ***The fire hasn't got a tape measure and if it starts at the ground floor it will love to race up the first 18m. Just shows you the smoke of confusion out there***"[55] (emphasis added).

6.8. Celotex tested RS5000 in a way its senior executives knew (from September 2014) not to have been a legitimate BS8414 test (a test intended to justify the use of RS5000 over 18m). [56] They

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[49] A BR 135 classification certificate for the test was not achieved until a decade later {**KIN00000134**}. NB, on its face the 2005 test appears unlikely to have passed (absent manipulation of some sort) as the speed at which the flames reached 4m height (10 minutes into the test) point suggests they would have overtopped the rig within the hour) p106 of draft test report {**BRE00005769**}

[50] Wehrle letter to Genius Facades {**ARC00000699}**

[51] **{ARC00000699}**

[52] **{CEL00008861}**

[53] {**CCL00001170_0042**}

[54] **{CEL00004352}** (class D) and **{CEL00008862}** *Growing awareness Celotex Rs5000 has 1 test and no published Euroclass* **{CEL00008862}**

[55] Email thread 2.4.15 SIG and Celotex {**CEL00001406**}

[56] The BS8414 test in May 2014 and subject to a BR 135 Classification report certifying it met the BR 135 Performance criteria 11.8.14 {CEL00002375}. The test had been manipulated by Celotex by the use of magnesium oxide ("MgO") (a material typically used to line

knew the test was used to market the product. Despite that, instead of recalling the product, as they should have, Celotex actively promoted the product for use on Grenfell and indeed proposed to use Grenfell as its flagship project to advertise RS5000.

6.9. **Siderise:** marketed its product as fit for use in rainscreen cladding systems[57] but was well aware that the construction in which tested (between two slabs of concrete) was not a typical construction for rainscreen cladding.

7. Fundamentally Flawed Building and Product Testing Regulations

7.1. The relevance of the ADB guidance[58] is that it arguably created a degree of confusion as to the relevance of Class 0, possibly leading to the (admittedly careless and unjustified) perception that Class 0 was sufficient, even though ADB defines Class 0 as a classification only of wall and ceiling linings,[59] and the tests which underlie a Class 0 rating (even though such classification does not flow directly from any test) measure only surface heat release and flame spread (paragraph 7.3 below). Had anyone troubled to address compliance, this would have been readily understood. In the case of some of the Grenfell contractors, it patently was understood.

7.2. The fundamental problem with the Building Regulations and accompanying guidance is that they have developed reactively in response to disasters or environmental initiatives, rather than being a product of thorough and cohesive review at any point, despite the many government consultations and research projects. When the Euroclass reaction to fire gradations A-F were introduced into ADB in 2000, Class 0 should have been abolished.[60] It is an outdated and confusing classification which relates solely to surface spread of flame but gives no indication of reaction to fire. Class 0 has instead created a completely false sense of security amongst industry at large, and possibly designers and contractors at Grenfell.

7.3. ADB appears to be designed to avoid fire spreading from one building to another[61] rather than contemplating fire breaking out from the building itself onto the façade. The failure to

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furnaces; not a product typically used in construction) to reinforce the cavity barriers behind the thermocouples which were at locations critical to passing/failing the BS8414 test. The MgO used at the thermocouples was concealed and it is clear that some Cx individuals involved in the test knew the successful BR 135 classification report had been achieved by deceit. Others found out subsequently but at a time when Grenfell could still have been saved from the product: see Debbie Berger annotation "*WTF? 6mm MgO + 8mm marley eternity panel*" to indicate the presence of MgO on the 27.10.14 report {CEL00008507_0013}

[57] {**SIL00000228**}

[58] Given that Grenfell has already been held non-compliant, and that the guidance is not mandatory

[59] The exception to this is that *if* the surface of a composite material is limited combustibility, then the Class 0 rating which applies to the surface will apply to the whole product (ADB, Appendix A, paragraph 13: {**CLG00000224_0122**}). But importantly this does not render a Class 0 product a product of limited combustibility. See Section 13 below.

[60] Radar Report 23.5.00 {**CLG00000949**}, {**CLG00000950**}, {**CLG00000951**}; BRAC working party meeting 15.04.02 {**CLG00000720**}.

[61] A reaction to the Great Fire of London and latterly World War II and see Professor Torero Phase One Report lines 824-829 {**JTOS0000001_0027**}

recognise this, and to increase fire resistance of materials to keep pace with the increased insulation requirements, is a fundamental flaw in the Guidance to the Building Regulations, which is a wholly outdated document that remains based, insofar as fire resistance of external walls is concerned, on a 1946 document, contains no means of calculating the fire load resulting onto the façade as a result of the increased levels of insulation, and has inadequate requirements for fire resistance to mitigate this increased fuel load. Government knew from 2000 onwards that the Regulations needed overhaul as the National system did not equate to the European fire classification, was[62] testing a fundamentally different thing, namely flame spread and heat output on the external surface rather than reaction to fire, and led to confusion. It was understood in April 2002 that Class 0 was of uncertain utility.[63] Nevertheless, no amendment to ADB to remove this criterion /abandon these national tests which lead to a Class 0 classification has been made. By spring 2015 at latest,[64] Government knew all of the above, but possibly driven by its July 2013 aspirations to become a world leader in low carbon technology and reduce carbon emissions by 80% by 2050,[65] did nothing.

7.4. Ironically Grenfell's concrete structure, the only part of it to perform better than expected in the fire, is likely to have benefited from the reactive nature of the Building Regulations to the Ronan Point collapse, prior to Grenfell's construction.

7.5. The whole regime for the fire testing of products is unsatisfactory for various reasons. It is confusing for designers and specifiers. The regime currently in place is capable of manipulation by product manufacturers as we have seen in the case of Celotex (see paragraph 6.8 above and to be fully explored in module 2).

8. RBKC's Desire for Sustainability Funding: The Environmental Imperative

8.1. The desire to offset costs of the refurbishment by obtaining funding for environmental sustainability (initially ECO funding, but subsequently the Green Deal appeared more lucrative and was pursued until the Government withdrew it) was reflected in the Design Team's imperative to win a BREEAM award, and both that and the ability to obtain ECO funding formed part of Rydon's tender submissions,[66] with the obligation to pursue ECO funding being

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[62] For materials below limited combustibility

[63] It was well understood by the Building Regulations Advisory Committee in April 2002 that the fire propagation test BS476-6 had existed since 1963 and no-one now knew how the Index criterion I had been stipulated at a value of not more than 20, albeit they believed it was perhaps selected to avoid certain poor performance products. BRAC minutes of meeting 15.4.02 paragraph 6.7 {**CLG00000720_0003**}

[64] Seven BRE 2015 workstream reports led by BRE (but with a large industry steering group for each study) prepared for Brian Martin of the then DCLG: *"Compartment size, resistance to fire and fire safety research"* https://www.gov.uk/government/publications/compartment-size-resistance-to-fire-and-fire-safety-research

[65] {**RYD00094249_0036}**

[66] Rydon's tender 3.12.14 **{RYD00094244_0089}** suggested Harley had the relevant qualifications necessary to achieve ECO funding (PAS 2030 accreditation). In fact, that proved not to be true {**RYD00039491}**

written into Rydon's Pre-construction Agreement and the ultimately agreed contract. In the event, it appears no ECO funding was obtained.

8.2. This imperative to obtain funding for external wall insulation and a BREEAM award, undoubtedly led (with much encouragement from the manufacturer, Celotex) to the use of combustible insulation at Grenfell[67] despite that being a flagrant breach of Building Regulations and ADB on a building over 18m. The over focus on sustainability, an ostensibly laudable aim, but in this case driven in large measure by a desire for funding, literally fuelled the inferno which ensued. Combustible insulation results in fires reaching much higher temperatures, and flashover much more rapidly than they otherwise would.

8.3. This over focus on sustainability at the expense of fire safety is reflected nationally in the Building Regulations, as the understandable desire to achieve environmental targets, reflected in significantly increased insulation requirements in Approved Document L "**ADL**", has not been mitigated, as it should have been, by improved fire resistance requirements in ADB.

II. MODULE ONE: THE PRIMARY REFURBISHMENT

9. Initial Capital Investment Decision

Reasons for the Decision

9.1. A collection of factors drove the initial decision to refurbish Grenfell Tower.[68] There were concerns, expressed by KALC's architects SE, that Grenfell Tower created a poor-quality ground floor frontage for KALC. TMO had expressed concern that KALC rendered Grenfell (one of TMO's "*worst property assets*") a "*poor cousin to the brand new facility being developed next door*". RBKC aspired to develop the lower floors of Grenfell into new flats as part of the *Hidden Homes* initiative. Years of neglect left Grenfell with "*significant investment needs*":[69] the heating and hot water system had reached the end of its life and required a £2.5m investment imminently; the original 1974 windows required replacement[70] and energy efficiency required improvement.[71]

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[67] Whilst it had been made clear that ECO funding would only be available if Rockwool and Rockpanel were used, once the bottom fell out of the Eco grant funding market, there remained, throughout the design process the desire at RBKC to offset the refurbishment expenses by some form of grant funding: see the ultimately entered five year contract entered by RBKC with Cenergist {**ART00003468**} at item 1.3.

[68] See generally, email from Jane Trethewey of RBKC dated 2.11.11 and response from Mark Anderson of TMO on 24.11.11 both at {**TMO10000965**}

[69] {**RBK00026127**}

[70] Partly for energy efficiency, but also due to safety concerns (see Laura Johnson's report of 9 February 2012 at {**RBK00026127**} and because residents were concerned about the degree of noise which would be caused by KALC {**RBK00026127}** and {**RBK00002316**}

[71] There had been complaints from residents about unbearably hot conditions in the building during the summer: see e.g. {**RBK00002316**} While partly due to the way in which the heating and hot water system functioned (see {**TMO10037654**} at item 7), this was also symptomatic of a lack of insulation in the building.

9.2. Improving Grenfell's *appearance* was regarded as important to the success of RBKC's KALC project. Initially, RBKC and TMO also considered implementing a shared CHP[72] heating and hot water system which would have been unaffordable using funds allocated to KALC alone.

9.3. There were also perceived advantages to TMO as an organisation. The opportunity was seen as one that could "*enhance the TMO's profile*" and "*complement and support the TMO's growth aspirations*".[73]

9.4. For both RBKC and the TMO, it appears complaints from residents also drove the decision to refurbish. Complaints centred on the impact of KALC and lack of investment into the estate, including the need to replace the windows and the inadequate hot water system.[74]

9.5. Leadbitter, Rydon and SE clearly saw the project as an attempt to mollify residents' concerns. Leadbitter, originally in line to carry out the Refurbishment, noted: "*we are re cladding a [sic] existing residential tower to satisfy the tenants as [RBKC] are going to "annoy" with 2 years site works while we build an Academy and a Leisure Centre*".[75] On Rydon being asked to give a "*price check*" for the scheme, it commented internally that Grenfell appeared to be "*a political nightmare…it looks as if they may have been forced into doing something with the tower"*.[76] SE described the "*political context for the development and the development of the adjoining site*" as "*very sensitive*".[77]

9.6. This is also apparent from the TMO's own documents.[78] RBKC was keen to "*report positively"* to the residents of the decision to refurbish Grenfell, even if specifics had not been firmly proposed. [79]

Over-cladding

9.7. From the outset, over-cladding coupled with a new heating system was seen as the way to satisfy many of RBKC and TMO's objectives.[80]

9.8. It is clear that environmental sustainability and energy efficiency was prioritised,[81] albeit that

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[72] Combined heat and power system. This was not ultimately pursued.

[73] Mark Anderson's report to the Operations Committee, January 2012 {**RBK00000360**}

[74] See e.g. {**RBK00002316**} and {**TMO10001346**}

[75] {**LBI00002536_0002**}

[76] In April 2013 **{RYD00001193}**

[77] Email from Bruce Sounes (SE) to Geof Blades (CEP) dated 10.4.12 {**CEP000000070**}

[78] Mark Anderson's report to the TMO Board meeting on 29 March 2012 noted: "*RBKC recognises that the KALC Project will have a significant effect upon the residents of Grenfell Tower… and is minded to fund an HRA Regeneration project on the estate."* {**TMO10001096**}

[79] Email from Jane Trethewey of RBKC dated 22.11.11 {**TMO10000965_0002**}

[80] {**TMO10000965**}.

[81] See Mark Anderson's email of 24.11.11 {**TMO10000965**}. See further {**SEA00003546**}: TMO and SE discussed *overall carbon reduction strategy* in the context of overall cost of the scheme and the need to keep the works within HRA (Housing Revenue Account) budget. 29.2.12; and {**SEA00003574**} demonstrates the requirement for external wall to provide "*significant energy efficiency (including the windows)*"

this may at least in part have been motivated by the desire to offset the cost of the refurbishment by some form of eco-funding. This sustainability imperative would have disastrous consequences for the outcome at Grenfell.

9.9. Over-cladding was also seen as a solution to Grenfell's appearance, offering a "*cladding design that links to the design of the Academy, so that the visual appearance of the area is significantly improved*."[82] The cladding's appearance became an obsession of RBKC[83], TMO, and their designers, SE.

Joint Procurement

9.10. RBKC's original intention had been to progress works to Grenfell at the same time as KALC. This was partly due to the contemplated shared heating and hot water system. RBKC also saw "*clear cost benefits"* to proceeding as one scheme and was "*keen not to lose any of the advantages of joint procurement, commissioning and efficiencies that could be gained for doing the projects at the same time*".[84]

9.11. In late 2011, "*very short timescales*" were driving KALC.[85] To pursue the two projects at the same time entailed a "*mad timetable*"[86] within which TMO was to formulate the objectives for Grenfell.[87] TMO expressed concern about carrying out a great deal of assessment of the options for Grenfell in a compressed time.[88]

9.12. Objectives and an indicative cost estimate (£5.5m) were formulated quickly for a recommendation to TMO in January 2012.[89] The imperative for speed continued beyond RBKC Cabinet approval.[90] The tight timescale inevitably limited both the scope for (i) adequate consideration of Grenfell's long-term needs and priorities;[91] (ii) the scope for

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[82] {**TMO10000965_0004**}. See the aesthetic benefits listed by Laura Johnson in her report to RBKC Cabinet {**RBK00028521_0008-9**} at paragraph 6.3.3

[83] **{IBI00001622}**

[84] Email from Jane Trethewey of RBKC dated 2.11.11 {**TMO10000965_0003-4}**; Email from Laura Johnson of RBKC dated 5.12.11 {**TMO10037519_0001-2}**

[85] Hidden Homes Meeting, 2.12.11 {**RBK00000347**}

[86] Email from Laura Johnson of RBKC 5.12.11 {**TMO10037519_002**}

[87] RBKC required rough estimates of cost for cladding, heating and hot water, and double glazing by January 2012. They also needed to know how KALC would be heated by February 2012. See email from Laura Johnson of RBKC dated 5.12.11 {**TMO10037519**}

[88] Email from Mark Anderson of TMO {**TMO10037519_0002-3**}.

[89] Mark Anderson's Report to the TMO Operations Committee {**RBK00000360**} Thereafter, on 29.3.12 the TMO Board approved a recommendation to submit an HRA Regeneration Bid for Grenfell Tower in the sum of £6m (ex VAT): {**TMO10001096**} and {**TMO10037654**}. On 2.5.12, the proposal was approved by RBKC Cabinet: see e.g. report to Cabinet {**RBK00028521**} and decision referenced in {**TMO10039615**} at paragraph 2.1.

[90] See {**RBK00028521**} paragraph 6.3.6

[91] Reports issued by Artelia in April and June 2013 pointed to an ill-defined and changing client brief as a contributory factor to eventual need to re-procure the project: see e.g. {**TMO10048424**} at section 2 {**_0011**} which refers to the development of the design of the project not according with best practice because it was developed "*from a series of client meetings without the design team defining a comprehensive brief addressing the project requirements, deliverables or the budget…"*

consulting with residents before formulating objectives.[92] Investment into Grenfell was ostensibly regarded by RBKC/TMO as one of the 30-year investment priorities, a "*long term"* strategy and a *"legacy*"[93] for the Borough. Those characterisations sit ill with the hasty approach, driven by KALC. Nor do they lessen any failure to give careful and measured consideration to the "*significant investment needs*" of the estate of Lancaster West.

10. Appointment of Professionals by TMO

Criteria for Selection

10.1. The design team ("**DT**") was originally selected under an OJEU procedure, presumably,[94] for its suitability to design the KALC project.[95]

10.2. The selection of that same DT on Grenfell was driven by a desire to benefit from time and cost efficiencies of running the KALC development and Grenfell refurbishment together.[96] There is no evidence that the suitability of the DT or any of its members was considered in the context of Grenfell (in which the lead consultant was plainly out of its depth[97]) nor re-appraised once apparent the two projects could not be run together.

Method of Retaining Consultants: A Circumvention of the Public Procurement Rules

10.3. From March 2012, the TMO made clear that the appointment of professionals would be "*subject to OJEU limits*".[98] The TMO's purpose was to avoid mandatory public procurement procedures[99] by keeping consultants' fees below the statutory threshold of £174,000.[100] This was to be achieved by deferring the payment of certain fees until the professionals' contracts had been novated to the eventually appointed contractor.[101] Those fees would then be paid indirectly through sums payable to the contractor.

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[92] A consultation with residents is said to have been carried out in March 2012, although the objectives of the project appear largely to have been formulated by then. The consultation is said to have received "overwhelming support" {**RBK00028521_0009**} at paragraph 6.3.5. However, meetings with residents were described by others as "unpleasant": {**SEA00003922**}

[93] There are multiple examples of the use of this language. See e.g. {**TMO10038016_0003**} section 5; and {**RBK00000360**}, section 5.

[94] {**SEA00010237}** Bruce Sounes of SE had, in his early years at SE, been involved in *"a range of educational and sports and leisure projects"* [Sounes paragraph 17 {**SEA00014273_0007}]**

[95] {**TMO10037528}** Although Claire Williams TMO did not seem too sure on 31.12.13 *"I suspect you came on board through KALC and David Gibson mentioned the I-EASY (sic) framework?* {**SEA00010236}**

[96] To ***"****maximise any opportunities that may arise from joint procurement and construction"* **[SEA00003567_0002}]**

[97] Note that SE as Lead Consultant was, according to Sounes contemporaneously, **{SEA4X03567_0001**} "***a little green on process and technicality so I propose some rapid CPD, MF being my first port of call"*** which in his statement **{SEA00014273_0032}** he says was *"because Studio E as a practice, had not previously been involved in high rise residential heating renewal nor the overcladding of occupied buildings"*.

[98] {**TMO10037569**}

[99] Public Contracts Regulations 2006 and see {**SEA00003624}**

[100] This is how it was understood by the DT too: see {**SEA00003624**}. See also the minutes of the Design Team Meeting on 18.7.12 {**ART00000169**}.

[101] See the intention to defer expressed at {**ART00000169**} and the execution of this intention at {**SEA00007317**} and {**ART00000698**}.

10.4. The circumvention of the procurement rules matters because as SE acknowledges,[102] and as is clear, SE is unlikely to have won the project through a procurement, and had it not been awarded the project, an architect with experience of high rise refurbishments of buildings and cladding might have been appointed, possibly with a better outcome.

11. Procurement of the Contractor

Leadbitter's Initial Involvement

11.1. Leadbitter was appointed by RBKC for KALC following a procurement process under the IESE Framework Agreement.[103] During that process, contractors were informed by a clarification that works to Grenfell would be carried out as part of the same project but under a separate contract with TMO.[104] Although there are indications in mid-2012[105] that contractor procurement options continued to be evaluated by Artelia and SE, by the end of November 2012, the TMO had approved a pre-construction agreement with Leadbitter to accommodate work up to a value of £250,000 by RIBA Stages D to F.1.[106]

11.2. On 8.1.13, the TMO Board approved a Stage D Cost Plan produced by Artelia and agreed to progress to award Leadbitter a contract within that budget.[107] By 10.1.13, Leadbitter was concerned about the level of cost approved by the TMO.[108] In February 2013 there was a "*significant cost discrepancy*" between Leadbitter and Artelia's cost plan.[109] This began a protracted period of approximately 6 months of discussions between TMO/Artelia, and between Artelia/Leadbitter, during which Artelia advised TMO that Leadbitter's cost projections were too high; they were not providing transparency over those costs, and TMO demanded justification of cost differences between Leadbitter and Artelia on cost and evidence that Leadbitter was providing value for money.

11.3. By the end of April 2013, the difference between Leadbitter and Artelia had reduced to approximately £680,000 and TMO, following advice from Artelia,[110] decided to continue with Leadbitter subject to a "*value engineering*" exercise to bring the cost down to the construction budget of £8.5m.[111] However, following a meeting on 13.5.13 between TMO and Laura

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[102] Sounes paragraph 63 {**SEA00014273_0032}**

[103] See https://www.iese.org.uk/news/new-framework-heralds-even-more-efficient-construction-public-services-south-east See also {**TMO10001755_0003-0006**}.

[104] See Artelia Programme Board Report to the TMO dated 7 November 2011: {**TMO10001755_0004**} at section 3.

[105] See in particular the minutes from design team meetings held on 24 May 2012 {**SEA00004295**} and 7 June 2012 {**SEA00004741**}.

[106] Minutes of Design Team Meeting on 22 November 2012 {**ART00000524**}.

[107] {**TMO10003033_0006**} at item 5.1 and {**TMO10002755**}

[108] Design Review Meeting minutes: {SEA00007080}. Leadbitter had been asked to confirm whether or not they could meet the budget by mid-January 2013 {**LBI00000031**}.

[109] Email from Alun Dawson (Artelia) to Bruce Sounes (SE) of 5 February 2013 {**ART00000698**}

[110] Artelia Status Report dated 23.4.13 {**TMO10038903**}

[111] Minutes of Project Review Meeting on 26.4.13 {**TMO10038996}**

Johnson of RBKC, and a further meeting between Artelia and TMO on 21.5.13, TMO gave instructions (including that "*value for money*" was the key driver) resulting in a change to Artelia's previous recommendation, recommending instead that the project be re-procured through an OJEU compliant process.[112]

Rydon's Appointment

11.4. Following a recommendation to TMO on 20.6.13[113] an OJEU notice was issued on 23.8.13.[114] Only five pre-qualification questionnaires were returned.[115] Rydon's pre-qualification questionnaire was the lowest scoring,[116] but all five contractors were invited to tender.

11.5. Of the five shortlisted contractors, two withdrew. Of the remaining three contractors, Rydon's programme was the shortest, its tender was the lowest (with the other two contractors being 7.5% and 12.7% higher), and it received the highest quality score. Rydon's aluminium cladding proposal offered the largest saving. By contrast to the assessment in November 2013, Rydon was therefore recommended as having made the most economically advantageous offer.[117]

Budget and "*Value Engineering*"

11.6. At inception of the Refurbishment, it was thought that over-cladding and windows would cost some £5.5m.[118] On 2.5.12, RBKC cabinet approved a capital investment of £6m.[119] This budget then increased such that the Stage D cost estimate for construction cost was £8,415,000 ex. VAT.[120] The available budget at the time of the final tender report was £8.5m.[121] It appears that the scheme which TMO through Artelia put out to tender was in fact above the available budget at £10,045,000.[122] Although Rydon and Durkan came below this figure at £9,249,294 and £9,940,928 respectively, there remained a shortfall between tendered cost and available budget.

11.7. Ultimately, Rydon's tender of £9,249,242 was reduced by some £800,000 down to £8,556,133 to reflect *value engineering* which had been required by TMO.[123] The amount of the reduction had been demanded by TMO[124] in mid-March 2014, just prior to Rydon being notified it was

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[112] Artelia's Addendum to the Status Report dated 18.6.13 {**TMO10039517**}. A draft dated 24.5.13 is at {**ART00009012**}
[113] {**TMO10002755}**
[114] {**RYD00001223}**
[115] {**TMO10039699**}
[116] {**RYD00001408**}
[117] Artelia's Final Tender Analysis Report dated 17.3.14 {**ART00002205**}
[118] Report to the TMO Operations Committee, January 2012{**RBK00000360**} paragraph 4.4
[119] See report to TMO Board seeking approval to submit an HRA Regeneration Bid {**TMO10001096**} and the subsequent report to RBKC Cabinet {**RBK00000374**} at paragraph 7.2.
[120] **{ART00006161}**
[121] {**SEA00007617**}
[122] **{ART00002133_0012}**
[123] Contract analysis bound into tender **{TMO10041791_0263}**
[124] {**RYD00003300**}

the preferred bidder, and included the then proposed saving of £243,067 to reflect the change from the zinc proteus honeycomb specified to aluminium.[125] It was left to Rydon as to how to achieve such savings, subject to approval by TMO. A basic tenet of value engineering is that functionality is maintained not reduced. It is an analytical process of either increasing functionality to obtain more value for the same cost, or reducing cost whilst preserving functionality. The demand by TMO simply to reduce cost to bring the project within available budget is not value engineering; rather it was a demand for a reduction. Rydon also appears to have interpreted it that way, suggesting internally it had reduced quality to reduce cost.[126] By the time the demand for a reduction was made in mid-March 2014, there had been concern amongst the DT that Rydon may not in fact have priced the cladding and window systems specified, and Rydon was asked to confirm.[127] Nevertheless, it was the extent of this proposed saving, which attracted a 6% weighting on their tender's overall score[128] and was a greater saving by £73,000 than the other tenderer who priced the aluminium alternative, that appears to have made Rydon attractive at this stage (they were already the lowest of the three tenderers).

<u>Illegitimate Post-Tender Variation</u>

11.8. It appears that Rydon may have been told by TMO that no decision would be made on the *value engineering* or, described properly, cost reduction, until after the formal award of the contract apparently *"to avoid other [main contractors] being given the impression that they were not given equal opportunity to look at V/E".*[129] This is an improper approach to the tendering process which likely amounted to a *material change* and as such could have resulted in a successful challenge to the award once the contract was awarded on the basis of a value engineering process which other tenderers were not given a fair opportunity to participate in, and had they been, could have been successful.[130] This raises serious questions to TMO's governance and approach to the tendering process, and its willingness to seek to circumvent the rules which are designed to promote equality, transparency, fairness, and value for public money in the tendering process. This willingness was also demonstrated in TMO's approach to the appointment of the professionals (see section 10 above and paragraph 19.2 below).

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[125] {**ART00006384}**

[126] {**RYD00086654}** Blake to Bachellier re provisional sums possibly having been missed *"Thinking about this- Frank was asked to <u>take out some performance</u> which from memory was about £200k"*(emphasis added)

[127] **{ART00002133_0016}**

[128] **{ART00002133_0007}**

[129] Harris *Sales Progress Report Form* entry 2.4.14 **{HAR00010160_0006}**

[130] Under the then Regulations then in force (Public Contract Regulations 2006) and see case under European Procurement directives and European Treaty: **Wall AG v La Ville de Francfort sur-le-Main [2010]** ECR I Nyr (Grand Chamber) par 37 and **Presstext Nachrightenagentur GmbH Austria and Others [2008]** Bus LR Digest D118, paragraphs 34-37 inc: price an important condition of the contract possibly constituting a material change.

11.9. There is, however, no evidence that the budget (although occasionally referred to as *"tight"*[131]) was too low to have permitted the use of a safe cladding system. Indeed, decisions made by TMO increased some elements of cladding cost (choice of cassettes over face fixed) but this did not assist safety; quite the opposite.[132] Unless safety is understood, no amount of project spend will cure an unsafe design.

12. Roles and Interface Between Professionals

Studio E

12.1. SE was originally retained from about December 2011 by TMO as *Designer and Lead Consultant*[133] on RIBA Standard Conditions for Architect 2010 as amended by Amendment no 1, 2011 as evidenced by SE's letter to TMO dated 11.11.13 (the "**Retainer**") which terms applied retrospectively to SE's work on Stage C onwards.[134] SE's Retainer was novated to Rydon in about April 2014[135] but there was a period in June in which SE was working for both Rydon and TMO.[136]

Studio E's Obligations

12.2. **Appointment of other consultants:**

(1) By its Retainer by TMO, SE was obliged to advise on the *"need for and scope of services by consultants, specialists…".*[137] SE was also responsible for co-ordinating and interfacing any design advice received from such consultants.

(2) Under its appointment by Rydon, SE was obliged to incorporate the input of other consultants into both the scheme design and detailed proposals.[138]

12.3. **Fire Engineer: Exova.** From the outset, SE took responsibility (as required by its Retainer) for co-ordinating fire advice[139] and Crawford sought advice from Exova throughout the project as and when needed. This behaviour came naturally to SE, having retained all the consultants on TMO's behalf on KALC, including Exova as their fire sub-consultant. SE can be faulted for two key failures in relation to Exova:

(1) Failing to ensure Exova revisited its assessment of compliance with B4, External flame spread, when in mid-September 2014 SE became aware that Exova claimed it was not

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[131] 12.12.13 {**CCL00002430}**

[132] Reynobond 55 PE cassettes are class E whereas the riveted PE 55 achieve class Cs2 d0 - Lane Phase 1 Supp. {**BLAS000002_0008}**

[133] This despite the suggestion at one time that Artelia would be Lead Consultant: in the event, Artelia acted as Project Manager and EA as well as QS. Sounes paragraph 21.1 dates the time SE began work as Dec 2011

[134] Appendix D – Project Brief {**SEA00009826}**

[135] Sounes paragraph 21.2 {**SEA00014273_0009}** Terms not executed until 3.2.16 {**RYD00094228}**

[136] Sounes paragraph 38 {**SEA00014273_0016}**

[137] RIBA Services 2010 **{SEA00009824_0005}**

[138] Paragraph 24 Schedule A of SE's Appointment to Rydon {**RYD00094228_0010}**

[139] Sounes paragraph 69 {**SEA00014273_0035**}; Meeting 28.3.12 {**MAX00000008**}at item 4.

aware of what cladding system was proposed,[140] thus making it clear that Exova's last iteration of the Outline Fire Strategy was flawed insofar as it assumed *"the proposed changes will have no effect on the building in relation to external fire spread but this will be confirmed by an analysis in a future iteration of this report"*.[141]

(2) Failure at any time thereafter to ensure that Exova were properly instructed (by Rydon) and asked to address the cladding system's impact on B4 compliance instead of obtaining piecemeal *free advice* from Exova[142] which was patently being sought and received against incomplete information.

12.4. **Disability Consultant.** Similarly, it fell to SE to consider whether to instruct a disability consultant as had been done on KALC. [143]

(1) SE did consult with a disabled access consultant, Jane Simpson, concerning access and the removal of the ramp, but there is no evidence that SE required consideration of specialist input on means of escape for the disabled, including whether there should be an evacuation lift, despite the significant proportion of the residents who fell into this category.

(2) On the contrary, SE appears to have simply taken instructions as to what was required from others or made inappropriate assumptions namely that refuge would be taken by those with restricted mobility in other flats on the same floor.[144]

(3) Furthermore, SE does not seem to have questioned Exova on this point either, since, unlike the Kensington Leisure Centre Outline Fire Strategy (which provided for refuges and an evacuation lift[145]) the outline fire strategy for Grenfell made no reference to the evacuation of the disabled whatsoever.

12.5. **Responsibility for Building Regulation Compliance:** In its role as Lead Designer for TMO, SE was obliged to prepare a design which complied with relevant legislation. The work necessary to ensure that should have been *well advanced before any serious design work starts.*[146]

12.6. The design development of the concept design should have occurred within RIBA work stages D and E:

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[140] **{EXO00001640}**
[141] **{TMO00828399_009}**
[142] **{RYD00018337}**
[143] Sounes paragraph 73 {**SEA00014273_0035**}; email from Markus Kiefer (SE) to James Lee (Exova) dated 10.04.12 {**SEA00003957**}
[144] {**SEA00006551**}
[145] **{RBK00015703_0007}**
[146] Hyett paragraph 3.2.2 **{PHYR0000003_0006}**

(1) During the Stage D *design development* phase carried out for TMO, SE was tasked with *"Investigating the effect of statutory standards and construction safety on Concept Design"*.[147]

(2) During Stage E, *Technical Design*, SE was obliged to produce tender documentation[148] defined as including *"Preparing technical designs and specifications sufficient to co-ordinate components and elements of the project including information for statutory standard and construction safety"*. During Stage E, SE produced the NBS Specification[149] against which Rydon tendered. The products SE specified should have been compliant.

12.7. **Post-Novation to Rydon.** Once novated to Rydon, SE's role comprised:

(1) Co-ordinating Building Regulation approval on behalf of Rydon (which in turn was to obtain "*all statutory consents to enable work to be completed in accordance with [the NBS Specification]"*[150]*)* and further required SE to *"seek to ensure that all designs comply with the relevant statutory Requirements"*.[151]

(2) Co-ordination of design by sub-contractors. SE had responsibility not only for co-ordinating subcontractors, including Harley's design, but also examining suppliers' drawings and details, with particular reference to tolerances and dimensional co-ordination.[152]

(3) Responsibility for selection of products/materials. SE had responsibility to Rydon for the suitability and compliance of any specific products it chose to specify[153] and by the same token any products specified by others (Harley) shown on drawings which SE then approved.

12.8. **Overlapping contractual obligations not a defence for SE.** It is not any defence to SE's failure to properly investigate compliance that a specialist sub-contractor and/or Rydon was obliged to carry out the development of and/or be responsible for the detailed design of the cladding.

(1) The obligations SE owed to both TMO and to Rydon to design are not in any way reduced by the fact of Rydon's design obligations to TMO, rather they run parallel.

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[147] RIBA Services 2010 incorporated into the Retainer at Appendix B {**SEA00009824}**

[148] See Appendix D *Project Brief* **{PHYR0000003_0005}**

[149] First version 29.11.13 **{TMO10040461}** revised (doors) {**SEA0000069}**

[150] JCT Design & Build Contract 2011 clause 2.1.3 as amended {**TMO00832630_0018}**

[151] Paragraphs 7 & 8 of Schedule A to SE's Appointment to Rydon {**RYD00094228_0009}**

[152] Ibid, Clause 27 {**RYD000094228_0010}**

[153] Schedule of architectural services items 11&12 {**RYD0004228_0000**}

(2) In any event, by taking upon itself the specification of specific brands of cladding and insulation products, SE has in one sense arguably reduced the contractor's design obligation, subject to the fact that a competent design and build contractor (and in turn sub-contractor) must, in order to develop and own a design, first understand the basis of the design as it is so far developed at the point he becomes involved. Rydon/Harley should have identified that the design was non-compliant and then were under an implied duty to warn that it was not.[154]

Overview of SE's Key Compliance Failures

12.9. **Statutory code evaluation.** SE's key compliance failure was not carrying out an early evaluation of the Building Regulations and ADB. Mr Hyett (the Inquiry's expert architect) considers that SE should have produced an *"indicative"* design[155] but failed to do so. The production of an early indicative design would have indicated the need for limited combustibility insulation and the correct positioning of cavity barriers both around windows and in cladding voids (albeit that cavity barriers would not have been effective within metal rainscreen cladding).

12.10. **Design development and approval of drawings.** Thereafter, SE failed in its design development both in specification (see paragraphs 12.12 and 12.13 below) and design development in failing to work up the design to a sufficient level of detail to identify compliance failures: SE only ever produced scale 1:20 drawings whereas it should have produced a smaller scale set of 1:5 drawings of the kind used for construction.[156]

12.11. SE also approved Harley drawings which specified non-compliant insulation (combustible Aluglaze, and TP10) claiming its approval of drawings was essentially confined to the aesthetic,[157] but Hyett rejects this categorically.[158]

Production of Employer's Requirements and Tender Documentation: SE's NBS Specification

12.12. During Stage E, SE produced the NBS Specification[159] against which Rydon tendered. In a very real sense, SE dictated the outcome of the Refurbishment, in that the die was initially cast

[154] **Plant Construction v Clive Adams & Associates (No. 2) [2000]** BLR 137
[155] Hyett paragraph 3.1.11 **{PHYR0000003_0005}**
[156] Hyett paragraph 3.10.2 **{PHYR0000003_0111}**
[157] Crawford, paragraphs 41-42 and 54-55{**SEA00014275**}
[158] Hyett paragraph 3.10.3**{PHYR0000003_0111}**
[159] First version 29.11.13 {**TMO10040461**} revised (doors) {**SEA0000069}**

by SE's NBS specification, the focus of which was on aesthetics of the cladding, rather than setting performance criteria for the cladding materials (including behaviour in fire) and then leaving it to the incoming design and build contractor to select products and materials to meet those criteria. It is clear from the outset of the Refurbishment that SE was almost entirely focussed on aesthetics of the cladding, rather than any performance criteria. Whilst the longevity of the panels was considered by Sounes,[160] he appears to have given no real consideration to the behaviour of the panels in fire.[161]

12.13. SE could have produced a *performance specification* leaving the design to the contractors, and merely specifying required outputs e.g. *adequately resist flame spread*, or *all insulating materials to be of limited combustibility*, but in fact chose to produce a largely *proprietary specification* as far as the cladding was concerned (section H92[162]) namely identifying the specific brands of cladding panels and insulation required, namely *Proteus HR honeycomb rainscreen panel* for the spandrel panels and columns.[163] Proprietary specifications are usually used if aesthetics is the primary concern. The NBS specification did also contain alternative specific brand options for the cladding panels; Reynobond, Alucobond or VM Zinc.[164] Critically however, no fire performance was required of either the cladding or insulation.

12.14. There is a caveat to NBS specification allowing substitution. The introduction to Section H92[165] provided that *"The manufacturers noted within this specification are indicative and may be substituted with similar or equal alternatives"*.

(1) There may be argument as to what *similar or equal* means, but in circumstances where no fire performance criteria are specified, but instead branded products have been specified (and the fire performance of the various products specified is not uniform) it would be legitimate for a contractor to substitute the product specified with a similar looking product of broadly the same quality.

(2) In any event, we consider that none of the specified cladding brands were A2, and only one, VM Zinc was FR, but this was not an expressed requirement in the specification. We note Mr Hyett's view that the Proteus may have been A2,[166] but it is our understanding that the product was ordinarily class B, and the A2 was a non-standard product.[167]

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[160] Sounes par 264 **{SEA00014273_0112}**
[161] Sounes paragraph 377 **{SEA00014273_0153}**
[162] **{SEA00000169_0063}**
[163] H92 items 120 &123 **{SEA00000169_0005} to {SEA00000169_0066}**
[164] Section H92 {**SEA00000169_0064}** item 11.
[165] **{SEA00000169_0064}**
[166] Hyett, paragraph 4.3.31-32 **{PHYR0000004_0065}**
[167] **{RYD00004086}**

13. The Cladding System: The Regulatory Context

Interpretation of Building Regulations and Approved Document B

13.1. The purpose of the Building Regulations is for securing "*health, safety, welfare"* and other purposes, e.g. protecting the environment.[168] Approved Documents are issued by the Secretary of State or the body designated by him[169] "*for the purpose of providing practical guidance"* as to how the Regulations may be achieved. Accordingly, both the Regulations and ADB must be interpreted in a manner consistent with preserving life and safety of those in and around buildings (save if and to the extent that it is apparent the functional requirement is predominantly concerned with e.g. environmental sustainability or one of the other expressed purposes). In the case of Part B, fire, it is clear the primary purpose is the protection of life, albeit that environmental considerations are also relevant. Contemporaneous guidance at the time of the design of the Refurbishment also made clear that *"The Building Regulations relating to fire are primarily concerned with the risk to life"*.[170]

Functional Requirements of the Building Regulations

13.2. The Regulations require that the relevant building work (which includes a "*material alteration*", namely making part of a building less compliant than it was previously) is carried out in accordance with Functional Requirements contained in Schedule 1,[171] and those relating to fire are at Part B of schedule 1 for the purposes of the façade, the relevant requirements are B3(4) (prevention of unseen fire spread in structure and fabric), and B4(1) ("*External walls …shall adequately resist the spread of fire over the walls*").

13.3. The Chairman has found that the cladding was a material alteration (such that it constituted Building work falling within the Regulations)[172] and was non-compliant with B4(1) because: *"…there is compelling evidence that requirement B4(1) was not met... it is clear that the walls did not resist the spread of fire… on the contrary they promoted it…"*.[173]

The Relevance of ADB

13.4. As mentioned above, Approved Documents merely provide practical guidance as to how the Functional Requirements may be achieved; there is no obligation to follow them, and following

[168] *Building Act s1. The purpose of Building Regulations is for securing the "health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings"*

[169] (MHCLG formerly DCLG)

[170] CWCT Standard for systemised Building Envelopes {**CWCT0000046_0011**}

[171] Regulation 4

[172] Phase One Report paragraph 26.5 p 583

[173] Ibid paragraph 26.4

them does not protect the designer against a finding of non-compliance.[174] ADB reiterates this.[175]

Possible Routes to Compliance for Buildings Over 18 Metres

13.5. The relevant version of ADB[176] postulates three possible routes to compliance with B4(1):

(1) The so-called *linear* or *prescriptive* route: paragraphs 12.5-12.9 ("*External Wall Construction*").[177] This involves either:

(i) That the precise cladding system proposed should meet the performance criteria stipulated in BR135 (3rd Ed).[178]

(ii) That the cladding system proposed should utilise only limited combustibility insulation (ADB paragraph 12.7) and the external surfaces of walls should meet the provisions in Diagram 40[179] (ADB paragraph 12.6), namely the external surfaces of walls should be Class 0 or European Class B s3, d2 or better.

(2) A holistic fire engineered study (paragraph 0.30).[180]

13.6. A fourth route to compliance, namely a desktop study by a suitable UKAS accredited testing body e.g. BRE etc, stating their opinion that the proposed system would meet the performance criteria of BR 135, is offered by the Building Control Alliance (BCA) Technical Guidance Note 18, first published June 2014[181] and revised in June 2015[182] ("**BCA TGN18**")

The "*Health Warning*"[183] Contained in ADB Paragraph 12.5

13.7. Paragraph 12.5 of ADB is prefaced by what Todd[184] described as the "*health warning*":

> *"The external envelope should not provide a medium for fire spread if it is likely to be a risk to health or safety. The use of combustible materials in the cladding system and extensive cavities may present such a risk in tall buildings*".

13.8. Paragraph 12.5 then introduces the concept of meeting the performance criteria given in the BRE Report *"Fire Performance of external thermal insulation for walls of multi storey*

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[174] Building Act 1984, section 7

[175] ADB confirms there is "*no obligation to adopt any particular solution contained in an approved document if you prefer to meet the relevant requirement in some other way*" {**CLG00000224_0007**}

[176] 2010 as amended {**CLG00000224_0001**}

[177] {**CLG00000224_0095-96**}

[178] ADB paragraph 12.5 {**CLG00000224_0095**}

[179] {**CLG00000224_0097**}

[180] {**CLG00000224_0015**}

[181] {C**TAR00000025**}

[182] {**KIN00000531**}

[183] Todd Phase One Report paragraph 5.2.56{**CTAR00000001_0069**}

[184] Ibid

buildings (BR135)"[185] using the BS8414 tests (BS8414-1:2002 and BS8414-2:2005) for both over-cladding fixed to the face of the building and steel frame respectively.

13.9. BR135 in turn identifies itself[186] as providing a basis for evaluating the fire performance of a cladding system by means of the BS8414 performance standards it incorporates by reference, but it does not specify when that standard should be used, as that is a matter for the designer. As explained in oral opening submissions on behalf of the G4 in Phase One,[187] BR135 clearly depicts the mechanisms of fire spread pictorially[188] and alerts the reader to the fact that within cavities in the façade, *"regardless of the materials used to line the cavities"* flames may elongate five to ten times their normal length. There can be no doubt that paragraph 12.5 and BR135 (incorporated by reference) provide a warning to the cladding designer of the dangers of combustible material within the façade. BR135 should be the first information the specifier/designer of a façade reads. In earlier versions of ADB (starting with the first in 1985) cladding and insulation over 15m (then the tall building criterion) was expressly permitted to be combustible.[189] That changed in the 1992 version of ADB, following the 1991 Knowsley Heights fire when, by paragraph 12.7, a very similar "*health warning*" was introduced to that which exists now at paragraph 12.5, and an express requirement for insulation to be limited combustibility was introduced. These were clear signals to specifiers/designers that use of combustible materials in the façade was now regarded as dangerous.

<u>The "*Filler*" Debate: ADB Paragraph 12.7</u>

13.10. Paragraph 12.7, headed "*Insulation Materials/Products*",[190] requires that *"…any insulation product, filler material (not including gaskets or sealants…) should be of limited combustibility..."* It has been said that "*filler*" is not a reference to the core of a cladding panel. Whether or not this is so, if filler is not insulation (as Lane suggested[191]), then it is nevertheless required to be of limited combustibility, which should indicate to the specifier that it is not <u>only</u> insulation materials which are required to be limited combustibility. [192]

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[185] Third Edition {**BRE00005555**}

[186] Paragraph 2.1

[187] Transcript of Opening Statements, 5 June 2018 (Day 2), Page 39, line 9 – Page 40, line 25

[188] Section 3 {**BRE00005555_0013**}

[189] ADB 1985, page 13, paragraphs 2.7 to 2.13

[190] {**CLG00000224_0096**}

[191] Phase One Report F6.5.17 to F6.5.46 {**BLAS0000027_0055-57**}

[192] Industry groups, while recognising the lack of clarity in paragraph 12.7 appear to have understood the requirement for limited combustibility materials in the whole wall **{CWCT0000029_0002-3}** and see the BCA, NHBC and CWCT guidance (paragraphs 13.11 et seq. below and Booth Murie's guidance at paragraph 14.14 below)

Industry's Interpretation of the Four Options

13.11. Both BCA TGN18 and the NHBC's "*The Use of combustible materials within the external wall construction of buildings over 18m in height"* (March 2015 draft[193]) (the "**NHBC 2015 Note**") make clear that limited combustibility insulation and cladding panel products are required unless a BS8414 test or desktop has been carried out.

13.12. Latterly in 2016, the NHBC's "*Acceptability of common wall constructions containing combustible materials in high rise buildings*" (July 2016)[194] (the "**NHBC 2016 Note**") introduced precisely defined proposed specifications for the external wall for brickwork, timber and ACM facades. That for ACM included Kingspan K15, Celotex RS5000 and Xtratherm SR/RS coupled with ACM cladding panels *"minimum class B …with a class 0 surface spread of flame classification"*.

13.13. In any event, during the design and construction of Grenfell it was clear that ADB provided, and industry bodies agreed, that either the precise cladding system must have been subject to a large scale test or the insulation and *all key components*[195] of the façade must be limited combustibility. The NHBC 2016 Note is irrelevant to Grenfell:

(1) The note was produced in July 2016, after practical completion of Grenfell;

(2) The specification for the external wall at Grenfell was materially different from the precisely defined specification in the July 2016 NHBC note;

(3) Based on what we now know about the behaviour of PIR and PUR insulation when coupled with ACM panels, it is clear that this external wall construction would be dangerous and should not have been recommended as suitable for over 18m. The reasons for that are a question for Module 2.

13.14. The Centre for Window and Cladding Technology's ("**CWCT**") "*Standard for Systemised Building Envelopes*" (September 2008) ("**CWCT 2008**")[196] is a guide for specifiers, designers and manufacturers of building envelopes. It was incorporated by reference by the NBS specification SE drafted and therefore was or ought to have been considered by SE and the designing contractors, Rydon and Harley.[197] It made clear:

(1) The need to comply with the Building Regulations (paragraph 6.1.3);

[193] {**KIN00000514**}
[194] {**CTAR00000026**}
[195] {**CTAR00000025_001**} also picked up in the NHBC 2015 Note {**KIN00000514_001**}
[196] {**CWCT00000046**}
[197] NBS Section H92 paragraph 220 {**SEA00000169_68**}

(2) The need to address the fire load imposed by the cladding system which *"shall not be composed of materials which readily support combustion, add significantly to the fire load and /or give off toxic fumes"* (paragraph 6.2);

(3) That the specifier must identify the need for the building envelope to provide resistance to fire, and that "*Aluminium envelope systems do not normally have significant resistance to fire"* (paragraph 6.3);

(4) That "*The building envelope should be designed to limit the spread of fire. This is normally achieved by limits on the materials used and the provision of fire stops and cavity barriers…*" (paragraph 6.4). Paragraph 6.4 also offered BR 135 as an alternative method of compliance.

13.15. In relation to Class 0:

(1) CWCT 2008 made clear that Class 0 is an inadequate performance criterion for the obvious reason that it relates only to surface spread of flame is not a measure of reaction to fire:[198]

(2) Furthermore, CWCT 2008 made clear that in the case of composite materials: "*the elements as a whole must demonstrate the appropriate fire performance*" (emphasis added). Given it is clear that Class 0 relates only to surfaces/linings,[199] the designer cannot simply ignore the core of a product if s/he is to comply with the requirements of ADB as made clear by the health warning and also by ADB.

(3) The fact that paragraph 13 of Appendix A to ADB under the heading "*Internal linings"* provides that Class 0 *"…is achieved if a material or the surface of a composite product is either: a. composed throughout of materials of limited combustibility; or b. class 1…"* plainly does not result in a Class 0 material equating to a limited combustibility product/material.[200] This provision simply means if the surface of a material, or the entirety of a material is limited combustibility, then it will also be Class 0. It does not follow (and is not suggested in ADB) that the reverse is true.

13.16. In relation to composite products:

(1) Certain composite products truly are limited combustibility, namely plasterboard, as is clear from the footnote to the definition of materials of limited combustibility.[201] It is

[198] Paragraph 6.4.2.1 {**CWCT0000046_0013**} "*Class 0 relates to the reaction to flame. A more sophisticated approach would be to select materials based on their reaction to radiation".*

[199] Appendix E of ADB: Definitions {**CLG00000224_0143**} and paragraph 13 of App A of ADB

[200] It could, however, result in the manufacturer being able to claim that the material is Class 0 throughout if (and only if) the surface material is composed throughout of materials of limited combustibility. This does not apply to any of the insulations used at GT

[201] ADB, Appendix A, paragraph 9: *"Table A7 also includes composite products (such as plasterboard) which are considered acceptable and where these are exposed as linings they should also meet any appropriate flame spread rating"* {**CLG00000224_0121**}

this wording at paragraph 9 Appendix A of ADB which explains the wording of paragraph 13 of Appendix A of ADB (set out at paragraph 13.15(3) above).

(2) It is clear that ACM panels cannot be compliant with ADB/Regulations, solely because the surface of an ACM product might be Class 0 (and therefore compliant with Diagram 40). The requirements governing flame spread on external surfaces addressed at paragraph 12.6 and Diagram 40 ADB are additive to the requirement for limited combustibility material in the façade and do not override the requirements of the Regulations, namely that the entirety of the external walls should *adequately resist the spread of fire.* Clearly that purpose is not achieved by composite panel core "*with a heat of combustion close to lighter fuel*".[202] Even Arconic noted in its Phase One Opening Statement: *"It would have been obvious to anyone professionally involved in the construction of a building that, by reason of the polyethylene core, this product was not of limited combustibility".* [203]

13.17. CWCT's Technical Note 73 (2011) made clear PIR insulation had no integrity against fire or hot smoke and that *"...relatively early in a fire, the temperature of hot smoke can be as high as 500 deg C".* [204]

13.18. In other words, all available guidance, and CWCT guidance expressly incorporated by the NBS Specification made clear that:

(1) The key components of the façade including panels and insulation should be limited combustibility unless a BS8414 test of the precise system/engineering study/desktop had been carried out;

(2) Aluminium cladding systems would provide little resistance against flame, Class 0 was not a relevant performance criterion for the external envelope; rather reaction to fire was the appropriate criterion. Class 0 was not relevant except as additive to the requirement for limited combustibility.

(3) Aluminium cladding panels would delaminate in heat.

13.19. All this data was available to SE and Rydon and Harley, all of whom, collectively and individually, designed the cladding system.

<u>The Adequacy of ADB</u>

13.20. None of this should be taken as suggesting that the drafting of ADB was pellucid, nor that it is fit for purpose. It is not, as explained above. It could have been clearer and simpler and should

[202] Professor Luke Bisby, Phase 1 Expert Report Presentation (Parts 1-3) {**LBY00000189_0021**}
[203] Arconic Opening Statement {**ARC00000558_0001-2**}, paragraph 6.
[204] {**CEL00001878_0003**}

have contained an accurate means for calculating the fire load imposed on the façade. But it was clear enough for those holding themselves out as competent cladding designers (SE, Rydon and Harley) to have read and understood it. Many did not trouble to read it, and those who did appear to have understood, but not to have applied their minds properly or at all to the risks posed by the system.

14. The Cladding System: Design, Selection and Compliance

Reynobond Cladding Panels

14.1. The chronology of events leading to the selection of Reynobond cladding panels for the external façade of Grenfell is characterised largely by ineptitude, commercial self-interest and brazen non-compliance.

14.2. SE, as a practice, admits that prior to Grenfell Tower, it had not previously been involved in high-rise residential refurbishment projects, nor in over-cladding occupied buildings.[205] This perhaps explains SE's initial approach to CEP[206] in March 2012 seeking assistance, which ultimately led to the selection of Reynobond panels.

14.3. From the outset, CEP (described by Arconic as its *"approved Reynobond fabricator"*[207]) firmly directed SE towards the selection of aluminium composite cladding.[208] CEP's influence (and, by extension, Arconic's influence) did not end with SE, but extended both to Harley (with whom it had previously worked on approximately 11 other construction projects since 2004) and also to Rydon. This trio of CEP, Harley and Rydon was ultimately instrumental in ensuring that Reynobond cladding panels were selected for Grenfell, with wanton failure to ensure compliance with Regulations and the consequent risk posed to human life in the event of a fire.

14.4. From February 2013 onwards, a value engineering process provided the perfect opportunity for the trio to exercise its influence. By this stage, SE had identified as an *"obvious target"* changing the zinc cladding material to *"something cheaper."*[209] CEP promptly fed back to Arconic that "*due to the cost of Zinc rainscreen [SE] are now considering alternative material and finishes to that of zinc"* promising that "*We'll propose your full Reynobond range and finishes as alternative options."*[210] Harley meanwhile advised SE that *"their recurring experience is that budgets force clients to adopt the cheapest cladding option: Aluminium*

[205] {**SEA00014273_0032**}
[206] {**SEA00003965**}
[207] {**CEP000000014**}
[208] {**SEA00003941**}and {**SEA00003943**}
[209] {**SEA00007414**}
[210] {**CEP000000150**} and {**MAX00003490**}

Composite Material (ACM), face-fixed"[211] Rydon for its part, internally discussed how *"the basis of [the meeting with planners] is to propose the material change from 'Zinc' to 'ACM – Aluminium' cladding and the removal of the external 'window louvres' so KCTMO can achieve their maximum VE target."*[212]

14.5. The change from zinc to aluminium composite cladding was ultimately proposed at this meeting with RBKC planners, which took place on 8.5.14.[213] Following a mock-up of sample cladding panels provided free of charge by Harley and CEP, this led ultimately to the selection of Reynobond 55 PE panels, in Smoke Silver Metallic colour. The efforts of CEP/Harley in obtaining this result were noticed by Arconic, who expressly thanked both for their "*hard work and perseverance in putting Reynobond forward.*"[214]

14.6. Striking in this chronology, is the paucity of analysis of Regulations, or of any broader consideration of fire safety at all. Hyett rightly criticises both SE and Rydon. [215]

14.7. The high point of any compliance analysis probably occurred in April 2014, when Arconic provided a BBA certificate to Harley and CEP,[216] which was passed on to both Rydon[217] and SE. Each and every recipient now disclaims responsibility for proper analysis of this document:

(1) Rydon claims this would have been passed on to SE to review;[218]

(2) SE (Sounes) observes that even if had he noticed that the panels were designated as Class 0 in the BBA certificate, he would have taken this to mean that the requirements of ADB were satisfied;[219]

(3) CEP,[220] and Harley likewise, claim to have taken comfort in the Class 0 classification.[221]

14.8. The purported reliance on the BBA certificate which each culpable party now prays in aid is fundamentally misplaced. As to Class 0, it is clear that ACM panels cannot be compliant with ADB or the Regulations, solely because the surface of an ACM product might be Class 0 (see section 13 above).

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[211] {**SEA00008790**}

[212] {**RYD00004142**}

[213] Williams, paragraph 190 {**TMO00840364_0034**}

[214] {**CEP000000443**}

[215] *"A routine Design Review in line with RIBA recommended practice and compliance with ISO 9001 would have identified a the outset of the construction documentation stage of the work that due to the decision to **fundamentally change** the rainscreen cladding system a **major investigation of the Reynobond system** would be **urgently required** to test its compliance with the requirements of the Building Regulations, and the relevant guidance with the Approved Documents, most notably ADB2. **Such a review appears either never to have been carried out, or if so, not to have been carried out properly**."* Hyett, paragraph 4.4.45, {**PHYR0000004_0113**}

[216] {**HAR00005498**}

[217] {**RYD00003932**}

[218] Rydon Maintenance Limited, first statement, paragraph 159{**RYD00094236_0071**}

[219] Sounes, paragraph 386 {**SEA00014273_0155**}

[220] Blades, first witness statement, paragraph 36 {**CEP00064244_0010**}

[221] Lamb, paragraph 49 {**HAR00010419_0013**}

14.9. In relation to the specific BBA certificate provided, as Hyett notes:

(1) Only the FR sample under paragraph 6.2 appears to have met the class 0 test[222] and the panels on Grenfell were to be PE;

(2) Paragraph 6.4 made clear that *"these performances may not be achieved by other colours of the product and the designations of a particular colour should be confirmed by…a Test or assessment"*[223] the colour had not yet been selected in April 2014;

(3) Paragraph 6.5 provides *"For resistance to fire, the performance of a wall incorporating the product, can only be determined by tests from a suitably accredited laboratory, and is not covered by this certificate"*[224] which plainly were not carried out.

14.10. The BBA certificate was manifestly incapable of providing comfort as to compliance with Regulations.

14.11. SE was aware of the need to address fire safety of the cladding, this having been expressly drawn to their attention as early as March 2012.[225] Although SE purport to have delegated fire safety issues to Exova,[226] no formal advice was ever sought as to the requirements of Regulations governing the façade. This is remarkable in itself, but more so given SE's own admitted ignorance of the requirements of Regulations and the lack of appropriate advice on this issue by Exova.[227] Hyett duly criticises both SE and Rydon/Artelia for failing to ensure this *"'loose-end' of great importance"* was addressed.[228]

14.12. TMO appeared to display concern only for aesthetic qualities of the cladding products, engaging in lengthy musings with SE: "*I'm still not 100% sure that I prefer the brushed aluminium to the "battle-ship grey" painted option…"*;[229] *"really didn't like the champagne",*[230] and *"the lime green should be less neon and a more pastel shade of green/turquoise or a deeper/darker British Racing green…"*.[231] When TMO eventually had its "*Lacknall* [sic] *moment"* and sought clarification from Rydon on the fire retardance of the new cladding,[232] the request appears to have gone unanswered by Rydon. Rydon could have been assisted by

[222] Hyett, paragraph 4.4.53 {**HYR0000004_0115**}
[223] Hyett, paragraph 4.4.54 {**HYR0000004_0115**}
[224] Hyett, paragraph 4.4.61 {**PHYR0000004_0118**}.
[225] {**SEA00003624**} and {**MAX00000008**}.
[226] Sounes, paragraph 343.4 {**SEA00014273_0140**}.
[227] Including its promise that: *"It is considered that the proposed changes will have no adverse affect on the building in relation to external fire spread but this will be confirmed by an analysis in a future issue of this report."* {**EXO00001106**}.
[228] Hyett, paragraph 4.4.15 {**PHYR0000004_0103**}.
[229] **{SEA00011321_0002}**
[230] **{SEA00011321_0001}**
[231] **{SEA00011401_0002}**
[232] {**RYD00023468**}

Harley with such a query, who on 27.3.15 were openly proclaiming: *"There's no point in 'fire stopping', as we all know; the ACM will be gone rather quickly in a fire!"*.[233]

14.13. Arconic made no effort to warn the relevant parties involved at Grenfell as to the patent unsuitability of its product. Arconic's approach to such disclosure is exemplified by its obfuscatory letter sent to various parties in December 2015. [234]

14.14. It is also clear that Arconic had, by April 2016,[235] Booth Muirie's "*Guide to Designing Approved Document B2 Compliant Multi Layered Walls Featuring Rainscreen Panel Systems Form from Aluminium Composite Material (ACM)"* which states clearly that *"The 1st and most straightforward way to design a rainscreen system compliant with AD B2 for buildings over 18m is to restrict **all** significant elements of each and every layer of the wall to non-combustible and/or limited combustibility materials…This would therefore include: …insulation within the rainscreen cavity (if present); and **rainscreen panels**"* (emphasis added).

14.15. Further, as early as December 2016, Arconic openly advertised to industry that its Reynobond PE products were unsuitable for buildings over 18m high. Sounes now admits[236] that he has since become aware of an Arconic document entitled *"Fire safety in high-rise buildings"* which explains Reynobond is available in different grades (PE, FR and A2) and that *"as soon as the building is higher than the firefighters' ladder, it has to be conceived with an incombustible materials",* which according to the diagram contained therein, means FR or A2.[237]

14.16. Particularly damning is CEP (Geof Blades') evidence *"that Arconic and Deborah French were fully aware of the building size, given that they had received the relevant documents"*.[238] This is echoed in a distastefully gleeful post-fire CEP (Neil Wilson) email: *"The Reynobond quote and order acknowledgements, state Grenfell tower on them, they knew"* met by the response "*That's brilliant, thanks Neil…Irrefutable!!!!!"*.[239]

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[233] {**HAR00006585**]

[234] Purporting to explain the (critical) difference between its PE and FR products. Explaining that *"both are classified "Class 0"* when tested in accordance with the British Standard BS476 part 6&7, but when applying European standard EN 13501 Reynobond PE obtains class E; and Reynobond FR obtains class B-s1, d0. Rather than explain frankly the consequences of a class E fire rating, instead Arconic coyly says only that *"those 2 products are very different in their behavior* [sic] *when exposed to a flame."* {**ARC00000699**}

[235] {**ARC00000701**} and {**ARC00000702**}

[236] Sounes, paragraph 388 {**SEA00014273_0155**}

[237] {**SEA00014274_0252**}

[238] Blades, paragraph 48 {**CEP00064247_0010**}

[239] {**CEP000008351**}

14.17. The appalling reality of the selection of the Reynobond panels on Grenfell is the parties either knew the panels were manifestly dangerous, wholly unsuitable and likely to endanger lives in fire; or did not care for matters beyond their own commercial interests. [240]

Rainscreen Insulation

14.18. The use of Celotex RS5000 on Grenfell was a flagrant breach of Regulations and ADB. None of the possible routes to compliance (summarised above) were satisfied.

14.19. Even before the launch of RS5000 in the market, SE specified Celotex FR5000 in the NBS Specification.[241] This is a product that was *never* suitable, and was never marketed as being suitable, for use above 18 metres. There were two key drivers behind SE's selection of Celotex RS5000 for use at Grenfell Tower neither of which was safety or compliance with ADB. These were:

(1) **Thermal efficiency:** a key objective of the TMO in carrying out the refurbishment, but Max Fordham were seemingly determined to *exceed* the requirements of Approved Document L by setting a U-Value target for external walls of 0.15 W/m2k;

(2) **Aesthetics:** in order to achieve this U-Value target, SE considered that a large volume of non-combustible insulation such as Rockwool would have been required if specified. By contrast, PUR/PIR products such as Kingspan K15 and Celotex FR5000 were marketed as more thermally efficient, and therefore requiring less volume. For SE, this alone decided matters since they were loath to push out "*the cladding line any further"* for "*buildability…and aesthetic*" reasons.[242] SE and Max Fordham therefore concluded that FR5000 was the "*only type of product"* that could give the required performance within the space available.[243] Hyett however is confident that a U-Value of 0.15 W/m2k was achievable using a mineral wool product "*without undue technical difficulty…or any necessary serious compromise on the part of residents with respect to amenity…"*.[244]

14.20. Even if Hyett is wrong, SE's reasoning patently did not justify the specification (contrary to ADB Paragraph 12.7) of an insulation material which was *not* of Limited Combustibility. Again, rather than setting a performance criterion for the insulation material (including in relation to fire) SE focused purely on aesthetics. It was this fixation which led to them

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[240] *"It is my opinion that Alcoa (as manufacturers), Harley (as self-professed specialists in the application of ACP rainscreen cladding), and Exova (as specialist fire consultants), should each have been aware of the dangers associated with ACP and should, accordingly, have ensured that the product as used for the 2012-2016 Works was fully and properly tested, certified, and applied in strict accordance with its certification and with all requirements of ADB2. This they collectively failed to do"* Hyett, para 4.4.150 {**PHYR0000004_0167**}

[241] NBS, Section H92, Paragraph 776 {**SEA00000169_73**}

[242] {**SEA00005276**}

[243] {**SEA00005840**}

[244] Hyett paragraph 3.5.12 {**PHYR0000003_0024**}

specifying a combustible insulation, which was never even marketed as suitable for use above 18 metres.

14.21. Whilst SE effectively assured the use of a PIR/PUR insulation product by specifying one within the NBS Specification, Harley drove the change from FR5000 to RS5000. Harley was the focus of a targeted marketing campaign by Celotex, who regarded Grenfell as a "*must win"* project.[245] That campaign was a success and Harley, very well aware of the restrictions placed upon insulation products in buildings with a storey above 18 metres, did nothing to independently assure themselves that RS5000 was in fact suitable, or safe, for use at Grenfell.

14.22. Whilst marketing materials provided by Celotex to Harley were deplorable,[246] in that they were wilfully misleading in stating, *inter alia*, that RS5000 was "*acceptable for use in buildings above 18 metres in height"*,[247] the Celotex literature ought to have given a responsible reader pause for thought, with the notices that the "*classification*" for RS5000 applied "*only to the system as tested and detailed in the classification report"*,[248] that the "*fire performance and classification report"* for RS5000 related only to "*the components detailed above"*, and that any changes to those components must "*be considered by the building designer"*.[249]

14.23. Those responsible for selection of materials on Grenfell Tower (Rydon, SE and Harley) most certainly knew or at the very least, ought to have known, that the use of RS5000 on Grenfell was non-compliant with Building Regulations and ADB.

Window Infill Panels

14.24. The product used as window infill panels is known as Aluglaze. The product was supplied by Panel Systems Limited ("**PSL**").

14.25. Prior to the selection of Aluglaze, the panels were proposed as glass,[250] and following a complaint from RBKC that the façade appeared "*dull and lifeless"* were briefly proposed as coloured High-Pressure Laminate.[251] Again, the focus in respect of these panels was primarily aesthetic, rather than performance or compliance related.

[245] {**CEL00000556**}
[246] {**CEL00000006**}
[247] {**CEL00000013_0005**}
[248] {**CEL00000012_0003**}
[249] {**CEL00000012_0004**} and {**CEL00000013_0005**}
[250] {**IBI00000465_0008**}
[251] {**RBK00000622_0001**}

14.26. As explained in PSL's Position Statement, Aluglaze is a generic brand used for a wide range of panel compositions.[252] The predominant composition of Aluglaze panels used on Grenfell Tower was a 28mm panel comprised of a polystyrene core.[253]

14.27. In addition, some orders were made for the same panels using a Kingspan TP10 core instead of Styrofoam.[254] Kingspan TP10 is a rigid PIR board which has a Euroclass E rating.[255] As explained by Lane, these panels are a form of thermal insulation[256] and therefore ought to have been Limited Combustibility, but were not. Instead they are "*insulating core panels*",[257] which pose particular fire risks and are subject to an express set of warnings at ADB Appendix F.[258] Thus, the fire risks involved with utilising insulating core panels, and the particularly potent risk associated with such panels with a *polystyrene* core was specifically highlighted in ADB and was well known. Indeed, PSL themselves reserved such panels for projects "*where fire performance is not stated"* in which case they *"would offer a panel with Styrofoam as the core"*. [259]

14.28. These panels were selected by Harley. Kevin Lamb freely admits that the choice of Kingspan TP10 was his decision since he had "*used this product over many years without issue"*.[260] The decision to change the "P1" panel core from Kingspan TP10, to Styrofoam, originated from a manuscript amendment to the Harley Specification by Mark Stapley.[261]

14.29. Notwithstanding the specific and detailed warnings provided in Appendix F of ADB concerning these types of panel and polystyrene in particular, the Specification Notes were later approved by SE without the suitability of these materials ever being questioned.[262] In any event, SE was *specifically* warned against the use of EPS (a form of polystyrene) in the façade by Leadbitter in 2013 who noted "*…EPS is a combustible material and it is not allowed in a rain screen cladding system by Building Control…"*.[263]

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[252] {**PAN00000017**}

[253] A 25mm Styrofoam LBH-X core. Styrofoam is a proprietary name; the material is extruded polystyrene. Styrofoam LBH-X has a Class E Euroclass fire rating, {**PAN00000008**} and is not a Class 0 material; PSL Brochure "*Architectural & Composite Panels"* dated October 2014 {**PAN00000003_0004**}. This was "sandwiched" between two 1.5mm 1050A aluminium alloy sheets, the data sheet for which claims no particular fire performance, although does indicate a low melting range of 645-657 ºC. {**PAN00000002**}.

[254] E.g. {**HAR00000553**}

[255] Classification Report No. WF 349135 dated 3.3.15 {**KIN00000284**}

[256] Dr Lane, Paragraph 11.12.9 {**BLAS0000011_0040**}

[257] Dr Lane, Paragraph 11.10.1 {**BLAS0000011_0033**}

[258] Concerning their *"unique fire behaviour characteristics"* in Appendix F of ADB. {**CLG00000224_0147}**

[259] PSL Position Statement, Paragraph 2.4 {**PAN00000017_0002**}

[260] Witness Statement of Kevin Lamb {**HAR00010419_0016**}

[261] {**HAR00003866**} and latterly {**HAR00003869**}

[262] E.g. {**RYD00037104**}

[263] {**SEA00007168**}

14.30. In short, neither Harley, SE nor Rydon appear to have given any consideration to whether or not the Aluglaze panels complied with Building Regulations or ADB, which they patently did not.

Windows and Window Surrounds

14.31. The following fundamental design failures contributed to the real likelihood that once a fire in a flat was close to a window, it would break out into the cladding.[264]

14.32. **Missing cavity barriers.** SE, Rydon and Harley fundamentally failed to identify and address the need for cavity barriers in accordance with Diagram 33 of ADB. [265] This is addressed further at paragraphs 14.38 and 14.39 below.

14.33. **Highly combustible insulation in voids.** SE failed to specify how the voids around window linings at head, jambs and cill would be insulated to meet both ADL and ADB.[266] Harley's construction-issue drawings, which were issued after being checked by SE stated that insulation was "by others" [267]. A Class F insulation, Celotex TB4000, was proposed by SD Plastering[268] and accepted by Rydon.[269] There is evidence that Rydon failed to brief SD Plastering properly and failed to secure confirmation from the design team as to the applicable requirements.[270]

14.34. **Use of combustible EPDM**. A reduction in the size of the windows to enable them to fit within existing structural openings resulted in a gap which varied between 30 and 120mm.[271] This gap was sealed with an EPDM membrane: a combustible material which ignites at 379°C. This facilitated the penetration of fire into the cavity.[272]

14.35. **Existing timber and purlboard left in place.** The original internal purlboard linings and timber surrounds were left in place.[273] It appears that no consideration was given of the fire risk entailed by leaving what were combustible materials[274] in situ.

14.36. **Introduction of uPVC.** In place of the originally specified birch window reveals and cills[275] (which had a Class 1 / Class C-s3, d2 fire rating) a change to uPVC conferred a cost saving of

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[264] Lane Phase 1, paragraphs 9.7.6 {**BLAS0000009_0048**}

[265] Hyett, paragraph 4.4.130 {**PHYR0000004_0153**}.

[266] Hyett, paragraph 4.3.96 {**PHYR0000004_0098**}

[267] Hyett, paragraph 4.4.143 {**PHYR0000004_0162**}

[268] {**RYD00040719**}

[269] {**SDP00000197**}

[270] Hyett, par 4.5.21 {**PHYR0000004_0185**}

[271] {**RBK00029361**} {**RYD00026883**}

[272] Lane Phase 1, paragraph 9.3.17, 9.3.22 {**BLAS0000009_0021-22**}

[273] This was a decision driven by Rydon, ostensibly out of concern s to avoid damage to residents' window reveals (see {**JSW00000042**}) and influenced by concerns about the presence of asbestos (see {**RYD00023902**}). Leaving these in place also involved less work for Rydon.

[274] Lane Phase 1, paragraph 9.2.14 {**BLAS0000009_0009**}

[275] {**SEA00000169_0249**}

£74,244[276]. This material deforms at temperatures beyond 80°C, revealing the combustible materials surrounding the windows. Above 100°C it releases hydrogen chloride gas.[277]

14.37. In addition to these design failures, a clear picture of poor workmanship emerges. This was inevitable given Rydon had deliberately sought the cheapest possible subcontractor[278], dismissing one on the basis that they "*may be too good for what we need in refurb*".[279] Widespread resident dissatisfaction inevitably ensued.[280]

Cavity Barriers

14.38. Cavity barriers are designed to inhibit the unseen spread of fire and smoke in concealed spaces.[281] Two key locations for cavity barriers must be distinguished.

14.39. **Around the windows.** Paragraphs 9.2 and 9.3 and Diagram 33 of ADB require cavity barriers to close the edges of cavities, including around window openings. The requirements are very clear.[282] Yet both SE and Harley failed to specify cavity barriers to close the window openings. These are very serious failings.[283] There was no protection against the passage of fire around the window opening directly into the cavity behind the rainscreen cladding.[284]

14.40. **Behind the cladding.** The provision of cavity barriers here was futile. Siderise marketing material wrongly suggested cavity barriers were suited to this application.[285] But Harley knew cavity barriers would be useless[286], as did SE and Exova.[287]

The Crown

14.41. This was a neglected area of the design, but it caused devastating lateral fire spread.[288] Both SE and Harley were culpable of serious failings.

14.42. The NBS specification provided no details.[289] An SE drawing provided some indication of intent, but no elevations showing the strategy for achieving compliance with ADB and no

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[276] {**RYD00086658**}

[277] Lane Phase 1, paragraph 8.7.10-11 {**BLAS0000008_0016}**

[278] {**RYD00032519**}, {**RYD00088777**} and {**RYD00088726**}

[279] {**RYD00029476**}

[280] {**RYD00051331**} and {**TMO00840273**}

[281] Requirement B3(4) of the Building Regulations 2010 and section 9.1 of ADB {**CLG00000224_0082**}

[282] Siderise even specifically highlighted for Harley that this was a "*weak link*" {**SIL00000024**}. See also the warning given in the BBA certificate for the Reynobond panels: Hyett, paragraph 4.4.63 {**PHYR0000004_0119**}

[283] Hyett, paragraph 4.3.68 {**PHYR0000004_0079**} and paragraph 4.4.130 {**PHYR0000004_0153**}

[284] Hyett, paragraph 44.136{**PHYR0000004_0158**}

[285] {**SIL00000228**}. This showed cavity barriers used in ventilated rainscreen cladding facades, but offered no test certification in support of that use. The tests carried out by Siderise were based on a product inserted between concrete lintels, which is not comparable.

[286] {**HAR00006585**}

[287] {**EXO00001434}**, {**EXO00001347**}

[288] Phase One Report, Volume 4, paragraphs 23.55 to 23.57

[289] Stating only "*MAJOR NONSTANDARD COMPONENTS 'CROWN' – Manufacturer TBC"* **{SEA00000169_0067}**

horizontal cavity barrier to close the top of the columns or the parapet at roof level. [290] SE's design was inadequate and insufficiently thought through. [291]

14.43. The absence of horizontal cavity barriers at the top of the cladding was a serious failure on the part of Harley.[292] The vertical cavity barriers to the columns simply stopped before reaching the top, allowing uninhibited lateral fire spread.[293]

15. Fire Strategy: Exova

15.1. Exova's failings were egregious. Each issue of its Outline Fire Strategy was a missed opportunity to prevent a fire on the scale of that which eventually occurred.

15.2. In all three issues of its Outline Fire Strategy, Exova stated in relation to compliance with Functional Requirement B4: "*It is considered that the proposed changes will have no adverse effect on the building in relation to external fire spread but this will be confirmed by an analysis in a future issue of this report.*"[294]

15.3. This sentence conceals a number of serious failings. Exova had failed to analyse the external wall construction proposals and was therefore in no position to assert the absence of any adverse effect. The sentence provided no guidance or performance criteria to assist the design team, the client or the contractor in relation to the choice of overcladding system. Crucially, the promised "*analysis in a future issue of this report*" never came. External fire spread was never analysed properly, or at all. Even once Exova were demonstrably aware of the external wall proposals, they took no steps to correct this statement.

15.4. Dr Lane's expert report on fire safety engineering is damning of Exova's performance and speaks for itself.[295] She expresses the view that there is evidence of "*serious incompetence*"[296] and "*very serious professional negligence*"[297] on the part of Exova.

15.5. These are not isolated failings. The evidence suggests that they are symptomatic of a wider cultural problem at Exova. Two facets of this which are particularly worthy of exploration during Phase Two. First, a willingness to accept client instructions that ought to have been questioned. An intention to make "*an existing crap condition worse*" and an instruction that "*no sprinklers wanted*" was accepted rather than challenged.[298] Second, the Building Control

[290] {**SEA00002551**}
[291] Hyett, paragraph 4.3.81 {**PHYR0000004_0090**}
[292] Hyett, paragraph 4.4.130 {**PHYR0000004_0153**}
[293] Hyett, paragraph 4.4.131 {**PHYR0000004_0154**}
[294] Issue 1 {**EXO00000519**}, Issue 2{**EXO00001758**} and Issue 3 {**ART00008213}.**
[295] {**BLARP20000003**}
[296] Lane, paragraph 6.7.12 {**BLARP20000003_0162**}
[297] Lane, paragraph 6.5.8 {**BLARP20000003_0148**}
[298] Email from Cate Cooney to Andrew Martyn (both Exova) dated 17.08.2012 {**EXO00001579**}.

process was treated as an obstacle that needed to be surmounted, rather than an opportunity to ensure that the building was safe. As to the latter, fire safety regulations were treated as matters that could be limited by debate and argument, rather than guidance which needed to be complied with in spirit as well as letter.[299] Rather than flagging up issues with Building Control, there is evidence of an attitude of seeking to avoid Building Control "*picking up*"[300] on things and seeking to "*massage*"[301] the presentation of aspects of the design.

15.6. Exova appears to have seen its role as one of advising on the BCO's "*likely attitude*" and an ability, potentially through contacts,[302] to procure BCO acceptance of proposals.

15.7. The sheer degree of incompetence and disinterest shown by Exova in relation to this project inevitably reflects upon those who allowed Exova's failings to occur and continue unchecked, most notably SE, Rydon and Building Control. At no point did SE instruct Exova, or suggest to anyone else that Exova be instructed, to provide a proper analysis in relation to Requirement B4, even once the specification of the over-cladding system had been settled upon. Notwithstanding the absence of any analysis in relation to requirement B4, Rydon deliberately and unjustifiably chose not to engage Exova.[303] Its reluctance to do so appears to have gone unchallenged by SE.[304] The absence of any proper information or analysis in relation to compliance with requirement B4 appears, inexplicably, never to have been raised by Building Control.[305]

15.8. None of this is to minimise Exova's own abject performance. But in seeking to excuse their own failings, neither SE, nor Rydon, nor RBKC Building Control can be heard to rely upon the absence of warning or cautionary advice about the over-cladding system from Exova. By their own conduct, they contributed to that state of affairs.

16. Building Control

16.1. A Building Control Officer ("**BCO**") provides the last line of defence against the construction of an unsafe building. For the residents of Grenfell Tower, RBKC Building Control provided no defence at all. It failed the residents completely and bears a significant share of responsibility for the disaster that followed.

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[299] A prime example of this is Mr Ashton's email of 24.10.13, already alighted upon above, which refers to a colleague's identification of a non-compliance as "debatable" {**EXO00001444**}

[300] Email from Mr Ashton, dated 24.10.13{**EXO00001444**}

[301] Email from Ms Cooney dated 17.08.2012 {**EXO00001579**}

[302] Email from Ms Cooney dated 17.08.2012 {**EXO00001579}**: "*LABC building control Kensington and Chelsea – do we have any contacts there?*"

[303] See in particular the email from Simon Lawrence to Neil Crawford of 19.09.2014, challenging him regarding the basis upon which Crawford was consulting with Exova: {**SEA00011749**}. See also Bruce Sounes' witness statement, paragraph 372 {**SEA00014273**}.

[304] Mr Crawford's response to Mr Lawrence, for example, is simply "*Thanks for the heads up on the Exova position.*" {**SEA00011749**}

[305] Lane, paragraphs 11.2.49 and 11.3.4 by way of example {**BLARP20000003_0232-0233**}

16.2. A catalogue of failures by the BCO, traversed in considerable detail by Beryl Menzies in her expert report,[306] culminated in the unjustified[307] issue of a Building Regulations completion certificate. These include: (1) a failure to recognise that no cavity barriers to seal the cavities at the window openings had been included in the designs, which she describes as a "fundamental failing";[308] (2) a failure, whether during the design stage or during site inspections, to request any information about the intended construction of the crown, or to check whether cavity barriers had been specified or installed;[309](3) a failure to seek detailed and comprehensive package information about the intended construction of the cladding system, to support a claim that ADB had been complied with, was also a "fundamental failing";[310] (4) reliance on the unsubstantiated word of a contractor that the cladding achieved Class 0 and met the ADB criteria for a buildings higher than 18m; [311] (5) concluding Celotex FR5000 insulation was suitable based only on a statement on Celotex's website;[312] and (6) not querying the use of Styrofoam and Kingspan TP10 insulation.[313]

16.3. Even after the Refurbishment, the BCO's failures did not cease. When, in 2017, National Grid carried out works to install a new gas riser in the stair, the BCO failed to exercise control over a material alteration which was installed in the firefighting stair, contrary to guidance in place at the time.[314]

16.4. These serious failings cannot be dismissed as solely the work of individuals. They are also a product of organisational deficiencies, including a lack of formal policies and protocols for the full plans applications process;[315] no evidence of a quality control / assurance system or quality audits;[316] a lack of continued professional training;[317] an ill-defined relationship between the BCO and the "Means of Escape Group";[318] and an unacceptable policy of "weeding" out documents.[319]

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[306] Expert Report of Beryl Menzies, October 2019 {**BMER0000001**}
[307] Given the Chairman's finding of non-compliance in the Phase One Report alone, this is beyond argument.
[308] Menzies, paragraphs 390-400.
[309] Menzies, paragraphs 405 and 409.
[310] Menzies, paragraphs 303-310, 408, 423, 433, 436 and 441.
[311] Menzies, paragraphs 42 and 431(a).
[312] Menzies, paragraph 442.ß
[313] Menzies, paragraphs 426 and 443
[314] Menzies, paragraph 560.
[315] Menzies, paragraphs 187-190, 259 and 542
[316] Menzies, paragraphs 175 and 207.
[317] Menzies, paragraphs 197 and 202.
[318] Menzies, paragraphs 208, 216, 222-223, and 228.
[319] Menzies, paragraphs 260, 543 and 545.

16.5. Such failures do not occur in isolation. Their extent raises questions about the contribution to these failures made by others[320], including the provision of documents in a disorganised and confusing manner; the failure to provide full details of the intended works; the submission of a flawed and outdated outline fire strategy; and an attitude or culture of treating BCO involvement as something to be curtailed and avoided.

17. Missed Opportunities to Avoid the Disaster

17.1. Perhaps the most tragic aspect of the Grenfell fire is at how many stages it could have been prevented.

The TMO's Failures

17.2. **Failure to heed residents' warnings**. The devastating consequences of the fire at Grenfell might have been mitigated, had warnings from residents been heeded. Resident warnings relating to fire safety were wide-ranging, but included (by way of example only) concerns about the basis upon which SE had been selected;[321] concerns that door self-closers had been left broken;[322] warnings of the need for some form of fire drill[323]; and concerns about the installation of gas pipes in the single escape stair.[324]

17.3. **Failure to heed LFB warnings.** Similarly, the consequences of the fire could have been mitigated had TMO listened in 2015 to the LFB's warning that TMO's risk assessor was prone to making unjustified statements.[325]

17.4. **Failure to heed LFEPA recommendations.** LFEPA also expressly warned RBKC on 4.3.16 on expressing itself satisfied with the Grenfell proposed works that "*This Authority strongly recommends that sprinklers are considered for new developments and major alterations to existing premises, particularly where the proposals relate to schools and care homes".*[326] It should have crossed RBKC/TMO's mind that Grenfell was a complex older building with an

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[320] They are already the subject of criticism by Menzies: see paragraphs 275-281, 293, 303-306, 404-405.

[321] During a residents' forum meeting on 28.3.12, Edward Daffarn queried the basis upon which SE had been chosen to carry out the initial design work on Grenfell {**LBI00000129**} It is now apparent that no procurement process, or qualitative checks on SE's suitability, had been carried out by the TMO before appointing SE to Grenfell.

[322] On 14.8.15, Mr Daffarn contacted TMO to inform it that Rydon had left a door open on the 16th floor and that the self-closer appeared to be broken. TMO's out of hours helpline suggested he shut the door or telephone the police. His complaint on 17.8.15 was dismissed {**IWS00000169_0067**} His concern in relation to the broken door closer received no response. Given the role of door closers in preventing smoke spread (Phase One Report, Paragraph 33.29) this complaint ought to have been treated very seriously.

[323] On 29.9.16 the Grenfell Leaseholders' Association expressly reminded the TMO of a fire at Grenfell in 2010 and the Shepherd's Court fire and noted the need for some form of fire drill. The TMO simply replied that there was a stay put policy in place and that therefore no fire drill was needed: {**RBK00000141**}

[324] On 20.3.17, for example, Lee Chapman emailed RBKC's Laura Johnson expressing concern about evacuation, (particularly of the immobile, very young or those with mental health issues) and requesting a fire safety report and raising concern {**RBK00002094**}. Ms Johnson's reply was to direct the matter towards third parties, stating that this was National Grid's responsibility and that TMO employed a "*competent and experienced Health and Safety Advisor, Janice Wray… supported by a competent independent consultant (CS Stokes)"* {**RBK00001574**}. Concerns about the gas pipe installation appear to be vindicated. See e.g. Menzies at {**BMER0000001_0151-5).**

[325] {**LFB00000061_0003**}

[326] {**RBK00003002**}

unsatisfactory ventilation system and a narrow single escape stair whose demographic included the very young, very old and some with mobility /cognition impairments, and that it cried out for sprinklers, in view of this clear and strong recommendation from LFEPA.

17.5. **Failure to use the knowledge it had of previous fires.** The disaster may have been avoided altogether had the TMO used its understanding of the lack of compliance of the cladding at Lakanal House fire in 2009 to choose a product which would not have promoted flame spread: Claire William's *Lacknall moment*[327] was a very grave missed opportunity. This was followed by a further opportunity in 2016[328], when RBKC/TMO became aware of the Shepherd's Court fire by virtue of a GAG blog. A further reminder of that fire came by letter from LFB dated 6.4.17[329] and Laura Johnson passed on a request to Janice Wray to identify if the cladding used at Grenfell was the same type as at Shepherd's Court, Wray received an unsatisfactory reply from Carl Stokes, but passed it back to RBKC without questioning.[330]

Exova's Failure: Absence of a Valid Fire Strategy

17.6. Exova's failure to provide an adequate fire strategy instead of one which failed to achieve its purpose of demonstrating statutory compliance with Building Regulations or the RRO and wholly ignored the building's Achilles heel: the cladding.

17.7. Thereafter during the time Exova remained involved (during 2015)[331] there was a plethora of opportunities for Exova to identify critical weaknesses and failings in the Grenfell cladding system.

Studio E's Failure to Ascertain Cladding's Behaviour in Fire

17.8. Had SE done its due diligence in the first place on what compliance with the Building Regulations required, and which products complied it would unarguably have established that the primary insulation (and other insulation such as that around windows and insulating core panels) was not compliant. It is also possible that had SE engaged with the requirements of Regulations/ADB including familiarising themselves with BR 135 incorporated by reference into ADB, and indeed into the main and sub-contract,[332] and with CWCT Guidance 2008,[333] it

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[327] {**RYD00023468**}

[328] "Anyone who witnessed the recent tower block fire at Shepherds Court, in nearby Shepherd's Bush, will know that the advice to remain in our properties would have led to certain fatalities and we are calling on our landlord to re-consider the advice that they have so badly circulated": {**TMO10015214**} and https://grenfellactiongroup.wordpress.com/2016/11/20/kctmo-playing-with-fire/

[329] {**RBK00002860**}

[330] {**CST00002764**} and {**TMO10016666_0002**}

[331] Contrary to its Phase 1 Position Statement suggesting it had no further involvement after November 2013 {**EXO00001572**}

[332] Main contract clause 2.171.3 **{TMO10041791_0023}** was BR135(3rd ed). sub-contract was 2nd Ed (Curtains spec par 7.1.3 **{ART0000014_0011})**

[333] *Standard for systemized building envelopes* Incorporated by reference into the NBS Spec Section H92 par 310 **{SEA00000169_0069}** and see section 13 above.

would have identified that the aluminium composite panels with a PE core were unsuitable for a complex building such as Grenfell. Thereafter a lack of understanding or vigilance by SE allowed significant design faults in its own design and that of Harley, such as a lack of cavity barriers around windows. Subsequently when SE were reminded/became aware that cavity barriers in a metal rainscreen cladding system would not work, [334] they could and should, have reconsidered the whole design.

RBKC Building Control's Failures

17.9. The BCO failed to obtain or scrutinise the required details of the cladding to ascertain compliance. It subsequently failed to identify one of the fundamental shortcomings in the design of Grenfell; namely that there were no cavity barriers around windows, and no effective means of preventing fire spread in the cavity created by the cladding, permitting free travel of fire and smoke between the flat below and that above. The BCO signed off the building, despite (i) non-compliance with Building Regulations and (ii) the absence of fire safety documentation required by those Regulations.

Manufacturers' Failure to Warn

17.10. Had some of the product manufacturer's employees spoken out about how flammable their products were instead of forcefully marketing them, the events leading to the Grenfell fire may have been avoided.

Contractors' Failure to Warn

17.11. Neither Harley nor Rydon warned either that:

(1) The cladding panels or insulation were non-compliant;

(2) That the means of preventing fire spread within the cladding void would not be effective as the cavity barriers would not be held in place and intumesce once the cladding panels heated up and deflected away.

The Clerk of Works ("**CoW**")

17.12. RBKC's CoW for the general building including cladding cannot have carried out proper inspections to ensure compliance. Albeit it would have been late in the day by the time the CoW had become aware the insulation was non-compliant, the problem could nevertheless have been fixed albeit at a cost to the design team and delay to the project.

[334] **{EXO00001434}**

III. PHASE 2: LOOKING FORWARD

18. Prevention

18.1. Grenfell, whilst an extraordinary disaster, could have happened, as we now know, at many high-rise blocks around the country. This is true whether in social housing or privately owned blocks. The consequences in social housing however may potentially be more severe if the communal parts of the property, in particular, doors, are in disrepair, as they were at Grenfell.

18.2. In order to understand how to prevent a future disaster, it is essential to examine and understand the reasons underlying the scale of the fire at Grenfell which begin with the ill-conceived and incompetently executed Refurbishment, the fact of a stay-put policy, and the LFB's reaction to that policy on the night of the fire, but do not end there.

19. Corporate and Local Authority Governance

19.1. There is undoubtedly a need for improved governance within local authorities regarding the management of their social housing properties and accountability to tenants. The lessons of Lakanal, despite the attention given to them, do not appear to have been learned.[335]

19.2. The documents show a remarkable disregard, from the TMO in particular, for proper procurement processes. Professionals[336] were appointed based solely on having been selected for KALC. Their qualitative suitability for Grenfell was not examined, nor were their costs market tested. On the contrary TMO implemented a deliberate policy of evading public procurement rules by reaching arrangements on payment designed to keep the TMO's liability below the limit beyond which an OJEU process had to be conducted. An attempted coronation of Leadbitter was only brought to an end by costs exceeding TMO's budget. Although an OJEU process was eventually followed to appoint Rydon, that process too was flawed. Proper procurement processes are important not only to ensure that public funds receive value for money, but that those appointed to design and carry out work with the potential to affects health and safety are properly qualified to do that that job.

19.3. Building Control appear to have lacked any real appreciation of what compliance comprised, and their presence merely served to justify a wholly non-compliant renovation. This is an aspect of local authority function/governance which will require close inspection.

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[335] {**RBK00029909**}: RBKC is advised by Hammersmith and Fulham that flat doors are their responsibility as Responsible person under RRO and reminds that as a result of Lakanal LFB has focused on raising awareness that systematic FRAs are required. *"flat entrance doors in blocks are critical to safety of the common parts in the event of a fire within a flat".* See also LABC to Paul Hanson re Fire doors {**RBK00030498**}: *"Their* ***correct specification, maintenance and management can be the difference between life and death for building occupants.*** *However they remain a significant area of neglect"* (emphasis added)

[336] The problem may extend beyond the professionals appointed to the Grenfell project. For example, the procurement process which resulted in Cenergist being awarded a five-year contract (see {**ART00003468}** at item 1.3) is unclear.

19.4. The corporates have demonstrated complacency and contempt for compliance. The fact that Celotex and possibly others have been able to manipulate test results in order to create a false market for insulation suitable above 18m is, in the seemingly regulated industry in which they operate, beyond belief. Not one employee raised the alarm, and this calls into question the utility or operation of whistle blowing procedures within the corporates. More generally it calls into question the culture within such organisations. In truth such catastrophically bad value sets can only occur in organisations where the culture and values are either inherently poor, or not embraced seriously by the organisation. It means there is a lack of robust strategy to ensure the behaviour of the company is aligned with its core purpose and values. This too is an aspect which demands the Inquiry's attention and should be aired in Module 6.

19.5. SE's lack of understanding of compliance, and assumption that it should be left to others, raises concerns about how the architectural profession sees itself and its functions. As Hyett notes, the profession has turned its focus from technical design to aesthetics, and similarly there seems to be an over-focus on sustainability/environmental imperatives at the expense of fire safety. This too is fertile ground for the Inquiry's investigation.

20. Inadequacy of ADB: The Role of Central Government

20.1. As explained above, ADB is fundamentally not fit for purpose and Central Government has been aware of that since 2000. The research which Government commissioned in 2000 and 2015 made pellucid the problems in ADB, and yet Government failed to act, as it should have, to overhaul ADB. The precise reasons for that extraordinary inaction over a prolonged period will require exploration, with a view to curbing the freedoms which allowed it.

20.2. The inaction of Central Government is all the more extraordinary when viewed in the context of the many cladding fires which have occurred, and the level of knowledge of the issues which both Government and industry shared by the time of the Select Committee Report in 2000.[337]

20.3. This knowledge derived from the Fairfield and Summerland fires in the early 1970's which led to the introduction in 1976 of the concept of cavity barriers into the Building Regulations.[338] Thereafter the Knowsley fire in 1991 and Garnock Court in 1999 led to the joint venture between Government and BRE to develop Fire Note 9, the first large scale fire test (now the BS8414 test). The Select Committee Report in 2000 recommended that small scale testing of the types underlying the national classifications was unsatisfactory and that the new large-scale test (fire note 9) should be used. That large scale test was introduced into ADB 2000 as an

[337] {**CTAR00000020**}; {**CTAR00000021**}
[338] {**CLG00001506**}

alternative option for compliance, together with the warning at Appendix F concerning insulating core panels. Nevertheless, despite the clear evidence to the Select Committee that class 0 was potentially confusing,[339] no steps were taken to clarify that class 0 was relevant only to surface spread of heat and flame; but that the important criterion was reaction to fire. Critically, the Select Committee Report did recommend that Registered Social Landlords should review their existing building stock to ensure compliance with current as opposed to outdated Building Regulations.

20.4. That recommendation does not appear to have been heeded, since the 2009 Lakanal House fire seemed to take Government by surprise (Government noted in the immediate aftermath that it did not know how many such buildings are around the country nor how many in social housing stock, but that it was more likely in the social housing sector).[340] Furthermore, Lakanal House included cladding which did not even conform to the Class 0 external surface requirement.

20.5. The Shepherd's Court fire in 2016 clearly demonstrated the dangers of sandwich panels and the fact that such panels will delaminate[341], but yet again Government took no action to clarify ADB and still has not done so: the changes proposed by the recent ADB consultation do not grapple with any of the fundamental flaws in the guidance.

20.6. This inaction by Government despite the degree of knowledge it had since 2000 as fortified by the knowledge it acquired in 2015 is a complete abdication of responsibility and raises vitally important questions as to how such a situation has been allowed to arise and still pertains even after Grenfell. A hugely important role of this Inquiry will be to make essential and urgent[342] recommendations which, if implemented, may go some way to restoring public confidence in a system and attitude within Government which has allowed this situation to occur and continues to allow it.

20.7. The question of whether sprinklers should be retro-fitted into high-rise properties over 30m should be addressed by the Inquiry. Government's response to the research it received on sprinklers has been wholly inadequate to date. BRE had carried out research on sprinklers for Government in 2004, but concluded their widespread use would not be cost effective.[343] Sprinklers were not introduced as a requirement at all, even in new build, until ADB 2006, and even then, only for buildings over 30m. As explained above, Government obtained yet further

[339] Transcript page 5, paragraph 2.2

[340] 6.7.09 Memo Fire & Rescue Service Development division to Denham MP and all ministers {**CLG00000122**}

[341] See e.g. LFB letter 6.4.17 to RBKC (Laura Johnson) {**LFB00000085**}

[342] Given that a provision of the Building (Amendment) Regulations 2018 banning the use of materials below A2 s1, d0 in blinds/awnings has recently been quashed by Judicial Review it is clear that the Inquiry's recommendations are urgently needed: **British Blind and Shutter Association v SSHCLG [2019]** EWHC 3162 (Admin)

[343] *OPDM Buildings Division Project Report: Look forward* BD2469 Revised 13.10.04 {**CLG00002347_0003**}

clarification of the flawed nature of ADB by the seven BRE 2015 workstream reports led by BRE (but with a large industry steering group for each study) prepared for Brian Martin of the then DCLG: *"Compartment size, resistance to fire and fire safety research"*. The 2015 workstream report 5 recommended, and Government ignored, the need to install sprinklers on buildings much lower than 30m. Yet no amendment to ADB reflect this has been forthcoming.

20.8. Amongst the urgently needed recommendations, apart from the general need to overhaul ADB in its entirety (to start afresh); there is a pressing need to ensure that means of escape for the disabled are properly addressed, and that real force is given to the toothless encouragement in ADB 0.19[344] to adopt an inclusive approach to design.

20.9. It was clear to Government in October 2004 that ADB did not adequately provide for means of escape for the disabled: *"It was clear from the comments made that current guidance on this issue was inadequate and is an issue that should be addressed"*.[345] Government received a clear reminder of this by the BRE 25.2.15 workstream report no 7.[346] The Report contained the results of a consultation. In answer to the question[347] *"Is there sufficient supportive information associated with the design of facilities for means of escape for disabled people within ADB?"* the majority response was "no" reflected in the following statements:

(1) *"Much more needs to be done to educate designers about the wide range of needs that arise"*

(2) *"Definitely not. The world needs much more practical guidance on managing evacuation of disabled people"*

20.10. The Inquiry's two panel members, Prof Nabeel Hamdi and Thouria Istephan are both expert in the field of inclusive design, and it is hoped they may assist in the formulation of much needed recommendations.

20.11. A further issue which Central Government has not addressed is the question of toxicity of materials in fire. It is well established that thermoplastics release toxic gases and the cladding materials did so at Grenfell, principally carbon monoxide and hydrogen cyanide.[348] Whilst the Euro-classification of a product takes into account the spread of fire and smoke, there is no requirement in the Building Regulations nor ADB to limit the generation (as opposed to spread) of smoke. Although the Fire Brigades Union prepared a paper for the Fire Safety Advisory

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[344] {**CLG00000224_0013**}

[345] *OPDM Buildings Division Project Report: Look forward* BD2469 Revised 13.10.04 {**CLG00002347_0003**}

[346] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/783491/Final_Work_stream_7_report-tagged.pdf

[347] Page 14 of Report

[348] Professor Purser, Phase 1 Report paragraph 41(a){**DAPR0000001_0016}**

Board in March 2002 recommending the imposition of limitation on the generation of smoke,[349] this request appears to have been rejected by the Building Regulations Advisory Committee in April 2002 for demonstrably bad reasons: *"The members of the Working Party agreed that, to avoid market distortion, no action should be taken at this time to amend the guidance in ADB to control smoke production from ignited construction products".*[350] This obvious failure is yet to be specifically addressed by regulation/guidance.

20.12. A related issue which needs also to be considered in Phase 2 is the presence of asbestos within buildings and what protocol should be adopted to protect residents and firefighters alike once a building containing such materials is on fire. Reports from the toxicity experts as to the impact of asbestos burning on the night at Grenfell are eagerly awaited.

20.13. Finally, the Inquiry should not take too great a comfort from the announcement on 19.12.19 of a Fire Safety Bill including the implementation of Hackitt (already promised over a year ago). The proposed clarification of RRO and further consultation regarding sprinklers may be thought to be far too little, far too late.

20 December 2019

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[349] {**CLG00001226**}
[350] Paragraph 43-44{**CLG00000720_0009**}