# In case of Emergency:

# What do the 2014 and 2018 fires in the Mackintosh Building tell us about how we manage our built heritage?

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Submitted in fulfilment of the requirements for the Degree of PHD School of Design Glasgow School of Art September 2020

## **Abstract**

Since 2014, the Glasgow School of Art's Mackintosh Building has suffered two fires; the first affected the West Side of the Building, destroying the Library, and the second fire in 2018 gutted the Building, transforming it into a roofless consolidated ruin shrouded in scaffolding. These fires are examples of calamities that could befall any of our traditional or historic buildings. Despite the shock of this happening twice, they were not exceptional events, and are indicative of a much wider problem: the way we currently manage our built heritage. Through studying the cause of the 2014 fire, the decision to restore, the fire of 2018 during that restoration, and the subsequent salvage operation, this thesis discusses the story of the Mackintosh Building as a cautionary tale. From this analysis, we can learn crucial lessons from these events about; not only how to best manage and maintain our built heritage, but also how to prepare for future disasters and emergencies.

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# Acknowledgments and Dedication

The Bringing Back the Mack PhD Scholarship was created by Dr Ewan Hyslop (HES) and Dr Robyne Calvert (GSA), who then became my supervisory team. I would like to thank them both for giving me the once-in-a-lifetime opportunity to work on the Mackintosh Restoration Project (MRP1) and for the patience, understanding, and generosity they have shown me over the past four years. They have been such positive role models, and have had an indelible impact on my approach as an academic. I would also like to thank my reassuring and organised PhD co-ordinator Dr Thea Stevens, my Secondary Supervisor at GSA, Prof. Bruce Peter, and my Mock Viva Panel; Dr Nicky Bird, Dr Raid Hanna, and Ranald MacInnes (HES) for all of their advice and support.

After the fire of 2018 when all seemed lost my Jedi Master/Primary Supervisor Dr Calvert and Carolyn Alexander, my dazzlingly brilliant fellow Mackintosh PhD student, kept me sane with their kindness, humour, and positivity. I am privileged to have worked alongside both of these incredible women and I am proud to call them friends as well as colleagues. I cannot wait to see what they do next.

MRP1 was run by two more incredible women; Senior Project Manager Liz Davidson, and Project Manager Sarah Mackinnon. Even though they were managing a multi-million-pound restoration project of international significance, they always had time for me; they included me in Design Team Meetings with Page/Park, allowed me access to the Mackintosh Building, and answered every single one of my countless questions. They also trusted me to work alongside Hannah Patching, Project Assistant, and Thom Simmons, Conservation Skills Coordinator, on the salvage of the Mackintosh Building after the fire of 2018. The salvage was emotionally and physically draining, but working with Hannah made it worthwhile and bearable, she is now a friend for life. Thanks must also go to HES Collections Manager and fellow salvage nerd Judith Rowett for being a personal and professional sounding board for all things salvage, and for generously sharing her time, research, and expertise with me.

I have been very interesting to live with since 2016, and so I have to thank my husband, Gary Thomson, for looking after me so well, and supporting me through this incredibly intense caffeine-fuelled period of my life, I would not have been able to do this without him. My little sister and friend, Abbie Purse, has allowed me to vent at her whenever I needed to, and she also formatted and proofread this thesis so she has my eternal gratitude. I will be returning the favour by proofreading her dissertation.

Since becoming a PhD student in 2016 I have lost my Grandad, gotten married, won an IHBC award for my research, learned how to lecture and how to write, started a job in the heritage industry that I thoroughly enjoy, and bought a cottage with my husband. As a working-class woman and the first member of my family to attend university, this thesis is dedicated to everyone who has helped me get here, including my parents, Jackie and Drew Purse. Thank you.

# **Author's Declaration**

This thesis represents the original work of Rachael Purse, unless otherwise stated in the text. The research upon which it is based was carried out for the School of Design, Glasgow School of Art, under the supervision of Dr Robyne Calvert and Dr Ewan Hyslop (Historic Environment Scotland) between July 2016 and August 2020.

## **1. Introduction**

#### **1.1 Introduction**

Three major fire events have occurred in Europe during the course of this PhD Scholarship, entitled Bringing Back the Mack (2017-2019); established after the 2014 fire in the Glasgow School of Art's (GSA) Mackintosh Building destroyed the Library and numerous other spaces in the Buildings west side.<sup>1</sup> On the 14<sup>th</sup> of June 2017, a fire started in Grenfell Tower, a residential twenty-four storey tower block completed in 1974 in North London. The fire started on the fourth floor, caused by a malfunctioning fridge-freezer, and then rapidly spread up the exterior of the building which was incorrectly clad and therefore highly combustible. Seventy-two people died and over seventy people were injured as a result of the fire, and it is therefore considered 'one of the UK's worst modern disasters'.<sup>2</sup> On the 15<sup>th</sup> of June 2018, the Mackintosh Building caught fire whilst undergoing a restoration project. This restoration project was repairing the damage caused by a fire in 2014 which took place when the Mackintosh Building was still actively used as part of The Glasgow School of Art campus. On the 15<sup>th</sup> of April 2019 Notre Dame Cathedral, a UNESCO World Heritage site completed in 1345, also caught fire whilst undergoing renovation works on its roof. The roof and spire were destroyed in the fire, but most of the structure remains intact.

The fire events listed above took place in structures designed and built in different periods, used for different purposes, and made of different materials, suggests that our built environment as a whole is not being adequately cared for. The heritage sector has been aware for many years that historic and traditional buildings are more vulnerable to a fire event than a modern structure, and yet fires in our built environment continue to take place with alarming regularity. Whilst no building can be completely fireproofed, the risk of a fire event occurring can be minimised in any building through an effective maintenance programme and the application of passive and active fire protection, detection, and suppression systems.

Maintenance, particularly of historic and traditional buildings, is crucial to their continued use and therefore their preservation. At the time of writing, there are 2,300 Buildings at Risk on the *Buildings at Risk Register for Scotland*.<sup>3</sup> A Building at Risk is defined as a 'listed building or an unlisted building within a conservation area' which 'meets one or several of the following criteria':

• vacant with no identified new use

<sup>&</sup>lt;sup>1</sup> The Mackintosh Building will be referred to throughout with capitalised first letters; when describing a specific king, King becomes capitalised, so the word Building is capitalised when referring to the Mackintosh Building.

<sup>&</sup>lt;sup>2</sup> BBC News, 'Grenfell Tower: What Happened - BBC News', *BBC News*, 18 June 2018, https://www.bbc.co.uk/news/uk-40301289.

<sup>&</sup>lt;sup>3</sup> Historic Environment Scotland, 'Frequently Asked Questions | Buildings at Risk Register', Buildings at Risk Register for Scotland, accessed 4 October 2019, https://www.buildingsatrisk.org.uk/faq#faq-5.

- suffering from neglect and/or poor maintenance
- suffering from structural problems
- fire damaged
- unsecured and open to the elements
- threatened with demolition<sup>4</sup>

Historic Environment Scotland's (HES) research has shown that vacant buildings which are not properly maintained are at a high risk of suffering a fire event, and 'it has been suggested that each year more than twenty empty or vacant Scottish buildings of historic value are lost to fire.'<sup>5</sup> The Fire Protection Association states that 'around 20% of fires in listed buildings result either directly or indirectly from construction or maintenance activity.'<sup>6</sup> The damage caused by a fire event can cause structural damage and can leave a building open to the elements, therefore leaving it vulnerable to yet more damage. Scotway House in Glasgow is a perfect example of what can happen to a building when all of these factors coalesce. This B-Listed building was constructed in 1885 to serve as the drawing office for shipbuilding firm D&W Henderson.<sup>7</sup> It had been derelict for some years when on the 20<sup>th</sup> May 2016 it caught fire. Post-fire what remained of the structure was declared unsafe and demolished.<sup>8</sup> Private Student Accommodation, named Scotway House, now sits on the site.

This thesis aims to act as a clarion call for improving how we care for and maintain our historic built environment. The second fire in the Mackintosh Building halted the Mackintosh Restoration Project gutted the Building just months before the project was complete and changed the course of this thesis. Instead of closing with an examination of the restored Mackintosh Building, assessing the success of the project, this thesis closes with the examination of a salvage operation and a question mark still hovering over the cause of the 2018 fire. The second, more destructive, fire of 2018 made the issue of fires in historic and traditional buildings all the more pressing to understand. As a result, this thesis therefore became focussed on how fires start in historic and traditional buildings, how they can be prevented, and what to do should a fire event take place. This thesis, therefore, presents a chronological examination of the events which led to the fire of 2014 and a critical analysis of MRP1 as well as the fire and salvage process of 2018. Pertinent case studies of restoration and re-creation

<sup>&</sup>lt;sup>4</sup> Historic Environment Scotland.

<sup>&</sup>lt;sup>5</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, vol. 2, Techinical Advice Notes (Historic Scotland, 2010), 84.

<sup>&</sup>lt;sup>6</sup> Stewart Kidd and Sharon Haire, 2:7.

 <sup>&</sup>lt;sup>7</sup> Historic Environment Scotland, 'Historic Environment Scotland Listed Building Portal: Listing for 165
Castlebank Street, Scotway House', Historic Environment Scotland Listed Building Portal, accessed 6 October
2019, http://portal.historicenvironment.scot/designation/LB43569.

<sup>&</sup>lt;sup>8</sup> BBC News, 'Listed Building in Glasgow Destroyed in Blaze', 21 May 2016, https://www.bbc.co.uk/news/uk-scotland-glasgow-west-36348272.

projects and fires in historic and traditional buildings are woven throughout this thesis, providing a contextual and comparative framework.

#### 1.2 Contribution to Knowledge, Methodology, and Approach

This thesis provides a critical analysis of the fire of 2014 in the Mackintosh Building, MRP1, the fire of 2018, and the salvage operation which followed. This research is intended to record and analyse these events of national importance in order to contribute to the fields of Building Conservation, Heritage Science, and Museum Studies. Based on the evidence and research presented in this thesis, it is clear that the vulnerability of historic and traditional buildings to fire is just one of many issues we face in protecting, preserving, and maintaining our built and cultural heritage. Fire prevention is part of a much larger and complex set of linked issues; ranging from recording our heritage according to best practice standards, to maintaining and preserving objects, interiors, and entire buildings. The factor which unites each of these facets and impacts their efficacy is access to or provision of funding. It is, therefore, unsurprising that the most generously, or even adequately, funded organisations can design and provide the best maintenance and conservation systems for the buildings and objects in their care.

The methodology for this thesis was a hybrid approach. An interdisciplinary architectural and design history approach was used to synthesise a history of the Mackintosh Building, using academic publications on the Building and its designer, Charles Rennie Mackintosh (1868-1928), as well as primary sources from GSA Archives and Collections. My main primary source of information for this thesis was the Mackintosh Building itself and my approach, therefore, incorporated a material culture methodology. I conducted regular site visits of the Mackintosh Building between 2016 and 2018, photographing and recording progress made on the restoration. I also met regularly with Elizabeth Davidson, MRP1 Senior Project Manager, Sarah Mackinnon, Project Manager, and Hannah Patching, Project Assistant, to interview them and access documentation and information on the restoration. This was a live construction project, thereby making it vital that I remained up to date with developments and decisions made by the Design Team as the restoration progressed. As well as conducting site visits, I was also directly involved in MRP1. I attended Design Team meetings as an observer where my opinion was occasionally solicited by Design Team members. I conducted site visits of the Mackintosh Building for students and professionals on behalf of the Project Management Team and I also shared my research with the Project Management Team and Design Team when requested. Gathering anecdotal evidence was, therefore, vital to the production of this thesis, and forms the backbone of my research. As MRP1 was a live project I had to rely heavily on the observations, expertise, and testimony of those working on MRP1, as well as GSA and HES staff members who were actively involved in the salvage operation which followed the fire of 2014.

It is crucial that any institutional or personal bias that the author(s) may have should be made clear to the reader at the beginning of a publication on a re-creation and/or restoration project. It should be stated if they played a role in the project, or if they are or were, an employee of the organisation who owns the property being restored. Authors should consider the opinions of others and should present critically balanced arguments. However, it should also be acknowledged that as I was a part of the Mackintosh Restoration Project from 2016-2020, I became emotionally attached to both the Building and the people who were restoring it. This has had an impact on this thesis and my opinion, especially in the wake of the 2018 fire, but the emotive element of my research and writing does not invalidate it. The events of 2014-2018 did not take place within a vacuum, and it is, therefore, crucial to engage with contemporary conservation and restoration philosophies, as well as media and community responses.

By focusing on smaller conservation and restoration projects within the larger restoration project, I recorded these often innovative aspects of the project for wider dissemination, enabling others to learn from them. When writing about a restoration project it is crucial to include a discussion on why a restoration has been decided as the best course of action to take, and the philosophies which underpin the project have also been recorded. To establish the significance of the Mackintosh Building, a solid historical context for the building and the geographical area surrounding it has been provided.

After the fire of 2018 I was a member of the Salvage Team, actively working on site on the salvage of materials from inside the Mackintosh Building alongside Hannah Patching and Thom Simmons, MRP1 Conservation Skills Co-ordinator. After the 2018 fire, I attended Mackintosh Reconstruction and Research meetings pertaining to the status of the Mackintosh Building; and which considered what was next for the Building and the research produced as a result of MRP1. Despite my involvement in the project I have been encouraged to be critical and unbiased in my evaluation of MRP1 and the fires of 2014 and 2018 by my Supervisory team; Dr Robyne Calvert, Mackintosh Research Fellow at GSA, and Dr Ewan Hyslop, Head of Technical Research at HES.

Contextualising and identifying the field of research for this thesis involved initial research into fires in non-domestic and well-known historic buildings which were then followed by restoration projects to repair or recreate interiors as well as objects such as furniture. Secondary case study buildings have also been selected; these buildings have been re-created or restored or have had fire suppression and/or detection systems installed, but they have not suffered significant fire damage in the past c.30 years. The buildings which have been augmented or recreated by some degree will also allow us to investigate the relationship between recreation and authenticity, and the current perceptions of these terms.

In 2015 Clandon House, owned by the NT, was also severely damaged by fire, and its restoration is ongoing at the time of writing. Clandon was, therefore, the Mackintosh Buildings' unfortunate

successor in a long line of historic buildings damaged by fire. Both of the fires in the Mackintosh Building, as well as its restoration, have much in common with Clandon House, but its use as a fully-functioning art school before the fire sets it apart from historic attractions like Clandon House and Notre Dame Cathedral. In the following tables the Primary and Secondary case studies used in my research are presented, alongside information on the owners and caretakers of each building, the dates and causes of the fires, and the dates of the restoration projects:

Building	Caretaker	Date of Fire	Cause of Fire	Post-fire
				Restoration
Hampton Court	Historic Royal	31 <sup>st</sup> March 1986	Candle or	1989-1995
	Palaces		cigarette,	
			naked flame	
Uppark House	National Trust	30 <sup>th</sup> August 1989	Hot lead works	1991-1994
			on the roof	
Windsor Castle	Royal Collection	20 <sup>th</sup> November	Curtain	1993-1997
	Trust	1992	pressed against	
			spotlight	
			ignited	
Battersea Arts	Battersea Arts	13 <sup>th</sup> March 2015	Undetermined	2015-2018
Centre	Centre			
Clandon House	National Trust	29 <sup>th</sup> April 2015	Faulty	2015-ongoing
			Electrical	
			distribution	
			Board	
Mackintosh	Glasgow School	23 <sup>rd</sup> May 2014	Ignition of	2015-2018
Building	of Art		flammable	
			gases from an	
			electrical spark	
			originating	
			from a	
			projector	

#### Table 1.1 Primary Case Study Fire Events in Historic Buildings

Table 1.2 Secondary	Case Studies:	Retrofitting of Fire	Protection and Detec	ction Systems and	d/or Restoration
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Building	Caretaker	Reason for Inclusion
Stirling Castle	Historic Environment Scotland	Restored/recreated between 1990 and 1999
		to its former glory as a 16 <sup>th</sup> -century Scottish
		royal palace, as a result, it is a very popular
		tourist destination.
The Bower	University of Glasgow	Damaged by fire on October 4 <sup>th,</sup> 2001 and
Building		restored to modern specifications, with the
		remains of its rare book collection
		transferred to the university's Special
		Collections.
Duff House	Historic Environment Scotland	Water Suppression system installed in the
		early 1990s, in the form of sprinklers.
Newhailes	National Trust for Scotland	Water Suppression system installed in the
		early 1990s, in the form of sprinklers.
Leighton House	The Royal Borough of	A complete recreation/restoration of an
Museum	Kensington and Chelsea	artist's house; interiors, furniture and
		objects.

## **1.3 Key Literature**

There is a great deal of literature on the topic of building conservation and restoration, both technical and academic, but the following were crucial to my research. *The Conservation Movement: A History of Architectural Preservation, Antiquity to Modernity*, by Miles Glendinning, *The Great Fire at Hampton Court* by Michael Fishlock, *Uppark Restored* by Christopher Rowell and John Martin Robinson, and *Restoration: The Rebuilding of Windsor Castle* by Adam Nicolson have all been key text as they provided a historic context for the fires in, and restoration of, the Mackintosh Building. The analysis of the way these publications were written also informed the approach of this thesis. Technical publications including HES's *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, by Stewart Kidd and Sharon Haire, and their *Short Guide: Climate Change Adaption for Traditional Buildings* by Roger Curtis and Jessica Hunnisett Snow are referred to throughout this thesis; alongside The Collection Trust's publications on collections care and museum management, allowing me to establish best practice standards for the heritage sector. Sian Jones' work on the subjects of authenticity and re-creation, particularly the following two articles; 'Negotiating Authentic Objects and Authentic Selves: Beyond the Deconstruction of Authenticity' from the *Journal of Material Culture*, and 3D heritage visualisation and the negotiation of

authenticity: the ACCORD project', published in the *International Journal of Heritage Studies*, have influenced my understanding of the concept of authenticity. Finally, *Mackintosh's Masterwork*, edited by William Buchanan, provided a history of the Mackintosh Building from its design until the publication of this book in 1989.

#### 1.4 Terminology

What follows is a selection of key terms used throughout this thesis, the definitions for which have been taken from both technical and academic publications. The definitions of words such as 'authenticity' and 'restoration' have changed considerably over the last hundred years, so it is important to establish the contemporary definitions of these words, and others, here.

#### 1.3.1 Authenticity

Shulan Fu and Jean Hillier have stated that 'there is no absolute thing as authenticity. It is a social construct'.<sup>9</sup>

Sian Jones has also summarised the current definitions of *authenticity* within the museum and heritage industries:

Broadly speaking, authenticity refers to the quality of being authentic, that is, real, original, truthful, or genuine; 'really proceeding from its stated source' (Oxford English Dictionary 2002, 153). Authorised heritage and museum discourses still treat authenticity as something intrinsic to historic buildings, monuments and objects; and lacking or derivative in the case of replicas.<sup>10</sup>

Jones also points out that 'the structure and composition of an object, building, artefact, or work of art has been central to the way in which conservators and material scientists approach authenticity' which has meant that 'a critical aspect of this analysis involves distinguishing between the original materials and subsequent renovations, additions, revisions and adhesions, intentional or otherwise.'<sup>11</sup> In practical terms, this means that 'with the traditional emphasis on originality, later additions have tended to be regarded as less authentic than original materials', especially with regards to historic structures.<sup>12</sup> With this in mind, the status and *authenticity* of any additions made to the Mackintosh

<sup>&</sup>lt;sup>9</sup>Shulan Fu and Jean Hillier, 'Disneyfication or Self-Referentiality: Recent Conservation Efforts and Modern Planning History in Datong', in *China: A Historical Geography of the Urban*, ed. Yannan Ding, Maurizio Marinelli, and Xiaohong Zhang (Cham: Springer International Publishing, 2018), 171, https://doi.org/10.1007/978-3-319-64042-6\_8.

<sup>&</sup>lt;sup>10</sup> Sian Jones et al., '3D Heritage Visualisation and the Negotiation of Authenticity: The ACCORD Project', *International Journal of Heritage Studies*, 17 October 2017, 3.

<sup>&</sup>lt;sup>11</sup> Sian Jones, 'Negotiating Authentic Objects and Authentic Selves: Beyond the Deconstruction of Authenticity', *Journal of Material Culture* 15 (2010): 184.

<sup>&</sup>lt;sup>12</sup> Sian Jones, 184.

Building can be considered as being lower in status and less authentic than Mackintosh's original design.

Jones posits that:

Authenticity is seen as an objective and measurable attribute inherent in the material fabric, form and function of artefacts and monuments, and a positivist set of research methods and criteria have evolved to test their genuineness. Furthermore, these approaches still lie at the heart of heritage conservation and management.<sup>13</sup>

Despite this, Jones believes that 'authenticity is not inherent in the object.'<sup>14</sup> Instead concluding that 'it is a quality that is culturally constructed and varies according to who is observing the object and in what context'.<sup>15</sup> Jones has established two approaches to *authenticity*; materialist and constructivist. The materialist approach which is 'still widely employed in heritage conservation... treats authenticity as a dimension of ''nature'' with real and immutable characteristics that can be identified and measured.'<sup>16</sup> Alternatively, the constructivist approach is 'popular amongst academics and cultural critics, who see authenticity as a product of 'culture', or, to be precise, the many different cultures through which it is constructed.'<sup>17</sup> I am an advocate of the constructivist method of assessing and viewing authenticity, but as Jones has stated, the materialist approach is most widely used in contemporary heritage conservation practices, therefore both approaches are used and discussed in this thesis.

#### 1.3.2 Buildings: Traditional vs. Historic

The terms *traditional building* and *historic building* are used throughout this thesis as per HES working definitions for both. The definition of a *traditional building* is:

...a building of traditional construction built before circa 1919. The definitions are not confined to listed buildings or buildings within conservation areas and indeed, it is estimated that there are probably around 500,000 such buildings across Scotland. Built by craftsmen using traditional indigenous building materials, a defining characteristic of the traditional building in its widest context is that its construction evolved over many years, adapting to the climate to promote the dissipation of water vapour. Its materials are breathable and attempts

<sup>16</sup> Sian Jones, 182.

<sup>&</sup>lt;sup>13</sup> Sian Jones, 182.

<sup>&</sup>lt;sup>14</sup> Sian Jones, 182.

<sup>&</sup>lt;sup>15</sup> Sian Jones, 182.

<sup>&</sup>lt;sup>17</sup> Sian Jones. 182.

to introduce modern standards of impermeability are likely to have unintended consequences.<sup>18</sup>

#### A historic building is defined as:

A building of architectural or historic interest or significance. The interest or significance may be local or national, and may be a consequence of, for example, the building's age, built form or location. It may result from its connection with a person or persons, or with local or national events or industry; or from a combination of these or other factors. A building does not have to be listed by Scottish Ministers or lie within a conservation area to have interest or significance.<sup>19</sup>

#### 1.3.3 Conservation

The definition of *conservation* is taken from ICOMOS's Burra Charter:

1.4 *Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance*.<sup>20</sup>

#### 1.3.4 Disneyfication

The term *Disneyfication* has become a fashionably derogatory term to use when describing a restoration or re-creation. It is defined as 'the transformation (as of something real or unsettling) into carefully controlled and safe entertainment or an environment with similar qualities'.<sup>21</sup> Shulan Fu and Jean Hillier explored the subjects of *Disneyfication* and *authenticity* in their study of the renovation of Datong, an ancient city in China. They defined *Disneyfication* 'as the creation of an area based on an abstracted history made to look and feel authentic'.<sup>22</sup>

#### 1.3.5 Future-proofing

The term *future-proofing* is most commonly associated with the electronics and software industries but is also used in the construction industry. To *future-proof* is 'to design software, a computer, etc. so that it can still be used in the future, even when technology changes.'<sup>23</sup> Brian D. Rich defines *future-proofing* in the historic environment as 'the process of anticipating the future and developing methods

<sup>&</sup>lt;sup>18</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, vol. 1, Techinical Advice Notes (Historic Scotland, 2010), 5.

<sup>&</sup>lt;sup>19</sup> Stewart Kidd and Sharon Haire, 1:6.

<sup>&</sup>lt;sup>20</sup> Austrailia ICOMOS Incorporated International Council on Monuments and Sites, 'The Burra Charter: The Austrailia ICOMOS Charter for Places of Culturl Significance 2013' (ICOMOS, 2013), 2.

<sup>&</sup>lt;sup>21</sup> Merriam Webster Dictionary, 'Definition of Disneyfication', Merriam Webster Dictionary Online, accessed 8 October 2019, https://www.merriam-webster.com/dictionary/Disneyfication.

<sup>&</sup>lt;sup>22</sup> Fu and Hillier, 'Disneyfication or Self-Referentiality', 166.

<sup>&</sup>lt;sup>23</sup> Cambridge Dictionary, 'Definition of Future-Proofing', Cambridge Dictionary, accessed 8 October 2019, https://dictionary.cambridge.org/dictionary/english/future-proofing.

of minimizing the negative effect of shocks and stresses due to future events.<sup>24</sup> *Future-proofing* has also more recently been used 'to describe the ability of a design to resist the impact of potential

#### 1.3.6 Historic House Museums

In 1997 a conference was held by ICOM on the topic of the *Historic House Museum* which was 'extensively discussed for the very first time.'<sup>25</sup> At this conference the following definition for this category of museum was established:

Museum-homes which are open to the public as such, that is, with their furnishings and collections, even if on successive occasions, which have characteristic colour schemes, and which have never been used to display collections of a different provenance, constitute a museographical category in every particular, and one that varies widely in typological respects. Briefly, the specific character of this type of building is the indissoluble link between container and contained, between palace/house/apartment and permanent collections/furnishings/ornamental fixtures.<sup>26</sup>

As well as creating a definition for this museum category, it was recognised that:

Historic houses, when they are open to the public and conserved in their original condition (i.e. with the furnishings and collections made by the people who used to live in them) and have not been converted to accommodate collections put together from different sources, constitute a museum category of a special and rather varied kind. Historic house museums comply with museological and technical museographical constraints that are different from those used in other museums. Their category is different because historic houses may comprise sites of all sizes and kinds, ranging from royal palaces to residences of powerful personages, the houses of famous personages, artist's studios, rich bourgeois houses and even modest cottages.<sup>27</sup>

My research suggests that the *Historic House Museum* could also be considered as a wider building category for historic and traditional buildings which contain collections but which are still functioning as they were originally intended. This is discussed further in the following chapters.

<sup>&</sup>lt;sup>24</sup> Brian D. Rich, 'The Principles of Future-Proofing: A Broader Understanding of Resilience in the Historic Built Environment', *Journal of Preservation Education and Research* 7 (2014): 32.

<sup>&</sup>lt;sup>25</sup> Giovanni Pinna, 'Introduction to Historic House Museums', *Museum International* 53, no. 2 (2001): 4.

<sup>&</sup>lt;sup>26</sup> Rosanna Pavoni, 'Towards a Definition and Typology of Historic House Museums', *Museum International* 53, no. 2 (2001): 17.

<sup>&</sup>lt;sup>27</sup> Giovanni Pinna, 'Introduction to Historic House Museums', 4.

climate change due to global warming'.<sup>28</sup> Essentially, a future-proof building 'is also one that does not become obsolete.'<sup>29</sup>

#### 1.3.7 Maintenance

The definition of *maintenance* are taken from ICOMOS's Burra Charter:

1.5 Maintenance means the continuous protective care of a place, and its setting.

Maintenance is to be distinguished from repair which involves restoration or reconstruction.<sup>30</sup>

#### 1.3.8 Museum and Museumfication

*Museumfication* is defined by Di Giovane as; 'the transition from a living city to that of an idealized representation of itself, wherein everything is considered not for its use but for its value as a potential museum artefact.'<sup>31</sup> This definition can also be applied to smaller spaces and places, and also describes an objects 'display or preservation in, or as if in, a museum', or a 'transformation into or confinement in a museum.'<sup>32</sup> In this thesis, *Museumification* is defined as the transformation of an 'ordinary' space and its contents into a museum.

The International Council of Museums (ICOM) established a new museum definition in July 2019, as they felt that 'over recent decades museums have radically transformed, adjusted and re-invented their principles, policies and practices', and thereby required a new definition.<sup>33</sup> The updated definition is as follows:

Museums are democratising, inclusive and polyphonic spaces for critical dialogue about the pasts and the futures. Acknowledging and addressing the conflicts and challenges of the present, they hold artefacts and specimens in trust for society, safeguard diverse memories for future generations and guarantee equal rights and equal access to heritage for all people.

Museums are not for profit. They are participatory and transparent, and work in active partnership with and for diverse communities to collect, preserve, research, interpret, exhibit,

https://www.lexico.com/en/definition/museumization.

<sup>&</sup>lt;sup>28</sup> Brian D. Rich, 'The Principles of Future-Proofing: A Broader Understanding of Resilience in the Historic Built Environment', 33.

<sup>&</sup>lt;sup>29</sup> Brian D. Rich, 33.

<sup>&</sup>lt;sup>30</sup> Austrailia ICOMOS Incorporated International Council on Monuments and Sites, 'The Burra Charter: The Austrailia ICOMOS Charter for Places of Culturl Significance 2013', 2.

<sup>&</sup>lt;sup>31</sup> Michael A. Di Giovine, *The Heritage-Scape: UNESCO, World Heritage, and Tourism* (Lexington Books, 2009), 261.

<sup>&</sup>lt;sup>32</sup> 'Definition of Museumization', Lexico Dictionaries, accessed 8 October 2019,

<sup>&</sup>lt;sup>33</sup> ICOM, 'Museum Definition', ICOM, accessed 16 October 2019,

https://icom.museum/en/activities/standards-guidelines/museum-definition/.

and enhance understandings of the world, aiming to contribute to human dignity and social justice, global equality and planetary well-being.<sup>34</sup>

#### 1.3.9 Restoration/Re-creation/Reconstruction

*Restoration* is defined as 'the act of restoring or state of being restored, as to a former or original condition, place', and 'the replacement or giving back of something lost, stolen'.<sup>35</sup> The International Council on Monuments and Sights' (ICOMOS) Burra Charter also states that:

1.7 *Restoration* means returning a *place* to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material.<sup>36</sup>

This differs from *re-creation*, which is 'a simulation or re-enactment of a scene, place, time, etc'.<sup>37</sup> *Re-creation* is comparable to the Burra Charter's definition of *Reconstruction*:

1.8 *Reconstruction* means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material.<sup>38</sup>

These words are not interchangeable as they define two different approaches to conservation. *Restoration* depends upon the existence of original materials, whereas *re-creation* depends just as much on intangible factors such as evidence of original design, as well as practical factors such as cost and end-use.

## 1.3.10 Significance

The *significance* of a place is defined as; 'the sum of the cultural and natural heritage values of a place, often set out in a statement of significance'.<sup>39</sup> These factors are usually conveyed in a 'statement of significance' a document which summarises the 'cultural and natural heritage values' attached to a place or structure.<sup>40</sup>

#### **1.5 Scope and Limitations**

This thesis does not include case study buildings which have suffered fire damage outside of the UK. This is due to legislative differences between countries, however, the work of international

https://www.collinsdictionary.com/dictionary/english/restoration.

https://www.collinsdictionary.com/dictionary/english/re-creation.

<sup>&</sup>lt;sup>34</sup> ICOM.

<sup>&</sup>lt;sup>35</sup> 'Restoration Definition and Meaning | Collins English Dictionary', accessed 23 May 2018,

<sup>&</sup>lt;sup>36</sup> Austrailia ICOMOS Incorporated International Council on Monuments and Sites, 'The Burra Charter: The Austrailia ICOMOS Charter for Places of Culturl Significance 2013', 2.

<sup>&</sup>lt;sup>37</sup> 'Re-Creation Definition and Meaning | Collins English Dictionary', accessed 23 May 2018,

<sup>&</sup>lt;sup>38</sup> Austrailia ICOMOS Incorporated International Council on Monuments and Sites, 'The Burra Charter: The Austrailia ICOMOS Charter for Places of Culturl Significance 2013', 2.

 <sup>&</sup>lt;sup>39</sup> Historic England, 'Conservation Principles, Policies and Guidance' (Historic England, 2008), 40 and 72.
<sup>40</sup> Historic England, 40 and 72.

committees and academic studies set outside of Britain will be used throughout. Scotland is part of the global heritage sector and this thesis reflects this. The criteria for the inclusion of each primary case study building is defined as follows; historic buildings within Britain which suffered significant fire damage in the 1980s or later and have subsequently been restored. The word 'modern' in this context is being used to define the timescale in question; when conservation and restoration techniques began to closely resemble those in use today, from the 1980s onwards. The 'modernisation' of this field is due in no small part to the work which was carried out in the wake of the fires at each of the case study buildings. The case study buildings have created a contextual framework for the Mackintosh Building's narrative to sit within.

At the time of writing the SFRS Fire Investigation Report for the 2018 fire in the Mackintosh Building has not been published. Establishing the cause of the fire will allow the GSA to move forward and release insurance money for the reconstruction and salvage of the Building. Until then the Mackintosh Building is left in limbo. When the cause of the fire is established, I hope that similar events can be prevented from happening in other historic and traditional buildings undergoing conservation and restoration works. There is no attempt made in this thesis to suggest the cause of the fire of 2018, as it would be based on pure speculation.

#### **1.6 Chapter Structure**

Following on from the introduction, chapter two will provide a historical and geographical context for both the creation of the Mackintosh Building and the Building Conservation Movement. In this chapter, I also propose that Charles Rennie Mackintosh himself could have been a conservationist, through an examination of his writing, lectures, and influences, and highlight the modern issue of conservation inertia and its effects on our built heritage.

Chapter three provides an examination of the 2014 fire in the Mackintosh Building and how it was caused using the SFRS Fire Report as the key source. I argue that this event highlights the wider threat of fire to all historic and traditional buildings is, thereby revealing that fire-safety in these building types is a national issue, not one which is specific to the GSA and Glasgow. Fire Loading and the use of hazardous materials within the Mackintosh Building are scrutinised using the Fire Report, as well as documents from the GSA Estates Department regarding student exhibition protocols during the Degree Show period. Hidden ducts and voids are established as a common, high fire risk feature, of historic and traditional buildings, and the ducts in the Mackintosh Building and their part in the spread of the fire in 2014 are assessed within this wider context. The topics of sustainability and adaption of the historic built environment are introduced, and it is argued that the adaption and augmentation of historic and traditional buildings are crucial to their long-term preservation. To that end, the cost and sources of funding for the retrofitting of fire suppression and detection systems within the historic built environment are highlighted as a major issue. I also assert

in this chapter that the Mackintosh Building, and others like it, could be defined as Historic House Museums, and the implications of this categorisation are analysed.

The fourth chapter is a critical analysis of the techniques and philosophies behind the post-fire salvage of the Mackintosh Building after the 2014 fire. Contemporary Disaster and Emergency Response Planning in museums and archives are therefore analysed and compared to the Emergency and Disaster Plan procedures the GSA had in place in 2014. The role of the Salvage Team in a disaster or emergency scenario is also defined and discussed and compared with the GSA's approach, establishing best practice procedures. The initial standard protocols for the salvage of objects from a burning/flooding building are also established, as is the methodology of object prioritization used in museums, archives, and historic houses, which were then compared with the GSA's approach. The decision made by the GSA to restore the Mackintosh Building is compared and contrasted with the decisions made to restore Hampton Court Palace, Uppark House, and Windsor Castle as I examined the ethos and approaches of these restoration projects in the chapter which follows.

Chapter five is a critical examination of MRP1 from 2014 until the fire of 2018, analysing and recording key aspects of the restoration project. The most innovative and important projects taking place within the wider restoration project are examined, including; the role of BIM and laser scanning in MRP1, how the Mackintosh Building was 'futureproofed', how the Library and its fixtures and fittings were re-created, and which fire suppression and detection systems were selected for installation.

The cause of the fire of 2018 is unknown at the time of writing, however, that does not prevent the analysis of the damage caused to the Mackintosh Building in chapter six. The emergency works and the salvage of the Building fabric, fixtures and fittings, reveals that the GSA's previous experience and knowledge of the Building positively impacted this process. A case study of the salvage works in which I was involved is also presented in chapter six. At the time of writing, salvage works have just resumed after being put on hold since March 2020 as a result of the Coronavirus Pandemic. It should also be noted that salvage works have also been delayed by the production of the 2018 Fire Report, which we still await the publication of. The reaction to the 2018 fire is also discussed in this chapter as it varies drastically from the reaction to the fire of 2014. This analysis involved examining journal and newspaper articles and the evaluation of the Scottish Parliaments Culture, Tourism, Europe and External Affairs Committee (CTEEAC) evidence sessions, held as a result of this second fire. This analysis highlights many commonly held misconceptions about fire prevention and detection in historic buildings and the process of restoring or altering a historic building.

The concluding chapter of this thesis, entitled Lessons Learned, collects together and expands upon 'lessons learned' from previous chapters, and assesses how this knowledge could be used to make positive changes in the heritage and museum sectors.

## 2. Methodology: Establishing Historical Context

#### 2.1 Introduction

This chapter provides a historical and ideological context for this thesis and further discusses the key literature described in chapter one. Before any analysis of MRP1 or the fires of 2014 and 2018 could be conducted it was crucial to understand the significance of the Mackintosh Building. I therefore established the geographical and historical context in which the Building was designed and constructed, between 1887 and 1909. At this point, Victorian Glasgow was considered the second city of the British Empire and was the sixth-largest city in Europe. Disposable incomes and conspicuous consumption in the form of competitive collecting led to a surge of creative energy in the city which moved swiftly from the sphere of art dealing and into that of art production. Glasgow's artists and designers were creating unique paintings, embroideries, and pieces of metalwork, as well as grand buildings, ships, and textiles. The textile industry had made Glasgow wealthy at the start of the 19<sup>th</sup> century, but Glasgow would come to dominate in heavy industries, producing railway locomotives, steel, and ship.<sup>1</sup>

By 1914 Templetons on Glasgow Green had become Britain's biggest carpet manufacturer, providing luxury products for the first-class decks of the Titanic and Westminster Abbey.<sup>2</sup> Glasgow required skilled craftspeople and designers, and as a result, the Glasgow School of Art (GSA) was established in 1841 when the Board of Trade proposed the creation of a Government School of Design.

#### 2.2 The Construction of the Mackintosh Building: The Design Competition & Phase One

The GSA has moved home three times within the city centre of Glasgow, to a larger more prestigious building each time. Its third move in 1899 would be to its final location, a purpose-built art school, marking the beginning of a new era for the School as well as the man who designed the building which housed it, Charles Rennie Mackintosh (1868-1928). In September 1892, the Board of Governors of the Glasgow School of Art decided that their school and its students needed a new home. Then situated at the corner of Rose Street and Sauchiehall Street in a block which also contained the Glasgow City Corporation Art Galleries, the GSA was a small school whose size belied its student's successes. To finance this venture, in 1894 the Governors applied for a £15,000-£20,000 grant from the Bellahouston Bequest Fund for 'a special building, fitted with modern requirements'.<sup>3</sup> By 1896 sufficient funds had been collected from various sources; from Templetons to the Scottish

<sup>&</sup>lt;sup>1</sup>T.M. Devine, *The Scottish Nation 1700-2007*, Fourth (Penguin Books, 2006), 249.

<sup>&</sup>lt;sup>2</sup> T.M. Devine, 251.

<sup>&</sup>lt;sup>3</sup> 'Board of Governors' Minutes, GOV 2/3.', 1894, Glasgow School of Art Archives.

Education Department, and a Building Committee was appointed to establish the necessary competition requirements for a design for the new building.

A slim piece of land in Garnethill on Renfrew Street was purchased, and based on this site's parameters the Building Committee created a set of conditions for an open architectural competition, inviting architects to 'submit a design for a School of Art' (Fig.2.1).<sup>4</sup> The architects who wanted to enter their designs unanimously stated that the specifications laid out by the Building Committee were impossible to meet given the relatively small budget of £14,000. The Committee therefore requested that plans and designs were to be submitted which illustrated what could be achieved within the £14,000 budget. In February 1897, all the competition entries were collected and exhibited in the Glasgow City Corporation Art Galleries for the public's perusal.<sup>5</sup>

When he entered the GSA design competition Charles Rennie Mackintosh was working as a draughtsman for esteemed Glasgow architects Honeyman & Keppie. He attended night classes at the GSA for around ten years, and whilst studying he was mentored by the School's forward-thinking Director Francis, or Fra, Newbery (1855-1946). When Mackintosh's vision for the school was selected by the Building Committee it was John Keppie who received public acclaim as Mackintosh was his employee. Mackintosh's Art School was designed to be built in two stages to meet budget constraints, with the second phase of building taking place when the Board had acquired the necessary funds. By December 1899 the East Side, or Phase One, of the GSA's new building was opened (Fig.2.2). *The Evening Times* stated that 'Externally it is as everyone, with an appreciation of artistic simplicity and fine design, is bound to confess, a structure which will long remain as a monument to the strong originality and artistic conception of the Glasgow designers.'<sup>6</sup>

Despite the best efforts of the Building Committee to impress upon Mackintosh the importance of staying on budget, he failed to do so, and when the accounts for Phase One were balanced in 1901 an overspend was brought to light. The West Side, or Phase Two of the build, therefore had to be postponed, and it did not begin until 1906.<sup>7</sup> Between 1901 and 1906 Mackintosh continued to develop as a designer and worked on several projects including Kate Cranston's Willow Tea Rooms. He also exhibited internationally, including exhibitions in both Turin and Vienna alongside his wife Margaret Macdonald Mackintosh and their circle of like-minded friends. Mackintosh's plans for Phase Two were accepted by the GSA's Governors in 1907 and building began soon after.<sup>8</sup> On December 20th,

<sup>&</sup>lt;sup>4</sup> Francis Newbery, 'Glasgow School of Art: Conditions of the Competition of Architects for the New School of Art' (Glasgow School of Art, 1896), Glasgow School of Art Archives; 'Board of Governors' Minutes, GOV 2/3.' <sup>5</sup> "Glasgow Herald Article, the Exhibition of the Competition Designs," *Glasgow Herald*, February 2, 1897.

<sup>&</sup>lt;sup>6</sup> 'The Evening Times. Glasgow School of Art's New Building', *Evening Times*, 21 December 1899.

<sup>&</sup>lt;sup>7</sup> William Buchanan, ed., *Mackintosh's Masterwork: The Glasgow School of Art* (Glasgow: Glasgow School of Art Press, 2004), 36–38.

<sup>&</sup>lt;sup>8</sup> 'Board of Governors' Minutes, GOV 2/5.', 1907, Glasgow School of Art Archives.

1910, the completed Glasgow School of Art Building was opened with speeches and a celebratory ball. This time with Mackintosh being recognised as the building's designer.

#### 2.3 Historic Context: The Mackintosh Building and the Building Conservation Movement

The Building Conservation Movement has had a direct impact on the way we perceive and preserve the Mackintosh Building, and as such its influence and history was examined to establish a philosophical and technical historical framework, whilst emphasising that the Mackintosh Building's story is part of a national narrative. It was the damage caused by the aerial bombing of the UK during World War I (WWI) and World War II (WWII), as well as other factors such as development pressure, which highlighted the importance of preserving the nation's surviving built heritage on a national level. This new impetus led to the creation of the Listing process, which began in Scotland with the collation of the National Trust for Scotland's (NTS) historic burgh lists in 1936. Created by architect Ian Lindsay (1906-1966), he and his small team established the Category A, B and C Listing method still in use in Scotland today. The current criteria used by HES for the selection and categorisation of listed buildings is as follows:

Category A: Buildings of national or international importance, either architectural or historic, or fine little-altered examples of some particular period, style or building type.

Category B: Buildings of regional or more than local importance, or major examples of some particular period, style or building type which may have been altered.

Category C: Buildings of local importance, lesser examples of any period, style, or building type, as originally constructed or moderately altered: and simple, traditional buildings which group well with others in categories A and B or are part of a planned group such as an estate or an industrial complex.<sup>9</sup>

Post-WWII, The Bruce Plan was published by Glasgow City Corporation in 1945, which set out a radical regeneration master plan for the city.<sup>10</sup> Despite the burgeoning Building Conservation Movement in the UK, The Bruce Plan advised that a large swathe of Glasgow city centre's Georgian and Victorian buildings should be demolished and replaced with regimented modern buildings. Amongst the buildings slated for demolition was the Mackintosh Building. Ultimately, a less destructive solution was decided upon as the demolition and rebuilding of such a large area was financially infeasible at the time. The drastic nature of the Bruce Plan reveals how desperately in need of adequate housing and infrastructure Glasgow was after WWII. It also exposes the views of

<sup>&</sup>lt;sup>9</sup> Summary taken from Kidd, Stewart and Haire, Sharon, 1:6 full criteria can be found in Historic Environment Scotland Policy Statement, Annex 2, June 2016.

<sup>&</sup>lt;sup>10</sup> Referred to as The Bruce Plan or The Bruce Report as it was authored by Glasgow City Corporation Engineer Robert Bruce, its official title is; *First Planning Report to the Highways and Planning Committee of the Corporation of the City of Glasgow.* 

Glasgow City Corporation, which saw no value in Glasgow's historic building stock or the architectural history of the city. The fact that the Mackintosh Building was slated for demolition in 1945 shows how low its perceived cultural significance and value was to Glasgow, and Scotland, at this time. In 1936 architectural historian Nikolaus Pevsner (1902-1983) included Mackintosh in his seminal *Pioneers of the Modern Movement*. This publication had 're-awakened' interest in Mackintosh and his work, as Pevsner framed Mackintosh as a modernist pioneer, making the Glasgow City Corporations decision to demolish the Building post-WWII even more surprising.<sup>11</sup>

In contrast to The Bruce Plan, the preservation of the Mackintosh Building and its designer through the GSA's 'museumification' of prestigious spaces within it began as early as 1947 when the Mackintosh Room (the original boardroom in the East Side, or Phase One, of the building) was opened as a permanent gallery for the display of Mackintosh furniture. This was the first permanent exhibition of Mackintosh's work.<sup>12</sup> The status of the Mackintosh Building and its designer was shifting. After GSA PhD student Thomas Howarth (1914-2000) published the first scholarly biography on Mackintosh; *Charles Rennie Mackintosh and the Modern Movement* in 1952 Mackintosh's star continued to ascend.

In the 1960s the Building Conservation Movement was flourishing in Scotland; NTS's groundbreaking Little Houses Improvement Scheme was carried out by Ian Lindsay's architectural practice, championing the importance of historic domestic dwellings and buildings of traditional construction as well as grand country houses. The project has been written about by Miles Glendinning and Diane Watters in *Little Houses: The National Trust for Scotland's Improvement Scheme for Small Historic Homes*, and it had a profound impact on the way the Scottish Government interacted with the historic built environment.<sup>13</sup> Inspired by the Victorian Society which was established in London in 1957 with founding members including Pevsner; in 1965 the New Glasgow Society was founded 'in the realisation that Glasgow is one of the finest remaining Victorian cities in the world'.<sup>14</sup> The New Glasgow Society advocated for high-quality architecture and amenities as the city was transformed, and it is still active today.

<sup>&</sup>lt;sup>11</sup> Buchanan, *Mackintosh's Masterwork*, 2004, 173.

<sup>&</sup>lt;sup>12</sup> Thomas Howarth, *Charles Rennie Mackintosh and the Modern Movement*, 2nd ed., Glasgow University Publications (London: Routledge & Kegan Paul, 1977), 294.

<sup>&</sup>lt;sup>13</sup> Watters, Diane and Glendinning, Miles, *Little Houses: The National Trust for Scotland's Improvement Scheme for Small Historic Homes* (The Royal Commission on the Ancient and Historical Monuments of Scotland and The National Trust for Scotland, 2006).

<sup>&</sup>lt;sup>14</sup> 'New Glasgow Society - History', accessed 7 June 2019,

https://www.newglasgowsociety.org/index.php/history.

In 1966 The Mackintosh Building was designated as a Category A-Listed Building.<sup>15</sup> Mackintosh Curator Peter Trowles (who left his post in 2018) conducted archival research on the effect Listing the Mackintosh Building had on the way the GSA perceived and used the Building, but he found no change in perspective recorded in the GSA Archives and found no evidence of concerns about the Listing or what that impact that could have on the Mackintosh Building's use.<sup>16</sup> In 1968 the Glasgow city authorities saw fit to celebrate the centenary of Mackintosh via a touring exhibition of his work which made its way around various European cities. This considerably raised Mackintosh's profile and cemented his status as an iconic Scottish designer worthy of international recognition.

#### 2.4 Glasgow's Cultural Revival

In 1983 Glasgow City Council (GCC) began to actively rebrand the city as a tourist destination; that year the Burrell Collection was opened to great acclaim, and in 1988 the Glasgow Garden Festival attracted over 4 million visitors. Glasgow was also awarded European City of Culture in 1990. In 1999 Glasgow was made UK City of Architecture and Design, and in 2014 it hosted the Commonwealth Games. As the city flourished again, so did the reputation of Charles Rennie Mackintosh; exhibitions of Mackintosh's work and the construction of his unbuilt design, House for an Art Lover, in 1996 in Bellahouston Park made Mackintosh a household name. By now his designs could be found emblazoned on a variety of souvenirs, from tea towels to coasters, in gift shops across Glasgow. The recognition and celebration of Mackintosh's 'genius' played a large role in the cultural rebirth of his hometown, this is ironic given the Glasgow City Corporation's plans to demolish the Mackintosh Building 40 years earlier. As the significance of Mackintosh as a designer increased, the significance of his designs increased in tandem, including the Mackintosh Building.

#### 2.5 The Mackintosh Building in the Modern Glasgow School of Art Campus

Sian Jones has stated that; 'the primary use of an object has often been privileged by a concern with authenticity, and those that maintain some aspect of their primary function are often deemed more authentic'.<sup>17</sup> Therefore, as the Mackintosh Building was designed, built, and used as an art school until the fire of 2014 we can assert that it is a very special building. In December 2013 the GSA celebrated the completion of the Reid Building, designed by architect Steven Holl. It sits directly

<sup>&</sup>lt;sup>15</sup> Historic Environment Scotland, 'Historic Environment Scotland Listed Building Portal: Listing for the Mackintosh Building', Historic Environment Scotland Listed Building Portal, accessed 5 December 2016, http://portal.historicenvironment.scot/designation/LB33105.

<sup>&</sup>lt;sup>17</sup> Sian Jones, 'Negotiating Authentic Objects and Authentic Selves: Beyond the Deconstruction of Authenticity', 184.

opposite the Mackintosh Building at the centre of the GSA's Garnethill campus and was a muchneeded extension to the School's estate.

#### 2.6 Fire and Built Heritage: Legislation and Technical Guidance

According to the current Scottish Building Standards the primary aim of fire detection and suppression systems in any building are to ensure that there is no loss of life or injury to those inside:

Buildings should be constructed in such a way that the risk of fire is reduced and if a fire does occur, there are measures in place to restrict growth of fire and smoke to enable the occupants to escape safely and effectively.<sup>18</sup>

However, the secondary concern of damage to contents and building fabric is made more pressing when they are of a historic and therefore valuable and unique nature. Retrofitting fire suppression, prevention, and detection systems into historic fabric can be problematic as it can involve damage to or alteration of the original fabric, but a minimum degree of protection is nevertheless a requirement for all buildings in use. For example, when designing the Mackintosh Building compartmentation was not a requirement. This lead to fire doors being installed along the Eastern and Western corridors in the late 1970s, disrupting Mackintosh's intended vistas but making the building safer for its users.<sup>19</sup>

The 2003 Building (Scotland) Act and the Building Procedure (Scotland) Regulations 2004 have had a positive impact on the way these systems can be installed within a historic structure. These standards are functional rather than prescriptive, meaning that there is 'greater flexibility in achieving the minimum standards', allowing building owners to 'cater more sympathetically to the needs of traditional buildings undergoing conversion.'<sup>20</sup>

#### 2.6.1 Sustainability and Adaption of the Historic Built Environment

Whilst the conservation of a historic building and the maintenance of its cultural significance should always be our primary concern, 'a balance must be achieved between the historic value of the fabric and the fire safety measures introduced to protect that fabric.'<sup>21</sup> HES believes that 'the best way to protect and preserve traditional buildings is to ensure that they remain in use', and expounds the 'use it or lose it' philosophy.<sup>22</sup> A vacant building made redundant due to the changing needs of its users or economic and industrial change can deteriorate rapidly. Once abandoned the building can become

<sup>&</sup>lt;sup>18</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:43.

<sup>&</sup>lt;sup>19</sup> Geoffrey M. Wimpenny, 'Renovation and Restoration of the Glasgow School of Art', *Charles Rennie Mackintosh Society Newsletter*, no. 13 (Autumn 1976).

<sup>&</sup>lt;sup>20</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:41.

<sup>&</sup>lt;sup>21</sup> Foreword by Dr. David Mitchell, Kidd, Stewart and Haire, Sharon, 1:xii.

<sup>&</sup>lt;sup>22</sup> Stewart Kidd and Sharon Haire, 1:11.

unsafe and ultimately this can lead to its demolition. Empty or abandoned buildings are also more vulnerable to acts of vandalism such as arson than inhabited structures. These buildings can then become eyesores within the local built environment. This cycle of neglect and vandalism, in turn, decreases their perceived cultural value, as well as their monetary value, and discourages the restoration and re-use of what was once a useful building.

There is currently a drive towards sustainability and energy efficiency in all sectors in Scotland, including the heritage industry. English Heritage (EH) research has shown that 'the cost of repairing a typical Victorian terraced house can be between 40%-60% cheaper than replacing it with a new home.'<sup>23</sup> Studies have also revealed the detrimental environmental impact the construction of new buildings has on our environment; with around 10% of all UK CO2 emissions arising from the production of building materials, and 90 million tonnes of waste produced by the construction industries per year, much of which ends up in landfills.<sup>24</sup> In 2005 the Sustainable Development Commission concluded that:

Refurbishment of buildings requires significantly fewer materials than redevelopment. Reuse of built elements results in lower environmental impact than redevelopment even using recycled materials. The environmental consequences of materials use in construction and refurbishment include depletion of natural resources, local and global impacts of extraction and processing activities, and transport effects. Many materials have harmful impacts during their manufacture, or contain substances harmful to health.<sup>25</sup>

The alternative, especially concerning housing as the population of the UK continues to rise, is 'an inherently unsustainable massive expansion in new building across our finite supply of land, with enormous environmental consequences.'<sup>26</sup> Therefore, we urgently need to assess how we adapt and reuse historic and traditional buildings for a sustainable future. Considering how to install fire detection and suppression systems in a sympathetic, effective, and philosophically sound manner in historic and traditional buildings is a part of this long-term adaptive process.<sup>27</sup> None of the case study buildings we will be investigating in this thesis has been developed into domestic housing, however, the conservation philosophies and techniques employed in high-status historic and traditional buildings is a part of the adaptive reuse of our extant built heritage.

The UK National Standards Body, the British Standards Institution (BSI), which describes the current 'best practice in the management and treatment of historic buildings' (last updated in 2013), for both

<sup>&</sup>lt;sup>23</sup> Sustainable Development Commission, 'Sustainable Buildings - The Challenge of the Existing Stock: A Technical Working Paper' (Sustainable Development Commission, July 2005), 16.

<sup>&</sup>lt;sup>24</sup> Sustainable Development Commission, 47 and 52.

<sup>&</sup>lt;sup>25</sup> Sustainable Development Commission, 6.

<sup>&</sup>lt;sup>26</sup> Sustainable Development Commission, 15.

<sup>&</sup>lt;sup>27</sup> British Standards Institution, 'BS 7913:2013 Guide to the Conservation of Historic Buildings' (BSI, 2013), 11.

listed and unlisted properties, agrees that 'retaining and re-using existing buildings generally has a lower environmental impact than replacing buildings in terms of embodied energy.'<sup>28</sup> It also promotes the importance of regular maintenance as an economically effective and environmentally responsible approach:

The most effective way of ensuring energy efficiency and sustainability is to keep historic buildings in good repair so that they last as long as possible, do not need replacement and do not suffer from avoidable decay that would require energy and carbon to rectify.<sup>29</sup>

#### 2.6.2 Case Study: Duff House Retrofit

Duff House is an A-Listed stately home designed by William Adam (1689-1748) which is now under the care of HES, was one of the first historic buildings in the UK to have an automatic fire suppression system retrofitted.<sup>30</sup> It is also an example of the successful adaptive reuse of a historic property:

Following a variety of uses and owners, the house lay empty from 1945. In 1990 a decision was taken to find a new use for the building by refurbishing it as an outstation of the National Galleries of Scotland and the new home of more than 180 paintings from the national collections as well as a range of important furniture, carpets and other furnishings.<sup>31</sup>

Duff House is situated in rural Aberdeenshire, as a result, the response time for the nearest fire services was estimated at seventeen minutes, and specialist back-up services from Aberdeen would take even longer to respond. Due to the valuable nature of the contents of the building, as well as the fact that 'the building's structural integrity would provide little or no fire separation', HES decided that as part of a holistic programme of works including the upgrading of fire barriers and the installation of an automatic fire detection system, a sprinkler system would be installed between 1995 and 1996.<sup>32</sup> As a result of these works, in 1998 Duff House was awarded a Europa Nostra Award 'for the nationally important reuse of a major country house, in particular for the innovative fire protection measures.'<sup>33</sup> In 2019 plans were in place to replace the pumps in Duff House's fire suppression system and this work, which will include a full inspection of the system. This will cost around

<sup>&</sup>lt;sup>28</sup> British Standards Institution, 10.

<sup>&</sup>lt;sup>29</sup> British Standards Institution, 10.

<sup>&</sup>lt;sup>30</sup> David Gibbon and Ian Forbes, 'Fire Suppression in Historic Buildings', *The Building Conservation Directory*, 2001.

<sup>&</sup>lt;sup>31</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:92.

<sup>&</sup>lt;sup>32</sup> Stewart Kidd and Sharon Haire, 2:93.

<sup>&</sup>lt;sup>33</sup> Stewart Kidd and Sharon Haire, 2:93.

 $\pounds$ 35,000.<sup>34</sup> When installing a system it is prudent to expect, and therefore budget for, these larger costs when a suppression system has been in service for 20 years.

#### 2.7 Historic Context the Building Conservation Movement in the UK

To fully understand modern conservation and restoration philosophies and techniques, it is crucial to look back at the genesis of the movement. This has enabled the assessment of how the opinions of the movement's founders affect contemporary practices. In 1849 artist, art critic, and writer John Ruskin (1819-1900) published his influential treatise *The Seven Lamps of Architecture* and said the following about contemporary restoration practices:

[Restoration]...means the most total destruction which a building can suffer... Do not let us deceive ourselves in this important matter; it is impossible, as impossible to raise the dead, to restore anything that has ever been great or beautiful in architecture... The spirit of the dead workman cannot be summoned up... and as for direct and simple copying, it is palpably impossible. What copying can there be of surfaces that have been worn half an inch down? The whole finish of the work was in the half finish that has gone; if you attempt to restore that finish you do it conjecturally; if you copy what is left... how is the new work better than the old? There was yet in the old some life, some mysterious suggestion of what it had been and of what it had wrought. There can be none in the brute hardness of the new... Do not let us talk then of restoration. The thing is a lie from beginning to end.<sup>35</sup>

In 1877 on March  $5^{\text{TH}}$  designer and social campaigner William Morris (1834-1896) wrote the following letter to *The Athenaeum*:

Sir; My eye just now caught the word 'restoration' in the morning paper and, on looking closer, I saw that this time it is nothing less than the minster of Tewkesbury that is to be destroyed by Sir Gilbert Scott. It is altogether too late to do something to save it – and whatever else of beautiful or historical is left to us on the sites of the ancient buildings we were once so famous for?<sup>36</sup>

Morris's 1877 letter is now seen as the catalyst which led to the establishment of the Society for the Protection of Ancient Buildings (SPAB) in the same year. Morris and contemporaries such as Ruskin were deeply concerned about the mania for restoration which seemed to be sweeping every parish in England.

<sup>&</sup>lt;sup>34</sup> Stewart Kidd, 'Sprinkler Systems', 5 February 2018.

<sup>&</sup>lt;sup>35</sup> John Ruskin, *The Seven Lamps of Architecture Lectures on Architecture and Painting the Study of Architecture* (Boston Dana Etes & Company Publishers, 1900), 185.

<sup>&</sup>lt;sup>36</sup> William Morris, *The Collected Letters of William Morris*, ed. Norman Kelvin (Princeton University Press, 1984), 382.

Ruskin and Morris's concerns were not ill-founded, restorations during the 19<sup>th</sup> century period were often heavy-handed and therefore changed the unique character of a building. Much historic fabric and was often lost in this process. For example, St Albans Cathedral, a rare Norman survival, required repair by the 1800s, however, the cathedral was by no means ruinous (Fig.2.3). Respected architect Sir George Gilbert Scott (1811-1878) was commissioned to carry out a programme of restoration at St Albans in 1860, but he died in 1878 before works were completed. Lord Grimthorpe, Edmund Beckett (1816-1905) was then brought on to complete the project. Lord Grimthorpe, a former barrister from a wealthy family, paid for unnecessary Gothic Revival alterations and additions to the cathedral from his own pocket, and as a result, became infamous for this destruction of the cathedral's original fabric and architectural style (Fig.2.4).

It is, therefore, unsurprising that Morris was concerned about the free license with which architects could alter culturally and historically important structures. It was in this spirit of prevention that SPAB was created. This is also where the problematic link between destruction and restoration was forged. In *Seven Lamps of Architecture*, Ruskin described restoration as a destructive activity, and this meant that SPAB's main preoccupation was protection from such works. Morris's choice of the word 'protection' rather than 'preservation' is significant. He aimed to protect buildings from demolition, ruin, and decay. What might be called the 'SPAB approach' to historic buildings evolved principally with medieval and vernacular buildings in mind, where the structure is of considerable archaeological interest. Much of the visual appeal of such buildings derives from the inimitable texture, techniques, colours of natural materials, hand-craftsmanship and time-worn finishes. It is more difficult to apply the same principles to Victorian buildings with their hard, cast or moulded industrial materials and methods, or even Georgian buildings, where at least as much of the aesthetic impact derives from the execution by craftsmen as it does from 'the patina of history'.<sup>37</sup>

#### 2.7.1 The SPAB Approach

As alluded to above, the SPAB philosophy can be problematic, and these anti-restoration conservative principles are still enshrined in the current *SPAB Approach*, written by director Matthew Slocombe.<sup>38</sup> *The Approach* states that SPAB's ideas stem from the views of John Ruskin, and it quotes the same passage from *Seven Lamps of Architecture* as above. Ruskin himself was inspired by the work of leading Gothic Revivalist architect and designer A.W.N Pugin. Pugin promoted the gothic ornamentation of buildings, but he also maintained that authenticity 'rested not in any specific qualities, but in maintaining a sharp separation between old and new', a philosophy wholeheartedly adopted by Ruskin and SPAB.<sup>39</sup> This fixation with 'authenticity' meant that 'it became vital whether a

<sup>&</sup>lt;sup>37</sup> Rowell, Christopher and Robinson, John Martin, Uppark Restored, First (The National Trust, 1996), 36.

<sup>&</sup>lt;sup>38</sup> Matthew Slocombe, 'The SPAB Approach to the Conservation and Care of Old Buildings' (SPAB, n.d.).

<sup>&</sup>lt;sup>39</sup> Matthew Slocombe.

building was "original" or a "fake".<sup>40</sup> This conservative take on restoration and the equation of old equals original, authentic, and valuable, is problematic and at odds with modern conservation and restoration philosophies and techniques. Despite this, it is still expounded by SPAB who believe that:

Building fabric is precious... the *SPAB Approach* therefore stands against Restorationist arguments that it is possible and worthwhile to return a building to its original — or imagined original — form. Equally, the *SPAB Approach* generally rejects arguments that original design or cultural associations are more important than surviving fabric. For the Society, protecting fabric allows meaning and significance to be drawn from it by individuals, groups and successive generations.<sup>41</sup>

Whilst it is accepted that original fabric is 'precious', the idea that a restoration should not be carried out even when the original design is available creates a hierarchy in which original materials or fabric are the sole vessels of a building's cultural significance. This denigrates design history and the work of the original designer as secondary to the length of time materials have sat in place as part of a structure.

The modern iteration of SPAB, therefore, does not approve of projects such as the Stirling Castle Palace project. But why should re-creating historical design be perceived as a negative choice or process? Surely these projects are a means of educating the public as well as industry professionals on the use of traditional skills and materials, thereby ensuring these skills are not forgotten and are passed on to the next generation of craftspeople and conservators. Although patina is important, age is not the only factor that makes a building important or special, surely buildings are also important because they are examples of design. SPAB also 'champions "conservative repair" in opposition to "restoration".<sup>42</sup> Slocombe defines the aim of conservative repair as; 'to retain as much as possible of a building's historic fabric. Sometimes it involves matching the existing materials of a building and sometimes use of compatible alternatives.<sup>43</sup> This is simply a different way of describing a minimally invasive and reversible restoration approach, which is the definition of conservation best practice today.

The *SPAB Manifesto*, which is at the centre of the *SPAB Approach*, was written by the founders of the organisation. To become a member, one still has to agree with the principles of this 1877 *Manifesto*. SPAB was 'the ancestor of all modern conservation campaigning societies.' <sup>44</sup> Its purpose was to

<sup>&</sup>lt;sup>40</sup> Glendinning, Miles, *The Conservation Movement: A History of Architectural Preservation, Antiquity to Modernity* (Routledge, 2013), 117.

<sup>&</sup>lt;sup>41</sup> Matthew Slocombe, 'The SPAB Approach to the Conservation and Care of Old Buildings', 9.

<sup>&</sup>lt;sup>42</sup> Matthew Slocombe, 'The SPAB Approach to the Conservation and Care of Old Buildings'.

<sup>&</sup>lt;sup>43</sup> Matthew Slocombe, 16.

<sup>&</sup>lt;sup>44</sup> Glendinning, Miles, *The Conservation Movement: A History of Architectural Preservation, Antiquity to Modernity*, 122.

publicise proposed restoration projects, with the hopes that public pressure would make the architects and building owners involved halt any destructive restoration works. Instead, SPAB proposed 'Protection in the place of Restoration, to stave off decay by daily care', and thereby condemned buildings which have become 'inconvenient for its present use', encouraging their abandonment and celebration as 'monuments of a bygone art, created by bygone manners'.<sup>45</sup>

These Victorian beliefs are still being expounded by SPAB and this is problematic for several reasons, especially as the energy output it takes/took to create a building is now more fully understood. From an environmental and economic point of view the abandonment of a sound structure because no alterations are acceptable, and the creation of an entirely new structure, is not a good use of resources, materials, or energy. The ruination of an abandoned building would be swift if regular maintenance was not carried out, and it has been shown that uninhabited buildings or disused buildings are at a higher risk of damage than those in continual use. The funding to continuously maintain an empty building with no purpose may also be difficult to secure if the building was to become, as stated by SPAB, 'a monument' with no specific users.<sup>46</sup>

#### 2.7.2 Conservation Inertia

There are no shades of grey within SPAB's *Approach* which allow for damage caused by incidents such as fires, floods, acts of vandalism, and even deliberate acts of terrorism or war to be repaired, recreated, or memorialised accordingly. In the words of SPAB's Director:

The Society's approach very often involves carefully considered inaction. Where no problems exist, or where a problem has no major effect on use or conservation, an old building is best left alone and simply enjoyed.<sup>47</sup>

This 'inaction' can be more problematic and destructive, as can be seen in the way that the NTS has dealt with the repair of Hill House's failing cement render. In 2012 Andrew PK Wright, Architect and Heritage Consultant conducted an evaluation of the condition and significance of Hill House on behalf of its owners, the NTS. In his assessment, he states that:

The fabric of The Hill House has been plagued throughout much of its existence by problems of water penetration which have proved difficult, if not impossible, to overcome. There have been numerous attempts to remedy the problems posed by the design and the use of materials for the external walls and chimneyheads and, while some of them have met with temporary success the problems continue to return and, moreover, they bring with them the risk of

<sup>&</sup>lt;sup>45</sup> SPAB founder members, 'The SPAB Manifesto', The SPAB, 1877, https://www.spab.org.uk/about-us/spabmanifesto.

<sup>&</sup>lt;sup>46</sup> SPAB founder members.

<sup>&</sup>lt;sup>47</sup> Matthew Slocombe, 'The SPAB Approach to the Conservation and Care of Old Buildings', 12.
further collateral damage to the structure and to the outstanding decorative finishes of the house.<sup>48</sup>

Since it was completed in 1904 Hill House has suffered from damp issues, which have damaged the Mackintosh designed interiors. Patch repairs on the cracked Portland cement render have been carried out over the years, to varying degrees of success. There is no detailing to slough rainwater from the roof away from the buildings' exterior, moisture is then trapped behind the failing render and this has resulted in the bricks and mortar of Hill House 'dissolving like an aspirin in a glass of water'.<sup>49</sup> In 2017 the NTS announced that they would be encasing Hill House in a metal chainmail membrane or 'Box' which will protect the House from rain and allow the structure to dry out over several years, before any conservation work begins. The plans for any future conservation or restoration works are yet to be decided upon, and this 'Box' is buying the NTS more time to finally make its decision. This temporary, and expensive, solution is the result of many years of inaction. Part of what makes conservation such a fascinating area of study is the fact that it is a subject made up entirely of shades of grey. Each completed restoration, re-creation or conservation project is the product of hundreds of negotiations and compromises made between the client, the building or object's owner, and the protections placed on the building by organisations such as HES. This means that every project is different and should ensure the best outcome for all parties involved. It also means that a sufficient amount of time should be spent making these complex decisions, and whilst this thesis is not advocating against this process, Hill House is an example of what can happen when these difficult decisions are postponed in the search for the 'right' answer. There are no 'perfect' solutions to conservation problems, and this fact must be acknowledged and embraced.

#### 2.8 What Would Mackintosh Do?

After the fire of 2014, it was made clear by the GSA that the Mackintosh Building would be restored, and thereafter many commentators have expostulated on what Charles Rennie Mackintosh himself would think about this. As Elizabeth Davidson, Senior Project Manager of MRP1 has said many times since; 'we don't have a Ouija board or a TARDIS so we cannot know his opinions.' It has often been stated that Mackintosh would have been unhappy with the restoration of the building named after him, as he was an original in every sense, a modernist with a unique design sensibility. Therefore by investigating this oft-discussed topic, this thesis has attempted to academically answer the question; 'what would Mackintosh do?'

<sup>&</sup>lt;sup>48</sup> Andrew PK Wright, 'The Hill House, Helensburgh Evaluation of Condition and Significance' (National Trust for Scotland, 2012), 2.

<sup>&</sup>lt;sup>49</sup> National Trust for Scotland, 'Hill House Box | National Trust for Scotland', accessed 8 August 2019, https://www.nts.org.uk/visit/places/the-hill-house/highlights/hill-house-box.

Alan Dunlop, a former student at GSA and now a Professor of Architecture has said that Mackintosh 'was driven by a lifelong search for new forms in architecture and technology and was never a copyist'.<sup>50</sup> Dunlop, therefore, had 'no doubt that he [Mackintosh] would reject the approach of building a replica.'<sup>51</sup> The validity of these claims, asserting intimate knowledge of Mackintosh's opinions over one hundred years after his death, cannot be assessed. However, Dunlop's opinion was also reflected by renowned architect Julian Harrap who believed that the very idea of a replica should be avoided and that the GSA now needed to be brave in its approach.<sup>52</sup>

### 2.8.1 Mackintosh's Literary Influences

In 1889 William Morris was corresponding with then Director of the GSA, Francis Newbery, about presenting some lectures there in the spring of that year.<sup>53</sup> The GSA often invited notable figures in contemporary art and design such as Morris to speak to its students; as it still does today. Mackintosh attended evening classes at the GSA between 1883 and 1894, so would have been a member of the student body when Morris gave his lecture.<sup>54</sup> The exact contents of Morris's lecture are not known, but a leaflet promoting the lecture shows that it was entitled 'Arts and Crafts' (Fig.2.5). There is no evidence to confirm that Mackintosh attended the lecture Morris gave at GSA, but it is accepted by scholars of Mackintosh that he was influenced by Morris's work.

Mackintosh, like many other Victorian designers, was also heavily influenced by John Ruskin. Mackintosh was an appreciator of the Arts & Crafts movement as well as Ruskin's architectural writing, Mackintosh even paraphrased and discussed Ruskin's *The Stones of Venice and The Seven Lamps of Architecture*, in his 'Untitled Paper on Architecture', dated c.1892.<sup>55</sup> There has, however, been no investigation into Mackintosh's thoughts on building conservation, despite the existence of his writing on the topic. Mackintosh's papers were collected and published in a slim volume in 1990 entitled *Charles Rennie Mackintosh: The Architectural Papers*, edited by former Professor of Mackintosh Studies at the University of Glasgow's Hunterian Museum, Pamela Robertson, and through these, we can speculate on Mackintosh's views on building restoration and conservation.

Since the publication of Nikolaus Pevsner's *Pioneers of Modern Architecture* in 1936 Mackintosh's designs have been associated with the Modernist Movement, and many of the notably revivalist and

 <sup>&</sup>lt;sup>50</sup> Oliver Wainright, 'Things We Found in the Fire: Glasgow's School of Art Restoration Begins', *The Guardian*, 20 April 2015, Online edition, https://www.theguardian.com/artanddesign/architecture-design-blog/2015/apr/20/glasgow-school-of-art-new-library-charles-rennie-mackintosh.

<sup>&</sup>lt;sup>51</sup> Oliver Wainright.

<sup>&</sup>lt;sup>52</sup> Oliver Wainright.

 <sup>&</sup>lt;sup>53</sup> William Morris, 'William Morris Letter 14-1-1889', 14 January 1889, Glasgow School of Art Archives.
 <sup>54</sup> GSA Archives and Collections, 'Mackintosh', GSA Archives & Collections, accessed 8 August 2019,

https://gsaarchives.net/mackintosh/.

<sup>&</sup>lt;sup>55</sup> Charles Rennie Mackintosh, *Charles Rennie Mackintosh The Architectural Papers*, ed. Pamela Robertson (White Cockade Publishing in association with the Hunterian Art Gallery, 1990).

vernacular features of his building designs have therefore been overlooked in deference to this opinion. Similarly, Mackintosh's architectural papers reveal his positive opinion on the revivalist Scottish Baronial architectural style, and his sketching tours of Scotland featured numerous castles he had seen in MacGibbon and Ross's hugely influential; *The Castellated and Domestic Architecture of Scotland*, an illustrated survey of Scotland's castles carried out by the authors over several years. Mackintosh's lecture on the topic, 'Scotch Baronial Architecture', was delivered on the 10<sup>th</sup> of February 1891 to the Glasgow Architectural Association, and in it, he paraphrases the work of MacGibbon and Ross, without mentioning their names.<sup>56</sup> Therefore, by looking at Mackintosh's buildings whilst bearing in mind his, admittedly scant, written opinions, his designs can be viewed differently. An analysis of Mackintosh's writing, the buildings he designed, and the men he held in high regard suggest that he may well have been a conservationist as well as an appreciator of modern technologies and materials, he is therefore not dissimilar to today's conservators and heritage professionals.

#### 2.8.2 Diary of an Italian Tour

In his 'Diary of an Italian Tour' from 1891 Mackintosh states that upon visiting a church named San Martino that it was 'undergoing alterations couldn't see much but seemed rather a good thing.'<sup>57</sup> This description of alteration or augmentation of the fabric of a historic building as a 'good thing' goes against Ruskin's views, and could be seen as a more modern and pragmatic viewpoint. Equally, however, when in Brescia Mackintosh describes the 'old cathedral being frightfully restored'<sup>58</sup>, and at St Fedele, he states that the 'interior restored in very bad classic.'<sup>59</sup> There are clearly shades of grey within Mackintosh's personal conservation philosophy, unlike that of Ruskin's. By stating that one of the restorations is carried out in a style which he dislikes or does not deem appropriate, it is possible to speculate that the *style* of the works carried out were the issue for Mackintosh, *not* the restoration works themselves. Mackintosh also does not appear to be taken with the ruination of some areas of Rome, and he provides humorous descriptions of these spaces, which were fetishised by the picturesque movement in art and literature and celebrated by men like Ruskin:

I show various palaces from Rome which are all more or less interesting according to taste. And now we must push on to Ancient / Rome and by the way I may add that the road from the Capitol to the Colosseum taking in the forum Romanum & <u>the Campo Vaccin</u>, bears a very striking resemblance to some parts of the east end of Glasgow assuming about two thirds of the population to be dead of colera.

<sup>&</sup>lt;sup>56</sup> Charles Rennie Mackintosh, 30–31.

<sup>&</sup>lt;sup>57</sup> Charles Rennie Mackintosh, 96.

<sup>&</sup>lt;sup>58</sup> Charles Rennie Mackintosh, 105.

<sup>&</sup>lt;sup>59</sup> Charles Rennie Mackintosh, 106.

It is as grimy, as filthy, as tumblesome as forlorn, and is as unpleasantly redolent of old clothes, and old women who were washerwomen once upon a time, but who have long since forsworn soap, either for their own or for others use. That the temples and palaces of the Forum & the Capitol should be dilapidated & decrepit is in the nature of things and offers no protext for grumbling I do not feel inclined to echo the opinion of the intelligent American tourist who describes Rome "As a nice place, but the public buildings much out of repair" The tumbledown structures I object to are the modern ones. The classical ruins / are ruins and behave as such. The dilapidated domestic edifices are not picturesque and their decrepitude is not venerable.<sup>60</sup>

Here Mackintosh separates the ruins of Rome into two distinct categories: 'classical ruins' and 'delapidated [sic] domestic edifices'. The old ruins are 'venerable' and 'picturesque' according to prevailing nineteenth-century artistic aesthetics, whilst the newer urban buildings are simply poorly maintained structures, so they are neither romantic nor beautiful. This is a belief that is still perpetuated today and leaves us with problematic modern ruins such as Gillespie Kidd & Coia's St Peter's Seminary in Cardross. Built in the 1960s, but out of use as a seminary by 1980, it has lain empty since 1995. As an A-Listed Building, it is of national importance, and the Scottish Government requested HES provide advice on options for the future of the structure, which they published in May 2019. The Seminary is described by HES as 'being in an advanced state of decay', and makes it clear that 'there is no easy solution', when it comes to the future of this building.<sup>61</sup> Ultimately, HES advised the Scottish Ministers that 'given the full implications, we could not recommend that Ministers intervene by bringing St Peter's into care as a Property in Care.'<sup>62</sup> The owners of the Seminary, the Archdiocese of Glasgow, are now likely to request its demolition.<sup>63</sup>

## 2.8.3 Wareham and its Churches

In 1895 Mackintosh also wrote a piece for *The British Architect*, entitled 'Wareham and its Churches', in which he considers the architecture of the area as well as the restoration work being carried out on its ecclesiastical buildings. Mackintosh's conservation philosophies are further revealed in this record of his visit to Wareham, as he describes the village as 'picturesque', and 'the most beautiful old-world village it has ever been my pleasure to see.'<sup>64</sup> In her introduction to Mackintosh's *Architectural Papers*, Robertson discusses this article:

<sup>&</sup>lt;sup>60</sup> Charles Rennie Mackintosh, 113. Spelling as written by Mackintosh.

<sup>&</sup>lt;sup>61</sup> Historic Environment Scotland, 'St Peter's Seminary - Cardross Advice to Scottish Ministers' (Historic Environment Scotland, May 2019), 3.

<sup>&</sup>lt;sup>62</sup> Historic Environment Scotland, 3.

<sup>&</sup>lt;sup>63</sup> Historic Environment Scotland, 18.

<sup>&</sup>lt;sup>64</sup> Charles Rennie Mackintosh, 'Wareham and Its Churches', *The Bri*, 8 November 1895, 326.

He toed a clear SPAB line, undoubtedly impressed upon him by Honeyman, an active SPAB member from 1877-88. Mackintosh claimed that St Mary and Holy Trinity had been ruined by 'ignorance and restoration – they usually go together', while at St Martin's he concluded 'a very small sum judiciously spent from time to time is all that is required to make it for all time one of the most interesting churches in the neighbourhood.<sup>65</sup>

The Honeyman Robertson refers to is John Honeyman (1831-1914) of Honeyman & Keppie, the architectural firm for which Mackintosh worked between 1889 and 1911.<sup>66</sup> In his piece on Wareham Mackintosh does state that 'ignorance and restoration... go together', in his description of the works at St Mary and Holy Trinity, however, he also states that regular maintenance is necessary for the long-term preservation of historic fabric. His writing and lectures therefore suggest that Mackintosh would not be opposed to conservation as it is currently defined and would actively support maintenance plans.

The word 'restoration' was used very differently by SPAB in the 19<sup>th</sup> century than it is today. As previously discussed, Ruskin had a very negative opinion of the term and its implications. For Ruskin, restoration is equated with the death of an object or a building. To him, the patina and the aura of authenticity imbued in a building over time was key to its uniqueness. Removing this patina, therefore, destroyed the history of a building and thereby its reason to be appreciated. Mackintosh, however, does not appear to have taken as hard a line as Ruskin. This may be because as a Scot he was used to the idea of the restoration and augmentation of castles and tower houses, which had been a popular and accepted form of architectural intervention in Scotland from the seventeenth- century onwards.<sup>67</sup>

## **2.9** Conclusion

With a historic and geographical context in place, it is now possible to discuss the fires of 2014 and 2018 in the Mackintosh Building. This context is essential to our understanding of the Building and its creator, as is an understanding of the building conservation movement's development in Scotland. Establishing where we are presently; in terms of conservation philosophies, is only useful if we also look to the past and evaluate the progress we have made. This thesis argues that not nearly enough progress has been made since the establishment of SPAB in 1877 and that appropriate interventions and alterations to historic buildings have not been normalised within the heritage sector. To preserve our built heritage we must continue to use it, and therefore adapt it, creating a more sustainable future

<sup>&</sup>lt;sup>65</sup> Charles Rennie Mackintosh, Charles Rennie Mackintosh The Architectural Papers, 19.

<sup>&</sup>lt;sup>66</sup> 'Dictionary of Scottish Architects - DSA Architect Biography Report (March 28, 2018, 3:30 Pm)', accessed 28 March 2018, http://www.scottisharchitects.org.uk/architect\_full.php?id=200362.

<sup>&</sup>lt;sup>67</sup> Miles Glendinning and Aonghus MacKechnie, *Scottish Architecture*, Thames & Hudson World of Art (Thames & Hudson, 2004), 76–77.

in the process. Damaging conservation inertia must be avoided and appropriate changes to the historic built environment must be encouraged and seen as positive.

On 28<sup>th</sup> April 2019 Scotland became the first government in the world to declare a state of Climate Emergency, and HES alongside other cultural heritage organisations have recognised that and the heritage sector has a role to play in the movement to prevent irrevocable climate change. In 2019 the Climate Heritage Network was launched in Edinburgh. One of their key messages is 'Cultural Heritage is a Climate Action Issue. Climate Action is a Cultural Heritage Issue.'<sup>68</sup> The two are intrinsically linked, and Scotland is at the forefront of this movement. To remain at the forefront, we must leave inertia behind and accept that the conservation of our built heritage is an imperfect science. Contemporary restoration and re-creation philosophies and techniques have more in common with birth and growth than they do with the finality of death.

<sup>&</sup>lt;sup>68</sup> Climate Heritage Network, 'The Climate Heritage Network', Climate Heritage Mobilization, accessed 27 June 2020, http://climateheritage.org/.



The Glasgow School of Art's original premises from 1869-1897 highlighted in Green. The new site for the School highlighted in Red.

Figure 2.1: New Plan of Glasgow with Suburbs, from Ordnance and Actual Surveys, constructed for the Post Office Directory.

By John Bartholomew & Co LTD, 1910-1911. Copyright National Library of Scotland.



Figure 2.2: Perspective drawing of Glasgow School of Art from the north-west (Phase 1) by Alexander McGibbon, 1899-1906. Copyright GSA Archives.



Figure 2.3: Colourised image on a postcard of St. Albans Cathedral, the image shows the building prior to its 'restoration' in the early 19<sup>th</sup> century.



Figure 2.4: Modern photograph of St. Albans Cathedral, showing the drastic aesthetic changes made during its 'restoration.' Copyright Daz/Shutterstock.



Figure 2.5: Programme showing William Morris as a lecturer at a GSA event in 1889. Reproduced copyright and courtesy of Kirkcudbright Galleries, Dumfries and Galloway Council, from the collections of Glasgow Museums.

# 3. Contextualising the Fire of 2014

Fire is the single greatest threat to the occupants, fabric and contents of any building.

- Sharon Haire69

### **3.1 Introduction**

This chapter examines the events which led to the 2014 fire in the Mackintosh Building, as well as the damage caused by the fire itself. Working chronologically from the construction of the Mackintosh Building between 1897 and 1909, and up to the fire of 2014, this chapter assesses the factors which led to the fire of 2014 and highlights the importance of fire safety in the historic built environment. The examination of the passive fire prevention systems, as well as the fire suppression and detection systems, used, and being installed in, the Mackintosh Building from its construction up until the 2014 fire also highlights changing attitudes to public safety and the value of our built heritage.

Arguably, the most crucial element of fire prevention in the historic built environment is careful custodianship, balancing the use and sustainability of a building with conservation philosophy and legislation. However, as is shown through the analysis of case studies including the Mackintosh Building the cost of retrofitting fire detection and suppression systems is high and can often be prohibitive. It must also be recognised that whilst they are effective, fire detection and suppression systems are imperfect, and it is crucial that the installation of these systems is prescriptive, with all decisions made on a case by case basis. Every historic building has its own unique set of problems and will, therefore, require its own unique combination of solutions. A fixation on sprinkler systems as the only way to guard against a fire event in a historic or traditional buildings is therefore problematic and unhelpful.

### 3.2 Fire Proofing of the Mackintosh Building: Historic Context

The Mackintosh Building was built to conform to contemporary fireproofing standards. Historically, from the 1790s onwards in the UK 'iron and brick arch systems of construction' were introduced as a fire safety measure in multi-storey textile mills in Lancashire and Yorkshire.<sup>70</sup> However, these iron and brick mills were more expensive to build than traditional timber structures so only the most wealthy industrialists could afford to erect them. This meant that 'it was not until the end of the nineteenth century [that]... fireproof construction became standard for new mills', due to increasing concerns about loss of life in fires in large multi-storey factories.<sup>71</sup> In a bid to make Scotland's built

<sup>&</sup>lt;sup>69</sup>Sharon Haire, 'Inform Guides: Fire Safety in the Home' (Historic Scotland, 2014).

<sup>&</sup>lt;sup>70</sup>Sara Wermiel, 'The Development of Fireproof Construction in Great Britain and the United States in the Nineteenth Century', *Construction History* 9 (1993): 6.

<sup>&</sup>lt;sup>71</sup> Sara Wermiel, 6.

environment safer, the Burgh Police Scotland Act of 1892, and the Glasgow Building Regulations Act of the same year addressed fire safety in new domestic and public buildings. Now, 'the construction of external and party walls, supporting structure, and internal partitions around passages and stairs were required to be of incombustible materials, such as stone or brick'.<sup>72</sup>

When the Mackintosh Building was constructed, between 1897 and 1910, fireproofing was, in many respects, less advanced than today, but fire safety measures were nevertheless built-in. During this period the fireproofing of buildings was 'intended to check the spread of a fire and eliminate the structure itself as a source of fuel'.<sup>73</sup> However, it is important to acknowledge that even today design errors can be made with devastating consequences; in 2017 a fire in the Grenfell tower block in London caused the deaths of seventy-two people. The fire spread rapidly up the exterior of the building, fuelled by highly combustible cladding which had been incorrectly installed. As a result, the UK Government has banned the installation of these cladding materials in high-rise structures, but this ban does not retroactively apply to buildings in which the cladding has already been installed. At the time of writing this leaves around 40,000 people still living in tower blocks across the UK that have been clad in these materials, a hugely worrying figure.<sup>74</sup>

As the Mackintosh Building was built in two sections or phases, this had the unintentional effect of compartmentalising the building (Fig.3.1). Compartmentalisation is defined by HES as a 'passive' method of fire protection which 'involves the sub-division of a building into smaller volumes by fire-resistant floors, walls and other divisions'.<sup>75</sup> HES still considers compartmentation to be 'the simplest and most cost-effective way to restrict the spread of fire and hence risk to life and damage to buildings.'<sup>76</sup> This divide between Phase One and Phase Two formed a natural fire break in the Mackintosh Building and allowed the fire of 2014 to be effectively contained by the SFRS in the West Side, or Phase Two, of the building. The interior of the Mackintosh Building contained a large amount of timber and therefore fireproofing was a concern. As a result, expanded metal lath and a fire-resistant render were used to protect structural steel elements (Fig.3.2).

<sup>&</sup>lt;sup>72</sup> Nicky Imrie, 'Mackintosh Architecture: Essay - Building Process and Records', Mackintosh Architecture: Context, Making and Meaning, 2014, https://www.mackintosh-

architecture.gla.ac.uk/catalogue/essay/?eid=building\_process.

<sup>&</sup>lt;sup>73</sup> Sara Wermiel, 'The Development of Fireproof Construction in Great Britain and the United States in the Nineteenth Century', 3.

<sup>&</sup>lt;sup>74</sup> Zamira Rahim, '40,000 People Still Live in Deadly Grenfell-Style Tower Blocks', *The Independent*, 8 April 2019, https://www.independent.co.uk/news/uk/home-news/grenfell-tower-fire-acm-cladding-housing-a8859846.html.

<sup>&</sup>lt;sup>75</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, vol. 2, Techinical Advice Notes (Historic Scotland, 2010), 16.

<sup>&</sup>lt;sup>76</sup> Stewart Kidd and Sharon Haire, 2:16.

## 3.3 Fireproofing in other Mackintosh Designed Buildings

As part of this thesis, it seemed pertinent to investigate the fire suppression and detection systems in place in other Mackintosh designed buildings in Glasgow. This created a wider framework to place the Mackintosh Building within, highlighting the fact that the Mackintosh Building and the issues it faced, and faces, do not exist in isolation.

## 3.3.1 The Glasgow Herald Building

Now an arts venue called The Lighthouse, the building situated at 7 Mitchell Lane in Glasgow was originally designed as offices for *The Glasgow Herald* newspaper. The building was completed in 1895 when Mackintosh was working for Honeyman & Keppie. It should be noted that a fire suppression system in the form of sprinklers had been installed in the earlier adjacent *Herald* offices in 1888, before Mackintosh's involvement with the building.<sup>77</sup> *The Glasgow Herald* Building's most striking feature is the water tower, designed y Mackintosh to house a tank which fed a system of 'roof-drenchers', designed by the manager of *The Glasgow Herald*, Alexander Sinclair and installed in 1891.<sup>78</sup> The 'roof-drenchers' consisted of 'perforated, galvanised iron tubes running along the roof ridges and window tops' which could release water to protect the building from airborne sparks from other building fires.<sup>79</sup> That this system was installed and designed as an integral part of the building reveals just how pressing concerns about fire were in late nineteenth-century Glasgow.

Inside, there were relatively few fireplaces, as the building was heated by steam pipes.<sup>80</sup> Structurally, the Glasgow Herald Building did not contain much timber, instead 'incombustible steel, iron, concrete, brick and stone' were used throughout to increase its fire resistance.<sup>81</sup> Concrete floors, with timber floorboards laid on top, were also installed, with the Glasgow Herald Building's concrete 'said to be of a new and superior type'.<sup>82</sup>

## 3.3.2 Queen's Cross Church

Built between 1896-1899 Queen's Cross Church was designed by Mackintosh whilst working as an assistant at Honeyman & Keppie. The Church is constructed of red Locharbriggs sandstone which has been roughly dressed, and steel tie beams are visible in the interior of the vaulted wooden ceiling.<sup>83</sup>

<sup>&</sup>lt;sup>77</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson, 'Mackintosh Architecture: Glasgow Herald Buildings', Mackintosh Architecture: Context, Making and Meaning, 2014, https://www.mackintosh-

architecture.gla.ac.uk/catalogue/freetext/display/?rs=25&xml=des&q=herald.

<sup>&</sup>lt;sup>78</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>79</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>80</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>81</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>82</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>83</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson, 'Mackintosh Architecture: Queen's Cross Church', Mackintosh Architecture: Context, Making and Meaning, 2014, https://www.mackintosh-

architecture.gla.ac.uk/catalogue/freetext/display/?rs=46&xml=int&q=church.

There is a timber transept gallery, as well as pews, and other furniture and the roof trusses of the neighbouring hall are also constructed in timber. The Church became the home of the Charles Rennie Mackintosh Society in 1977 and now regularly hosts events such as lectures and conferences, as well as weddings. There are currently no fire suppression systems installed in Queens Cross Church.

### 3.3.3 The Willow Tea Rooms

Miss Cranston's Willow Tea Rooms on Sauchiehall Street opened to the public in 1903. Though the building they occupy was not designed by Mackintosh, Katherine Cranston (1849-1934) tasked Mackintosh with re-designing the exterior, as well as the interior, furnishings, fixtures and fittings. The façade of the building consists of ashlar masonry coated with white stucco, and the structure comprises of contemporary fireproof materials; rolled-steel beams and concrete.<sup>84</sup> Timber panelling, joists, and staircases, as well as open fireplaces, a designated smoking room, and a busy working kitchen, would all have increased the chances of a fire incident occurring on the premises.<sup>85</sup>

In 2014 the Tearooms were purchased by the Willow Tea Rooms Trust, and in 2018 after an extensive restoration, the Tearooms re-opened to the public, providing its original services, as well as guided tours of the reinstated interior. As a result of the restoration a water mist suppression system was retrofitted throughout the building, as was a highly sensitive VESDA (very early warning aspirating smoke detection) air sampling automatic detection system.

## 3.3.4 Hill House

Hill House in Helensburgh was designed by Mackintosh as a family home for patron, friend, and publisher Walter Blackie (1860-1953). Completed in 1904, Hill House has been in the care of the NTS since 1982. The house was built using snecked-rubble, a common feature of Scottish vernacular architecture, as well as red brick. A non-porous Portland Cement render, instead of a more traditional lime harling, coated the exterior rubble.<sup>86</sup> Open fires provided heat, as did a central heating system which was connected to radiators placed throughout the House.

There are currently no fire suppression systems installed in Hill House, however, it does contain automatic fire detection systems; 'using a combination of an air sampling system (VESDA) and traditional detectors' which 'automatically calls the local fire brigade if triggered.'<sup>87</sup>

<sup>&</sup>lt;sup>84</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson, 'Mackintosh Architecture: The Willow Tea Rooms', Mackintosh Architecture: Context, Making and Meaning, 2014, https://www.mackintosharchitecture.gla.ac.uk/catalogue/freetext/display/?rs=5&xml=des&q=willow.

<sup>&</sup>lt;sup>85</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson.

<sup>&</sup>lt;sup>86</sup> Nicky Imrie, Joseph Sharples, and Pamela Robertson, 'Mackintosh Architecture: The Hill House', Mackintosh Architecture: Context, Making and Meaning, 2014, https://www.mackintosh-

architecture.gla.ac.uk/catalogue/freetext/display/?rs=28&xml=des&q=Hill%20House.

<sup>&</sup>lt;sup>87</sup> Richard Williams, 'Fire Suppression and Detection Systems in Hill House', 14 August 2019.

## 3.4 Fire Safety: The Mackintosh Building in the late 20th Century

In 1962 a serious fire destroyed St Andrews Halls in Glasgow, and as a result, only the façade could be retained. The large concert venue and ballroom opened in 1877 and less than a ten-minute walk from the Mackintosh Building. The fire in the Halls was caused by a lit cigarette, just as the fire at Hampton Court Palace would be in 1986. The Mitchell Library, which was connected to St Andrews Halls, was saved from the flames by the efforts of Fire Officers, as well as by a 'firewall' between the buildings which was 'built during the war to save the building from incendiary bombs'.<sup>88</sup> This shows how effectively compartmentalisation can prevent the spread of fire, and it also reminds us of the fragility of our built environment and the damage that can be caused by one careless smoker. In 1964, perhaps prompted by the 1962 fire in St Andrews Halls, Glasgow City Corporation's Firemaster, J. Swanson, was asked to conduct an inspection of the Mackintosh Building and produce a report based on his findings.

### 3.4.1 Swanson's Fire Inspection of the Mackintosh Building

J. Swanson was requested to carry out his inspection by Harry Jefferson Barnes (1915-1982), who was the Director of the GSA from 1964 to 1980; according to Swanson this was in response to 'a small fire in a first-floor studio which would have had very serious consequences and this report will, therefore, endeavour to give advice as to how this danger can be minimised.'<sup>89</sup> This 'small fire' was caused by a 'moveable black heater' which did not meet contemporary fire regulations. It was being used by students to warm the lofty ceilinged first-floor studios. The GSA was expanding during the 1960s and 1970s, with the construction of the Foulis Building, completed in 1963, and the Newbery Tower, completed in 1970. Both buildings were demolished in 2012 to make way for the new Stephen Holl designed Reid Building, which was completed a few months before the 2014 fire.

In his *Inspection Report* ducts are not explicitly mentioned, however, Swanson does state that: 'it is necessary that all holes in ceilings and walls through which fire may spread easily should be made good.'<sup>91</sup> (Fig.3.3) Swanson stated that the amount of timber used 'in linings, partitions and decorative work' made the fire load of the Mackintosh Building 'very high'.<sup>92</sup> He also noted that due to the age of the timber it would now be very dry and therefore combustible, meaning 'that fire could very rapidly spread throughout the entire building.'<sup>93</sup> The fire load of this ageing timber alone made

 <sup>&</sup>lt;sup>89</sup> J. Swanson, 'Fire Inspection Report', 1964, Glasgow School of Art Archives & Collections These papers were found by Dr Robyne Calvert who generously shared them with me, many thanks to her for this material.
 <sup>89</sup> J. Swanson, 'Fire Inspection Report', 1964, Glasgow School of Art Archives & Collections These papers were found by Dr Robyne Calvert who generously shared them with me, many thanks to her for this material.
 <sup>91</sup> J. Swanson, 'Fire Inspection Report'.

<sup>&</sup>lt;sup>92</sup> J. Swanson.

<sup>&</sup>lt;sup>93</sup> J. Swanson.

Swanson conclude that 'the utmost care must be exercised in regard to fire safety' in the Mackintosh Building.<sup>94</sup>

In terms of fire load additional to the structure of the building, it was the top floor studios with which Swanson was most concerned, he felt that they left 'much to be desired' in terms of good housekeeping.<sup>95</sup> Swanson states that a problematic practice 'of allowing materials to accumulate over a period of years' had developed and a 'cleaning out process should be undertaken' to rid the top floors of this extraneous material.<sup>96</sup> Swanson recognised that the 'function' of the Mackintosh Building as a working art school gave 'rise to accumulation of quantities of timber and other combustible materials' however, he makes it clear that in excess this is unacceptable (Swanson even found old mattresses being stored on the top floor of the building), and reminds the reader that; 'the role in which good housekeeping plays in limiting the danger from fire cannot be over-emphasised and should be borne in mind at all times particularly by the school staff.'<sup>97</sup>

Swanson went on to gather 'information about the procedure as to the disposal of cleaning rags, paints etc.' and found that: 'it would appear that this is mainly a responsibility for the individual student'.<sup>98</sup> He again highlights the importance of good housekeeping, as well as informing the student body of their responsibilities when working with flammable materials, Swanson believed that 'it is therefore necessary to underline the fact that under no circumstances should rags, particularly oil-soaked rags and other combustibles be left in the studios.'<sup>99</sup> Swanson warned that 'such rags are liable to ignite spontaneously and therefore must not be allowed to gather in quantity over a period of time' or they would pose a serious fire hazard to the Building and its users.<sup>100</sup> He did not call for the prohibition of these materials as they were then essential to a great number of practising artists in the Building, instead, he pragmatically suggested an acceptable compromise in the form of the careful use and disposal of flammable materials.

Swanson went on to describe the fire prevention systems that were in place in the Mackintosh Building at the time of his inspection: 'at the moment the school authorities maintain a "watching" system by a firm of security guards who inspect the premises on an agreed number of occasions each night.'<sup>101</sup> However, Swanson saw that this system was flawed; the 'small fire' in the first-floor studio which led to Barnes' commissioning this report 'occurred outwith the inspection hours' and in

- 96 J. Swanson.
- 97 J. Swanson.
- 98 J. Swanson.
- 99 J. Swanson.
- <sup>100</sup> J. Swanson.
- <sup>101</sup> J. Swanson.

<sup>94</sup> J. Swanson.

<sup>95</sup> J. Swanson.

Swanson's opinion, this clearly 'illustrates that the protection system is in need of improvement.'<sup>102</sup> He concluded by stating that: 'it is therefore recommended that very serious consideration be given to the installation of automatic fire alarms throughout the building.'<sup>103</sup>

Portentously, Swanson also noted that 'there is also a considerable exposure hazard from adjoining buildings, particularly from the Regal Cinema, the roof of which is immediately adjacent to the rear of the school.'<sup>104</sup> During the second fire in the Mackintosh Building in 2018, the Regal Cinema, which had become the O2 ABC nightclub, was set alight and as a result of the structural damage caused the Category B Listed building will have to be demolished.

After Swanson recommended that an automatic fire detection system was installed, Barnes sought out a quote for the works. Barnes moved quickly, and the installation of an 'Automatic Heat and Smoke Detection Fire Alarm' began on 23<sup>rd</sup> of August 1964, the same year as Swanson's report was written. Works took place during the summer break and were completed by the end of that year.<sup>105</sup> The installation of these alarms cost £6,207 (£6,207 equates to £109,356 in today's money) and there was also a maintenance fee of £100 to be paid annually.<sup>106</sup> This work was paid for by the Scottish Education Department after Barnes applied to them for funding using Swanson's report as evidence of the need for safety improvements to the Mackintosh Building. Barnes also sought a quotation for the installation of 'a fully automatic Sprinkler Installation complete with all pipes, control valves, pressure tanks and pumps', and was quoted £20,000-£22,000 for the installation.<sup>107</sup> However, the company in question, Associated Fire Alarms Ltd, stated that 'this cost does not include for building work required which will be extensive in a building of this nature.'<sup>108</sup> The installation cost alone equates to between £352,364 and £387,600 today, a large sum that did not include the comprehensive planning and construction costs involved in a project of this size.<sup>109</sup> It is therefore unsurprising that Barnes was only able to extract the cost for the fire alarms from the Scottish Education Department.

The installation of 'smoke doors' in three staircases was also 'being investigated' by the GSA in 1964; the approximate cost of which was 'about £2,500', which is £44,045 today.<sup>110</sup> Upgrading the fire safety of the Mackintosh Building was something that Barnes undertook after a small fire

<sup>&</sup>lt;sup>102</sup> J. Swanson.

<sup>&</sup>lt;sup>103</sup> J. Swanson.

<sup>&</sup>lt;sup>104</sup> J. Swanson.

<sup>&</sup>lt;sup>105</sup> J. Swanson.

<sup>&</sup>lt;sup>106</sup> J. Swanson; The National Archives, 'The National Archives - Currency Converter: 1270–2017', text, Currency converter, accessed 5 February 2019, http://www.nationalarchives.gov.uk/currency-converter/.

<sup>&</sup>lt;sup>107</sup> J. Swanson, 'Fire Inspection Report'.

<sup>&</sup>lt;sup>108</sup> J. Swanson.

<sup>&</sup>lt;sup>109</sup> Archives, 'The National Archives - Currency Converter'.

<sup>&</sup>lt;sup>110</sup> J. Swanson, 'Fire Inspection Report'; Archives, 'The National Archives - Currency Converter'.

occurred, and his preventative and proactive approach secured an effective automatic fire detection system for the Building which remained in service until it was replaced in 1994.<sup>111</sup>

The Mackintosh Building was designed to function as an art school, and it did so for over a hundred years, until the 2014 fire. However, it nevertheless required careful management, especially concerning the use of hazardous or flammable materials inside it. We know that the Mackintosh Building was not listed until 1966, two years after Swanson's report was written, but Swanson still recognised that 'the building was designed by Charles Rennie Mackintosh and is therefore of considerable architectural importance', revealing just how much the status of this building had increased since it was earmarked for demolition by another Glasgow City Corporation employee in 1945.<sup>112</sup>

## 3.4.2 Mackintosh Society Reports

In a 1979 article in the *Charles Rennie Mackintosh Society Newsletter* entitled, 'Notes on Mackintosh Buildings', Colin B. Kirkwood describes the conservation works which were taking place in the Mackintosh Building:

Currently undergoing an extensive programme of conservation, the next major phase of which involves the entire renewing of the lighting and power circuits... This phase will be followed by a complete overhaul of the central heating system. For reasons of fire prevention it is unlikely that the original system of heating by hot air will be restored. The multiplicity of ducts if opened up would constitute a major fire hazard.<sup>113</sup>

Any repairs or conservation works until this point were being undertaken in a piecemeal manner as and when funds were available. In 1984 as part of a major upgrade to the Mackintosh Building's services the whole building was completely rewired and the oil-powered boilers which had provided heat and hot water since the 1920s were replaced 'by a less obtrusive gas calorifier system'.<sup>114</sup> This work was carried out in two phases over two consecutive summers to prevent disruption to GSA staff and students during term time.

In 1995 architect and researcher Professor George Cairns wrote an article for the *Charles Rennie Mackintosh Society Newsletter* entitled; 'The Glasgow School of Art: The Missing Link of

<sup>&</sup>lt;sup>111</sup> The Hunterian, University of Glasgow, 'Mackintosh Architecture: Glasgow School of Art Chronology', Mackintosh Architecture: Context, Making and Meaning, accessed 5 February 2019, https://www.mackintosharchitecture.gla.ac.uk/catalogue/freetext/display/?rs=31&xml=chr&q=Glasgow%20School%20of%20Art.
<sup>112</sup> J. Swanson, 'Fire Inspection Report'.

<sup>&</sup>lt;sup>113</sup> Colin B. Kirkwood, 'Notes on Mackintosh Buildings', *Charles Rennie Mackintosh Society Newsletter*, no. 23 (23 August 1979).

<sup>&</sup>lt;sup>114</sup> George Cairns, 'The Glasgow School of Art: The Missing Link of Environmental Systems History', *Charles Rennie Mackintosh Society Newsletter*, no. 66 (Winter/Spring 1995): 9.

Environmental Systems History'.<sup>115</sup> Cairns, who wrote his doctoral thesis on the architecture of the Mackintosh Building, highlighted that these ducts and their corresponding fans were 'of integral construction with the original building fabric' but 'were long abandoned and initial searches of available references provided little information on their design and operation.'<sup>116</sup> The original air conditioning system was replaced in the 1920s with a more efficient piped hot water and steam radiator system, as the initial system did not effectively heat large volumes of space, however, this meant that 'there was no provision for cooling and no ventilation for the major areas beyond the use of opening windows.'<sup>117</sup> The ducts and voids in the Mackintosh Building, which had been a known fire hazard since the 1960s were again being written about, this time in an academic paper focused on their original function.

A year after Cairn's piece, between 1996 and 1997, Stewart Kidd, the co-author of *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, visited the Mackintosh Building as an employee of HES (then Historic Scotland). Kidd recalls the following about his visit:

I am aware that there has been speculation as to the part which the timber-lined ventilation trunking may have played in both fires. I'm not able to comment directly on this but I do recall that when I visited the site... in company with a senior member of staff of Historic Scotland, we both commented on the potential for serious fire spread throughout the building via the trunking. I recall the comment 'just like a very effective chimney' being agreed as an appropriate description of the hazard.<sup>118</sup>

HES Guidelines state that, 'in addition to flues... other long-forgotten ducts or shafts may be part of the original construction'.<sup>119</sup> The voids in the Mackintosh Building were recorded by Mackintosh in his original plans and have never been 'lost' to the GSA, as is proven by the numerous reports and articles above which discuss them from the 1960s onwards.

The maintenance of records of changes made to a building's fabric and systems is an important part of effective building management, and thankfully, the GSA archives are the most complete of any art school, greatly aiding our understanding of alterations made to the Mackintosh Building as well as its construction and design. The ducts in the Mackintosh Building had not been used for their original purpose, as air conditioning shafts, since the 1920s. These same ducts have been considered a fire hazard by the GSA since the 1960s. It is, therefore, highly problematic that it took until the 2000s for

<sup>&</sup>lt;sup>115</sup> George Cairns, 'The Glasgow School of Art: The Missing Link of Environmental Systems History'.

<sup>&</sup>lt;sup>116</sup> George Cairns, 5.

<sup>&</sup>lt;sup>117</sup> George Cairns, 9.

<sup>&</sup>lt;sup>118</sup> Stewart Kidd, 'Written Submission from Stewart Kidd for the Scootish Parliament's Culture Tourism and External Affairs Committee' (The Scottish Parliament, 29 October 2018), 3.

<sup>&</sup>lt;sup>119</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, vol. 1, Techinical Advice Notes (Historic Scotland, 2010), 23.

the fire stopping of ducts in the Mackintosh building to take place, 80 years after the ducts were made obsolete.

## 3.5 The 2000s: Major Improvement Scheme of the Mackintosh Building

## 3.5.1 Mackintosh Conservation and Access Project

Between 2006 and 2009 the Mackintosh Conservation and Access Project, funded by bodies including the Heritage Lottery Fund (HLF) was established with the following aims:

- Increase access to enhance the visitor experience and learning
- Improve the care, exhibition and access to the archives and collections
- Meet future visitor demand
- Manage visitor access to a working art school<sup>120</sup>

As a result of this work there was also a 'partial renewal of mechanical and electrical services installations' in the Mackintosh Building, and 'where access to run services was taken through existing ducts, these were fire stopped as part of the installation process.'<sup>121</sup> The partial nature of this process means that not all ducts in the Mackintosh Building were fire-stopped as part of this programme of works.

## 3.5.2 Burro Happold Fedra Mackintosh Building Feasibility Study

In 2006 'running concurrently with the Mackintosh Conservation & Access Project' the GSA commissioned a *Property Protection Feasibility Study* of the Mackintosh Building from Burro Happold Fedra, which concluded that the installation of complete modern fire-stopping 'would...be virtually impossible given the current structure and the amount of compartmentation and fire stopping which would be required'.<sup>122</sup> The report, therefore, recommended that a mist suppression system was installed due to 'the high-risk nature of the building, and its activities'.<sup>123</sup> The GSA then:

convened a workshop with Historic Scotland [now HES], Page\Park and FEDRA to share concerns and potential solutions. All present agreed the importance of fire suppression, particularly given the huge investment already committed through the Conservation & Access Project. GSA then embarked on a fundraising campaign, whilst the team explored systems

<sup>&</sup>lt;sup>120</sup> Page\Park, 'Written Submission from Page\Park' (Scottish Parliament's Culture Toursim, Europe and External Affairs Committee, 25 October 2018), 3.

<sup>&</sup>lt;sup>121</sup> Page\Park, 3.

<sup>&</sup>lt;sup>122</sup> Page\Park, "Written Submission from Page\Park for the Scottish Parliament Culture, Tourism, Europe and External Affairs Committee," 4.

<sup>&</sup>lt;sup>123</sup> Page\Park, 4.

which would be acceptable to the building insurers, and looked at the programming of the works which had to be carried out in a single continuous phase.<sup>124</sup>

Retrofitting an automatic fire suppression and/or detection system in a Listed Building is a long and expensive process. The GSA acknowledged that this process was far from straightforward from the outset, and as a result, their proposal involved:

the application of appropriate, highly specialist technology to the protection of a working Category A Listed Building from fire damage, for which there was very limited precedent. We sought and received the agreement of Historic Scotland, Glasgow City Council (GCC) Building Control and our Insurers.<sup>125</sup>

The Burro Happold FEDRA *Property Feasibility Study* of the Mackintosh Building found that the Mackintosh Building was 'essentially uncompartmented in fire safety terms, with multiple voids and penetrations of walls and floor/ceilings.'<sup>126</sup> It was noted that 'doors enclosing staircases, and separating sections of the building from one another, do not meet modern requirements for fire doors', however, it was acknowledged that 'given the age and listed nature of the building, which makes it difficult to alter and upgrade, this is unsurprising.'<sup>127</sup> José L. Torero of University College London, stated in his 2019 article on fire safety in historic buildings that: 'Compartmentalization is many times impossible in a historic building because the structure cannot be modified, thus the importance of fire suppression increases.'<sup>128</sup> Therefore, 'conventionally, sprinklers will be used to reduce the fire size and thus prevent flashover'.<sup>129</sup> Flashover 'corresponds to the moment when the smoke layer produced by the fire reaches a sufficient temperature and soot volume fraction that results in enough radiation so that all other combustible objects [in the space] at ignite.'<sup>130</sup> José L. Torero points out that whilst sprinklers are normally installed to 'reduce the fire size and thus prevent flashover', however, the design of an existing building, particularly those with high ceilings, 'can be used to compensate for the omission of a sprinkler system.'<sup>131</sup>

The Feasibility Report's authors also 'noted' the voids 'throughout the building' which were acknowledged once more to be a route for the rapid spread of fire around the building.<sup>132</sup> However, these ducts were also seen as 'opportunities' as they could 'provide potential routes for the

<sup>&</sup>lt;sup>124</sup> Page\Park, 'Written Submission from Page\Park', 4.

<sup>&</sup>lt;sup>125</sup> Page\Park, 'Written Submission from Page\Park'.

<sup>&</sup>lt;sup>126</sup> Burro Happold FEDRA, "Mackintosh Building: Property Feasibility Study," 14.

<sup>&</sup>lt;sup>127</sup> Burro Happold FEDRA, 14.

<sup>&</sup>lt;sup>128</sup> Jose L. Torero, 'Fire Safety of Historical Buildings: Principles and Methodological Approach', *International Journal of Architectural Heritage* 13, no. 7 (2019): 931.

<sup>&</sup>lt;sup>129</sup> Jose L. Torero, 932.

<sup>&</sup>lt;sup>130</sup> Jose L. Torero, 931.

<sup>&</sup>lt;sup>131</sup> Jose L. Torero, 932.

<sup>&</sup>lt;sup>132</sup> Burro Happold FEDRA, 'Mackintosh Building: Property Feasibility Study', 15.

distribution of protection system equipment throughout the building.<sup>133</sup> HES Guidelines make it clear that 'whilst the blocking of any unused ducts that may contribute to fire spread should be considered, the role of the ducts in providing internal ventilation must be also taken into account; this is of particular importance in traditionally constructed buildings.<sup>134</sup> HES, therefore, advises that 'mechanically or electrically operated fire dampers that operate to close off ducts when a fire is detected' are installed in any ducts.<sup>135</sup>

The report confirms that the ducts which rose through the building vertically were originally used to distribute hot air, and provided a succinct summary of their former function:

Historically, the services distribution has been enabled using multiple horizontal and vertical voids throughout the building. Originating from the plant areas located at Lower Basement/ Basement levels and using the original horizontal heating duct which is located under the full length of the Basement Corridor, service ducts for piped and cabled services run along this void and thence up through the building in numerous vertical risers. These risers were the original route for hot air, from the buildings hot pipe matrix room, which was driven through the Lower Basement horizontal duct and then up vertical risers for distribution on the various levels of the building. The vertical risers may be observed at each level on either side of the main corridor at regular intervals.<sup>136</sup>

When Burro Happold Fedra conducted their survey of the Mackintosh Building in 2006, they observed that there was 'no firestopping...in the extensive horizontal distribution duct at Lower Basement level'. Other areas including a void on the first floor, and the void under the 'sloping seating of the lecture theatre' were also earmarked for fire protection.<sup>137</sup>

## 3.5.3 Retrofit of the fire suppression system

Jose L. Torero states that 'the implementation of fire safety in the built environment has been traditionally a prescriptive process.'<sup>138</sup> Meaning that 'what was perceived as safe in the past might not be perceived as safe today', buildings are, therefore, 'constantly being retrofitted so as to be updated to new code requirements.'<sup>139</sup> The planning and execution of a retrofit project of this scale involves the participation of several groups, including bodies such as HES, the Fire Services, insurers, architects, engineers, and craftspeople. All works must reflect current conservation and building

<sup>&</sup>lt;sup>133</sup> Burro Happold FEDRA, 15.

<sup>&</sup>lt;sup>134</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:23.

<sup>&</sup>lt;sup>135</sup> Stewart Kidd and Sharon Haire, 1:23.

<sup>&</sup>lt;sup>136</sup> Burro Happold FEDRA, 'Mackintosh Building: Property Feasibilty Study', 15.

<sup>&</sup>lt;sup>137</sup> Burro Happold FEDRA, "Mackintosh Building: Property Feasibility Study," 13–16.

<sup>&</sup>lt;sup>138</sup> Jose L. Torero, 'Fire Safety of Historical Buildings: Principles and Methodological Approach', 926.

<sup>&</sup>lt;sup>139</sup> Jose L. Torero, 926.

standards, and therefore must not cause unacceptable levels of damage to the original fabric or be detrimental to the aesthetic and character of the historic or traditional building. HES recognises that:

The most difficult question any owner of a traditional property can be asked is what they would wish to have left after a fire. Whilst 'everything' might be an obvious response, the answer in reality needs to consider a complex set of interlinked issues, including the safety of the building structure, the contents of the building and crucially, human safety. Achieving this balance requires careful consideration of some of the basic principles of fire protection measures such as detection and suppression systems.<sup>140</sup>

In 2009 GSA obtained 'approval in principle' to install a water mist fire suppression system from HES, Glasgow City Council's Building Control, and their insurers.<sup>141</sup> However, funding still had to be found for this project, which began in 2009 and ended in 2012. The GSA was able to raise £520,000, but HES and the Heritage Lottery Fund were unable to provide grants, with HES stating that they were supportive of the project but 'that they were only empowered to provide grant aid for repairs to listed buildings, not improvements.'<sup>142</sup> Whilst this suppression system was considered the best method of preventing or minimising the damage caused by a fire incident in the Mackintosh Building, that does not mean that fire suppression systems should be installed in all historic and traditional buildings. José L. Torero points out that:

It is necessary to understand that [fire] safety is not attained by compliance and furthermore that compliance does not mean safety. Many historic buildings have features that make them inherently safe despite not being compliant with current codes [building standards].<sup>143</sup>

The installation of this system was 'very close to being completed when the May 2014 fire occurred at the west end of the building', which meant that at the time of the fire the suppression systems were not operational.<sup>144</sup> Page\Park architects, who were working with GSA and on the installation, stated that:

Unlike other contract works which were phased to concentrate activity over the quieter summer periods, the installation of the fire suppression system was a single continuous phase of work, reflecting the importance of this installation to GSA.<sup>145</sup>

<sup>&</sup>lt;sup>140</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:57.

<sup>&</sup>lt;sup>141</sup> Glasgow School of Art, 'Glasgow School of Art Evidence Submission' (Scottish Parliament's Culture Toursim, Europe and External Affairs Committee, 15 November 2018), 9.

<sup>&</sup>lt;sup>142</sup> Glasgow School of Art, 9.

<sup>&</sup>lt;sup>143</sup> Jose L. Torero, 'Fire Safety of Historical Buildings: Principles and Methodological Approach', 939.

<sup>&</sup>lt;sup>144</sup> Page\Park, 'Written Submission from Page\Park', 4.

<sup>&</sup>lt;sup>145</sup> Page\Park, 4.

## 3.6 Funding the installation/retrofitting of fire suppression and detection systems

HES has several grants schemes, none of which can provide funding for the installation of fire detection systems in historic buildings. HES's 'Historic Environment Repair Grant' is 'to be used to repair buildings or ancient monuments which are of special architectural, historic or archaeological significance.'<sup>146</sup> The Mackintosh Building and the work planned does, however, meet all of the following grant criteria listed in the HES table below:

Table 3.1: grant criteria for an application to the HES 'Historic Environment Repair Grant'

- the building or ancient monument must be of significant architectural or historic importance
- the repairs or conservation proposed must be urgently needed
- you must be able to demonstrate the need for grant support to enable the repairs or conservation to go ahead

Assessment of applications is a competitive process that also takes account of any wider benefits that the repair or conservation project may provide. Private residences are less likely to receive grants from public funds as a result.

This is because such benefits include:

- enhanced public access
- benefits for communities
- social and economic regeneration
- promotion of quality
- development of knowledge and skills

Ultimately, the installation of a new system into this Mackintosh Building makes it ineligible as;

Grants are not available for:

- routine maintenance
- minor repairs
- the repair or installation of services
- extension
- alterations
- demolition

<sup>&</sup>lt;sup>146</sup> Historic Environment Scotland, 'Overview: Historic Environment Repair Grant', n.d.,

https://www.historicenvironment.scot/grants-and-funding/our-grants/historic-environment-repair-grant/.

### 3.6.1 HES Grant Funding

HES are provided with discretionary funding for the provision of their grants by the Scottish Government. These grants can be 'awarded to enterprises to assist them with activities in the area of culture and heritage conservation' under the 'Historic Scotland Culture And Heritage Infrastructure Scheme 2014 - 2020'.<sup>147</sup> According to the EU Commission Regulations which govern the way this funding is used 'aid' or grants can be used to fund the following tangible and intangible heritage assets:

(a) costs for the construction, upgrade, acquisition, conservation or improvement of infrastructure, if at least 80 % of either the time or the space capacity per year is used for cultural purposes;

(b) costs for the acquisition, including leasing, transfer of possession or physical relocation of cultural heritage;

(c) costs for safeguarding, preservation, restoration and rehabilitation of tangible and intangible cultural heritage, including extra costs for storage under appropriate conditions, special tools, materials and costs for documentation, research, digitalisation and publication;

(d) costs for improving the accessibility of cultural heritage to the public, including costs for digitisation and other new technologies, costs to improve accessibility for persons with special needs (in particular, ramps and lifts for disabled persons, braille indications and hands-on exhibits in museums) and for promoting cultural diversity with respect to presentations, programmes and visitors;

(e) costs for cultural projects and activities, cooperation and exchange programmes and grants including costs for selection procedures, costs for promotion and costs incurred directly as a result of the project<sup>148</sup>

Therefore, the installation or retrofitting of any new services in a historic building, including fire detection and suppression systems, are not deemed eligible for grant funding. The maintenance costs of a historic building are also ineligible for grant aid. HES can only provide grants for 'the construction, upgrade, acquisition, conservation or improvement' of existing historic fabric or infrastructure. Retrofitting fire suppression and detection systems in a historic or traditional building is costly, and the money to pay for such large projects cannot usually be found within an institution or organisations regular budget, as was the case with the GSA. This makes their ineligibility for grant aid

<sup>&</sup>lt;sup>147</sup> Historic Environment Scotland, 'Historic Scotland Culture and Heritage Infrastructure Scheme 2014-2020 Legal Basis' (Historic Environment Scotland, n.d.).

<sup>&</sup>lt;sup>148</sup> European Commision, 'COMMISSION REGULATION (EU) No 651/2014' (The Official Journal of the European Union, 26 June 2014).

unfortunate. However, should the Scottish Government decide that these retrofit projects are eligible for grant funding, suitable additional funding based on case study costs of other retrofits and the estimated number of applicants must be provided by the Scottish Government to HES so that they can organisationally meet demand without compromising their current grant programmes.

### 3.7 Fire Stopping in the Ducts of the Mackintosh Building in 2014

Between 2015 and 2016 Page\Park architects (who were appointed to carry out the restoration of the Mackintosh Building after the fire of 2014) stated that works 'included the full fire-stopping of ducts' with fire dampers.<sup>149</sup> However, every duct inside the Mackintosh Building had not been fully fire-stopped at the time of the 2014 fire, thus allowing it to travel upwards through the building and into the Library. The unstopped ducts in the Mackintosh Building did not cause the fire of 2014, but they did allow the fire to spread upwards through the building, thereby causing more damage. The fact that the ducts were not dealt with until after the fire of 2014 is indicative of a reactionary rather than preventative attitude towards the conservation of the historic built environment which detrimentally affects buildings and their owners across the UK. This situation is exacerbated by a lack of available funding for preventative measures such as the installation of fire suppression and detection systems.

### 3.8 The 2014 Fire in the Mackintosh Building

On 23<sup>rd</sup> May 2014 Glasgow School of Art's Mackintosh Building was unintentionally set alight. In Studio 19 on the afternoon of the fire, students were putting together their exhibitions for their final year degree show. It is a frenetic time for students and staff as the GSA prepares for this annual event and the public exhibition of students work. An exhibition display area which was constructed out of 'chipboard and wooden studs and the ceiling was of stretched polythene' was being created by a student.<sup>150</sup> The student had also created foam panels made from the same expanding foam offsite which were then brought into the exhibition space and attached to the interior of the chipboard display area. This foam is typically used for insulation, draught prevention and filling gaps. The student had chosen to use 'some 50 cans' of the product, called *No Nonsense Expanding Foam Hand Held* to fill gaps between the foam panels of their exhibition area in Studio 19.<sup>151</sup> This foam is expelled from its container via the use of a propellant, a composite of three highly flammable gases; propane, isobutene and dimethyl ether, and given the number of cans used by the student and the size of Studio 19 the gases must have been highly concentrated in the space.<sup>152</sup> The *Fire Investigation Report*, published by the SFRS in November 2014, stated that the most likely cause of the fire was the ignition of these

<sup>&</sup>lt;sup>149</sup> Page\Park, 'Written Submission from Page\Park', 5.

<sup>&</sup>lt;sup>150</sup> Scottish Fire and Rescue Services, 'Scottish Fire and Rescue Service: Fire Investigation Report - Mackintosh Building, 167 Renfrew Street, Glasgow', 2014, 10.

<sup>&</sup>lt;sup>151</sup> Scottish Fire and Rescue Services, 10.

<sup>&</sup>lt;sup>152</sup> Scottish Fire and Rescue Services, 11.

gases by an electrical spark from within an overhead projector which was also being used in the room as part of an exhibition installation.<sup>153</sup> It should be noted that the projector was subject to all standard PAT testing and was, therefore, safe to use.<sup>154</sup> A carbon dioxide fire extinguisher was used in an attempt to put the fire out, but its growth was too rapid to control.

The SFRS arrived at the scene 4 minutes after the initial call was made by the GSA at 12:27.<sup>155</sup> Firebreaks were quickly established in a stairwell in the West Side of the building as well as within the roof space, this effectively divided the building in two and prevented the spread of fire into the East Side. By 14:00 30% of the Mackintosh Building was burning, but the efforts of the SFRS meant that the firebreaks held. The fire had spread across the walls and into the ceiling of Studio 19 where timber-lined service ducts created a direct path for the fire to the floor of Studio 31, directly above. Four more timber-lined voids in Studio 31 gave the fire a route upwards through the building and into the Mackintosh Library. The fire then continued up into Studios 43, 44 and 45. Reaching the top floor of the building, it badly damaged Studio 58, the adjacent Professors Studios and the Hen Run.

### 3.8.1 Ducts and Hidden Voids and the Spread of the Fire

The 2014 *Fire Investigation Report* describes the movement of fire through the Mackintosh Building's timber-lined ducts which were now being used to house services:

wall area [in Studio 19] was lined with timber panels – Canadian redwood pine, which formed the outer covering of a vertical service void. An area slightly to the left of the projector had some panels removed allowing access for ongoing maintenance...This void ran the entire height of the building to roof level... This timber-lined void acted like a chimney and allowed flames, hot gases and smoke to travel vertically. As flames and hot gases reached ceiling level of studio 19 they spread horizontally igniting further timber panelling and when these failed flames, hot gases and smoke entered further voids on the same wall but on the other side of the doorway of studio 19.<sup>156</sup>

The *Report* states that 'As flames travelled within the timber-lined voids and ductwork, an intense rapidly burning fire would be the result.'<sup>157</sup> The concentrated heat which this wood was subject to 'generated further flammable vapours' through a process called pyrolysis.<sup>158</sup> The report defines this chemical reaction as 'the thermal decomposition of organic material through the application of heat without the addition of extra air or oxygen.'<sup>159</sup> Obsolete ducts are a huge issue in historic buildings

<sup>&</sup>lt;sup>153</sup> Scottish Fire and Rescue Services, 10–11.

<sup>&</sup>lt;sup>154</sup> Scottish Fire and Rescue Services, 10–11.

<sup>&</sup>lt;sup>155</sup> Scottish Fire and Rescue Services, 3.

<sup>&</sup>lt;sup>156</sup> Scottish Fire and Rescue Services, 8.

<sup>&</sup>lt;sup>157</sup> Scottish Fire and Rescue Services, 13.

<sup>&</sup>lt;sup>158</sup> Scottish Fire and Rescue Services, 13.

<sup>&</sup>lt;sup>159</sup> Scottish Fire and Rescue Services, 13.

and coupled with roof voids and attic spaces, these empty passageways can allow fire to spread the length and breadth of a building. HES Guidelines make it clear that 'Interconnecting voids probably present the greatest hazard to the traditional building in a fire'.<sup>160</sup>

#### 3.8.2 The Use of Expanding Foam in Studio 19

The SFRS has stated the following about the foam product used in Studio 19:

This foam is classed as a hazardous product. It is extremely flammable and harmful to health. The foam is in a liquid form within the can and is known as polymethylene polyphenyl Isocyanate. When expelled from the can and allowed to dry it is extremely flammable. We could find no evidence to suggest that this product failed to perform to the standards specified by its manufacturer.<sup>161</sup>

As a result, 'the foam lined walls of the space once ignited would burn rapidly.'<sup>162</sup> The *Fire Report* also summarises the dangers associated with the use of the foam within Studio 19:

(i) Extremely rapid spread of flame across the surface of the material, the speed often being in excess of 0.5 metres per second;

(ii) Very high temperatures in the order of 1,000°C can be generated during the initial stage of burning;

(iii) The emission of large quantities of highly toxic gases and smoke.

The ceiling height and large open area of studio 19 would have contributed to a wellventilated intense fire. As the fire spread to involve all the foam the heat and combustible gases given off would have risen to ceiling level igniting timber panels covering the voids.<sup>163</sup>

Images provided to the SFRS taken two to three days before the fire show the temporary exhibition space in Studio 19 before the foam panels had been attached to the chipboard structure (See Fig.3.4). The pre-made foam panels can also be seen. A timber services duct, previously part of the Mackintosh Building's original ventilation system, had had its exterior panels removed before the fire as a new mist suppression system was being installed throughout the building, leaving the void open and therefore vulnerable (Fig.3.5). The projector being used in Studio 19 was sitting on a shelf under this open duct, where again foam had been used around the shelf to fill gaps.<sup>164</sup> (Fig.3.6)

<sup>&</sup>lt;sup>160</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:17.

<sup>&</sup>lt;sup>161</sup> Scottish Fire and Rescue Services, 'Scottish Fire and Rescue Service: Fire Investigation Report - Mackintosh Building, 167 Renfrew Street, Glasgow', 2014, 10.

<sup>&</sup>lt;sup>162</sup> Scottish Fire and Rescue Services, 12.

<sup>&</sup>lt;sup>163</sup> Scottish Fire and Rescue Services, 12.

<sup>&</sup>lt;sup>164</sup> Scottish Fire and Rescue Services, 10.

#### 3.8.3 The Use of a Projector in Studio 19

The *Fire Report* states that when the fire started the 'projector was on and had been running for two to three hours' whilst on its shelf.<sup>165</sup> Whilst the projector had been PAT tested by the GSA the *Fire Report* notes:

The projector generates a large amount of heat when operating and a built in fan entrains air from the surrounding areas which is blown across the internal parts of the projector and lamp assembly to dissipate heat and keep it from overheating. This bulb has a surface temperature in excess of 200 degrees Celsius and was contained within the lamp assembly. The filament will easily have a temperature in excess of 1000 degrees Celsius.<sup>166</sup>

The projector had been loaned to the student by the GSA for use within their temporary exhibition space for the duration of the Degree Show and the GSA confirmed that:

students are advised when they take out equipment to make sure that air intake & outlet are not covered and if required to make holes in boxes/plinths to allow the air to circulate properly. They are also informed not to use them in dusty environments.<sup>167</sup>

## 3.8.4 The Use of Hazardous Substances In the Mackintosh Building

Current HES Guidelines for 'Typical Fire Hazards to be considered during Construction Works' state that:

Propane and butane bottled gases are commonly used in construction and maintenance activity and they should be carefully handled... Care should be taken in the use of flammable liquids – especially adhesives for laying tiles or flooring materials and paint thinners and cleaning solvents... Their vapours are also generally heavier than air and thus may accumulate to form an explosive concentration. Vapours heavier than air vapours may travel considerable distances before being ignited.<sup>168</sup>

There is also a risk from certain types of temporary electrical connections and lighting units.<sup>169</sup>

<sup>&</sup>lt;sup>165</sup> Scottish Fire and Rescue Services, 10.

<sup>&</sup>lt;sup>166</sup> Scottish Fire and Rescue Services, 'Scottish Fire and Rescue Service: Fire Investigation Report - Mackintosh Building, 167 Renfrew Street, Glasgow', 2014, 10.

<sup>&</sup>lt;sup>167</sup> Scottish Fire and Rescue Services, 'Scottish Fire and Rescue Service: Fire Investigation Report - Mackintosh Building, 167 Renfrew Street, Glasgow', 2014, 10.

<sup>&</sup>lt;sup>168</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:9.

<sup>&</sup>lt;sup>169</sup> Stewart Kidd and Sharon Haire, 1:9.

Before the fire of 2014, the GSA did have a 'Code of Practice for Student Exhibitions and Degree Shows' in place which was to be followed by all students exhibiting work in the annual degree show held in the Mackintosh Building. It states the following concerning both fire escapes and the installation of any temporary electrical equipment:

Table 3.2: Excerpt from the GSA's 'Code of Practice for Student Exhibitions and Degree Shows', in place before the 2014 fire.

- **Fire escape routes and exit doors:** On no account can fire escape routes, corridors, stairs, exit doors and signs be blocked, restricted or hidden. These facilities are mandatory under the Health and Safety at Work Act and the Fire Prevention Acts, and cannot be tampered with.
- Electrical installations and cabling: There is considerable increase in the use of electronic equipment, projectors, monitors and laptop computers to drive installations. Exhibition-standard lighting is also popular. All of these require sources of power, which must be considered when planning a location. Trailing leads, flexes and cables are a distinct hazard, and must not cross floors open to traffic. Installations must be able to be switched off without climbing on chairs, ladders, etc.

The School's Health and Safety policy requires that equipment and appliances are (PAT) Portable Appliance Tested before bringing them on to the premises. Remember that a shock from a faulty electrical installation could well be fatal!

These common-sense regulations were put in place to ensure the safety of the Mackintosh Building's users. Every year before the Degree Show GSA students were assigned a space within the building in which to exhibit their work. After being given a space, students were then required to fill out a form detailing their exhibition plans which they must have signed by both the lecturer assigning their space as well as a Technical Advisor from their School or Department, confirming that the planned exhibition met the standards set by the GSA Estate Department's codes.<sup>170</sup> This completed form was then handed back to Estates so that students could be supplied with the necessary support to create their exhibition spaces whilst ensuring that the safety of building users would not be affected by any exhibits.

GSA teaching staff must ensure that all students proposals are signed off prior to installation as well as inspected during and after installation for any infractions to the codes set out by GSA's Estates Department. There are trained Health and Safety Officers (HSO) in each department of the GSA, and an HSO must be present during any events; from lectures in the Reid to tableau vivant's in the Library. Perhaps all students, or a designated student per class exhibiting in the Degree Show could

<sup>&</sup>lt;sup>170</sup> The Estates Department, 'Code of Practice for Student Exhibitions and Degree Shows' (Glasgow School of Art, January 2011).

also undergo HSO Training. During Degree Show preparations these students would report to the staff HSO and department heads. This would hopefully encourage the students to engage with health and safety regulation, keeping each other safe at this busy point in the academic year as well as learning valuable transferable skills.

### 3.8.5 Banning Materials

This shows that a section of the student proposal forms for Degree Show Exhibitions did include a list of problematic objects or materials which had to be declared by students prior to their installation:

Table 3.3: Excerpt from the student proposal forms all students participating in the GSA Degree Show had to fill in before installing their exhibition in the Mackintosh Building. This form was in use at the time of the 2014 fire.

Does the work involve:	
F	Flashing lights
Ν	Noise/Sound
S	Sharp objects
Ν	Moving objects
F	Fragile objects
C	Objects which are unbalanced
F	Fumes
C	Gas
E	Electricity
v	Water
R	Radio-active materials
C	Chemicals
A	Animals
A	Acid
S	Smoke
C	Cranes/Lifting Gear
R	Roofs
If the above applies you will require to look further into the exhibition of your work and take advice from your School/Department.	

Telling students to declare the use of any items listed above, including fumes and gas, is a sensible measure, however, the descriptions of these materials are perhaps too vague, and therefore could be left open for misinterpretation. The GSA did not appear to have a list that explicitly banned any materials or substances in 2014, and if the GSA did create such a list it could have been seen as creatively restrictive by the student body. The onus to 'look further into the exhibition' if these items are involved in their work is on the student themselves, they must seek 'advice' from their 'School/Department'. This approach, hoping that students will act sensibly and responsibly, places the crucial decisions to be made about health and safety into the hands of individuals who have not been trained to make them.

## 3.8.6 Regulations regarding the use of problematic materials in the Mackintosh Building

A BBC Scotland documentary entitled *The Mack: A Tale of Two Fires* was released in 2019 and included an interview with Tom Inns, who was Director of the GSA from 2013 to 2018. In it he describes the use of the expanding foam in the Mackintosh Building during the 2014 Degree Show preparations, he stated: 'It was an error of judgement, which led to an unfortunate accident. The error of judgement was to be using a spray can in a studio environment. It's against the rules.'<sup>171</sup> This begs the question, why were these rules not enforced? Was it a lack of staff oversight, or was it because with no official list of banned substances, the student using the foam felt that they were within their rights to challenge staff authority and use it? I argue that it was a combination of these factors.

To ensure this kind of incident does not happen again owners of Listed Buildings should consider the implementation of a banned materials list, created based on expert consultation. This procedure could be encouraged as standard practice within any A Listed Building. HES technical advice states that:

The fire load implications of any materials brought into heritage buildings should always be assessed – this is particularly relevant in the case of temporary exhibits and similar activities... The likely hazards presented by display stands, backing materials and fabrics used as part of a display should also be considered. Clearly fire-rated materials can be procured easily and exhibition organisers or designers should be asked to provide the appropriate certification or test results if the appropriateness of a particular substance in doubt.<sup>172</sup>

The GSA Estates Department states in their 'Guidance Note for Buildings used for exhibition locations and temporary studios' that the following are 'typical sources of fire':

<sup>&</sup>lt;sup>171</sup> Lindsey Hanlon, 'The Mack: A Tale of Two Fires', The Mack: A Tale of Two Fires (BBC, 2019).

<sup>&</sup>lt;sup>172</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:30.

Table 3.4: Excerpt from the GSA Estates Department states in their 'Guidance Note for Buildings used for exhibition locations and temporary studios', in use at the time of the 2014 fire.

use of flammable substances;
special and visual effects;
faulty electrical equipment or poor quality wiring within the building;
untreated scenery and combustible materials;
heaters;
hot work (e.g. welding or gas burning during construction or installation phases);
poor housekeeping;
smoking.

The Estates Department also required that a fire risk assessment of any practice-based work in the Mackintosh Building was carried out by GSA students and staff members before work commenced, 'to identify the hazards and ensure that adequate precautions are taken to reduce risks to an acceptable level', and does recognise that:

Some locations may contain hazardous materials or substances, for example chemicals, asbestos or microorganisms that could potentially be a risk to people working on the exhibition or temporary studio.<sup>173</sup>

The focus of the Estates Department in terms of hazardous materials within this documentation is asbestos. Asbestos was used within the structure and services of buildings until the mid-1970s in the UK and if inhaled can cause permanent lung damage. There is no mention of the more 'everyday' hazardous materials used by students and staff within the building, which is troubling as Swanson raised concerns about items such as oil-soaked rags and paints, both of which are highly flammable, 50 years before the 2014 fire.

To ensure regulations are followed, final year students should not be ultimately responsible for reporting the use of problematic materials, they and their lecturers should not be responsible for the

<sup>&</sup>lt;sup>173</sup> The Estates Department, "Glasgow School of Art: Health and Safety Guidance Note; Buildings Used for Exhibition Locations and Temporary Studios."

final checks concerning the use of potentially hazardous substances and materials; the estates and curatorial staff should.

### 3.8.7 How likely was a fire incident under these circumstances?

The flammable gas from the foam canisters, the heat generated by the projector, and the presence of flammable foam panelling, makes it unsurprising that a fire incident occurred in Studio 19, or that it became uncontrollable so quickly. There was an automatic fire detection system in place throughout the Mackintosh Building, which alerted the SFRS and those inside the building to the fire, as a result, everyone inside was evacuated, and there were no fatalities or injuries. However, there was no operational automatic fire suppression system in the Mackintosh Building, but work had been halted whilst students prepared for the Degree Show.<sup>174</sup> This meant that the only fire suppression method available in 2014 was the use of fire extinguishers, which under the circumstances were ineffective.

### 3.9 Conservation Principles and Retrofitting

Before any augmentation or alteration of historic fabric can take place, a sound conservation ethos should be established at the centre of a heritage management plan:

The impact of any proposed change should be justified. The approach taken to that justification should be proportionate to the nature and significance of the historic building and the scale of impact of the proposed works... large scale interventions affecting a complex site might need a detailed conservation management plan... work proposals should be based on an appropriate level of research into the historic building in order to understand its significance, structure, fabric, design, layout, services and other parameters.<sup>175</sup>

This investigative work creates a solid baseline for any project, allowing augmentation of a historic building to be carried out from an informed position by owners and ultimately contractors. BS 7193:2013 also states that; 'the principle of minimum intervention (i.e. retention of as much fabric as possible of a building when repair or other intervention is required) is important.'<sup>176</sup> As a result, it is required that 'all interventions should be recorded to facilitate future understanding', any new or

<sup>&</sup>lt;sup>174</sup> Scottish Fire and Rescue Services, 'Scottish Fire and Rescue Service: Fire Investigation Report - Mackintosh Building, 167 Renfrew Street, Glasgow', 2014, 12–13.

additional maintenance implications caused by the addition of new materials and systems within the structure must also be clearly communicated to the owner of the building.<sup>177</sup> Reversibility is also a key point here. HES proposes the following rules for the retrofitting of any fire suppression or detection systems in a historic building:

Table 3.5: Excerpt from HES 'Guide for Practitioners 7: Fire Safety Management in Traditional Buildings', 2010, copyright HES.

- Essential The fire systems should be central to meeting the objectives of the protection of life, buildings and contents.
  - 2. Appropriate to risk Any system that is installed should be apposite to the risks being considered.
  - 3. Compliant with legislation Systems should be installed according to demonstrable performance-based and other legislatively prescribed standards of safety.
  - 4. Minimally invasive The retrospective fitting of fire systems should involve minimal degrees of physical intervention on the historic structure.
  - 5. Sensitively integrated Installed systems should be designed to be integrated sympathetically with the historic fabric and its detail.
  - Reversible Fire systems should be installed according to a reversible, 'plug-in, plug-out' installation philosophy.

The British Standards make it clear that the:

sustainable management of historic buildings includes ongoing risk analysis for the hazards of fire and flood and to monitor measures put in place (e.g., warning or active systems) for the provision, checking and use of equipment and services.<sup>178</sup>

### 3.9.1 Maintenance of Suppression and Detection Systems

Maintenance of the systems and services installed within a building should also be recognised as a crucial component of a building's maintenance burden, especially if new systems such as fire suppression systems, are being retrofitted. According to the National Fire Protection Association's (NFPA) Standard 25 on the inspection and maintenance of water-based fire suppression systems:

#### Table 3.6: Excerpt from the NFPA Standard 25. Copyright NFPA, 2017.

5.2.1.1.1 Any sprinkler that shows signs of the following shall be replaced:
1. Leakage
<ol> <li>Corrosion detrimental to sprinkler performance</li> </ol>
3. Physical damage
4. Loss of fluid in the glass bulb heat-responsive element
5. Loading detrimental to sprinkler performance
6. Paint other than that applied by the sprinkler manufacturer

The same applies to water mist nozzles. After being in service for ten years sprinkler heads run on a dry system explain must be tested; a 'representative sample... shall consist of not less than four sprinklers or one percent of the number of sprinklers per individual sprinkler sample, whichever is greater.' If one sprinkler head or nozzle fails from this test sample, then all those in the system must be replaced. Similarly, 'automatic water mist nozzles that have been in service for twenty years shall be replaced, or representative samples shall be tested and then retested at ten-year intervals.'

This annual maintenance, as mandated by the British Standards for commercial and industrial systems costs between £500 and £1000, depending on the size of the system. All water-based fire suppression systems require monthly, quarterly, and annual testing and inspection by the building's owners and occupiers as well as the remote ten-yearly testing procedure described above. When a suppression system has been in service for twenty years, numerous elements may require replacement. However, the suppression systems in London department stores Selfridges and Harrods, which were installed in
the 1920s are still partially intact; the pumps, tanks and sprinkler heads have all been replaced but the original pipework remains. Stewart Kidd, an expert in fire and historic buildings asserts that 'sprinkler systems have significant cost advantages over other types of fire protection' as their lifespan can be between twenty and thirty years long, and 'most of the routine maintenance is simply a visual check which can be undertaken by trained employees.'<sup>179</sup>

## 3.10 Scottish Historic Buildings Fire Database (SHBFD)

Despite the findings in the previous section that there are practical solutions regarding the installation of fire suppression systems into historic buildings, HES research reveals that between 2007 and 2009 there were over 900 recorded fire incidents in Listed Buildings in Scotland.<sup>180</sup> This is particularly worrying as Listed Buildings make up only a small percentage of Scotland's historic built environment. In 2002 the Scottish Historic Buildings Fire Database (SHBFD) was established as a joint initiative between what was then Historic Scotland (now HES), the Royal Commission for Ancient and Historic Monuments Scotland (RCAHMS) and the SFRS, creating what HES states was 'arguably the most comprehensive system of historic building fire reporting in existence in the world'.<sup>181</sup> The SHBFD was responsible for the compilation of the 2007-2009 fire-incident statistics for Listed buildings. A regional paper-based reporting system was used by the SFRS until this point; however, internet access and updated IT systems enabled the centralisation of information, and forms filled out by attending Fire Officers are now paperless and are processed electronically.

There are currently no statistics produced by the SFRS on fire incidents in Listed Buildings and there is no way for the SFRS to categorise a building as Listed or historic within the current reporting system. If HES data on Listed Buildings was integrated with the reporting and mapping systems used by SFRS, the software could be programmed to automatically record the status of the building involved in a fire incident without adding any extra reporting responsibilities onto the attending officers. Accurate statistics would enable the assessment of the effectiveness of different methods of fire protection measures, as well as highlight any geographical areas or building types in which fires are common. Extra funding to combat the cause of fires in high incidence areas/building types could then be allocated to mitigate the overall risk to our built heritage, preventing future fires and ensuring the preservation of our historic buildings as well as the safety of their users.

## 3.10.1 Properties in Care Recording

HES's Properties in Care (PICs) are the monuments which HES has been delegated to care for by the Scottish Government Ministers. The 2014 'Scheme of Delegation' states that HES should 'conserve these PICs, articulate and safeguard their cultural significance, provide public access to PICs' and manage 'the associated commercial operations'.<sup>182</sup> HES currently uses an operating system called PRIME, a web-based accident reporting system which staff use to record any incidents which occur in staff-only areas as well as public areas within their PICs. The term 'incidents' is used by HES as a 'generic term and covers scenarios such as near-misses, damage only incidents, violence & aggression, vehicle accidents, property damage, theft etc', so there are numerous types of incident as well as fire events being recorded at all HES properties on an ongoing basis.<sup>183</sup> HES will have all of their properties recorded within their computerised Fire Safety Risk Matrix in 2019, meaning that data about fire events and the risk assessments for over 300 historic sites and buildings will be available for analysis.

All HES PICs are subject to a Fire Safety Risk Assessment which is stored within this matrix, each property is then subject to a rolling review based on the seriousness of the risks faced at each. This pragmatic risk-based approach is also taken by HES regarding minimising the impact of climate change on their properties. HES has combined Scottish Government Guidance on fire safety in buildings with its own research on the historic built environment, and its properties are being assessed on the following factors:

<sup>&</sup>lt;sup>184</sup> Historic Environment Scotland, 'Listed Building' dataset, downloaded 07/07/2020, http://portal.historicenvironment.scot/downloads/listedbuildings

Table 3.7: Excerpt from HES 'Fire Safety Risk Assessment' showing factors which properties are assessed on in order to calculate their fire risk level.

•	Nature of the structure				
•	Use of the building				
•	Number and nature of the occupants				
•	Contents and processes undertaken				
•	Potential sources or causes of fire				
•	Potential for fire spread				
•	Fire safety measures provided				
•	Standard of fire safety management				
٠	History of fire in the building				

The Scottish Government also recognises the following risks to buildings of any age, some of which apply to HES properties where there is accommodation or kitchens on-site or where the property is used for events such as weddings or temporary exhibitions:

Table 3.8: Excerpt from Scottish Government Guidelines on fire safety.



# 3.10.2 HES Fire Risk Assessment Methodology

Using these risk factors, the HES Fire Risk Assessment Methodology was then created by their Fire Safety Advisers and is used on a rolling basis to assess all sites. The results of these assessments are then recorded within the Fire Safety Risk Assessment Matrix:

Table 3.9: Excerpts taken from HES Fire Safety Risk Assessment Matrix.

#### 1. Risk methodology

The risk-based approach focuses primarily on premises and activities that give rise to the most serious risk to life, property and business continuity. This will inform a programme of improvements to fire safety arrangements.

Fire safety is delivered through the Conservation and Commercial & Tourism Directorates and locally through four Regions. In determining the risk for each region, the following matrix has been used. This matrix gives consideration to all the elements of risk, taking account of severity, frequency, impact – economic, social and environmental, hazards, probability and consequences.

#### Life Risk

- Visitor Numbers
  - Over 100,000 per year
  - 20,000 100,000 per year
  - Under 20,000
- Sleeping Risk

\_

- Staff Numbers
- Special Events
- Nature of occupants

## Risk to Business Continuity including financial projections

#### Structural features

- Roofless structures
- Means of escape
- Construction materials
- Adequacy of compartmentation

#### Use of Buildings

- Sleeping accommodation
- Exhibition areas
- Offices/ shops
- Storage
- Processes undertaken
- Workshops

#### **Fire Safety Measures**

- Known fire safety deficiencies
- Time since last Fire Risk Assessment
- Fire Service Response Times

Risk Level	Severity (Impact – Life safety, disruption to society,				
	environment, cost, impact on Service resources				
1: Insignificant	Minimal damage and cost, no threat to life, minimal disruption, roofless				
	Structure				
2: Minor	Minimal cost through damage and/or disruption, unlikely				
	risk to life, unmanned site, minor impact on resources				
3: Moderate	Financial loss and disruption, increased risk to life, smaller sites and small				
	domestic properties				
4: Significant	Likely loss of life, significant societal and financial cost,				
	significant disruption to business, larger sites and sites providing sleeping				
	accommodation and/ or events, frequent use of resources following an incident				
5: Catastrophic	Very high likelihood of fatalities and/or casualties, major				
	disruption to business and society or environment, major attraction or business				
	hub, major sleeping risk, constant use of resources				

The matrix leads to a risk score, 1 to 5 in ascending order of severity. The risk score is then ranked to determine priorities for fire safety management improvements and programmes for fire risk assessment. It will also support the Fire Safety Strategy by providing evidence for a phased approach to improvements in fire safety management arrangements across the Historic Environment Scotland Estate.

Except for level 1 sites where risk is negligible, Fire Safety Risk Assessments should be carried out and reviewed on a regular basis. Historic Environment Scotland will conduct full Fire Safety Risk Assessments at the following intervals:

Level 5 – Annually

Level 4 – Two yearly

Level 3 – Three yearly

Level 2 - Four yearly

The fire safety advisers will complete the fire risk assessments, however where a need is identified, i.e. as part of a major project, a specialist fire engineering company may be utilised to provide fire risk assessment services.

Fire Risk Assessment reviews will also be required where there is any building alteration, change of occupation or use of the building or following a fire incident. In these circumstances, arrangements for a review of the fire risk assessment should be made immediately.

# 3.10.3 A Historic Building Fire Risk Assessment Matrix for the wider historic environment in Scotland

This assessment matrix allows for loss of life as well as damage to fabric to be recorded and assessed by HES. However, there is no Fire Safety Risk Assessment Matrix for Listed or historic buildings which are not under the care of HES. This means that there is a significant gap in the data which could be used to assess fire risks and events in all of Scotland's historic and traditional buildings. There are over 3,700 category A-Listed Buildings in Scotland, and not all of these are under the care of HES.<sup>184</sup> This means that many buildings which are considered of 'national or international importance' are subject only to Scottish Government Guidance which, rightly, aims to preserve life and not the fabric or contents of a building.<sup>185</sup>

The extra layer of protection afforded to historic and traditional buildings by HES's Fire Risk Assessment process could also be adopted by the owners of A-Listed Buildings, especially those which have national, or international significance, such as the Mackintosh Building. In future, a policy could be implemented which required all owners of category A-Listed Buildings in Scotland to carry out regular fire risk assessments on their properties using HES's own Fire Safety Risk Assessment procedure. In an ideal scenario, the information supplied by the owners of Category A-Listed Buildings could then collected and combined with the data on fire incidents in Listed buildings created by the SFRS. Both datasets could then be fed into a central Fire Safety Risk Assessment Matrix for buildings of importance which are not owned by HES. This would be a costly and complex scheme but would yield more data on the fire safety of Scotland's built heritage, and would also encourage private owners and occupiers of Listed buildings to reassess the importance of fire safety within their properties on a national scale.

<sup>&</sup>lt;sup>184</sup> Historic Environment Scotland, 'Listed Building' dataset, downloaded 07/07/2020, http://portal.historicenvironment.scot/downloads/listedbuildings

<sup>&</sup>lt;sup>186</sup> Sharon Haire, 'Inform Guides: Fire Safety in the Home'.

#### 3.11 Chapter Conclusion

The 2014 fire in the Mackintosh Building should have a lasting impact on the way we manage our built heritage on a national level. The 2014 fire was devastating, and should be seen as a call-to-arms, a warning that complacency has serious consequences. The owners of historic and traditional buildings, particularly those of national and international importance, must do more to ensure that they are being managed appropriately. This may involve the Scottish Government implementing stricter policies on the use of certain materials within A-Listed buildings and investing in research on fires in Listed Buildings. One of the factors which makes the Mackintosh Building so significant is that it has been in continuous use as an art school since it was built. It is a living, working building, and it should remain as such, therefore this thesis does not advocate for the museumification of the Mackintosh Building and others like it, instead it argues that their preservation and significance can be achieved through continued use and maintenance.

As acknowledged at the start of this chapter, 'fire is the single greatest threat to the occupants, fabric and contents of any building.'<sup>186</sup> However, realistic expectations must nevertheless be placed on the owners and caretakers of A-Listed buildings by the Scottish Government. It should be recognised that before the installation of the mist suppression systems in 2014 the Mackintosh Building met all current fire safety regulations. The mist-suppression system was an additional, not compulsory, measure taken by the GSA to protect the Mackintosh Building in a fire event. It took several years to gather the necessary funds, plan for, and get permissions for such a large project in an A-Listed Building, and it was felt by the GSA that this proactive approach was worth the effort. It would therefore be a valuable research project to find out how many public buildings and A-Listed Buildings in the care of the Scottish Government had fire suppression systems retrofitted before 2014. Retrofitting fire suppression and detection systems is a difficult and often prohibitively expensive process, there is no simple 'one size fits all' approach, and suppression systems themselves are not always necessary. It is, therefore, naive to think that these processes can take place at all without the provision of some form of external funding and guidance from the Scottish Government or organisations such as HES.

<sup>&</sup>lt;sup>186</sup> Sharon Haire, 'Inform Guides: Fire Safety in the Home'.



The Glasgow School of Art, based on Honeyman, Keppie & Mackintosh plans of 1907

Figure 3.1: Drawing showing the two building phases of the Mackintosh Building, copyright Mackintosh Architecture, University of Glasgow; CAD by Abigail Morris.



Figure 3.2: Photograph of the expanded metal lath and plaster in Studio 19, revealed during the restoration process. Taken by Rachael Purse, February 2018.



Figure 3.3: Cross-section of West Side of Mackintosh Building, ink and wash, 1910. Ducts running vertically through the building are highlighted in red. Copyright Glasgow School of Art Archives and Collections.



Figure 3.5: An image of the student display area in studio 19. This was taken two to three days prior to the fire. Note the area circled is the pipe void with panels removed. Image courtesy of Police Scotland, 2014.



Figure 3.4: An image of the student display area prior to the foam panels (seen on the right-hand side) being located on the walls in Studio 19. Image courtesy of Police Scotland, 2014.



Figure 3.6: Ground Floor Plan of the Mackintosh Building, ink and wash, 1910. Location of the projector in 2014 encircled, air duct can be seen. Copyright Glasgow School of Art Archives and Collections.

# 4. Salvage and the Decision to Restore after the 2014 Fire

Preparing for disasters may not prevent them but will lessen their impact. Preparing and following a disaster response plan can help to avoid costly or fatal damage and can prevent a disaster from becoming a tragedy. – John E. Hunter

# 4.1 Introduction

This chapter assesses the GSA's disaster and emergency response preparedness at the time of the 2014 fire and analyses the implementation of this plan in the salvage operation which began soon after the fire itself. To carry out this assessment I first established best practice principles, as well as minimum standards, for disaster and emergency planning in museums and archives. The salvage operations which occurred at the three main case study buildings introduced previously will also be examined; Hampton Court Palace, Uppark House and Windsor Castle. Through this method of comparison and assessment, the clear evolution of salvage techniques since the fire at Hampton Court Palace in 1986 is revealed. With this baseline and chronology established, positive changes which can still be made to ensure the preservation of our cultural heritage are then highlighted.

## 4.2 Disaster and Emergency Planning in Museums and Archives: Best Practice Standards

According to The Institute of Conservation (ICON):

In order to protect collections effectively and efficiently in the event of an emergency it is essential that historic house owners and managers have prepared an emergency plan for the site. This is best done in collaboration with the local fire and rescue service where possible.<sup>187</sup>

In 2004, emergency/disaster response plans became an additional requirement for Accreditation for museums and archives in the UK, although they are not a statutory requirement. The Museum Accreditation Scheme 'is the UK standard for museums and galleries... making sure museums manage their collections properly, engage with visitors, and are governed appropriately.'<sup>188</sup> There are c.1,700 accredited museums in the UK at time of writing and 148 accredited archives which are advised and monitored by a separate panel of experts, but the collections held by the GSA are not currently on either of these lists.<sup>189</sup>

<sup>&</sup>lt;sup>187</sup> 'The Conservation Register: Emergency Planning in Historic Houses', accessed 19 June 2018, http://www.conservationregister.com/Plcon-EmergencyPlanning.asp.

 $<sup>^{\</sup>mbox{\tiny 188}}$  'About Accreditation | Arts Council England', accessed 22 April 2019,

 $https://www.artscouncil.org.uk/accreditation-scheme/about-accreditation {\tt \#section-1.}$ 

<sup>&</sup>lt;sup>189</sup> The UK Accreditation Partnership, 'List of Accredited Museums in the United Kingdom, Channel Islands, and the Isle of Man', February 2019; National Archives, 'Accredited Archive Services in the United Kingdom' (National Archives, 2019).

The GSA Archives and Collections Department did have a *Disaster Response Plan* in place at the time of the 2014 fire, which was written in 2010. As a historic building which was still in use and which contained a valuable collection, the Mackintosh Building inhabited a grey area in terms of building categorisation before the 2014 fire. It contained museum-like spaces such as the Library, as well as the Mackintosh Room and Furniture Gallery, where Mackintosh furniture and light fittings were displayed. However, it was also still a working art school.

The GSA's pre-2014 fire *Disaster Response Plan*, outlined below, meets four out of the five minimum standards for this type of document, seen in Table 4.1, as set out by the Collections Trust in *Spectrum*, the UK's collections management standard. The GSA assessed and reviewed risks to their collection and updated their *Disaster Response Plan* accordingly; staff contact details were kept up to date, and multiple copies of the plan were kept across the GSA campus, as well as digitally. All staff and volunteers working in the Archives also knew what to do in case of an emergency, however, they did not participate in any form of regular salvage training, and there was no designated Salvage Team. At the time of the 2014 fire, the GSA had not met the fifth minimum standard in emergency and disaster response planning; in that they had not prioritised their objects.

Minimum requirement	Why this is important
You assess the risks facing your collections and information systems, and review these regularly in line with your policy.	Your governing body can make informed decisions about safeguarding your objects and data.
You have multiple copies of a written emergency plan that will help you respond effectively to all foreseeable emergencies (with at least one copy safely off-site).	You have clear steps to follow so you will not forget something important in a real emergency. You do not lose your only copy of the plan in an emergency.
You always have access to up-to- date contact details for the people and organisations named in your emergency plan.	You do not waste time tracking down the people you need urgently.
You have prioritised the objects you would save first in an emergency, and recorded this information in a way that can guide any rescue that may be possible.	You are able to move objects to safety in a planned way that reflects their value to you.
All your staff and volunteers know, and have practised, what they should do in all of the situations covered by your emergency plan.	Whoever is first on the scene can react quickly, efficiently and safely. You are not relying on someone who happens to be on holiday when disaster strikes.

Table 4.1: expected the Minimum Requirements of a Disaster and Emergency Response Plan. Taken from Emergency Planning for Collections.

Alongside the Collections Trust, HES also makes the importance of emergency planning for the historic built environment clear:

Originally known as 'salvage' and owing much to the practices developed in wartime, the concept of preparing for and planning to deal with the consequences of fires and other untoward incidents is now well-established in the area of buildings and facilities management... there are major advantages in planning to deal with the impact of a fire on the fabric and contents of historic buildings.<sup>190</sup>

## 4.2.1 GSA's Disaster Planning Approach Before the 2014 Fire

The GSA's *Disaster Response Plan* placed an emphasis on initial salvage procedures to be carried out on objects which have suffered water damage. This is a practical choice as water ingress in the form of flooding is the most common type of disaster incident which occurs in museums and archives. However, there is no advice for the treatment of fire or heat damaged objects, and the only place where fire is discussed within this document is under the heading 'Responding to an Emergency'.<sup>191</sup> The GSA *Disaster Response Plan* states that the person who discovers the fire incident should raise the alarm, and 'on hearing the fire alarm evacuate the building immediately... Do not re-enter until given the all clear by the fire brigade.'<sup>192</sup> This means that at the time of the 2014 fire, there were no disaster or emergency plans which dealt with the removal of objects from the Mackintosh Building in the event of a fire. ICON's Conservation Register states that:

The most important items to retrieve in the event of an emergency should be identified. This may be difficult if you feel that a great deal of the collection is highly significant and if all the collections were purchased for the house. It is however very important to have identified priority items. In the event of an emergency actions and decisions may need to be taken very quickly. Depending on the nature of the incident you may be able to move items at risk to a point of safety yourself or you may need to rely on the Fire and Rescue Service to do this for you. They will have limited time and they will require clear instructions and plans. Some priority items may be too large to move and may require in-situ protection.<sup>193</sup>

There was no priority object list or 'grab-list' for any items accessioned by GSA Archives and Collections within the Mackintosh Building at the time of the 2014 fire. Furthermore, high-value fixtures and fittings such as Mackintosh's Library Lights were not accessioned within the GSA's

<sup>&</sup>lt;sup>190</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:75.

<sup>&</sup>lt;sup>191</sup> GSA Archives and Collections, 'The Glasgow School of Art Archives and Collections Centre Disaster Response Plan', 2010.

<sup>&</sup>lt;sup>192</sup> GSA Archives and Collections, 4.

<sup>&</sup>lt;sup>193</sup> 'The Conservation Register: Emergency Planning in Historic Houses'.

Collection; however, this made sense at the time as they were physically attached too, and therefore part of, the Building. As a result, there were no instructions or a priority list concerning the removal or significance of fixtures and fittings within the building.

HE, HES, and *Spectrum* all advise the inclusion of floor plans in Disaster Boxes which show where a priority object is located within a room, as well as 'grab sheets' which are used to identify priority objects which may be salvaged by Fire Officers who have never seen them before (Fig.4.2). These object grab sheets also advise on how to remove the object with minimal damage and how many people are needed to move it. The object's condition can also be recorded on the sheet in a blank table, allowing objects to be easily sorted by the Salvage Team for treatment. HES's Collections Team has taken this a step further by also including safe routes to and from priority objects in their properties, taking into account the sometimes-unusual width and height of doorways and stairwells etc. as well as the safest means of escape from the building (Fig.4.2).

#### 4.3 Salvage Teams

In Uppark House, Hampton Court Palace and Windsor Castle there were Salvage Teams at the time of the fires; and there still are. A Salvage Team is a group of trained individuals who are responsible for the salvage and initial treatment of objects and assets in an emergency situation which threatens the safety of the collection. Some team members may be local people who live nearby the museum or institution in question, others will be members of staff. HE suggests the following structure for salvage management roles:



Table 4.2: HE's suggested staffing structure for the management of a salvage operation. Taken from their 'Example House Emergency Response Plan.'

The structure of HES's Collections Incident Response Team is as follows:



Table 4.3: Historic Environment Scotland's staff management structure of an Incident Response Team. Image provided by Judith Rowett, Regional Collections Manager at HES.

# 4.4 Case Study: Hampton Court Palace Salvage Team Training

At present at Hampton Court Palace there are 12-15 designated individuals in its Salvage Team. This team commits to training monthly as well as taking part in larger exercises with the Fire and Rescue Services (FRS) where both organisations practice working together in an imagined emergency situation, removing objects from Hampton Court safely and efficiently. Historic Royal Palaces (HRP), who are the custodians of Hampton Court as well as other high-profile sites such as Kew Palace and the Tower of London, have one 'Tabletop' disaster exercise per site per year. These exercises involve around 50 people, including the local FRS, HRP maintenance and operational staff, insurance coordinators, and experts such as curators. A disaster then unfolds throughout the day, with the group having to adapt to changing circumstances as they are updated by the organisers of the 'Tabletop'. Previous disasters have included terrorist attacks, robberies, and fires.<sup>194</sup> The purpose of these training days is to ensure that if a disaster was to happen, it would be dealt with assuredly and efficiently by all HRP staff members as well as outside organisations such as the police and FRS.

<sup>&</sup>lt;sup>194</sup> Terry Crowdy, Interview on fire detection and suppression measures at Hampton Court Place with Terry Crowdy, Fire and Emergency Planning Adviser for Historic Royal Palaces, 9 March 2017.

Hampton Court Palace also had a bespoke software system created called 'Witchcraft', which is an 'alert cascade'. It is a web-based system which contains pre-loaded and regularly updated contact lists as well as pre-loaded disaster or emergency scenarios. In the event of an emergency or disaster 'Witchcraft' is automatically triggered and then texts, emails, and calls the required pre-set contact group with information about the incident as well as digital copies of the plans and other documents which are also kept in Disaster Boxes at Hampton. 'Witchcraft' can also tell on which device or devices you have received the incident information, ensuring that those on-site at Hampton know who has been notified; Wembley Stadium also uses this type of software. With 562,000 visitors between 2013 and 2014 Hampton Court Palace is a very different site to the Mackintosh Building. However, despite their differences Hampton Court Palace and the Mackintosh Building both need to have an effective disaster and emergency response plan, tailored to suit each building's needs to achieve the same end; damage limitation in the face of disaster.

## 4.5 3D Scanning and Salvage Planning and Training

Judith Rowett, the Regional Collections Manager for the South West at HES, is currently conducting research on the use of 3D scanning data on salvage planning and salvage operations alongside HES's Digital Documentation Team. Rowett believes that 3D models of PIC could have applications in training staff and volunteers; providing a 'real-world view of the interiors', allowing for the creation of online training programmes which include virtual walk-throughs, perhaps highlighting access routes to and from priority objects in an emergency scenario.<sup>195</sup> The documentation of PIC through the scanning process will also yield data on 'potential choke points', as well as precise measurements of the structure in question. These 3D digital models could also be shared with the SFRS, giving them 'a clear idea of the building layout and affected areas.<sup>196</sup> Before the Salvage Team enter a building 3D models could also be used 'to orientate teams and highlight potential choke points/areas which are difficult to access, and how to navigate them.'<sup>197</sup> Whilst Rowett's research is still in its infancy, the crucial role which 3D scans of the Mackintosh Building played in its salvage and restoration, discussed later in this chapter, proves just how important digital documentation of our historic building environment is.

## 4.6 Removal of Objects from a Disaster Scenario by Salvage Team

Whilst it is not advisable to remain inside a burning building, the West Yorkshire Fire & Rescue Service offers the following advice in their *Emergency Plans for Heritage Buildings & Collections* guidelines:

<sup>&</sup>lt;sup>195</sup> Judith Rowett, 'Salvage and Emergency Planning', 24 June 2019.

<sup>&</sup>lt;sup>196</sup> Judith Rowett.

<sup>&</sup>lt;sup>197</sup> Judith Rowett.

*Table 4.4: Figure taken from 'Emergency Plans for Heritage Buildings & Collections' by the West Yorkshire Fire & Rescue Service.* 

Salvage teams may need to enter a building which has suffered fire or other damage. They will only be allowed in those areas which the officer in charge of the fire service gives permission for.

This may be when;

- Fire is at high level, entry into rooms below may be possible.
- When fire is in adjacent rooms and 'fire is surrounded'
- When fire is remote from collection rooms
- After fire has been extinguished

HE's *Example House Emergency Response Plan* for a typified historic house museum also states the following:

Do not enter inner cordon unless you have been briefed by the Senior FRSO [Fire & Rescue Service Officer] and know: • Where the fire is and there is no danger of being trapped • What your specific task is and you are capable of undertaking it • Your personal protective equipment is suitable and sufficient • You are under the supervision of the Fire Service at all times • The immediate evacuation signal - short sharp blows on a whistle If you are satisfied with the above and you have been authorised to enter the area by the FRSO: Sign in the entry log Stay with your buddy or team Be aware of your surroundings at all times. Breathe only fresh air not smoke Check doors are not warm before opening them Keep escape route within sight Keep to job in hand, do not wander Listen for evacuation whistle Stay in radio contact (if available) Sign out of the entry log **Danger Signs** Any signs of smoke or fire evacuate the building immediately and contact the FRSO Remember The exit route & any alternatives Never put yourself or a member of your team at risk

Again, the case is being made for the Salvage Team to train with their local FRS, so that if an emergency situation does arise everyone has a clear understanding of their roles, as well as how to remain safe. Building trust and learning how to work together as a cohesive unit with the fire services ensures that salvage operations will be carried out as efficiently and effectively as possible. Roles should be assigned to all members of the Salvage Team, who could be fully trained members of staff on the property, volunteers, or seasonal workers. It is therefore imperative that all new staff or volunteers are advised of salvage policies and procedures during their induction so that they can act as part of the Salvage Team if they are on-site when an emergency situation occurs. HE and HES properties Disaster and Emergency Response Plans both require that a risk assessment is carried out before salvage can take place, and therefore include a blank risk assessment table in their Disaster Plans.

## 4.7 Initial Salvage of Priority Objects

According to John E. Hunter a museum's disaster or emergency response plan is created in four phases:

- First Phase: 'identification of natural events that might threaten the institution, that is, conducting a multi-hazard vulnerability assessment, and determining what the effects of such hazards could be under varying circumstances.'
- Second Phase: 'designing and assessing strategies for coping with the identified events. Strategic goals should include disaster prevention where possible, minimization of damage during a disaster, mitigation of further damage and deterioration afterwards, and recovery and resumption of normal operations.'
- Third Phase: 'writing a plan to guide the museum staff before, during and after a disaster.'
- Fourth Phase: 'regular reviews of the disaster plan to keep it current, training in the plan's execution, periodic drills to test the plan's effectiveness, and evaluation of the plan's performance after any disastrous occurrence.<sup>198</sup>

One of the crucial tasks of phase one of the planning process, as described by Hunter, is:

a survey to identify assets requiring protection against loss or damage from a disaster. This survey will produce an inventory or a summary of the museum's assets listed by importance to the museum and its continued operation.<sup>199</sup>

This evaluation of a collections most valuable assets 'will be based on the broad and somewhat subjective criteria of irreplaceability and value' and will depend upon the type of collection held by

<sup>&</sup>lt;sup>198</sup> John E. Hunter, 'Museum Disaster Preparedness Planning', in *Care of Collections*, ed. Simon J. Knell (Psychology Press, 1994), 246.

<sup>&</sup>lt;sup>199</sup> John E. Hunter, 247.

each individual institution. Hunter suggests the following set of criteria for determining the 'value' of an object:

- 1. Intrinsic, sentimental or historic value
- 2. Aesthetic or scientific value
- 3. Legal and administrative Value
- 4. Research and documentary value
- 5. Monetary value<sup>200</sup>

Hunter goes on to describe how this process will lead to the classification of objects into a minimum of three priority categories:

Priority 1: Assets of such importance that their safety must be guaranteed at all costs because their loss would be catastrophic.

Priority 2: Assets of relatively great importance, the loss of which would be serious but not catastrophic.

Priority 3: Assets of relatively little importance, the loss of which would not be a handicap<sup>201</sup>

Hunter states that 'the importance of prioritizing the museum's assets cannot be overemphasized'.<sup>202</sup>

Whilst writing *Restoration: The Rebuilding of Windsor Castle*, Michael Fishlock was given access to the diary of Joanna Palmer, wife of General Sir Patrick Palmer, the Constable and Governor of the Castle, who was involved with the salvage of Windsor Castle's Library and Print Room. Her recollections reveal how useful priority object lists are in a disaster or emergency scenario:

I ran... into the Print Room and within seconds one of the girls who works there [it was Henrietta Ryan, Deputy Curator of the Print Room] had found the 'Salvage List', which reads something like A 1-6, B 7 & 8, C 17-19. These are the catalogue numbers clearly printed on the outside of the red boxes – each approximately 3 feet by 2 feet by 3 inches – and containing any number of drawings. The point of the salvage list is to get out the most valuable drawings (Leonardo da Vinci, Holbein etc.) first and under any conditions. As she read the catalogue numbers, she pulled a box off the shelf and passed it to someone who ran and passed it to me who ran and passed it to Cpl Cook [a member of the Palmers' staff].<sup>203</sup>

<sup>&</sup>lt;sup>200</sup> John E. Hunter, 248.

<sup>&</sup>lt;sup>201</sup> John E. Hunter, 248.

<sup>&</sup>lt;sup>202</sup> John E. Hunter, 248.

<sup>&</sup>lt;sup>203</sup> Nicolson, Adam, *Restoration: The Rebuilding of Windsor Castle* (Michael Joseph Ltd and The Royal Collection Trust, 1997), 20.

#### 4.7.1 GSA Approach to Salvage Team and Priority Objects

At the time of the 2014 fire, the GSA did not have a dedicated Salvage Team, and no individuals had been identified or trained to be part of a Salvage Team. However, Susannah Waters, Archives and Collections Manager at GSA stated in 2016 that:

The Library and the Archives and Collections teams had undertaken disaster preparedness activities prior to the fire. The areas of this work which we found to be particularly useful were: having an up-to-date contact list of conservators and suppliers; having a basic how-to guide on dealing with water damaged material; being a subscriber to Harwell Restoration Services; and being a member of the Glasgow Area Disaster Planning Network. Having insurance in place for our holdings also greatly aided our ability to undertake work with some confidence that money was available to pay for this.<sup>204</sup>

When a firebreak was established by the SFRS during the 2014 fire in the Mackintosh Building the focus was on removing objects from the East Side as the fire in the West Side made this area inaccessible. GSA Archives and Collections staff were on-site and were able to direct the Fire Officers to specific items within the building such as the original Mackintosh furniture in the boardroom and the Mackintosh Room. The prioritization of objects was, therefore, happening in real-time during this emergency situation.

To an extent in 2014 the GSA's Disaster Planning was successful; however, this reactionary approach to prioritization does not make allowances for numerous changeable factors, such as; the availability of knowledgeable staff during an emergency situation, and the state of mind and effectiveness of said staff members making prioritization decisions under the immense pressure of a disaster scenario. There was also a lack of documentation concerning access routes to, and the removal of, priority objects. HES's Collections Team has implemented what should be an industry standard for a salvage documentation system. Objects of high priority can be marked out as such in museum storage via the use of a laminated salvage card, whilst the salvage cards for objects on display can be kept in disaster boxes. These cards are designed to make the retrieval and identification of priority objects by Fire Officers and members of the Salvage Team more efficient. All the objects considered to be a priority by the Archives and Collections Team on the day of the fire were salvaged by the SFRS, and the archives in the basement of the fire-affected West Side were emptied with only water damage incurred from the firefighting efforts.

In 2017, when asked why they elected not to prioritize objects, a senior member of GSA Archives and Collections staff stated:

<sup>&</sup>lt;sup>204</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', *Scottish Archives: The Journal of the Scottish Records Association*, 2016, 14.

The Archives and Collections do not have a written grab list as part of our disaster preparedness plans, as we have been advised not to 'advertise' or circulate this sort of information for security reasons. Our recent experience of the fire also taught us that how material is prioritised may not be based solely on its value (monetary or informationally) but also on its vulnerability and access post-disaster.<sup>205</sup>

The security concerns given as a reason by GSA for not having grab lists and/or priority lists are curious. Once created, do not have to be shared publicly. These lists are created solely for use in an emergency situation by the organisation who cares for the objects in question. The existence of priority objects need only be shared with the Fire Officers and other individuals taking part in an initial salvage operation, e.g., Salvage Team members. Grab lists and priority lists may also be shared with staff members, volunteers, and local Fire Services as part of regular salvage training. Once selected, priority objects do not need to be 'advertised' as such whilst they are on display, or on public-facing databases such as online catalogues.

Whilst it is understandable that the fire of 2014 taught the GSA valuable lessons about the difficulty in assessing the value of an object, this acknowledgement in itself highlights how crucial it is to conduct prioritisation. The process of prioritising objects, as described by Hunter, can be lengthy and could involve multiple curators depending on the size and scope of the collection in question. During the prioritisation process, the issues of 'access', 'money or informationally' value and 'vulnerability' of all objects would be discussed. This would have provided the answers to these vital questions, which Waters and her team were wrestling with during and after the fire of 2014.

## 4.7.2 Practicality and Prioritisation

During the salvage operation at Windsor Castle in the Grand Reception Room, it became clear to the Salvage Team that a 'vast Russian malachite urn', which 'had been a present to Queen Victoria from Tsar Nicholas I in 1841' and was 'taller than a man, with a mouth almost five feet wide, and weighed two tons', would have to be left inside.<sup>206</sup> As a result, the urn suffered from thermal shock:

The malachite is not more than a thin veneer on a body that is carved from a limestone block. In the heat of the fire, these two layers had remained miraculously bonded together... however, as the firefighters had made their way into the heart of the building, pushing the fire before them, hosing down everything they came to, it was inevitable that cold water would fall on the great malachite urn. The effect was instantaneous:... the glue could no longer hold

<sup>&</sup>lt;sup>205</sup> GSA Archives and Collections Staff Member, 'Object Prioritization', 16 January 2017.

<sup>&</sup>lt;sup>206</sup> Nicolson, Adam, *Restoration: The Rebuilding of Windsor Castle*, 18.

the two together and the malachite veneer, particularly around the upper rim, shattered explosively off the surface of the vase, jumping like popcorn into the surrounding room.<sup>207</sup>

Whilst a virtually immovable object like this urn (Fig.4.3) may be considered a Priority 1 or 2 object in terms of its value, the practicalities of removing it make it impossible to list as a priority object. Grab lists are just that; when creating one the access to and physical constraints of moving large objects must also be considered. To counteract this, systems have been devised to allow the emergency removal of large, heavy, and high-value objects commonly found in higher status historic buildings such as tapestries. At Stirling Palace, Windsor Castle, and Hampton Court Palace tapestries are all hung using Velcro. From a conservation perspective, this method allows weight to be distributed evenly across the tapestry, preventing stress along its top edge. In an emergency situation, a 'best practice' removal that would normally involve a team of people and scaffolding can be performed in minutes using a 'rip-cord' mechanism which can be pulled across the length of the tapestry, disengaging the Velcro and releasing it (see Fig. 4.4). Prioritisation is, therefore, an exercise in accepting what could be lost or damaged in a disaster as well as what could be saved.

## 4.8 Keeping Track of Salvaged Objects

In an emergency which happens outside of office hours, the GSA's *Disaster Response Plan* designates the first contacted person or the first person on the scene as the Emergency Co-ordinator, who is then responsible for assessing the situation and contacting other Library and Archive staff if they are required. Once objects had been removed from the building they were to be placed in 'an available seminar room or clean studio.'<sup>208</sup> The Salvage Team was to be split into 4 teams; a Removal Team, Sorting Team, Drying Team, and Freezing Team, depending on the type of emergency and object first aid required. *Spectrum* minimum standards require that all objects should be recorded in an object inventory table, blank copies of which should be found in the disaster box. The 2014 version of the GSA *Disaster Response Plan* contained a single blank table entitled 'Disaster Report Form'. Here are the headings for this form compared alongside HE's example 'Inventory of Salvaged Objects':

<sup>&</sup>lt;sup>207</sup> Nicolson, Adam, 39.

<sup>&</sup>lt;sup>208</sup> GSA Archives and Collections, 'The Glasgow School of Art Archives and Collections Centre Disaster Response Plan', 4.

Table 4.6: GSA headings for their salvaged objects inventory sheets, to be filled-in during the salvage process. Taken from 'The Glasgow School of Art Archives and Collections Centre Disaster Response Plan'.

Ref	Removal	Sorting	Description (eg loose paper,	Damage Sustained			Action		
No:	Crate No:	Batch No:	bound volume, textile, metalwork etc)						
				Soaked	Wet in parts	Other	Freeze	Air Dry	Other

Table 4.7: HES's 'Inventory of Salvaged Objects' table headings. Taken from their 'Example House Emergency Response Plan'

Inventory of Salvaged Objects									
Object Type	Inventory No (if known)	Object Description/s	Floor & Room Recovered from	1st Aid Rqrd? Where	Returned form 1 <sup>st</sup> Aid?	Pack ?	Crate? Wrap? Ref Number	Where Stored?	
EXAMPLE ONLY	90002454 5	8 blue vases	FR4 Dining Room	No	EXAMPLE	Yes	Crate 1	Brodsworth Barn 1	
	90017777	Small painting Horse Racing	Billiard Room	No	EXAMPLE	Yes	Crate 3	Momart Receipt 00114	
	-	Children on swing	FR4 Dining Room	Yes wet	EXAMPLE		Item ref FR4 P1		

The HE Inventory table is more flexible as well as succinct, it allows for more information on the location and treatment of objects to be included as well as updated. There are also three copies of this blank table included within HE's example *Emergency Response Plan*.

HES and HE are national organisations with hundreds of properties in their care as well as dedicated teams who care for their collections. These organisations, therefore, have more staff members with expertise in collections care and salvage than an average museum or archive does, but it is still expected that any first aid required is carried out on objects as soon as possible to prevent further damage. This is why disaster plans, including the GSA's, have easy to follow instructions on how different objects and materials are to be treated so that on-site members of staff who are not from a conservation or collections background can perform first aid effectively. In GSA's plan prior to the 2014 fire, this information was found in tables which described how to handle, pack, and dry objects according to their materiality, e.g., beadwork textiles or solid wood furniture. After the 2014 fire the *Disaster Response Plan* was altered in 2016 as the archives were now in their temporary new homes; the Whisky Bond, and the Reid Building. The information on the treatment of salvaged objects could now be found in sections for relevant salvage sub-teams, e.g., the Drying Team are informed how to safely dry a variety of objects, and the Freezing Team are informed what should and should not be frozen, and how to package objects ready for freezing. This layout ensures that each sub-team is presented with information pertinent to them.

#### 4.8.1 Storage of Salvaged Objects

Before objects are removed from a building it is important to have a safe and secure location to store and treat them in. HE and HES disaster and emergency plans both identify safe spaces and suitable salvage recovery areas unique to each of their properties, with HES stating that; 'Suitable locations would be dependent on the type of incident and the type of salvage operation required. It is, therefore, necessary to have several options available.'<sup>209</sup> GSA Archives and Collections had not identified specific safe spaces in their *Disaster Response Plan*, but staff were able to requisition the refectory as well as a number of other rooms in the evacuated Reid Building for use as recovery zones.

Country houses sat within grand estates have a distinct advantage over most urban buildings in terms of space available for requisition. After the fire at Uppark House, the lawns outside were used to lay out salvaged objects, as were the stables, before objects were moved either to a nearby NT property or to secure storage units.<sup>210</sup> 'Three ballroom-sized marquees' were also erected to dry out textiles, and later in the salvage process 'former servants' quarters...were converted into storage.'<sup>211</sup> Keeping the areas where high-value objects are being stored post-disaster secure as well as safe from further damage is a priority. Aiding with the GSA salvage operation gave the HES Collections Team valuable insights into the realities of large-scale salvage, and as a result HES are introducing a wristband system, whereby members of their Salvage Teams and those conserving objects will be given a neon plastic wristband which have 'Salvage Team' printed on them alongside the HES logo. These wristbands will be stored in disaster boxes ready to be given out by team leaders. The bands are a quick and easy way of identifying team members, as they are effectively used to identify different types of ticket holder at large scale events such as outdoor music festivals.

#### 4.9 Case Studies: Initial Salvage in Practice

## 4.9.1 Hampton Court Palace Initial Salvage

In 1986 at Hampton Court Palace the Salvage Squad were able to enter the building during the fire with other HRP staff members and Fire Officers and they removed nearly all of the 'pictures, furniture, ceramics and tapestries from the State Apartments'.<sup>212</sup> Only one painting was destroyed in the blaze and eighty were removed, along with fifty pieces of furniture, seventy ceramic objects, two tapestries, two carpets and two chandeliers. At this point the Salvage Squad trained once a month 'in the techniques of handling works of art in emergency situations', and on the day of the fire itself 'the team of eleven included a joiner, a foreman, two gardeners, a stonemason, a storeman, the verger of

<sup>&</sup>lt;sup>209</sup> Historic Environment Scotland, 'Example Collections Incident Response Salvage Plan' (Historic Environment Scotland, 2017), 15.

<sup>&</sup>lt;sup>210</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 23.

<sup>&</sup>lt;sup>211</sup> Rowell, Christopher and Robinson, John Martin, 24.

<sup>&</sup>lt;sup>212</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, Second (The Herbert Press, 1993), 15.

the Chapel Royal, and three of Joe's sons.<sup>213</sup> This proves that as long as they are given adequate training, Salvage Team members do not need to have a background in collections management to be effective during an emergency.

## 4.9.2 Uppark House Initial Salvage

At Uppark House in 1989 the removal of the 'pictures, furniture, textiles and fittings'<sup>214</sup> also began as soon as the fire was discovered. The accessible objects were removed by staff, the Meade-Fetherstonhaugh family (who lived in a section of the House) and volunteers, with firefighters, also removing large paintings, one of which was 'crowbarred from the panelling they were set into in the 1720s.' <sup>215</sup> David Sekers, the Director of the National Trust's Southern Region and Christopher Rowell, regional Historic Buildings Representative, and co-author of *Uppark Restored* arrived at Uppark at around 18:30:

they made a rapid circuit of the building to assess the success of the salvage operation. This had been a heroic effort, but it was clear that the state-rooms were on the point of destruction, and that the less obviously portable objects - fixed furniture, per-glasses and curtains, as well as fixtures and fittings, wallpapers and decorative woodwork - would be totally destroyed unless a second phase of salvage was attempted. The interior had long been out of bounds to anyone other than firemen, and despite the increasing danger, the Chief Salvage Officer detailed a group of firemen to respond to National Trust requests for rescue attempts.<sup>216</sup>

The prioritization of objects by NT staff prior to the fire meant that; 'other salvage teams, an officer and four or five men, went in continuously with designated paintings or other objects in view.'<sup>217</sup> The drama of the situation as well as the desperation to remove fixtures and fittings is made clear in the following description, which also reiterates that the salvage of objects in an emergency situation involves a level of acceptance that some damage may be caused during the process:

In the Red Drawing Room, firemen tore down the red flock wallpaper, first put up in c.1750 and papered over the 1851 or 1859. Because it was fixed to hessian and mounted on battens, rather than being stuck to the wall, it came away in huge strips and was hurled through the windows on to the lawn. Later that evening, at about 9.30 pm, the pair of magnificent mideighteenth-century rococo carved and gilded pier-glasses, attributed to Matthias Lock, was unscrewed from the walls and, with great difficulty because the room was by now in flames, manoeuvred sideways through the windows. One of them was already on fire as it was

<sup>&</sup>lt;sup>213</sup> Fishlock, Michael, 18.

<sup>&</sup>lt;sup>214</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 15.

<sup>&</sup>lt;sup>215</sup> Rowell, Christopher and Robinson, John Martin, 19.

<sup>&</sup>lt;sup>216</sup> Rowell, Christopher and Robinson, John Martin, 20.

<sup>&</sup>lt;sup>217</sup> Rowell, Christopher and Robinson, John Martin, 18.

manhandled to safety. The original bevelled glass, already cracked by the heat, was smashed to lighten the load.<sup>218</sup>

A large overmantel mirror designed specifically for the Dining Room at Uppark House in c.1815 was also damaged in order to save it; a fireman smashed the mirror after being given permission by an NT employee and then 'carried the frame to safety.'<sup>219</sup>

## 4.9.3 Windsor Castle Initial Salvage

At the time of the fire at Windsor Castle in 1992, the Private Chapel where the fire began was being used to store around twenty-four paintings as part of a restoration programme called the Kingsbury Works. The Castle was being rewired, the heating systems were being replaced, and an automatic fire detection system was being installed. This system was due to be completed in ten days and was therefore not in operation on the day of the fire. Thirty-five paintings were saved from the Chapel as soon as the alarm was raised by workmen and conservators employed by the Royal Collection Trust. Windsor Castle's twenty-five-person Salvage Squad was helped by soldiers stationed nearby after they were called in to remove objects, all of which were placed on the lawns outside, as at Uppark House. The Library and Print Room had an hour to be evacuated, as calculated by Major Eastwood the Castle Superintendent and Fire Officer, and this operation was carried out successfully by the Library staff with the help of residents of Windsor.

In order to prevent the spread of the fire, which was successful, the dramatic destruction of historic fabric had to occur:

The decision was taken to destroy large sections of the ornate plasterwork in both the Crimson and the Green Drawing Rooms and in the rooms above them. Walls and ceilings were stripped so that any fire that came through there could be seen as it arrived and stopped before it took hold. As they hacked the plaster down, smoke was already travelling through the voids, not fire but the precursor to fire.<sup>220</sup>

The result of the salvage operation was that only two major items were lost in the fire; 'the giant portrait by Sir William Beechey of George III on horseback at a review and a Gothic rosewood sideboard designed by the young A.W.N Pugin for George IV's great rebuilding of Windsor in the 1820s.'<sup>221</sup>

<sup>&</sup>lt;sup>218</sup> Rowell, Christopher and Robinson, John Martin, 20.

<sup>&</sup>lt;sup>219</sup> Rowell, Christopher and Robinson, John Martin, 22.

<sup>&</sup>lt;sup>220</sup> Nicolson, Adam, *Restoration: The Rebuilding of Windsor Castle*, 23.

<sup>&</sup>lt;sup>221</sup> Nicolson, Adam, 29.

#### 4.10 Mackintosh Building Initial Salvage

At the Mackintosh Building in 2014, the salvage operation began during the fire, with furniture and other moveable objects being removed from the East Side of the Building by the SFRS under instruction from the Archives and Collections team at GSA.<sup>222</sup> Portable pumps had to be deployed to remove the now significant amount of run-off water from the basements where the GSA's Archives and Collections were housed. The salvage operation and the extinguishing of hot spots within the Mackintosh Building would take the SFRS until the 30<sup>th</sup> of May, a full week after the fire had begun.<sup>223</sup>

Staff from across the GSA aided with the salvage operation, however, 111 items from the GSA's collection, including original Mackintosh furniture from the Ingram Street Tea Rooms and the Argyle Street Tea Rooms, as well as numerous oil paintings by GSA alumni, were destroyed in the fire.<sup>224</sup> The majority of these objects were located in the former Book Store above the library, adding to the already high fuel load of the library itself. The Book Store was accessible via one staircase and it did not contain any environmental monitoring devices or instruments. The environment in all museum stores and displays should be effectively monitored at all times to prevent damage to the collection. Museums Galleries Scotland (MGS) considers 'monitoring of the museum environment' to be 'one of the basic tasks of all museums'.<sup>225</sup>

In an article for *The Journal of Scottish Records Association*, Susannah Waters the Archives and Collections Manager at the GSA records how ordinary the day of the fire was:

I and a colleague were in the Archives and Collections office/reading room. It was quiet, the end-of-the-week, a 'tying up loose ends before the bank-holiday weekend' type of day. However, our tranquillity was interrupted by a noise from the corridor, followed by a very loud knock on the door and a GSA tutor telling us to get out immediately. People were coming towards us from our right-hand side, where flames and smoke could be seen at the

<sup>226</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 1.

doorway of an adjacent studio. We therefore knew straight away that something serious was happening.<sup>226</sup>

She states that 'at the time there was little we [GSA staff] could do'.<sup>227</sup> However:

The Archives and Collections team managed to do a few 'useful' things that afternoon, such as marking-up building plans for the fire brigade with information about where the archives and artefacts were located and working with them to organize the safe retrieval of Mackintosh Furniture from a gallery located in the East side of the building. We also contacted Emma Dadson from Harwell Document Restoration Services who we had a subscription with to update her on our situation. Emma of course, had already heard about the fire via the news and agreed to come up to Glasgow (from Oxford) as soon as we knew more about our situation. We all went home that evening not knowing when we might be able to get back into the building but presuming it would be at least several days.<sup>228</sup>

At the Mackintosh Building in 2014, the fire was quickly brought under control by the SFRS who allowed a small number of GSA staff to access the Mackintosh Building the morning following it, Saturday 24<sup>th</sup> May 2014. Waters describes the importance of a shared understanding between the SFRS on site and her Archives and Collections team:

The fire brigade's understanding of the importance of the building's contents (the student work which had just been installed for that year's degree show, and the historical materials) was apparent in the huge support they gave which allowed us to start undertaking the work we needed to do as soon as possible.<sup>229</sup>

## 4.10.1 Taking Stock

Peter Trowles, then the Mackintosh Curator, inspected the damage post-fire, finding that:

Unfortunately, as expected, the Mackintosh Library and an Archives and Collections store above it had been almost completely destroyed. The Library interior was the most intricately decorated space inside the Mackintosh Building, with its cupboard-lined walls, carved wooden balcony, geometric metal light-shades, and bespoke furniture. It also contained approximately 10,000 books and journals some of which formed part of the School's rare books collection. The store above the Library held the majority of GSA's collection of oil paintings and a number of pieces of Mackintosh furniture.

<sup>&</sup>lt;sup>226</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 1.

<sup>&</sup>lt;sup>227</sup> Susannah Waters, 2.

<sup>&</sup>lt;sup>228</sup> Susannah Waters, 2.

<sup>&</sup>lt;sup>229</sup> Susannah Waters, 3.

In addition to these losses, one of our sub-basement stores and our office/reading room had suffered water ingress as a result of the fire brigade's efforts to extinguish the fire. This store contained some of our paper archives, some small plaster casts, and the majority of GSA's textiles and object collections. Some archive material was also located in our office/reading room. In contrast to the damage to the above areas, our remaining two stores (containing the majority of the paper archives and artworks) had not been affected by the fire or by water ingress.<sup>230</sup>

After his inspection Trowles then passed his findings on to Waters and Dadson who secured spaces in the Reid Building and the McLellan Galleries for the storage and treatment of salvaged objects, as well as setting up a 'recovery headquarters' with IT facilities.<sup>231</sup> That afternoon work began on removing the collection from the Mackintosh Building's sub-basement stores which contained 'paper archives, textiles, small objects in a variety of media (metal, ceramic, wood), some small plaster casts and some reproduction Mackintosh furniture'.<sup>232</sup>

At the same time Dadson's team, alongside members of the HES Collections Team who had arrived on-site to help, 'worked closely with the fire brigade to clear large burnt fragments from the store above the Library. This helped to stabilise this area of the building and to ensure fragments were documented as part of the removal process.'<sup>233</sup>

## 4.11 The Mackintosh Building Salvage after the Fire was Extinguished

## 4.11.1 Sunday 25th May 2014

On Sunday 25<sup>th</sup> it was announced that the campus was to be closed for a week, which enabled the Archives and Collections team to use the Reid Building to sort, dry, and package objects for freezing. During this process objects were 'listed (using pencil and paper), alongside their condition and new location (Reid / Harwell)'.<sup>234</sup> Throughout this period the building was cordoned off and only accessible to authorised personnel. A team from the National Records of Scotland arrived alongside Frances Lennard, Textile Conservator at the University of Glasgow, bringing with them expertise and materials for the salvage and 'first aid' process. A nightly de-brief was also established as part of the daily schedule for the week following the fire, with Waters recognising that; 'the nature of the work, involving large numbers of people and a difficult working environment, meant that plans needed to be flexible and that keeping all staff informed of any changes was essential.'<sup>235</sup> Likewise, at the start of

<sup>&</sup>lt;sup>230</sup> Susannah Waters, 4–5.

<sup>&</sup>lt;sup>231</sup> Susannah Waters, 4.

<sup>&</sup>lt;sup>232</sup> Susannah Waters, 4.

<sup>&</sup>lt;sup>233</sup> Susannah Waters, 4.

<sup>&</sup>lt;sup>234</sup> Susannah Waters, 5.

<sup>&</sup>lt;sup>235</sup> Susannah Waters, 6.

each day, the SFRS had to give clearance for individuals to access areas they considered safe. It was not until Monday 26<sup>th</sup>, three days after the fire, that 'roles were allocated where possible', taking into consideration the skills of each individual.<sup>236</sup>

# 4.11.2 Monday 26th May 2014

By Monday, all of the 'vulnerable textiles and paper items from wet areas' were removed from the Mackintosh Building, now the focus was on 'removing the remaining objects (metalwork, sculpture, ceramics etc.)'.<sup>237</sup> Waters notes that:

Some of the objects and textiles had lost their original packaging, and with it their reference numbers which made identification by non-Archives and Collections staff difficult. As a result of this, an area of our long term recovery work is to investigate alternative ways of labelling items, where possible, directly onto objects.<sup>238</sup>

# 4.11.3 Tuesday 27th May 2014

On Tuesday 27<sup>th</sup> of May, the GSA began assessing the long-term implications of the fire, and Waters and two other members of staff began interacting with the GSA's insurance company 'to discuss loss and the activities we would potentially need to undertake to restore our holdings.'<sup>239</sup> Peter Trowles, meanwhile, was working with HES 'about how best to approach the identification and analysis of the remains taken from the fire-damaged Library and store.'<sup>240</sup> At this point, Glasgow City Council (GCC) intervened, Building Control wanted to take over control of the site from the SFRS to begin their assessment of the structural stability of the Mackintosh Building. Therefore, without the SFRS to clear access to the building, salvage works inside had to stop. Faced with the possibility of this closure the remaining dry objects within the Mackintosh Building's basement had to be removed by the end of the day, as it was thought that the building would be inaccessible for around a week. This led to the production of some of the most iconic photographs of the whole salvage operation (Fig.4.5):

The decision was therefore taken to set up a chain gang of staff to move the boxes and plans chest drawers from these two stores to the McLellan Galleries, a building adjacent to The Mackintosh which the School had secured from Glasgow City Council for decanting purposes.<sup>241</sup>

<sup>&</sup>lt;sup>236</sup> Susannah Waters, 6.

<sup>&</sup>lt;sup>237</sup> Susannah Waters, 7.

<sup>&</sup>lt;sup>238</sup> Susannah Waters, 7.

<sup>&</sup>lt;sup>239</sup> Susannah Waters, 7.

<sup>&</sup>lt;sup>240</sup> Susannah Waters, 8.

<sup>&</sup>lt;sup>241</sup> Susannah Waters, 8.

The Mackintosh building did, in fact, remain accessible to GSA and HES staff for the rest of the week, allowing the removal of 'large pieces of furniture and a number of oil paintings which were located throughout the building and which had been too difficult to remove at short notice earlier in the week'.<sup>242</sup> Some of the GSA's large plaster cast collection was also able to be moved from the fire affected West Side of the Mackintosh Building into the unaffected East Side.

## 4.12 The Book Store

The store above the library, known as the Book Store or Furniture store, contained 139 pieces of mostly Mackintosh furniture and 92 oil paintings, all of which were destroyed.<sup>243</sup> The Book Store had a single entrance and exit and was accessible from only one staircase, making it difficult to access in an emergency, and its contents also added to the already significant fire load of the library below, therefore, it is a less t5han ideal collections store. Judith Rowett, called in to help with the salvage operation as a member of HES's Collections Team, recalls the difficulty she had in identifying individual oil paintings, as they were stored on the ground stacked up against each other, and in the heat of the fire had become one charred lump. Prying them apart was the only way to identify them. There was no inventory of objects in the Book Store, nor was there any indication that it contained important or valuable objects. Rowett suggests that in this scenario 'a basic list with images, and with any significant objects asterisked' would be useful.<sup>244</sup> Waters also emphasises the 'importance of labelling directly onto items (for example a large number of our textiles had labels sewn into them) and of having up-to-date catalogue records', meaning that the identification and re-labelling of the GSA's collection became a crucial and time-consuming part of the recovery programme of works.<sup>245</sup>

<sup>&</sup>lt;sup>242</sup> Susannah Waters, 10.

 <sup>&</sup>lt;sup>243</sup> Polly Christie, 'Archives and Collection Recovery' (Stirling Seminar, The Engine Shed, 15 March 2018).
<sup>244</sup> Judith Rowett, 'Salvage and Emergency Planning', 24 June 2019.

<sup>&</sup>lt;sup>245</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 12.

Spectrum standards state that the following forms the 'core' information of an inventory of objects:

Table 4.8: Taken from Spectrum 'Primary Procedure: Inventory', 2017, copyright Collections Trust.

• A unique object number (from which it should be clear whether the object is from your accessioned collections, on loan, or has some other status such as a handling item) - **Object number.** 

- An object name **Object name**.
- The number of objects (if a group) Number of objects.
- A brief description (or image) Brief description.
- The current location Current location.

• If not your museum, a record of who owns the object -Current owner (and, if your museum does own it, a record of where it came from).

• A note of who recorded this information and when - Recorder and Recording date.

The Spectrum Standards on object labelling dictate the following:

Every item in a museum collection must carry its identity number at all times so that it can be linked to the information a museum holds about the object. If this bond between the object and its documentation is broken, the consequences may be serious. At best, time will be wasted because of the need to track down documentation and re-establish the link. At worst, the object will lose its provenance and other associated information for all time.<sup>246</sup>

All objects within a collection should, therefore, be labelled as a minimum standard, in a reversible yet long-lasting medium depending on the materiality of the object. Time was certainly wasted after the 2014 fire as numerous objects did not have labels physically attached to them, leading to months spent post-fire deducing the identity of objects based on catalogue descriptions and photographs. The existence of an inventory for the Book Store, as well as the physical labelling of the objects it contained, would have made the identification of these damaged objects far more efficient. If the process of creating an inventory of objects in this space had been carried out, perhaps it would have drawn attention to the storage conditions and value of objects held in the space, thereby leading to positive changes in their storage and care.

<sup>&</sup>lt;sup>246</sup> Collections Trust, 'Labelling and Marking Museum Objects Booklet' (Collections Trust, 2008), 1.
The Book Store had become a storage space in 1981.<sup>247</sup> The use of this small space above the Library as a store is problematic. The timber structure with its accumulation of decades of paint; the furniture in the Library as well as the books it stored meant that this space had a considerable fuel load which is 'literally, the potential quantity of combustible material' in a building.<sup>248</sup> Additional fuel loading is considered by HES to be a particular issue when considering storage in a historic building, and HES therefore states that 'care must be taken to ensure that storage of bulk stocks of leaflets, brochures and books or catering supplies and equipment does not create a fire hazard.'<sup>249</sup> In this instance, numerous oil paintings were being stored above the Library. The Library was an internationally recognised heritage space with an already high fuel load which included original Mackintosh furniture and rare books, therefore, the room above should not have been used to store highly flammable items such as oil paintings as this added to the fuel load. When the fire reached the Library the contents of the Book Store were made inaccessible.

In HES's store artwork is kept on racking and in metal plan chests, Rowett has covered over the artworks on racking with Tyvek, which can be lifted to view the object underneath (Fig.4.6). A laminated label has then been attached to the Tyvek covering which contains an image of the object, its object number, a description, and whether or not it is a priority object. If these tags were destroyed or lost HES also have object inventories with 'precise locations and identifying features (such as measurements) recorded', so that staff could determine the identity of a damaged object separated from its tag.<sup>250</sup> This method of storage ensures that the condition of the paintings does not deteriorate whilst in storage, and ensures they are accessible to staff in an emergency, but also for research and condition monitoring purposes.

It is interesting to note that the majority of the GSA's oil painting collection by alumni was kept in the Book Store, in conditions which were not in accordance with 'best practice' standards. These paintings could be described as 'low status' objects, and yet they were stored alongside original Mackintosh furniture items, which in any other collection would surely be high-status priority objects. Perhaps if the prioritisation process had been conducted as part of their emergency and disaster planning, the GSA would have recognised the value of some of these objects and stored them accordingly. In 2008 the GSA received a large HLF (Heritage Lottery Fund) Grant for upgrading its collections stores.

<sup>&</sup>lt;sup>247</sup> Natalia Burakowska, 'The Mackintosh Building Library' (MRP1 Design Team: External Panel, Page\Park Offices, 16 June 2016).

<sup>&</sup>lt;sup>248</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 1:29.

<sup>&</sup>lt;sup>249</sup> Stewart Kidd and Sharon Haire, 1:30.

<sup>&</sup>lt;sup>250</sup> Judith Rowett, 'Salvage and Emergency Planning', 24 June 2019.

#### 4.13 Lost Objects of the 2014 Fire

A list of items recovered, and a list of items destroyed in the 2014 fire has never officially been released or publicised by the GSA. Using the GSA's Archives and Collections online catalogue it is not possible to search for items destroyed in the fire, using the search term 'fire', however, the object information for items which were destroyed includes the searchable subject '23<sup>rd</sup> May 2014' which when clicked leads the user to a holding page with the following message:

There was a fire in the west wing of the Mackintosh Building at The Glasgow School of Art on the 23rd May 2014, which unfortunately affected Glasgow School of Art's archives and collections.

Since this date, staff have been working to assess and stabilise affected material. The majority of our paper archives and artworks on paper (including 100 works by Charles Rennie Mackintosh) were unharmed by the fire. A small percentage of the archives suffered water damage but these items have either been air dried or frozen and are now stabilised. Our textile collections suffered water damage but have now been air dried and stabilised and our plaster casts have suffered smoke damage and some water damage.

Sadly some items from the School's Archives and Collections were lost. Items from our Mackintosh furniture collection which were in use in the Mackintosh Library or held in the store above this space were either destroyed or very badly damaged by the fire. Fragments of furniture and fittings are already being recovered from the Mackintosh Library as part of the forensic archaeology work currently underway. Many of our most important pieces were on display in the Furniture Gallery and Mackintosh Room in the east wing of the building and were therefore unaffected by the fire. In January 2015 some of these pieces were brought out of storage and returned to public view in a new furniture gallery in the School's Reid Building. The public will be able to visit this gallery as part of an organised tour led by one of the GSA's student guides. Almost all the oil paintings on canvas in the School's collection were stored above the Library and were therefore also sadly destroyed. All of the surviving material is now stable and secure and will be reviewed by expert conservators as part of a recovery programme which will take place over the next three years. We will continue to update users on our recovery.

We have decided to include descriptions and images of material lost in the fire on our online catalogue. Although the items no longer exist, their descriptions still provide useful

contextual information for researchers, such as titles, dates, custodial histories, related material etc. The images are also a useful resource, providing vital surrogates for users.<sup>251</sup>

A link to 111 objects at the end of this message appears to confirm the number of objects lost in the fire of 2014. In July 2019 the GSA Archives and Collections updated their database software and the database itself. The search term '23<sup>rd</sup> May 2014' now produces 370 items. This number of objects associated with this date, and therefore the fire, has increased significantly to include newly accessioned items such as the Library Lights, whose reconstruction and restoration is discussed later in this thesis At the time of the 2014 fire, these lights were not accessioned into the GSA collection as they were considered fixtures, and therefore part of the Mackintosh Building itself. The decision to accession them was made during their recovery post-2014 fire; it is, therefore, interesting to note that their status as objects has changed since the room for which they were designed has been destroyed, they are now survivors of the 2014 fire.

# 4.14 Processing Salvaged Objects

By Friday 30<sup>th</sup> of May, a week on from the fire:

nearly all of GSA's historical collections had been removed from the Mackintosh Building. Only the large plaster casts remained (it was decided that moving them out of the building could potentially cause more damage than leaving them inside), along with a handful of very large furniture items and some fixtures and fittings which couldn't easily be removed.<sup>252</sup>

Archives and Collections predicted that they would need assistance 'barcoding and listing the dry material which had been removed to the McLellan Galleries before it was sent to off-site storage', and so Waters contacted the GADPN, the Scottish Council on Archives and ICON who provided Archives and Collections with 'c.8 volunteers to work each day Tuesday (3 June) to Friday (6 June), providing us with a rota of volunteers, their names and contact details.'<sup>253</sup> Desk space was found in the Bourdon Building for Archives and Collections staff to begin typing-up the hand-written lists made which recorded the movement and treatment of objects. Waters states that:

this was a fairly complicated process as the handwritten sheets had been compiled by a number of individuals and, as previously mentioned, because a large number of the items had been separated from their reference numbers, or indeed were uncatalogued (our cataloguing backlog shelf was in the store that had suffered water damage). Many of these objects had simply been described and although some descriptions were easy to recognize and/or relate to

<sup>253</sup> Susannah Waters, 11.

<sup>&</sup>lt;sup>251</sup> 'Search Results | GSA Archives', accessed 8 October 2018,

http://www.gsaarchives.net/archon/index.php?p=core/search&subjectid=112.

<sup>&</sup>lt;sup>252</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 10.

our catalogue for example we only have one blue ceramic rabbit), others were more complicated (we have a number of metal busts of men!). This process however, gave us a starting point to work from and provided a general overview of what had gone to storage.<sup>254</sup>

## 4.15 Digital Object Records

The importance of having high-resolution images of objects within the GSA's collection was highlighted by the fire and salvage process:

In some cases digital images helped us to identify items that had lost their reference number, and in other cases (particularly in relation to our oil painting collection which was largely destroyed in the fire), the digital version of these artworks are all that we now have left and therefore provide important documentary evidence of items that have been lost.<sup>255</sup>

Prior to the fire, a number of items lost in 2014 did not have high-resolution images taken of them, as a result, they are now lost to us more completely than the objects for which photographs exist.

In 2017 the NTS launched an eighteen-month recording programme called Project Reveal, a 'Trust wide collections digitisation project' which aimed to create 'an updated and accurate database record of every item' in their care, resulting in 'an updated database with high quality images and unique object numbers for every item in the Trust material culture collections'.<sup>256</sup> This was a huge undertaking, with around 100,000 objects to record, it required the input of 'six regionally based project teams.'<sup>257</sup> Disappointingly, this database is not available online for public access.

Similarly, HES is conducting its own collections recording project, as part of the 3D scanning Rae Project. This 'rolling programme' aims 'to enhance the accessibility and interpretation of the collection and the 336 properties to which they relate.'<sup>258</sup> HES collections are searchable online, and the objects which have been scanned can be viewed as interactive 3D objects via the online platform Sketchfab, as well as via more traditional object photographs.

Waters also reminds us that the salvage process is a long one, stating that:

For approximately four months after this period we were still sorting, packing and labelling material to move into storage and it was only after six months that we were able to reestablish an enquiry service or physical access to our holdings for visitors. At the present time

<sup>&</sup>lt;sup>254</sup> Susannah Waters, 12.

<sup>&</sup>lt;sup>255</sup> Susannah Waters, 12.

<sup>&</sup>lt;sup>256</sup> National Trust for Scotland, 'Revealing Our Collections', text/html, National Trust for Scotland, 28 June 2019, https://www.nts.org.uk/stories/revealing-our-collections.

<sup>&</sup>lt;sup>257</sup> Scotland.

<sup>&</sup>lt;sup>258</sup> 'Highlights | Historic Environment Scotland', Collections | Historic Environment Scotland, accessed 26 June 2019, https://collections.historicenvironment.scot/highlights.

[2016] we are still only able to offer a limited service for users, although we aim to have a new fully-functional reading room in place before the start of GSA's next academic year 2015/16.<sup>259</sup>

Salvage is not simply the act of removing objects from immediate danger, the majority of the salvage work is carried out after this point, as the repair and conservation of damaged objects can take years. It is therefore critical that objects immediately receive the correct treatment, and are stored accordingly, or their removal will have been for nought. As part of their disaster and preparedness planning, organisations with a collection in their care should be prepared for worst-case-scenarios where objects are lost; for example, they could be immovable due to size, weight, or how they are fixed in position. It is therefore crucial that objects are recorded digitally, whether through laser scanning or photography, as this preserves the physical appearance of an object, ensuring that it can still be studied, and potentially replicated if damaged or destroyed. This is the position the GSA finds itself in after the fire of 2018 in the Mackintosh Building. Thanks to laser scanning technology the Building and its interiors currently exist digitally, but not physically.

## 4.16 Object First Aid

The GSA *Disaster Plan* contains clear descriptions of what can be described as 'object first aid'. This ensures that even staff without formal training in conservation would be able to effectively triage damaged objects. Physical copies of Disaster Plans are contained within a museum or an archives Disaster Boxes and digital copies are also held by the institution, enabling staff to access the Disaster Plan remotely. However, as Disaster Plans contain sensitive information such as contact details of staff members, the object first aid information contained within is not as accessible as it could be. To that end, HES has produced a *Salvage Essentials* folding pocketbook (Fig.4.7), which categorises objects by type, e.g., books and metalwork, and provides succinct first aid procedures which can be understood by a general audience. It would be of great value if this pocketbook was published and made available to all properties which contain object collections.

## 4.17 Hampton Court Palace: Object First Aid

At Hampton Court Palace, as at the Mackintosh Building, work on object treatment began immediately:

Jenny Band and Graham Goode of the Crown Suppliers Textile Studios (now the Textile Conservation Studios of the Historic Royal Palaces Agency) were dragging pieces of throne canopy from the black rubble and immersing them in baths of de-ionized water for cleaning.

<sup>&</sup>lt;sup>259</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 14.

As they recovered piece after piece of sooty fringe, their spirits rose; they were amazed how much material had survived.<sup>260</sup>

Hampton Court Palace was particularly fortunate in terms of resources, as it had been home to the Textile Conservation Centre (TCC) from 1975. In 1999 the TCC moved to the University of Glasgow, but even after this date Hampton Court Palace's textile conservation works, particularly regarding its tapestry collection, remain world-leading.<sup>261</sup> The GSA was, therefore, able to call upon the expert services of the TCC in 2014 as it was, by then, housed in the same city.

# 4.17.1 Uppark House: Object First Aid

The NT had numerous expert conservators in its employ in 1989, and as a result, they were able to immediately call in 'the Trust's adviser on paintings conservation, picture conservators from the Trust, the Royal Collection and in private practice' who worked 'through the night', and were replaced by a fresh team the next morning, who continued their work.<sup>262</sup> The authors of *Uppark Restored* state that conservators 'in private practice... continued to work day after day' on the salvaged objects 'with no thought of remuneration'.<sup>263</sup> They were later compensated for their help, but this selfless attitude highlights the emotional aspect of the salvage process, whereby people who care deeply about a building, its contents, or simply about heritage in general, are mobilised and respond to an emergency scenario which threatens all of the above.<sup>264</sup> The authors of *Uppark Restored* go on to state that, 'in the rescue and subsequent repair of Uppark the Trust's conservation service came of age.<sup>265</sup>

In the initial aftermath of the fire, space had to be created for the treatment of large wet textiles, so 'three ballroom-sized marquees were pitched on the west lawn' which enabled conservators to slowly dry them whilst monitoring their condition.<sup>266</sup> Soot-stained curtains were 'interleaved with sheets of polythene' which allowed them to dry out in a way which 'avoided permanent staining.'<sup>267</sup>

# 4.17.2 Windsor Castle: Object First Aid

At the time of the fire, Windsor Castle was undergoing restoration works, there were, therefore, art handlers and conservators on-site when the alarm was initially raised. The objects removed from the Castle were placed outside on the lawns, as at Hampton Court Palace and Uppark House, before being

<sup>&</sup>lt;sup>260</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 18.

<sup>&</sup>lt;sup>261</sup> 'Legacy | The Textile Conservation Centre', accessed 21 June 2019,

http://www.textileconservationcentre.org.uk/legacy.html.

<sup>&</sup>lt;sup>262</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 30.

<sup>&</sup>lt;sup>263</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>264</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>265</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>266</sup> Rowell, Christopher and Robinson, John Martin, 25.

<sup>&</sup>lt;sup>267</sup> Rowell, Christopher and Robinson, John Martin, 25.

transported to a secure storage location. The fire spread quickly through the Castle, but all rooms containing items from the Royal Collection were evacuated successfully. Large, heavy items and fixtures and fittings which could not be removed remained in situ and were destroyed by the fire when it reached them.

As there was no wet fire suppression system in Windsor Castle, the objects which were evacuated were not water damaged by sprinklers. The Fire Services were concentrating their hoses on the portions of the Castle already ablaze, allowing for the removal of objects by the Salvage Squad, Windsor residents, and staff, which consequently prevented water damage to objects. The successful salvage operation meant that there were no objects to provide first aid too, instead, the focus was on storing them correctly to prevent future damage.

# 4.17.3 Mackintosh Building: Object First Aid

A small team of GSA staff were able to bring all of the textiles and paperwork from the sub-basement, which had no electricity or natural light sources, upstairs for sorting, which was done by Waters and Dadson. They removed wet packaging and sorted objects into three categories; wet, damp and dry, and then laid objects out to air.<sup>268</sup> (Fig.4.8)

Dadson 'made arrangements for a Harwell (the UK's leading disaster recovery specialists) van with 200 crates and two personnel to arrive the next day so that very wet items could be removed for freezing'.<sup>269</sup> The process of freeze-drying wet items ensures that moulds do not form, and any other physical deterioration is halted. Objects are then vacuum dried, which removes excess moisture and prepares the object for further conservation. The GSA 'emailed staff to ask for further volunteers, and the Archives and Collections put a call out via Museums Galleries Scotland and the Institute of Conservation (Icon) for a textile conservator'.<sup>270</sup>

GSA Archives and Collections also contacted the National Records of Scotland for their expertise in paper conservation. Waters notes at this stage that it was very useful to have the contact information for a variety of individuals and companies saved onto her personal mobile phone, Waters had also previously shared her contact details with other members of The Glasgow Area Disaster Planning Network which 'comprises of archive services in the Glasgow area, supported by the National Records of Scotland's conservation team, who have agreed to support each other in dealing with disasters'.<sup>271</sup> Waters states that her mobile phone became her 'mobile office during the week after the

<sup>&</sup>lt;sup>268</sup> Susannah Waters, 'Rescue and Recovery: Working with Glasgow School of Art's Archives after the Mackintosh Building Fire', 4.

<sup>&</sup>lt;sup>269</sup> Susannah Waters, 4.

<sup>&</sup>lt;sup>270</sup> Susannah Waters, 4.

<sup>&</sup>lt;sup>271</sup> Susannah Waters. 4.

fire providing a means of taking notes and photographs, sending emails and even being used as a torch on occasion', highlighting their importance to a modern salvage operation.<sup>272</sup>

# 4.18 Structural Salvage and Temporary Roofing

During a fire incident, the Fire Services are in control of the site in question, and after a fire has been put out, the police and Building Control take over. The insurers, loss adjusters, and building owners, therefore, do not have ultimate authority in the immediate aftermath of a fire. The most pressing concern is for public safety, and whether or not the smouldering building poses a risk. This leaves building owners in a difficult limbo, awaiting information from other organisations. Building Control is unlikely to seek advice from external parties, and whilst they may request aid from organisations such as HES this is not always the case. For Building Control public safety is paramount, therefore, if a damaged structure is unstable, or masonry is falling or at risk of falling, Building Control are required to order its demolition.

# 4.18.1 Hampton Court Palace: Structural Salvage and Temporary Roof

The Property Services Agency (PSA) was the government department responsible for Hampton Court Palace at the time of the fire, and they immediately set about making the protecting the fire-affected areas of the building stable and safe as well as protected from the weather. Michael Fishlock described the condition of the damaged area of Hampton Court Palace:

The burnt-out shell was dotted with partially supported beams and trusses. Loose material balanced precariously on ledges, while sections of ceiling swung in the draughts which blew through the open windows. In one room there was the strange sight of an old water boiler suspended in space, hanging by its own pipes.<sup>273</sup>

This description reflects the often-surreal aesthetic of a fire-damaged building, as well as the inherent dangers posed by precariously positioned masonry and even services. EH engineers, working alongside engineers from the PSA worked together to 'lower to safety, prop up or support the dangerous structure.'<sup>274</sup> It is standard conservation practice to retain as much existing material as possible, therefore the team at Hampton Court Palace decided to remove only what was absolutely necessary in terms of safety, as 'any attempt to remove large beams and trusses might have caused further damage to the adjoining brickwork.'<sup>275</sup>

<sup>&</sup>lt;sup>272</sup> Susannah Waters, 5.

<sup>&</sup>lt;sup>273</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 36.

<sup>&</sup>lt;sup>274</sup> Fishlock, Michael, 36.

<sup>&</sup>lt;sup>275</sup> Fishlock, Michael, 36.

The day after the fire at Hampton Court Palace, a meeting was held with scaffolding firm SGB who had designed 'a roof to cover the damaged areas' by 16:00 that day.<sup>276</sup> The temporary roof consisted of scaffolding surrounding the building, with sheets of aluminium rolled across the roof, 'clear panels were incorporated to let in light from above, and latticed horizontal beams ran through the building, bracing both the external and the central spine walls.'<sup>277</sup> The temporary roof and scaffolding works were completed in eighteen days and remained effective and in place for four years.

# 4.18.2 Uppark House: Structural Salvage and Temporary Roof

At Uppark House the scaffolding which buttressed the weakened exterior and interior walls could not be installed until the House was excavated. A 'honeycomb of supports' began to materialise as the rooms were gradually excavated and the scaffolders moved in, eventually culminating in 'a giant roofed structure of interlocking supports that was completed by 1989.<sup>278</sup> The scaffolding itself enabled emergency repairs and the removal of fixtures and fittings for restoration.

The scaffolding was reinforced in 1990 by the appointed architect Ian Maclaren, and a temporary roof was added 'to protect the interior from the weather until the house itself could be made permanently watertight.'<sup>279</sup> The roof was created using corrugated iron sheeting, but during its construction in 1990 severe weather blew the roof apart (Fig.4.9) and killed two workmen in the process; they were crushed by the corrugated iron sheeting.<sup>280</sup> Uppark House was left exposed to the elements for several months before the roof could be reconstructed. The roof was repaired, and the temporary roof was then removed in May 1991.<sup>281</sup>

## 4.18.3 Windsor Castle: Structural Salvage and Temporary Roof

Windsor Castle is not owned by the government or cared for by a government agency, it is owned by the Crown. This meant that prior to the fire EH had 'been scarcely involved at Windsor', due to the complexity of the planning situation.<sup>282</sup> Whilst Windsor Castle is a Grade 1 Listed Building and a Scheduled Monument, it is not subject to the local planning authority as, 'in a building owned and occupied by the crown, there is no requirement... for works there to be subject to any kind of planning process or building regulation.'<sup>283</sup> Ron Edwards, who was involved in the structural salvage process, describes the down-taking of fire-damaged areas of Windsor Castle as; 'not a ball and chain

<sup>&</sup>lt;sup>276</sup> Fishlock, Michael, 35.

<sup>&</sup>lt;sup>277</sup> Fishlock, Michael, 35.

<sup>&</sup>lt;sup>278</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 27.

<sup>&</sup>lt;sup>279</sup> Rowell, Christopher and Robinson, John Martin, 58.

<sup>&</sup>lt;sup>280</sup> Rowell, Christopher and Robinson, John Martin, 58.

<sup>&</sup>lt;sup>281</sup> Rowell, Christopher and Robinson, John Martin, 59.

<sup>&</sup>lt;sup>282</sup> Nicolson, Adam, *Restoration: The Rebuilding of Windsor Castle*, 43.

<sup>&</sup>lt;sup>283</sup> Nicolson, Adam, 44.

job, this was a careful dismantling.<sup>284</sup> The Demolition Co-Partnership, the company which had also dealt with Hampton Court Palace post-fire, had to abseil into the building in order to 'dig out the brickwork that still supported the ends of the roof trusses'.<sup>285</sup> They would then haul the trusses up and out of the building using the five cranes brought on site for that purpose.

Two nights after the fire at Windsor Castle, 'drawings had already been done for half the scaffolding that was to support the new roofs' and 'within a week the whole design for the temporary roofs was complete.'<sup>286</sup> These roofs had to be designed so that they did not rest on the weakened exterior walls of the Castle, and the team acknowledged how crucial it was that the tragedy at Uppark House only two years earlier was not repeated. The roof itself was made of 'monarfelx polythene sheeting' which enclosed the scaffolding and would not cause fatalities if blown free of the scaffold, however, this material was not robust enough to withstand the weather in such an exposed location and needed 'constant replacement and repair'.<sup>287</sup>

# 4.18.4 Mackintosh Building: Structural Salvage

Decisions are made swiftly in the aftermath of a disaster such as a fire, and therefore the GSA engaged the services of Dominic Echlin, a Conservation Engineer from David Narro Associates. Echlin was able to conduct an initial structural assessment of the Building's post-fire state and liaise with GCC Building Control, the Fire Services, and HES conservation engineers.

The area causing particular concern was the West Gable and within that the Library window piers which had suffered from severe heat damage during the fire. In 2008 the exterior of the Mackintosh Building had been scanned by the Digital Design Studio (now the Department of Simulation + Visualisation) so that a 3D visualisation of the building could be created for internal use as the GSA wanted to 'virtually simulate the placement of the newly designed Reid Building', which was completed in 2013.<sup>288</sup> A day after the fire, on the 24<sup>th</sup> May 2014, the exterior of the Mackintosh Building was scanned again by HES's Digital Documentation Team (DDT), as well as the interior.<sup>289</sup> In an article for the *Journal of Cultural Heritage*, the DDT describes this process:

High-resolution laser scans were undertaken from all accessible vantage points. This included adjacent roofs which the team accessed using safety harnesses. A full photographic survey of safely accessible fire-damaged areas was made using Nikon D3X and D800 DSLR cameras.

<sup>&</sup>lt;sup>284</sup> Nicolson, Adam, 50.

<sup>&</sup>lt;sup>285</sup> Nicolson, Adam, 49.

<sup>&</sup>lt;sup>286</sup> Nicolson, Adam, 47.

<sup>&</sup>lt;sup>287</sup> Nicolson, Adam, 48.

 <sup>&</sup>lt;sup>288</sup> Lyn Wilson et al., '3D Documentation for Disaster Management in Historic Buildings: Applications Following
 Fire Damage at the Mackintosh Building, The Glasgow School of Art', *Journal of Cultural Heritage*, 2017, 3.
 <sup>289</sup> Lyn Wilson et al., 2.

After six days, the SFRS handed over control of the building over to Glasgow City Council and no further access was permitted.<sup>290</sup>

These laser scans were then 'registered together' to create a 'highly accurate point cloud'.<sup>291</sup> A point cloud is a term used to describe laser scan data 'which consists of x, y, z, coordinates and often includes other information such as intensity of the return of laser signal and RGB Values.'<sup>292</sup> This data was invaluable in the emergency decision-making process.

The data captured by HES's DDT in the days following the fire was compared with the data captured by the GSA in 2008, this meant that the GSA were able to 'demonstrate and quantify the extent of movement' in the West Gable.<sup>293</sup> It was found that the area of the West Gable which had 'experienced the greatest movement was the top triangle'.<sup>294</sup> This was caused by the 'collapse of the roof structure during the fire, causing the gable to be pushed out.'<sup>295</sup> The masonry wall was also at its thinnest and therefore weakest in this area of the gable. The DDT was even able to provide 'precise measurements of movement of each stone on the upper gable.'<sup>296</sup> Working as an interdisciplinary team; Dominic Echlin, HES engineers, the DDT, and GCC Building Control were able to agree that whilst the masonry blocks in the upper section of the West Gable would be dismantled, 'the main West façade would be left intact as the 4D data showed there had been insignificant movement.'<sup>297</sup> (Fig.4.10) The DDT has stated that:

The condition monitoring was vital for informed decision-making in this emergency situation and led directly to the conservation of the majority of the fabric of the building, minimising areas where stone was to be removed.<sup>298</sup>

The point cloud data captured during the DDT's survey of the building in 2014 was 'imported into Autodesk AutoCAD software and accurate 2D CAD drawings of the upper gable were produced from the 3D data.'<sup>299</sup> Then, each stone in the gable was numbered and this 'marked-up CAD drawing' was provided to a HES stonemason 'who accessed the gable via cherry picker and physically numbered the stone according to the drawing.'<sup>300</sup> This process 'allowed for targeted removal of the individual

<sup>292</sup> Lyn Wilson et al., 3.

<sup>294</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>290</sup> Lyn Wilson et al., 3.

<sup>&</sup>lt;sup>291</sup> Lyn Wilson et al., 3.

<sup>&</sup>lt;sup>293</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>295</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>296</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>297</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>298</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>299</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>300</sup> Lyn Wilson et al., 4.

stones' which would enable their accurate re-assembly during restoration. Impressively, 'this entire process was completed within four days of the fire break-out.'<sup>301</sup>

In October of 2014, a temporary roof structure was installed over the fire-affected areas of the Building in a week-long process. <sup>302</sup> (Fig.4.11 and 4.12) Over the summer of 2014 the Building was able to dry out effectively whilst a temporary roof was installed to protect the Building from the approaching winter weather. Installed by SGB roofing, 'an aluminium frame structure', was 'assembled in sections at ground level in Renfrew Street' then lifted by crane to the roof of the Mackintosh Building and covered in 'a plastic material.'<sup>303</sup>

# 4.19 Excavation of Debris

Whilst the excavation of the Mackintosh Building's Library was a progressive conservation decision and was ultimately a rewarding project, it was not without precedent. The salvage of Hampton Court Palace's damaged interiors was perhaps the first operation to employ archaeological techniques, and as a result, it would have an impact on the next serious fire incident in a historic building, Uppark House in 1989. The policies implemented at Hampton Court Palace were then built upon by its unfortunate successors, one of which would be the Mackintosh Building.

# 4.19.1 Hampton Court Palace: Salvage Excavation

The policy decided upon at Hampton Court Palace was defined as 'total salvage'.<sup>304</sup> This timeconsuming methodology 'was not so much to save money on new materials, as to ensure that as much of the original fabric as possible remained intact.'<sup>305</sup>

After the fire at Hampton Court Palace, the EH Central Excavation Unit was called in and carried out 'what was in effect an archaeological dig' to recover a seventeenth-century rock crystal chandelier; their work ensured that 'not a single bead' was lost, however, 'many had fractured when cold water hit the hot rubble and these were repaired by using an adhesive sensitive to ultra-violet rays.'<sup>306</sup>

<sup>302</sup> 'Back-up Roof for Fire-Hit Art School', 7 October 2014, sec. Glasgow & West Scotland, https://www.bbc.com/news/uk-scotland-glasgow-west-29519393.

<sup>&</sup>lt;sup>301</sup> Lyn Wilson et al., 4.

<sup>&</sup>lt;sup>303</sup> 'Temporary Roof Lifted on to the Mackintosh Building', accessed 3 July 2019,

http://gsapress.blogspot.com/2014/10/temporary-roof-lifted-on-to-mackintosh.html.

<sup>&</sup>lt;sup>304</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, Second (The Herbert Press, 1993), 3.

<sup>&</sup>lt;sup>305</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 3.

<sup>&</sup>lt;sup>306</sup> Fishlock, Michael, 40.

#### 4.19.2 Uppark House: Salvage Excavation

At Uppark House, it was decided that an archaeological dig would take place on the interior debris, an evolution of the salvage process which occurred at Hampton Court Palace a few years earlier. In fact, the excavation at Hampton Court Palace is referenced in *Uppark Restored*:

Before the fire was officially extinguished, the fire brigade deemed it safe to dig out the several feet of debris in certain rooms. With watchers, armed with sirens to warn of any structural movement and stationed at a high level on the scaffolding, digging began. After most fires, even in important buildings, it had been the practice simply to cart away and dump the rubble, as for example, after the 1980 fire at the National Trust's Nostell Priory, in Yorkshire. By contrast, the fire at Hampton Court in 1986, investigation, recording and preservation of what was apparently rubbish repaid considerable dividends.<sup>307</sup>

The NT, therefore, selected 'teams of volunteers and staff under the supervision of the Trust's archaeological advisers and conservators [who] systematically excavated the ruins.'<sup>308</sup> Inside Uppark House; 'each room (the sequence dictated by the surrounding walls) was separated into grid squares for the purpose of recording the location of each "find".'<sup>309</sup> This grid 'consisted of a chequerboard of ropes stretched above the workers with letters and numbers designating each compartment.'<sup>310</sup> Then; 'as interesting fragments emerged from the sludge (a piece of carved woodwork or plasterwork, sherds of glass and porcelain) they were placed in plastic trays labelled with the grid references.'<sup>311</sup> This enabled the restoration team to 'determine that broken glass found in the Staircase Hall belonged to the mid-eighteenth-century Gothick lantern previously hanging there. In this way, the glass was replaced to the exact profile of the original.'<sup>312</sup> This technique was also used to identify individual fragments of the Mackintosh Library Lights so that they could be accurately reunited with their corresponding parts before being restored or reconstructed.

Uppark House was 'dampened down for five days after the fire was officially put out', but this did not interfere with the excavation, which began 'almost immediately' as it had been deemed safe by the attending Fire Services.<sup>313</sup> The 'residue', or debris, which covered the floors of Uppark House after the fire had to be removed quickly to enable the weakened walls of the building to be shored up. As a result, the debris was 'shovelled into dustbins, also marked with grid references, to be sifted later on a

<sup>&</sup>lt;sup>307</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 25.

<sup>&</sup>lt;sup>308</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>309</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>310</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>311</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>312</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>313</sup> Rowell, Christopher and Robinson, John Martin, 24.

conveyor belt which passed the debris over a mesh.<sup>314</sup> There were 3,860 dustbins filled with debris and Rowell and Martin state that 'the clear principle was that nothing should be lost.<sup>315</sup> This meant that no material recovered was discarded, 'every piece of charred textile – however apparently insignificant - was carefully dusted with a small brush to remove acidic ash and residue, and each item was labelled and recorded.<sup>316</sup> The salvaged material was then stored in plastic polytunnels which had been erected on the grounds for that purpose.

## 4.19.3 Windsor Castle: Excavation

The excavation at Uppark House and the salvage works at Hampton Court Palace are both mentioned by Nicolson in *Restoration: Rebuilding Windsor Castle*, he states that 'English Heritage stepped up and offered to help with the salvage process'.<sup>317</sup> They advised that the debris should be carefully sifted 'for any valuable remains' and that a careful survey of the surviving fabric' should be undertaken. One thousand 'bins', 'which the National Trust had used at Uppark House were 'available and on offer' to the Royal Household.<sup>318</sup>

As at Uppark House and Hampton Court Palace, 'the clearance of Windsor Castle was problematic in term of cost and time'. Nicolson also draws attention to the unique status of Windsor Castle. EH costed an archaeological dig of the debris at £1.1 million, and the Royal Household and the Department of National Heritage were not 'entirely certain this was the route to go, particularly if the eventual style of restoration was not going to be the kind that would require the many fragments... a careful sifting of the debris would recover.'<sup>319</sup> A solution was reached between the three organisations; 'English Heritage, the Household and Royal Collection jointly established what were the most critical zones within rooms, different intensities of sifting were applied to different parts of the site.'<sup>320</sup> However, due to dangerous conditions the contents of the Crimson Drawing Room and State and Octagon Dining Rooms were 'shovelled by well-insured but unskilled workmen into dustbins' via a mechanised conveyer belt like the one used at Uppark House.<sup>321</sup> The areas around the three chandeliers and the malachite urn 'were subjected to a micro-sift', and it was discovered that 'virtually all the pieces remained gathered where they had first dropped', partially due to the 'thick layer of ash and plaster on the floor' which cushioned their fall.<sup>322</sup> The area affected by fire at

<sup>&</sup>lt;sup>314</sup> Rowell, Christopher and Robinson, John Martin, 27.

<sup>&</sup>lt;sup>315</sup> Rowell, Christopher and Robinson, John Martin, 28.

<sup>&</sup>lt;sup>316</sup> Rowell, Christopher and Robinson, John Martin, 28.

<sup>&</sup>lt;sup>317</sup> Nicolson, Adam, *Restoration: The Rebuilding of Windsor Castle*, 43.

<sup>&</sup>lt;sup>318</sup> Nicolson, Adam, 43.

<sup>&</sup>lt;sup>319</sup> Nicolson, Adam, 59.

<sup>&</sup>lt;sup>320</sup> Nicolson, Adam, 61.

<sup>&</sup>lt;sup>321</sup> Nicolson, Adam, 61.

<sup>&</sup>lt;sup>322</sup> Nicolson, Adam, 61.

Windsor Castle was far larger than that at Uppark House or Hampton Court Palace, and this is reflected by the 8,400 'bins' used to store debris before sifting.<sup>323</sup>

## 4.19.4 The Mackintosh Library: Excavation

After the Mackintosh Building was stabilised and Building Control was satisfied, the GSA began assessing the interiors. It was then decided that a forensic excavation of the Library would take place in order to 'inform the restoration process.'<sup>324</sup> It was acknowledged by the GSA that 'similar work was undertaken after the major fire at Windsor Castle in the 1990s and provided invaluable information to the restoration and archives teams.'<sup>325</sup> To help plan the Library excavation project, the 3D laser scan data captured by HES's DDT of the Library was used 'to calculate the volume of debris within.'<sup>326</sup> (Fig.4.13) This meant that the timescale and cost of the excavation could be more accurately estimated by the archaeologists and GSA. The HES DDT was also able to determine the most efficient exit routes out of the building, an important step which ensured the safety of the archaeologists working on the library. The routes out of the Mackintosh Building were 'easier to measure digitally rather than physically, due to the complex and hazardous nature of the building postfire'.<sup>327</sup>

The excavation was led by Kirkdale Archaeology; their Director Gordon Ewart spoke to *The Guardian* when the dig commenced in November 2014, stating that his team was 'looking for books that are viable, specific objects – notably the clock, furniture and light fittings, as well as wood and the fabric of the library itself.'<sup>328</sup> Whilst Duncan Chappel, Librarian at GSA hoped that 'as part of the salvage operation, as well as the artefacts and the Mackintosh furniture, some of those books might be saved.'<sup>329</sup> The Library floor was divided into one-metre squares, forming a grid, and layers of debris were then 'excavated in 25 cm increments.'<sup>330</sup> (Fig.4.14 and 4.15) Then, these strata were taken to the Mackintosh Building's Museum, a large space just along the corridor from the Library which was unaffected by the fire of 2014. Here the strata were sifted through with forensic precision by Kirkdale Archaeology, HES, and object specialists from AOC Archaeology. Every fragment salvaged was then

<sup>&</sup>lt;sup>323</sup> Nicolson, Adam, 64.

<sup>&</sup>lt;sup>324</sup> Glasgow School Of Art, 'Forensic Archaeologists Begin Work in The Mackintosh Library', *The Glasgow School of Art Media Centre* (blog), 18 November 2019, http://gsapress.blogspot.com/2014/11/forensic-archaeologists-begin-work-in.html.

<sup>&</sup>lt;sup>325</sup> Glasgow School Of Art.

<sup>&</sup>lt;sup>326</sup> Lyn Wilson et al., '3D Documentation for Disaster Management in Historic Buildings: Applications Following Fire Damage at the Mackintosh Building, The Glasgow School of Art', 5.

<sup>&</sup>lt;sup>327</sup> Lyn Wilson et al., 5.

<sup>&</sup>lt;sup>328</sup> Libby Brooks, 'Archaeologists Dig into Glasgow School of Art's Mackintosh Library', *The Guardian*, 18 November 2014, sec. Education, https://www.theguardian.com/education/2014/nov/18/archaeologists-diginto-mackintosh-library.

<sup>&</sup>lt;sup>329</sup> Brooks.

<sup>&</sup>lt;sup>330</sup> Brooks.

catalogued; they were numbered, their find location and material types were recorded, they were photographed, and their condition was stabilised. The biggest success story from this excavation process was the salvage of over 630 fragments of the original Charles Rennie Mackintosh Library Lights. MRP1 Project Manager Sarah Mackinnon and Archives and Collections Recovery Lead Polly Christie lead the process of restoring these Lights (Fig.4.16).

## 4.20 Recording the Salvage Process

#### 4.20.1 Hampton Court Palace: Recording the Salvage

A Central Office of Information (COI) film was commissioned to document the salvage and restoration of Hampton Court Palace and over 39,000 photographs were taken over the 5-year restoration project.<sup>331</sup> These photographs, once developed, were then indexed and mounted by volunteers. These images, along with all other material relating to the restoration, are not available to view online and are only accessible from The National Archives at Kew in London.

#### 4.20.2 Uppark House: Recording the Salvage

At Uppark House, just as at the Mackintosh Building, technology was being employed to record the structure, alongside the National Monuments Record, the NT archaeological department 'surveyed the structure [of Uppark House] both as a possible preliminary to reconstruction and as an historical record.'<sup>332</sup> This information was 'later supplemented by photogrammetry (precision photography to scale), which allowed the data to be incorporated on computer as an essential basis for architects' computer-assisted drawings.'<sup>333</sup> Manual records were also transferred onto a computer programme called 'Delilah', operated by the EH Archaeological Excavation Team who 'had pioneered their technique after the 1986 Hampton Court fire.'<sup>334</sup> The authors of *Uppark Restored* record that this process 'was of considerable benefit, but its efficacy was qualified by the understandable misidentification of objects by inexperienced recording staff.'<sup>335</sup> As, 'later when the repairs were underway, only expert manual sorting would reveal how many eighteenth-century metal curtain cloakpins or window catches had survived, because they had been filed on the computer as ''miscellaneous metalwork''.'<sup>336</sup>

<sup>&</sup>lt;sup>331</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 39.

<sup>&</sup>lt;sup>332</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 30.

<sup>&</sup>lt;sup>333</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>334</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>335</sup> Rowell, Christopher and Robinson, John Martin, 30.

<sup>&</sup>lt;sup>336</sup> Rowell, Christopher and Robinson, John Martin, 30.

#### 4.20.3 Windsor Castle: Recording the Salvage

The salvage and restoration process at Windsor Castle was recorded via photography, but these images, like the records of the project, are not available online. They can be viewed by making an appointment with a member of staff at Windsor Castle, where physical copies of photographs are held in albums. EH also used the fire as an opportunity to perform an archaeological building survey of the Castle using traditional methods as well as photogrammetry. Whilst images of some of these photogrammetric elevations are included in *Restoration: The Rebuilding of Windsor Castle*, they are not available to view online on what is now the HE online archive, however, photographs can be ordered individually, for a price, and sent digitally.

#### 4.20.4 Mackintosh Building: Recording the Salvage

The salvage and excavation process at the Mackintosh Building was recorded via documentation and photography by HES, Kirkdale Archaeology, AOC Archaeology, and the GSA. Individuals involved in the salvage, such as Susannah Waters, have written about the process in academic journals, and the publication of more journal articles on various aspects of the salvage and recovery process were planned by other members of GSA staff. However, the second fire of 2018 delayed this process. The records from the salvage process are not available to the public, and are not held on a database, however, in 2019 discussions began as to what information is held, and by whom, so that it can be collated into a central depository for preservation and future use by the GSA and external researchers.

#### 4.21 The Decision to Restore

#### 4.21.1 Hampton Court Palace: The Decision to Restore

After several months of speculation, the Secretary of State for the UK Government 'confirmed the [salvage and restoration project] working party's recommendation that the Palace should be restored to its former glory, "using traditional materials and construction", the principles upon which work would be based were firmly established.'<sup>337</sup> This is perhaps unsurprising as the fire had damaged a comparatively small section of Hampton Court Palace, the vast majority of which was undamaged by fire or the firefighting efforts.

## 4.21.2 Uppark House: The Decision to Restore

On the night of the fire at Uppark House the Director-General of the NT, Martin Drury, stated in a press release that; 'We shall reconstruct Uppark if we can, although it is too soon to know if this is possible.'<sup>338</sup> This measured response differs greatly to the impassioned speeches given by Muriel Grey, Director of the Board of Governors of the GSA, in the immediate aftermath of the 2014 and

<sup>&</sup>lt;sup>337</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 43.

<sup>&</sup>lt;sup>338</sup> Rowell, Christopher and Robinson, John Martin, Uppark Restored, 33.

2018 fires in the Mackintosh Building. By the 13<sup>th</sup> September 1989, it was announced that 'We [the NT] feel that enough survives to justify total restoration.'<sup>339</sup> A public debate in the newspapers followed, and the authors of *Uppark Restored* record that a correspondent wrote to *The Times* on 18 September 1989 speaking out against a re-creation:

The result of such misguided activity will be very largely fake; a very skilful fake, I have no doubt, but a fake (or if you prefer "reproduction antique") none the less. What will be the point in this? Those visiting Uppark in the future would know it was a copy of the original; would the public therefore go to see it anymore?<sup>340</sup>

The authors of *Uppark Restored* stated that; '(The answer to the question is that when the house reopened in the summer of 1995 over 60,000 visitors came to see it in the first five months – double the annual total before the fire.)'<sup>341</sup> Several contemporary commentators also argued that the site should be 'returned to nature', believing that the 'rescued furniture and paintings etc. can easily be found worth homes elsewhere.'<sup>342</sup> Arguments were also put forward that Uppark House should be demolished. Mr David Martin, the Conservative MP for Portsmouth South, wrote to *The Times* on 6 September 1989 to express his views:

Sir,

The expressed intent to restore the fire-ruined Uppark House in Sussex surprises me. In these days of outrage at development of green-fields sites, let alone a prominent one on a Sussex Downs hilltop, here is an ideal opportunity to demolish it altogether and return the site to nature.

Imagine attempting to get planning permission for a building such a house (or rather museum business premises) in such a position today! The very same great and good people supporting the National Trust and similar bodies wanting to restore it would be leading petitions, dismayed letters to MPs etc., to preserve such an area of high landscape value and unique habitat for something or other from being vandalised by developers.

In their assaults on vast acres of countryside, were the yuppies of the 17<sup>th</sup> century so very different? Why should we allow time to confer legitimacy on **their** depredations?

Yours truly,

DAVID MARTIN,

<sup>&</sup>lt;sup>339</sup> Rowell, Christopher and Robinson, John Martin, 33.

<sup>&</sup>lt;sup>340</sup> Rowell, Christopher and Robinson, John Martin, 33.

<sup>&</sup>lt;sup>341</sup> Rowell, Christopher and Robinson, John Martin, 33.

<sup>&</sup>lt;sup>342</sup> Rowell, Christopher and Robinson, John Martin, 33.

# House of Commons<sup>343</sup>

The authors of *Uppark Restored* state that this particular letter 'evoked a certain amount of derision in the local press, being generally denounced as "arrogant nonsense".<sup>344</sup> Perhaps had the contents of Uppark House not been salvaged, or more of its structure and interior fixtures been destroyed, this argument would have had more weight. The argument put forward by David Martin MP is therefore not valid in this context, however, that does not make it inherently 'wrong'.

The 'philosophy of restoration which has developed since the later nineteenth century', is also discussed in *Uppark Restored*.<sup>345</sup> It is stated that conservation and restoration philosophy 'is still much influenced by the writings and opinions of those larger-than-life Victorian defenders of old buildings John Ruskin (1819-1900) and William Morris (1834-98).'<sup>346</sup> The same can still be said today, over 20 years after the publication of *Uppark Restored*. The Society for the Protection of Ancient Buildings (SPAB) 'urged that if the interior had been gutted "no attempt should be made to create a lifeless replica of the eighteenth-century rooms.'''<sup>347</sup> Instead suggesting that 'the shell [of Uppark House] should be consolidated, a roof added and the internal spaces reconstructed as a museum of the National Trust contents' in a modern style.<sup>348</sup> However, Rowell and Robinson do note that 'this view was moderated once the true extent of the damage was clearer.'<sup>349</sup> Meaning that SPAB's issue here was with the idea of *replication* of historic fabric, rather than the *restoration* of historic fabric. This is confirmed by the authors who go on to say; 'the basic question at Uppark was the extent to which the destroyed parts of the decorative interior should be replaced in replica, if at all.'<sup>350</sup>

Ultimately, because 'the National Trust, a champion of the historically authentic, non-museum display of works of art, considered it important that the contents, which had been designed or purchased specifically for the house by two generations of discerning Georgian collectors, should be seen again in their natural surroundings'.<sup>351</sup> On a practical note, the authors also state that Uppark House 'was comprehensively insured for total reinstatement... The insurance money could only be used for the rebuilding and repair of Uppark and not for any other purpose.'<sup>352</sup>

<sup>&</sup>lt;sup>343</sup> Rowell, Christopher and Robinson, John Martin, 33–34.

<sup>&</sup>lt;sup>344</sup> Rowell, Christopher and Robinson, John Martin, 33–34.

<sup>&</sup>lt;sup>345</sup> Rowell, Christopher and Robinson, John Martin, 35.

<sup>&</sup>lt;sup>346</sup> Rowell, Christopher and Robinson, John Martin, 35.

<sup>&</sup>lt;sup>347</sup> Rowell, Christopher and Robinson, John Martin, 39.

<sup>&</sup>lt;sup>348</sup> Rowell, Christopher and Robinson, John Martin, 39.

<sup>&</sup>lt;sup>349</sup> Rowell, Christopher and Robinson, John Martin, 39.

<sup>&</sup>lt;sup>350</sup> Rowell, Christopher and Robinson, John Martin, 39.

<sup>&</sup>lt;sup>351</sup> Rowell, Christopher and Robinson, John Martin, 45.

<sup>&</sup>lt;sup>352</sup> Rowell, Christopher and Robinson, John Martin, 44.

#### 4.21.3 Windsor Castle: The Decision to Restore

The author of *Restoration: The Rebuilding of Windsor Castle*, Adam Nicolson, says that 'symbolism ran rampant' in the media after the fire at Windsor Castle, as 'the fire was seen in some quarters as a symptom of national decline', whilst 'others thought it a metaphor for the threat to the monarchy.'<sup>353</sup> He also believes that 'others relished the sheer destruction', including several architectural journalists and the then Vice-President of RIBA.<sup>354</sup> Nicolson saw the individuals who wanted to leave the castle in its ruined state or create a garden from the remains as creating 'a form of punishment' via their proposals, presumably for the Royal Family.<sup>355</sup> He made it clear that any 'radical', meaning modern, interventions to the exterior of Windsor's 'external profile 'could not 'ever have been entertained' as they were 'inconceivable, given the nature of the client and the purposes to which this building [Windsor Castle] must be put'.<sup>356</sup> Nicolson went on to describe 'restoration in substitute materials' as being thought of as 'too tawdry and cheapskate for Windsor'.<sup>357</sup> This viewpoint takes no account of the valid restoration philosophy of replacement and replication of original designs in more sustainable materials.

The *Options Report* for the restoration of Windsor Castle, which was presented internally and not published publicly, was in Nicolson's opinion 'the key document in the whole restoration project' as:

It formulates and amplifies most of the assumptions made by the Duke of Edinburgh after the fire and subtly steers the reader towards his conclusions. That at least is the subtext. Superficially, the report maintains a cool distance from any particular preference, and portrays itself as an impartial laying out of all the available options. In fact, it has a clear agenda of its own and signals its intentions early on.<sup>358</sup>

It is therefore disappointing that this valuable document was not made available as a resource to others; Nicolson posits that this is 'perhaps because it was felt that public attitudes to the different options which the report described would bring distorting pressures on the decision-making process.'<sup>359</sup>

Public relations and perception management are crucial elements of any restoration project. It is vital that the local community, as well as experts from various industries, are consulted with and communicated with effectively, otherwise the reputation of the institution conducting a post-disaster

<sup>&</sup>lt;sup>353</sup> Adam Nicolson, *Restoration: The Rebuilding of Windsor Castle* (London: Michael Joseph Ltd and The Royal Collection Trust, 1997), 70, http://capitadiscovery.co.uk/gsa/items/223061.

<sup>&</sup>lt;sup>354</sup> Nicolson, 70.

<sup>&</sup>lt;sup>355</sup> Nicolson, 70.

<sup>&</sup>lt;sup>356</sup> Nicolson, 77.

<sup>&</sup>lt;sup>357</sup> Nicolson, 77.

<sup>&</sup>lt;sup>358</sup> Nicolson, 76.

<sup>&</sup>lt;sup>359</sup> Nicolson, 76.

restoration can suffer. Nicolson appears to confirm that there were public relations issues after the fire at Windsor Castle as the restoration was paid for mostly by entry fees to Buckingham Palace; 'given the mood of the time and the general tightening of government finances, that the public opinion would have pressed for the cheapest of all options.'<sup>360</sup>

Nicolson records the *Options Report's* restoration approaches as being; 'Authentic Restoration, Equivalent Restoration, and Contemporary Redesign.'<sup>361</sup> Even though the 'Authentic Restoration' approach had been used at Uppark House, the anthropomorphised *Options Report* nevertheless 'wrinkles it's nose at the idea'.<sup>362</sup> Nicolson explained that this approach would be 'by far the most expensive' and that:

At Windsor there was no insurer and both the Royal Household and the Department of National Heritage did not like the idea of spending many millions of pounds of historical authenticity, a large part of which no one would ever see.<sup>363</sup>

It is important to be pragmatic about the cost of a restoration project, and Nicolson is again honest when he states that costing this option was 'useful to demonstrate that the next alternative, Equivalent Restoration, was not the most expensive available', and was the option which the Royal Family and Royal Household wanted.<sup>364</sup> The Contemporary Redesign approach was the most cost-effective, but Nicolson informs us that thanks to Hugh Roberts, Deputy Surveyor of the Queen's Works of Art, putting on a 'bravura performance' in 'describing the historical background of the burnt rooms' in the *Options Report* this route was not selected.<sup>365</sup>

## 4.21.4 Glasgow School of Art: The Decision to Restore

As the majority of the Mackintosh Building was undamaged and most of its contents were salvaged, MRP1 represented a unique opportunity for research on the Mackintosh Building and its designer. The fire stripped back a number of spaces within the Building, which allowed new research to be conducted into its materiality and construction. Rigorous academic research underlined all decisions made during MRP1, and it was recognised by the GSA that an interdisciplinary approach would be crucial to the success of the restoration project from the outset. To that end two symposia entitled

- <sup>361</sup> Nicolson, 78.
- <sup>362</sup> Nicolson, 78.
- <sup>363</sup> Nicolson, 78.
- <sup>364</sup> Nicolson, 78.

<sup>&</sup>lt;sup>360</sup> Nicolson, 76.

<sup>&</sup>lt;sup>365</sup> Nicolson, 79.

*Building On: Mackintosh* were organised by the GSA, one of which was 'part of the Scotland+Venice contribution to the international Venice Architectural Biennale' of 2014.<sup>366</sup>

The initial symposium in Venice focused on the Library, and 'brought together professionals and the public to seek to explore and identify the key questions and cultural themes which the restoration of the Mackintosh Building and in particular the Library raises.'<sup>367</sup> Journalist Susan Mansfield reported on the Venetian Symposium in *The Scotsman*, where she relayed the opinions of the experts who had gathered, including Conservation Architect Julian Harrap who warned:

The school has a major responsibility. If they don't grasp the complexity of this, they risk ending up with an ephemeral, disappointing recreation. Unless they rise to the challenge, they could undermine the fantastic reputation they have.<sup>368</sup>

David Mullane, former director of the Charles Rennie Mackintosh Society, 'said a replica of the library could be "an embarrassment" and suggested it should be replaced by a modern purpose-built study space.'<sup>369</sup> Tom Inns stated that the first symposium had 'been a very, very useful event.'<sup>370</sup> Complaints were raised in the media and by members of the Scottish heritage community that this event was made inaccessible for most as it was held in Venice. However, the GSA stated that the talks given and the discussions held were recorded and published online after the symposium, and are still available to access.

The idea that a space like the Mackintosh Building's Library, which was being re-created as part of MRP1, would be a mere facsimile or 'fake', was discussed at the two GSA Symposia, as well as in the press, most notably by Architectural Journalist Oliver Wainwright in April of 2015:

the biggest question hangs over what should become of the hallowed gem of the library, regarded by many as one of the most important interiors of the 20th century – which the school has vowed to rebuild exactly as it was. The eyes of the world are watching... Some camps see a duty to rebuild an exact replica; others believe such an act to be a Disney-like betrayal of an architect who himself was radically modern... However, when the famous library is rebuilt, will it ever be more than a shrine to the ghost of Mackintosh?... If it's rebuilt anew, it could have all the atmosphere of a freshly fitted MFI kitchen.<sup>371</sup>

<sup>&</sup>lt;sup>366</sup> Khirstine Johnston, 'Building On - Mackintosh', Building On - Mackintosh, accessed 12 July 2019, https://buildingonmackintosh.wordpress.com/.

<sup>&</sup>lt;sup>367</sup> Khirstine Johnston.

 <sup>&</sup>lt;sup>368</sup> Susan Mansfield, 'Eyes of World on Glasgow School of Art Restoration', *The Scotsman*, 20 October 2014, https://www.scotsman.com/lifestyle-2-15039/eyes-of-world-on-glasgow-school-of-art-restoration-1-3577607.
 <sup>369</sup> Susan Mansfield.

<sup>&</sup>lt;sup>370</sup> Susan Mansfield.

<sup>&</sup>lt;sup>371</sup> Oliver Wainright, 'Things We Found in the Fire: Glasgow's School of Art Restoration Begins'.

The GSA Symposia and the creation of a conservation ethos for MRP1 are discussed alongside MRP1 itself in the following chapter. As previously noted, Muriel Grey and the GSA immediately made their intention to restore the fire-damaged areas of the Mackintosh Building clear through interviews and statements to the media, later announcing that the entire Mackintosh Building would be restored as part of the Mackintosh Campus Project, a 'transformational estate plan for The Glasgow School of Art's Garnethill campus' which encompassed 'the exemplary programme of restoration in the world-famous Mackintosh Building, and it's return to the heart of the GSA campus, together with the purchase and refurbishment of the former Stow College building, which will become the new home for GSA's School of Fine Art.'<sup>372</sup>

## 4.22 Conclusion

The disaster scenarios examined in this chapter make it clear that Emergency and Disaster Response Plans are vital for any building which contains objects of cultural significance. For these plans to be effective, all members of staff must be familiar with their contents, and they must be updated regularly. A Salvage Team should also be created and should train regularly together, as well as with external organisations such as the local Fire and Rescue Services. As part of creating an Emergency and Disaster Response Plan all institutions or organisations which hold a collection of culturally significant objects should undertake the process of prioritisation, and in doing so create a Priority Object List of objects to be removed first in an emergency situation. An accurate inventory of all objects in a collection should also be created, and the locations of each object must be kept up to date. All objects should also be physically numbered and stored according to Collections Trust Spectrum guidelines, making them easier to locate and identify during a disaster scenario or salvage operation. It is crucial to prepare for the potential loss of important objects in a disaster, therefore, these objects should also be recorded digitally, via some form of scanning or photography. This ensures that if they are damaged, they can be identified and then repaired more easily, and could even be re-created.

Examination of the fires at Hampton Court Palace, Uppark House, and Windsor Castle reveal that after a fire in a historic or traditional building it is highly likely that it will be necessary to install a temporary roof. Designs, plans, and costings for such a structure could therefore be considered as part of an A-Listed Building's Emergency and Disaster Response Plan by the owners and insurers of the building, especially if the building contains historically important interiors and objects. The analysis of these case studies has also highlighted the effectiveness of post-disaster excavations in specific areas where there is a chance of retrieving valuable fragments of materials. This excavation process could, therefore, be made an obligatory part of any salvage operation in spaces which contained

<sup>&</sup>lt;sup>372</sup> Glasgow School of Art, 'Mackintosh Campus Project', accessed 7 August 2019, http://www.gsa.ac.uk/about-gsa/history-and-future/our-future/mackintosh-campus-project/.

significant objects and/or fixtures and fittings. Recognising excavations as standard practice postdisaster would ensure that there is funding available for such vital projects via insurers.

The decision to restore a building after a disaster is fraught with philosophical and often political concerns, not to mention budgetary constraints. There is no prescriptive method of restoration which can be applied to every historic building, instead, restoration today provides a multitude of different approaches which can be tailored to suit the needs of each building, its users, and its owners. I agree with the decision made to restore the Mackintosh Building after the fire of 2014 as I believe that the design of the building and its continued use were the factors which made it so unique. Whilst the patina in spaces such as the Library has been lost, it would have been an even greater loss to deprive people of experiencing the Mackintosh Building as a re-creation.

Restoring and/or re-creating a damaged historic building is a complex process, but this chapter has argued that the decision to do so should be based on the following factors:

- What quantity of the contents, fixtures and fittings survive.
- How much of the building fabric remains.
- If there are enough records of the building, such as laser scans, drawings and photographs, to enable accurate re-creation of the building.

After the fire of 2014 most of Mackintosh Building and its contents were salvaged or undamaged, the Building's exterior had recently been laser scanned, and had been drawn and photographed since its erection. Its interiors and contents, including the library, had also been well recorded. Therefore, deciding not re-create or restore it post-fire would have made little sense.



Object First Aid							
Wet or Damp	Contaminated	Broken	Weak	Dangerous to Handle	Mouldy	Smoke Damaged	Other

*Figure 4.1: Historic England 'Example grab sheet 1' for a priority object on display in a historic house. Taken from their 'Example House Emergency Response Plan', 2016. Copyright Historic England.* 



Figure 4.2: Location and exit routes for the removal of a priority object from an HES property. Image provided by Judith Rowett, Regional Collections Manager at HES. Copyright HES.



Figure 4.3: The restored malachite urn from Windsor Castle, RCIN 43957, image copyright Royal Collection Trust.



Figure 4.4: An emergency tapestry removal 'rip-cord' with a wooden toggle at the end is covered by a plastic guard at Hampton Court Palace, 2017. Image taken by Rachael Purse.



Figure 4.5: This photograph is entitled 'Human Chain', shows the GSA Archives & Collections working to remove the contents of the Mackintosh Building, 2014. Image copyright GSA Archives & Collections.



Figure 4.6: Image of HES Stores, showing how paintings are stored on wracking. Image kindly provided by Judith Rowett.

#### Actions at Safe Area: In bold

#### SMALL MISCELLANEOUS ITEMS (e.g. cer ics, glas · Before lifting check for detachable parts and

- remove separately Interleave with bubble wrap/acid free tissue &
- pack in crates
- Place heavy items at the bottom of crates
  Place plates vertically in the crate
- Make sure objects are separated by packing material e.g. pre-cut bubble wrap
   If wet blot dry with kitchen towel, without rubbing surface
- Lay out on blotting paper to dry.

# TEXTILES

- Wet textiles are heavy
   Avoid excess folding. Put polythene or bubble wrap between layers & along folds
- Carry over extended arms to avoid further folding
  Use polythene & bubble wrap as carrying support
- Roll carpets pile out. Plastic drainpipes give good
- support If textiles cannot be removed, roll & put by a wall or under a table & cover with polythene. If
- possible put on blocks to keep off the floor
- Woollen druggets can be used to protect items that cannot be removed
- Blot wet textiles with absorbent materials: kitchen towels, absorbent cushions/pillows
- To dry: place flat on bread crates with fan to aid air movement.

#### METALWORK

 Small objects: treat as miscellaneous small items Fixed or large objects should be covered to protect from water with Tyvek/dustsheets, or boxing in – not with polythene.

# · Use trolleys for heavy items.

- Only attempt to remove chandeliers or lanterns if they have been fitted with a quick release mechanism to disconnect from electrics. Remove door furniture in a fire if there is time.
- If wet: blot with kitchen towe
- Ferrous metals can be sprayed with WD40 to prevent rusting.

#### FURNITURE/ WOOD H

- If too large or heavy to move place on wooden blocks, covered with polythene to protect from water damage
- Use webbing straps to lift heavy or awkward items
  Remove drawers to reduce weight; carry any contents
- in the drawers
- Tie or lock cupboard doors shut
- Keep hands away from any upholstery/fringing
- Lift chairs by seats or legs not by backs or arms
   Cover items with polythene before taking outside
   Do not lift furniture by handles

- Tables: Lift by structural member beneath top
   If wet: blot dry with kitchen towel/absorbent

materials.

#### BOOKS $\square$

- Remove the most important books first
   Pack books in three separate categories
- dry, damp and wet
- Take books from bottom shelf first, then work up.
  If shelves are unstable, work from top shelf down.
  Wet books: Keep shut, put in individual freezer bags
- & pack spine down in crates
- Dry books: Place flat in crates or strong carrying bags
   If dry: brush clean with shaving brush
- If damp: stand on end, fan out to dry on polythene (or place flat if won't stand), and interleave pages with blotting paper, every 0.5 cm. Change at intervals
- If wet: brush off loose dirt, put in freezer bag and label.

#### STONE, SCULPTURE AND PLASTERWORK

#### Protect floors with duck boarding

- Use wooden battens to hold polythene in place
   Move using trolleys and barrows
- Move larger items near to wall & put polythene underneath to stop absort water from the floor orbing
- Water: Protect with polythene
- Do not use polythene where risk of fire
   Fire: Use protective framework or flame
   retardant cover if available
- Statuary: store upright on battens
  Table tops & large flat pieces: store on side If wet: place on polythene & wooden blocks to allow air movement.

#### PAINTINGS

- Hold painting by the sides & supported underneath Never lift paintings by top of frame or stretcher; joints may give or fingers puncture canvas
  Keep hands still on the frame. If the frame is wet the mouldings and gilding will be soft and sticky
- Carry with painted side towards you
  Use picture slings to move large paintings
- If painting cannot be removed, protect by draping polythene over front & back
- At safe area stack paintings using T bars/bubble wrap corners, back to back and front to front, resting on wooden blocks or bubble wrap
- If wet and there is space: lay horizontal face up on polythene covered wooden blocks to aid drying
   If wet and no space: keep vertical, but do not stack.

### PAPER

- Give priority to pastels and images on parchn or vellum Leave in frames and act on conservation advice
- within 24 hours At safe area stack frames face to face & back to back, interleaving with foam, bubble wrap or card
- If damp/wet: lay flat, face up on blotter/blotting paper to dry

#### PHOTOGRAPHS 寫

- Wear surgical gloves at all times Prepare safe area: keep cool & ventilated with fans. Set up drying lines, absorbent & wax papers, polythene, crates, buckets, clean water Divide material into dry/wet/damp/at risk
- Do not allow photos to dry in contact with another surface
  Keep immersion time of wet photos to a minimum
- Prints: Leave in mounts. Air dry loose face up on blotters
- Wet framed prints: remove from frames & dry face up on blotting paper, Stop if sticking to glazing.
   Albums: fan out & air dry upright. Do not interleave
- Glass negatives: prop on long edge without
- touching emulsion surface. If broken, dry emulsion side up on blotter touchi
- Plastic film: dry vertically suspended from line, held by plastic peg at top and bottom, avoiding image.

Figure 4.7: Flat lay of HES 'Salvage Essentials' folding pocketbook for Salvage Object First Aid.

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Figure 4.8: Textiles and objects from the Mackintosh Building being dried-out and given first aid in the Reid Building, 2014, copyright GSA Archives & Collections.



Figure 4.9: Image showing the remains of Uppark House's temporary roof after the storms of January 1990. Image taken from 'Uppark Restored'. Copyright National Trust.



Figure 4.10: Stones in the West Gable, or Library Tower, are numbered and the removed following the fire of 2014. Images from '3D documentation for disaster management in historic buildings: Applications following fire damage at the Mackintosh building, The Glasgow School of Art'. Copyright HES.



Figure 4.11: The Frame of the temporary roof, designed by SGB Roofing, is lowered into position via a crane, October 2014. Image copyright GSA.



Figure 4.12: The temporary roof two years after its initial installation, image taken when the roof of the Mackintosh Building was being rebuilt, 2016. Image copyright McAteer.



Figure 4.13: Lasserscan data of the debris on the Library floor. Images from '3D documentation for disaster management in historic buildings: Applications following fire damage at the Mackintosh building, The Glasgow School of Art'. Copyright HES.


*Figure 4.14: Image of planned excavation grids, in 3D, of the Mackintosh Building Library, 2014. Copyright Kirkdale Archaeology.* 



Figure 4.15: Plan of the gridded floor of the Mackintosh Building Library, the window bays can be seen on the left of the plan, 2014. Copyright Kirkdale Archaeology.

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exterior windows	0		1 Zone 4	1	1 Z0	<b>1</b> ne 5	Zoi	ne 6	1 Z0	ne 7		1 Zone 8	3	0	
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	2			17	6		4		11	5	8	6	1	2	
	3		5	2	3	2	4	1		1		1		3	
	4		1 Zor	3 e 3			46 Zone 2		3	10	Zoi	e 1		4	
	5		13	4	1	58	148	1			17	8		5	
	6		1		4	19	5			25	3	2		6	
	7		3	2		2	11		1	36				7	
	8		9 Zone 9	2	5 Zor	e 10	19 Zon	<b>10</b> e 11	Zor	ne 12	Zor	e 13		8	
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Figure 4.16: Grid of the Mackintosh Library floor showing the location of light fragments, created by Polly Christie and Sarah Mackinnon.

# 5. The Mackintosh Restoration Project

# **5.1 Introduction**

The restoration of the Mackintosh Building (MRP1) which took place between 2014 and 2018, is arguably the largest re-creation and restoration project of its kind in the UK since the fire and subsequent restoration of Windsor Castle took place in the 1990s. This chapter seeks to ensure that we can learn valuable lessons from MRP1, as whilst it was never completed, the innovative work carried out during this project needs to be recorded, analysed, and disseminated. The project itself was a significant milestone for the heritage sector and for the history of the conservation movement. The techniques used and lessons learned during MRP1 could shape future restoration and re-creation projects, particularly with regard to ensuring the future sustainable use of traditional and historic buildings.

It would, of course, be preferable that the motivation for a re-creation or restoration was not to repair the damage wrought by a destructive accident. However, we need to be prepared for this eventuality, as the case studies have shown these disasters are all too frequent; this is reflected by the fire in Notre Dame Cathedral in 2019. By ensuring that best practice examples of contemporary restoration and conservation techniques and philosophies are published and made widely accessible, we can then at least ensure that, in case of emergency, the knowledge is available to those that need it.

#### 5.2 Creating a Philosophical Baseline for MRP1

In the aftermath of the 2014 fire, it became all too clear how important the Mackintosh Building was, not only to the staff and students of the GSA, but to people around the world. Images of students overwhelmed with emotion standing on Sauchiehall Street as they watched the building burn could not fail to make an impression on the evening news that night. Whilst the SFRS were still dealing with hotspots in the building, Chair of the Board of Governor's Muriel Grey stood outside and made a speech to Channel 4 News which continued to define the ethos of MRP1:

Bad news first is that we have lost the iconic and unique Mackintosh library. This is an enormous blow and we are understandably devastated.

But the most amazing, almost miraculous news is that the majority of the building is still intact. Due to one of the most astonishingly intelligent and professional pieces of strategy by the Fire Services, they succeeded in protecting the vast majority of the building, apparently by forming a human wall of firefighters up the west end of the main staircase and containing the fire. Mackintosh didn't work with precious materials, he worked with precious ideas... and we can rebuild that.<sup>373</sup>

This ethos of positivity and hope in the light of loss and destruction gave MRP1 an aura of confidence and optimism which continued until the second fire in 2018 caused more devastation than the first.

The 2014 fire damaged or destroyed some of the Mackintosh Building's important interiors, including the Mackintosh Library. Post-fire the GSA released a statement entitled 'Restoration Intent', which acknowledged their 'enormous responsibility' to bring the Mackintosh Building 'back to life as a robust, functioning and inspirational working art school'.<sup>374</sup> Whilst the 'global interest in the restoration of the Mackintosh Building and the diversity of opinion that surrounds this' was also recognised, the GSA nevertheless reiterated the first declarations made to the press by Muriel Grey, who said that 'we will rebuild, and we will rebuild well', confirming that this would remain the foundation of the restoration project.<sup>375</sup> The GSA went on to declare their overall ambitions for the project in May of 2014:

to achieve an exemplary restoration of the Mackintosh Building, using meticulous and detailed conservation, traditional craftsmanship and construction skills combined with technology, design innovation and robust functionality.<sup>376</sup>

The aim of MRP1 was to take the Mackintosh Building, including undamaged areas, back to their 'factory settings' as Tom Inns, the then Director of the GSA often stated, in order to re-create the building as it would have been when it opened in 1910 as far as was practical. This involved removing and rectifying additions and alterations which had distorted the original design of the building whilst also ensuring a sustainable future for the Mackintosh Building's use at the heart of the GSA campus. Inns also 'neatly summarised our [GSA's] intent thus: "What the eye sees will be Mackintosh. What Mackintosh sees will be 21st century".<sup>377</sup>

## 5.3 The Mackintosh Restoration Project 2014-2015: Work Begins

In November 2014 the GSA established 'a specific Board Committee to lead on the restoration of the Mackintosh Building' which was Chaired by Eleanor McAlister, an economist and town planner, and included 'representatives from across the School including members of the Board', as well as external

<sup>&</sup>lt;sup>373</sup> "'Miracle" That Glasgow School of Art Saved', Channel 4 News, 24 May 2014.

<sup>&</sup>lt;sup>374</sup> Glasgow School of Art, 'Restoration Intent', *Glasgow School of Art Website* (blog), accessed 8 January 2017, http://www.gsa.ac.uk/about-gsa/mackintosh-building-restoration/restoration-intent/.

<sup>&</sup>lt;sup>375</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>376</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>377</sup> Glasgow School of Art.

expert Ranald MacInnes who represented HES as their then Head of Heritage Management.<sup>378</sup> That month, after the establishment of the Restoration Committee, the GSA, with advice from GCC and HES, appointed Elizabeth Davidson as Senior Project Manager of the Mackintosh Restoration Project (Davidson also became a member of the Restoration Committee).<sup>379</sup> The appointment of Sarah Mackinnon as Project Manager then followed.<sup>380</sup> With these positions filled, the MRP1 Project Management Team could begin working for their client, GSA, to select architects and contractors and create a Design Team. At this point 'weekly tours of the Mackintosh Building' were also 'being organised for groups of students' by the GSA.<sup>381</sup> These tours 'allowed students who were based in the Mackintosh Building to see their studios again, for the first time since the fire', and 'also allowed new students who have never been in the building to see the interiors for the first time.'<sup>382</sup> This more 'open' approach to the site ensured that the Mackintosh Building remained 'in use' throughout the Restoration Project as an educational tool; inspiring the practices of GSA students, and providing a variety of practitioners from the heritage sector, from geologists to building surveyors and architects, the opportunity to visit or work on this hugely significant restoration/re-creation, and in doing so develop their skill set as professionals.

## **5.4 Appointing an Architect**

In October 2015 architects were invited by the Restoration Committee to submit an expression of interest to lead MRP1. The GSA stipulated that the teams who applied must include as a minimum an architect, structural engineer and mechanical and engineering consultants.<sup>383</sup> The GSA's brief on the project itself was as follows:

To meticulously restore the Mackintosh [Building] using the highest standards of materials and craftsmanship whilst also ensuring that the opportunity is taken to holistically upgrade the entire building using 21st Century technology and innovation to create a working art school where functionality and safety of the spaces is a given. Within this brief, the School also wishes to continue to foster creativity and spontaneity. The winning design team will have to respond to all of the above and to bring the School itself, students, staff and governors with them on this journey. They will also need to engage with the wider public, art and architecture

<sup>&</sup>lt;sup>378</sup> Glasgow School of Art, 'Mackintosh Restoration Update: November 2014', November 2014,

https://glasgowschoolofart.createsend.com/t/ViewEmailInIFrame/r/D60984EF05465E4E2540EF23F30FEDED/C 67FD2F38AC4859C/?tx=0.

<sup>&</sup>lt;sup>379</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>380</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>381</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>382</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>383</sup> Glasgow School of Art, 'Mackintosh Restoration Update: March 2015', March 2015,

https://glasgowschoolofart.createsend.com/campaigns/reports/viewCampaign.aspx?d=r&c=F829F3A601CEF6 19&ID=B30C35788FF9821C2540EF23F30FEDED&temp=False&tx=0.

critics... all of whom have a view as to what restoration means/should mean for this iconic and internationally recognised building.<sup>384</sup>

In January 2015 it was announced that five firms had been shortlisted by the GSA's Restoration Committee: Avanti Architects, John McAslan and Partners, LDN Architects, Page\Park and Purcell. These teams were then invited to create a detailed proposal and present it to the GSA in March 2015. In April of 2015, it was decided that Glasgow based architectural firm Page\Park would lead the Mackintosh Restoration Project.<sup>385</sup> Page\Park had previously worked on other Mackintosh designed buildings. Professor Tom Innes, the GSA's then Director had this to say about their appointment:

The team assembled by Page\Park Architects impressed us not only with their deep knowledge of the building, but of the wider work of Charles Rennie Mackintosh. They displayed a superb methodology to the task of restoration – in particular their room by room analysis of the structure, materiality, craftsmanship and intent of Mackintosh in designing, specifying and overseeing the construction of his masterwork.

They also bring an understanding of the building's particular importance to Glasgow – its people and history – as well as of its status as an international design icon.

Although the design team will lead the programme, the GSA will have a fundamental role in the development of the detailed restoration plan. We were particularly impressed by their openness to work in partnership with the GSA as we set out on an exciting journey of discovery.

There will be many fascinating questions to be addressed as we undertake this complex restoration project. We are looking forward to working with Page\Park Architects and the design team to explore how we can best meet the needs of the GSA in the 21st century whilst remaining true to Mackintosh's astonishing vision.<sup>386</sup>

## 5.5 Research and Records

After their appointment, Page\Park began a programme of research into the Mackintosh Building in collaboration with the GSA. Over the course of MRP1 the GSA's Archives and Collections were searched for images and documents relating to the history of the Mackintosh Building. The results of this research would inform the restoration process alongside the analysis of physical evidence. The GSA has a large archive, and this amount of material made researching the Mackintosh Building less

<sup>&</sup>lt;sup>384</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>385</sup> Scottish Construction Now, 'Page\Park Architects to Restore the Mackintosh Building', *1st April 2015* (blog), n.d., https://www.scottishconstructionnow.com/article/pagepark-architects-to-restore-the-mackintosh-building.

<sup>&</sup>lt;sup>386</sup> Scottish Construction Now.

problematic than a building or institution with a less robust historical record. For example, at Uppark House during the restoration process it was discovered that there were 'gaps' in the NT's knowledge of the interiors, which caused issues when reinstating lost interior details. This lack of knowledge was seen as problematic by the NT, and led to 'a mandatory policy of architectural photography' of all NT buildings, creating a 'comprehensive record' with huge 'educational potential'.<sup>387</sup> Anecdotally, when discussing the 2014 fire and MRP1 with curators and other caretakes of cultural heritage, I found that their overwhelming response to this event was to immediately check that their properties and objects were appropriately recorded, and if not, they would immediately investigate how they could be. This is an example of how harmful a reactionary approach is to our heritage; it should not take the loss or damage of an object or building to prompt action from the often underfunded and understaffed organisations who care for our cultural heritage. This is perhaps symptomatic of the fact that the permanence and resilience of our built heritage in particular is often taken for granted.

One of the most valuable resources for MRP1 were a series of architectural photographs taken by Bedford Lemere's studio in 1910, when the Mackintosh Building had been completed (Fig.5.1). These images can be viewed via the Mackintosh Architecture website, but the original glass plate negatives are held by HES at their archives in Edinburgh. The negatives were viewed by members of the MRP1 project team in July 2016, and they revealed details such as surface textures which were not as clear in the photographic prints. These negatives were not in the GSA's collection, but they were still important to the restoration process. This highlights the value of reaching out and working with other organisations, and of keeping track of where objects and other archival materials relating to our historic or traditional buildings are kept.

Research continued throughout MRP1; towards the end of 2015 Elizabeth Davidson and Sarah Mackinnon also visited the Battersea Arts Centre in London, which suffered a fire whilst undergoing restoration works on the 13<sup>th</sup> March 2015, and Clandon Park in Sussex which had suffered a severe fire on the 29<sup>th</sup> of April 2015. This established a relationship with the teams on both restoration projects, with Mackinnon stating that:

We shared our experience and learned much from theirs and although these are both very different situations, there was a lot of common ground. We hope to maintain the relationships and continue to liaise throughout the restoration of our various buildings.<sup>388</sup>

Davidson and Mackinnon also met with some of the team who were involved in the restoration of Windsor Castle following the fire of 1992. Mackinnon expressed that; 'We found their hindsight was

<sup>&</sup>lt;sup>387</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 31.

<sup>&</sup>lt;sup>388</sup> Glasgow School Of Art, 'Mackintosh Restoration Update: October 2015', October 2015, https://glasgowschoolofart.createsend.com/t/ViewEmailInIFrame/r/170B79D9D8374B252540EF23F30FEDED/ C67FD2F38AC4859C/?tx=0.

fascinating and they gave us some really useful insights into how we might approach the Mackintosh Restoration.<sup>389</sup> In March 2016 the GSA also announced the creation of this PhD Studentship; entitled 'Bringing Back the Mack: The Recovery and Restoration of the Mackintosh Building at The Glasgow School of Art,', which was to be funded and supervised by HES and the GSA. None of the other case study fires or restoration/re-creations included in this thesis had a PhD student directly attached to, and studying, the projects when they were 'live'. The creation of this scholarship by the GSA and HES recognised the significant research output potential of MRP1, as well as the projects own historical import. This approach could become a 'standard' part of any large-scale restoration/re-creation projects and would not only ensure the production of academic research and a thesis on the project, but would also provide a skills and training legacy in the form of the scholarship winner.

#### 5.6 Establishing the Design Team

By the 31<sup>st</sup> of March 2015 the GSA had 'appointed a design team to drive and guide the re-building process.'<sup>390</sup> Table 5.1, created by Elizabeth Davidson, reveals how decisions were made and who by during MRP1. The Design Team consisted of six organisations, including Page/Park, as well as specialist contractors. The design team, alongside Gardiner & Theobald, who produced the GSA's procurement strategy for MRP1 as well as costings, would propose designs for the re-creation. These designs, for everything from lighting to bathrooms and automatic fire detection systems, were discussed at regularly held Design Team meetings at Page\Park's offices. The Internal Project Management Team, which Elizabeth Davidson managed, were employed directly by GSA and acted on their behalf. This meant that, for example, when Page\Park proposed installing materials or surface finishes which would not be hard-wearing or easy to maintain in a working art school, Davidson and Sarah Mackinnon could veto these ideas on the GSA's behalf.

A project of MRP1's size and importance requires internal and external oversight, and as a result an Expert Panel was established by Page\Park, who invited commentators including Professor Paul Clarke, Professor of Architectural Design in Belfast School of Architecture & the Be at Ulster University, and Alan Hooper, Programme Leader of BARCH Architecture at GSA, to convene as and when necessary, so that the Design Team could present their work for comment. The Mackintosh Operational Group (MOG) which consisted of GSA staff members as well as representatives from HES, were then presented with proposals agreed upon by the Design Team and the Internal Project Management Team. This meant that any issues such as timescales and finances could be discussed, as could conversations about, for example, the design of new furniture for the Building. This allowed GSA department directors to be a part of the restoration project, and ensured any decisions being made would have positive outcomes for the Building's intended users. This structure of decision-

<sup>&</sup>lt;sup>389</sup> Glasgow School Of Art.

<sup>&</sup>lt;sup>390</sup> Glasgow School of Art, 'Mackintosh Restoration Update: March 2015'.

making shows that the long-term sustainability of the Mackintosh Building as a working art school was a priority for everyone involved in MRP1, as it should be for all caretakers of historic and traditional buildings.



Table 5.1: The 'Operational Controls Chart' for MRP1 created by Elizabeth Davidson:

## 5.7 Building On: Mackintosh Symposium, Glasgow

On the 17<sup>th</sup> of April 2015 the second 'Building On: Mackintosh Symposium' was held in Glasgow. The event was ticketed, but free, and members of the public as well as journalists, academics and heritage professionals were encouraged to attend. The event was filmed, and all the talks given were made available online after the symposium. 'Break-out Sessions' and interaction with the audience throughout the day allowed attendees to directly express their opinions to members of the Design Team including Elizabeth Davidson and Brian Park of Page\Park Architects. Rory Ocayto reported on the Glasgow Symposium in *The Architects Journal*:

Should Page\Park Architects, picked last month to restore the fire-damaged Glasgow School of Art, be architecturally faithful to the building's designer Charles Rennie Mackintosh? It's a moot point and one debated – just a wee bit and frankly not adequately or seriously enough – at last week's Building on Mackintosh symposium.<sup>391</sup>

Whilst Brian Park admitted that 'the task ahead is as good as it gets in this profession', Ocayto also cautioned that 'the whole world will be watching every move, and probably tut-tutting more often than not.'<sup>392</sup> Ocayto finishes his piece on a hopeful and somewhat anarchic note:

The clearest voice at the symposium was that of archaeologist Keith Emerick, whose simple message was: 'Don't be afraid of conjecture. Take the risk.' That approach at least would be faithful to both Mackintosh and the city of Glasgow.<sup>393</sup>

Whilst there was media coverage of this event, the GSA or the MRP1 team did not publish written findings or responses to the ideas aired during the symposium. Discussing the value of these events to the GSA and MRP1 through such a publication could have ensured that participants and attendees were certain their views were being heard and had an impact on the restoration process.

## **5.8 The Procurement Process**

Gardiner & Theobald Management Services produced a *Procurement Strategy Report* on Behalf of the GSA in July 2015. A Procurement Workshop was held as part of this process, which GSA, Page\Park, David Narro Associates and Harley Haddow staff attended.<sup>394</sup> The following options were discussed by this group as they decided upon the preferred procurement route for MRP1:

<sup>&</sup>lt;sup>391</sup> Rory Olcatyo, 'Take a Risk and Stay True to Mackintosh and Glasgow', *Architects Journal* (blog), 24 April 2015, https://www.architectsjournal.co.uk/opinion/take-a-risk-and-stay-true-to-mackintosh-and-glasgow/8681615.article.

<sup>&</sup>lt;sup>392</sup> Rory Olcatyo.

<sup>&</sup>lt;sup>393</sup> Rory Olcatyo.

<sup>&</sup>lt;sup>394</sup> Gardiner & Theobald LLP Management Services, 'Mackintosh Restoration Project Procurement Strategy Report', July 2015, 4.

Traditional single stage Traditional two-stage Design & Build single stage Design & Build two-stage Management Contracting Construction Management<sup>395</sup>

The table below reveals the 'Key Drivers' for procurement policy which were selected by the GSA and Gardiner & Theobald prior to the Procurement Workshop:

Table 5.2: Table from the Gardiner & Theobald LLP Management Services, "Mackintosh Restoration Project ProcurementStrategy Report, "July 2015.

Early Contractor Input	Client Control of Specification Quality
Transfer of Design Responsibility to Contractor	Flexibility for Change
Price Certainty at Contract Award	Early Start on Site
Programme Certainty	Single Point of Contracting Responsibility
Maximise Transfer of Risk	Ability to Accommodate Specialist Input
Ability for Contractor to Collaborate	Quality of Completed Building

These 'Key Drivers' were then rated by the GSA according to their level of importance and then reviewed by Gardiner & Theobald against each of the six established procurement options. This process of analysis revealed that 'the Two Stage Traditional form of procurement provides the most appropriate form of procurement for the main contractor appointment'.<sup>396</sup> This was also the procurement route which HRP decided upon for the appointment of their main contractor for the restoration of Hampton Court Palace, Michael Fishlock explains why:

in normal circumstances, a contract is designed to run for a fixed period, with various penalties built-in if the contractor fails to complete on time... In this case, however, there were many uncertainties when the contract was let, and to achieve this objective would have been almost impossible. By creating a two-phase contract, we were able to work with the contractor to resolve these uncertainties in the six months of phase one.<sup>397</sup>

<sup>&</sup>lt;sup>395</sup> Gardiner & Theobald LLP Management Services, 5.

<sup>&</sup>lt;sup>396</sup> Gardiner & Theobald LLP Management Services, 9.

<sup>&</sup>lt;sup>397</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 70.

A 'Single Stage Traditional procurement route is such that full design information is required to enable the tender documents to be issued', whereas, Traditional Two Stage Tendering 'seeks to accelerate the traditional process by overlapping the design and construction phases of the project and gaining "buildability" input by involving a contractor during the design phase.<sup>398</sup> The GSA selected the Two Stage Traditional procurement route as this would give MRP1 the following benefits:

- This procurement route has advantages which make it attractive for a restoration project
- Allows an earlier start on site and, therefore potentially earlier completion.
- Allows early involvement of a contractor to advise on construction issues.
- Allows consideration of buildability of design by contractor.
- Design team are under the client's control throughout.
- The client has some control over the selection of subcontractors.
- Once all the work packages are tendered and subcontractors appointed, the main contractor takes responsibility for their performance/works.<sup>399</sup>

Staff from the MRP1 Project Management Team, as well as from Page\Park, have stated that the MRP1 Project highlighted that contemporary procurement practices in Scotland are not suited to the needs of a restoration project in a historic or traditional building. John Brown of Page\Park wrote his Part 2 dissertation on the procurement issues he encountered during the project, and in meetings in 2019 when discussions about a possible MRP2 began, both Sarah Mackinnon and Elizabeth Davidson suggested that conversations should be had with the Scottish Government on this topic. MRP1 therefore highlighted that practicalities of procurement for restoration and re-creation projects have not changed a great deal since the 1980s, and it is an area where there is clearly still room for improvement.

## 5.9 Design Team Brief

In April 2016 The GSA produced a *Brief to the Design Team*. This document was not static, it remained a living document as MRP1 evolved. The creation of a *Brief* is a time-consuming process, the GSA therefore took advantage of the research period from 2014-2016 before the Main Contract of MRP1 began. To create the document MRP1staff had to consult with HES, GCC and the GSA's previous and intended users of the Mackintosh Building. This process aimed to ensure that the *Brief* took into account the long-term use of the Building as well as its cultural and historical significance. The *Brief* established that throughout MRP1 the Burra Charter's following definitions of 'conservation terminology' would be employed:

<sup>&</sup>lt;sup>398</sup> Gardiner & Theobald LLP Management Services, 'Mackintosh Restoration Project Procurement Strategy Report', 9, 36.

<sup>&</sup>lt;sup>399</sup> Gardiner & Theobald LLP Management Services, 37.

1. Preservation - Maintaining a place in its existing state and preventing further deterioration.

2. Restoration - Returning a place to a known earlier state by removing accretions or by reassembling existing elements *without* the introduction of new material.

3. Reconstruction – Returning a place to a known earlier state – distinguished from *restoration* by the introduction of new material.<sup>400</sup>

However, the GSA nevertheless recognised that alongside these existing definitions a 'new "lexicon" of conservation terminology... may well be one of the outputs of the project [MRP1] as it progresses.<sup>401</sup> As a result, for the purposes of the *Brief* the following terms were also used to describe 'various actions and locations throughout the building':

- Conservation where sufficient of the original fabric remains to be suitable for repair and restoration to an original (or near original) appearance.
- Repair the work to mend and restore an object or artefact to a stable condition.
- Reinstate bringing back into use, assuming the same or similar status or position.
- Replicate the exact reproduction of an artefact or object based on original materials, designs, detailing and methods of fabrication.
- Rebuilding the complete or partial replacement of a building or artefact through repair, reconstruction, replication or restoration.<sup>402</sup>

The following Key Principles were also established to underpin the Brief:

**Flexibility and Adaptability** – the ability of the building design to embrace future change and adopt new ways of working without major remodelling

**Future Proofing** – the ability of the building design to take account of technological and operational developments

**Quality** – the restoration, repairs, reconstruction and new design interventions will ALL require to be of an exemplary standard of design, material and fabrication excellence.

Accessibility – the Building should be as open as possible for its users but consider means by which the enhanced security and safety of its occupants are unobtrusively integrated to the works.

**Connectivity** – the disruption of the fire introduces the opportunity to integrate services and new technologies sensitively into the design of the internal spaces.

<sup>&</sup>lt;sup>400</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', April 2016, 2.

<sup>&</sup>lt;sup>401</sup> Glasgow School of Art, 2.

<sup>&</sup>lt;sup>402</sup> Glasgow School of Art, 2.

**Innovation** – the School has a global reputation for invention and unconventionality – these should [be] reflected if possible in the Project particularly in the use of or exploration of new technology and product design.

**Sustainability** – both the design process, the site construction works and the final product should champion sustainable means of procurement, delivery, operational experience and the life cycle maintenance of the Building.

Accountability – every member of the team – both consultants and client bodies are responsible for acting with the highest standards of integrity, transparency and ethical considerations.<sup>403</sup>

This setting out of definitions and principles may seem aspirational or idealist, but the process of producing them and agreeing upon their use was a productive task for the GSA. Cementing the core values of a restoration project before any work physically begins on-site ensures that the client and project management team have a clear set of aims and objectives which can then be presented to contractors and architects. This ensures that everyone involved in large and complex projects of this nature is 'on the same page'. Making decisions about what you want as a client, and then assessing what is possible and practical given budget, time, and statutory restrictions, enables the contractors and architects involved to proceed with their work with confidence.

#### 5.10 Aims and Objectives

The GSA outlined its 'Aims and Objectives' for MRP1 in the Brief:

The Glasgow School of Art wishes to repair and reinstate the Mackintosh Building so as to both capture the genius of the original, magnificent Art Nouveau design and to equip the School with a robust, functioning, safe and compliant educational building that continues to inspire the study, teaching and practice of the creative arts in original and exciting ways. The works will involve exemplary standards of craftsmanship, construction skills and conservation, advances in technical and engineering innovation, and seek to create a legacy of teaching and learning in both academic and hands-on skills. The project will embrace the spirit of critical challenge, cultural debate and creative chaos that infuses the Glasgow School of Art. "Innovation through Tradition" is one of the leitmotifs of the GSA and this seems a particularly apposite phrase to bear in mind during this project.<sup>404</sup>

The GSA also 'acknowledged that there will be a tension between these aspirations – but also believe that, since the fire, the opportunity exists to find a unifying and design-led vision for the next

<sup>&</sup>lt;sup>403</sup> Glasgow School of Art, 3.

<sup>&</sup>lt;sup>404</sup> Glasgow School of Art, 5.

generation of students who will progress through the School.<sup>405</sup> The GSA stated that; 'until the fire, the building had been in continuous [use] and essentially, little altered, intensive use for over a century and the functional, sometimes irreverent but invariably pragmatic role it has played for generations of students has been one of the greatest strengths of the institution.<sup>406</sup> The GSA also made it clear that whilst they recognised the historic importance of the Mackintosh Building; it 'is not a Museum nor a Museum piece and the disruption of the fire will create a moment in time for the School to explore and critically appraise how it uses these extraordinary series of spaces.<sup>407</sup>

At the time of the fire of 2014, the Mackintosh Building had been home to the GSA's School of Fine Art, but the fire made the GSA reassess the purpose and importance of the Mackintosh Building within the GSA campus. It was therefore decided that post-restoration, the Mackintosh Building should be experienced by students from all of GSA's internal Schools, consequently it was proposed that it would be used as the 'First Year School'.<sup>408</sup> When the Mackintosh Building first opened in 1899, after the completion of Phase One, it housed 'the 3 schools of Fine Art, Architecture and Design'.<sup>409</sup> The GSA believed that; 'in bringing back together the first year cohort of these disciplines it allows all students to not only experience life and teaching in this extraordinary building but to be exposed to the full spectrum of creative activity of GSA before specializing in their chosen field.'<sup>410</sup>

#### 5.11 Conservation Philosophy

Before any works are conducted the conservation philosophy or ethos of a restoration project should be established by the client or building owner based on current guidelines and expert advice. In their *Brief* to the MRP1 Design Team, the GSA clearly set-out the motivation for, and intended outcomes of, the restoration of the Mackintosh Building:

The School has decided to rebuild the Mackintosh Building and in so doing to restore as faithfully as possible the original design, appearance and experience of this extraordinary building. As a guiding principle therefore, the project will take as its base line the original (or near original) architectural concept that Mackintosh designed – accepting that these designs were regularly modified by the architect himself during the process of construction. This allows the project to return to as near a pure architectural intent as is possible, stripping away the less considered or ad-hoc accretions of later years and allowing the School to re-introduce new fit-for-purpose additions as appropriate.<sup>411</sup>

<sup>&</sup>lt;sup>405</sup> Glasgow School of Art, 5.

<sup>&</sup>lt;sup>406</sup> Glasgow School of Art, 5.

<sup>&</sup>lt;sup>407</sup> Glasgow School of Art, 5.

<sup>&</sup>lt;sup>408</sup> Glasgow School of Art, 6.

<sup>&</sup>lt;sup>409</sup> Glasgow School of Art, 6.

<sup>&</sup>lt;sup>410</sup> Glasgow School of Art, 6.

<sup>&</sup>lt;sup>411</sup> Glasgow School of Art, 11.

The use of language in this section of the *Brief* is interesting; 'faithfully', 'pure', and 'stripping away', are all emotive concepts bound up with ideas about honesty and authenticity, which is noteworthy as the conservation concepts these words are inextricably linked with, re-creation and replication, are not dealt with directly in this document.

The status, and therefore, authenticity, of any additions made to the Mackintosh Building are clearly considered by the GSA as being of a much lower status than Mackintosh's original designs, they are described as 'ad-hoc accretions' which will be stripped away to reveal the 'true' building hidden underneath. The impression the reader is left with is that the Mackintosh Building's 'uniqueness' had been slowly obscured over time. Sian Jones concurs that this is central to contemporary ideas about authenticity:

The structure and composition of an object, building, artefact, or work of art has been central to the way in which conservators and material scientists approach authenticity... A critical aspect of this analysis involves distinguishing between the original materials and subsequent renovations, additions, revisions and adhesions, intentional or otherwise. With the traditional emphasis on originality, later additions have tended to be regarded as less authentic than original materials.<sup>412</sup>

The GSA could, therefore, be said to have employed a similar approach in the Mackintosh Building, an approach which enabled the removal of later non-Mackintosh designed alterations and additions as they could be perceived as extraneous 'ad-hoc accretions'.<sup>413</sup>

# 5.12 Appointment of Main Contractors

In June 2016, it was announced that Kier Construction Scotland Ltd had been awarded the £25 million contract for MRP1 by the GSA. They would be working alongside Page\Park, who would lead the Design Team, to co-ordinate the works. Elizabeth Davidson stated that Kier had; 'assembled a depth of experience and knowledge combined with solid construction methodology and practice' and that:

They convinced GSA of their organisational abilities to deliver a highly-successful project, deliver good community benefits for local employment targets and social enterprises and engage with the range of skilled crafts people and sub-contractors which will be essential to move this project from excellent to world class.<sup>414</sup>

<sup>&</sup>lt;sup>412</sup> Sian Jones, 'Negotiating Authentic Objects and Authentic Selves: Beyond the Deconstruction of Authenticity', 184.

<sup>&</sup>lt;sup>413</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 11.

<sup>&</sup>lt;sup>414</sup> 'Firm to Repair Fire-Damaged Art School', *BBC News*, 28 June 2016, sec. Glasgow & West Scotland, https://www.bbc.com/news/uk-scotland-glasgow-west-36651411.

MRP1 commenced in earnest on the 4<sup>th</sup> of July 2016, which was also the day I started the 'Bringing Back the Mack' PhD Studentship. As 'stage one building warrants and listed building consent planning applications' had been approved, the 'restoration of the external shell of the [Mackintosh] building and all works to make the building wind and watertight' began 'confidently'.<sup>415</sup>

### 5.13 Creating a Philosophical Baseline: Page\Park 2017

After their appointment, Page\Park began work on a report detailing their 'placement & approach for the new interventions into the Mackintosh building', after spending 'two years cataloguing and researching archive information' and working with the GSA's Project Management Team, Elizabeth Davidson and Sarah Mackinnon.<sup>416</sup> Page\Park's ten key 'Principles of Approach' for MRP1 were:

1 Art School - first and foremost the Mackintosh building is an Art School for all – the user and visitor should both experience that.

2 Room and Space - a return to the original two 'technologically enabled' enclosure types– the formal room and the fluid space.

3 Use-these 'technologically enabled' rooms and spaces determine uses rather than uses determining them.

4 Access - the Mackintosh Building belongs to all.

5 Nurture - pioneering the collaborative learning environment.

6 Catalyst - Mackintosh as a creative tool.

7 Light - understanding how light is used in the building.

8 Enhancing the Building Performance - working with the building to optimise and improve its long term sustainability.

9 Imperceptibility - reinstating the original intention of the architecture, its aesthetic and functionality.

10 Functionality through Furniture.

Our actions in relation to this complex reconstruction seek to embrace this superstructure of understanding<sup>417</sup>

<sup>&</sup>lt;sup>415</sup> Glasgow School Of Art, 'Mackintosh Restoration Project Update: July 2016', July 2016,

https://glasgowschoolofart2.createsend.com/t/ViewEmailInIFrame/r/F026EFC3EEC8EAF82540EF23F30FEDED/C67FD2F38AC4859C/?tx=0.

<sup>&</sup>lt;sup>416</sup> Page\Park, 'Placing Interventions Draft', n.d., 3.

<sup>&</sup>lt;sup>417</sup> Page\Park, 4.

Page\Park's thoughtful meditation on interventions to the Mackintosh Building gives an insight into the complex decision-making process which should take place before making any alterations to a historic or traditional building. Page\Park also made it clear that there was 'a desire for our hands to be imperceptible in this restoration where practically possible.' <sup>418</sup> This philosophy meant that Mackintosh's original design would remain 'pure' when reinstated, it would not visibly look like the work of Page/Park. It is understandable that Page/Park did not want to intervene and tamper with Mackintosh's original designs, but this desire for 'imperceptibility' could be seen as problematic. The exact re-creations of spaces such as the Library would have lent the whole Mackintosh Building an air of authenticity once MRP1 was complete. However, not all spaces within the Building were being recreated to the same degree as the Library; not all rooms would be going back to their original lighting schemes or colour schemes for example. It is therefore the responsibility of the caretakers of restored or re-created buildings, interiors, or objects, to ensure that users, visitors and/or viewers of re-created spaces or objects are being clearly informed that what they are seeing is not original. Therefore, Page\Park's interventions should not have been 'imperceptible', in the completed Mackintosh Building, they should have been made easily identifiable from the original fabric and designs, as contemporary conservation standards dictate.

#### 5.14 Laser Scanning: Practical Applications

In May 2015 when the Mackintosh Building had been cleared of debris and was in the hands of interim contractors Taylor & Fraser, HES's DDT 'undertook a comprehensive programme of 3D digital documentation throughout the entire building interior and exterior... Every interior space was laser scanned and photographed at this time, amounting to 659 rooms, lift shafts, cupboards and heating ducts.<sup>419</sup> This data proved invaluable to the restoration project, and the BIM model of the Mackintosh Building was constructed using the laser scan data captured.

The DDT's innovative use of laser scanning tools allowed them to 3D digitally document the building's only lift shaft; the DDT suspended the scanner 'over the open lift shaft at each floor of the building', and stated that 'without laser scanning, these measurements could only have been made by constructing a scaffold within the lift shaft, which would have been both costly and time consuming.'<sup>420</sup> Therefore, 'laser scanning represented significant savings through efficiency whilst providing accurate results'.<sup>421</sup> These accurate measurements allowed Page\Park to create a made-to-measure lift for the space which met with minimum Scottish Building Codes regarding building

<sup>&</sup>lt;sup>418</sup> Page\Park, 4.

<sup>&</sup>lt;sup>419</sup> Lyn Wilson et al., '3D Documentation for Disaster Management in Historic Buildings: Applications Following Fire Damage at the Mackintosh Building, The Glasgow School of Art', 3.

<sup>&</sup>lt;sup>420</sup> Lyn Wilson et al., 6.

<sup>&</sup>lt;sup>421</sup> Lyn Wilson et al., 6.

accessibility. This would have enabled the Mackintosh Building to be more accessible to users for the first time in its history, without the loss or disruption of original fabric.

Whilst the restoration project was ongoing, the Mackintosh Building was inaccessible to the visiting public as it was a live construction site. Educational site visits were granted where possible but as work progressed it became more difficult to schedule site visits as activity increased. As a result, the GSA had to investigate new ways to engage with visitors, and the laser scans of the Mackintosh Building provided a variety of means of engagement with the building as well as with the restoration project. In October 2016, the GSA produced an exhibition in the Reid Building, showing 'large-scale prints that allowed visitors to think about the architectural space and volumes through the point cloud imagery.'<sup>422</sup> Where, 'the point clouds were considered works of art... allowing the architectural beauty of the Mackintosh Building to be seen in ways never before possible.'<sup>423</sup>

HES state in their Digital Documentation Technical Guidance that:

The digital documentation of our cultural heritage allows us to not only accurately record and capture buildings and objects in a 'non-contact and non-destructive' manner, it also allows us to create experiential and educational tools such as 3D visualisations of objects and virtual or augmented reality (VR and AR) experiences.<sup>424</sup>

HES has used digital documentation for 'monitoring and mapping change within the built and natural environment', for example, quantifying coastal erosion and structural movement.<sup>425</sup> The data captured can then be evaluated and the most effective and appropriate course of action can be decided upon. Thermal and moisture readings can also be added to 3D visualisations, furthering our understanding of how specific buildings function and informing conservation strategies and maintenance. HES states that 'undertaking periodic survey and data capture [of Properties in Care] can highlight the magnitude and rate of change', this helps 'to inform specialists and guide decisions about schemes of conservation.'<sup>426</sup> Ultimately HES want to produce 'a complete 'Properties in Care Asset Management System' (PICAMS)'. Since 2015 HES have also been trialling 'a bespoke tablet-based asset management system based on the British Geological Survey's successfully implemented SIGMA (System for Integrated Geoscience and Mapping)', which 'is intended to help [HES staff] visualise conservation issues' at their PICs.<sup>427</sup> The owners and caretakers of buildings which are not PiC will hopefully benefit from the trials HES is conducting, and regular scanning could become a routine part

<sup>&</sup>lt;sup>422</sup> Lyn Wilson et al., 6.

<sup>&</sup>lt;sup>423</sup> Lyn Wilson et al., 6.

<sup>&</sup>lt;sup>424</sup> Adam Frost, *Short Guide: Applied Digital Documentation in the Historic Environment*, 13 (Historic Environment Scotland, 2018), 39.

<sup>&</sup>lt;sup>425</sup> Adam Frost, 2.

<sup>&</sup>lt;sup>426</sup> Adam Frost, 2.

<sup>&</sup>lt;sup>427</sup> James Hepher, 'The Rae Project: Digital Documentation of a Nations Heritage'.

of historic and traditional building maintenance as a result. Its usefulness both before, during and after MRP1 is proof of how wide the applications are for laser scanning and should recommend it to the caretakers of our cultural heritage.

## 5.14.1 BIM and Laser Scanning

The tool used by both Kier Construction Scotland Ltd and Page\Park to communicate and create plans for works with each other, as well as with sub-contractors, was a software known as BIM (which stands for Building Information Modelling). In 2013 the Construction Industry Council (CIC) was commissioned by the UK government to produce a BIM Protocol. The UK Government defines BIM as:

a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, creating and maintaining our assets. BIM embeds key product and asset data and a 3-dimensional computer model that can be used for effective management of information throughout a project life cycle – from the earliest concept through to operation.<sup>428</sup>

The UK Government has also made it clear that 'our long term ambition is to be a global leader in the exploitation of this technology and increasingly as a supplier of BIM services and software by developing the UK's capability in this area.'<sup>429</sup>

In order to achieve this, in March 2017 the Review of Scottish Public Sector Procurement in Construction recommended that 'BIM be adopted on Public Sector Projects where appropriate from April 2017', the GSA had already decided to use BIM throughout MRP1 as it was stipulated in the original tender brief.<sup>430</sup> The BIM model of the Mackintosh Building was constructed using the point cloud data produced when the building was laser scanned by the DDT. It was managed by a Page\Park member of staff who liaised directly with their counterpart at Kier when changes needed to be made.

As BIM adoption had only recently been recommended by the Scottish Government when work on the Mackintosh Building began, Page\Park became one of the first adopters of this technology on a restoration project. This 'lack of familiarity' was a drawback, but in the process as a practice Page\Park were therefore able to undertake pioneering work in this sector. John Brown of Page\Park and architect on MRP1 has stated that there were several positives in using BIM. Brown has said it meant that work was 'automatically more co-ordinated' as 'co-ordination between the disciplines is

<sup>&</sup>lt;sup>428</sup> HM Government, 'Industrial Strategy: Government and Industry in Partnership, Building Information Modelling' (HM Government, 2012), 3.

<sup>&</sup>lt;sup>429</sup> HM Government, 5.

<sup>&</sup>lt;sup>430</sup> Scottish Government, 'Scottish Procurement Policy Note SPPN 01/2017' (Scottish Government, 8 March 2017), 2.

forced.<sup>'431</sup> Everyone at Page\Park had to work from the same model 'rather than on separate independent drawings', and this prevented 'basic co-ordination problems that can exist when working in 2D.'<sup>432</sup> This had an impact on working practices as Brown stated that 'working in BIM forces you to think about every detail' which 'meant that our [Page\Park's] understanding of the end product was greater.'<sup>433</sup> He emphasised that 'this is particularly true in the library, where Natalia [Burakowska, Heritage & Conservation Researcher at Page\Park] had literally built it piece by piece in the model, in a way you could never do in 2D.'<sup>434</sup>

Elizabeth Davidson has stated that the GSA's Internal Project Team did not see the BIM a great deal as Kier Scotland Ltd were responsible for inputting their own data, and co-ordinated with Page\Park. Kier staff and subcontractors found the BIM particularly useful for planning the installation of M&E systems (Mechanical and Electrical) in the Building. However, Davidson did expect Page\Park to be able to produce some 'beautiful visuals' of the restored Building and its interiors over the course of MRP1. Here, perhaps the amount of time and attention paid to the BIM hindered the production of the kind of visuals Davidson desired.<sup>435</sup>

Page\Park envisioned a life for their BIM once the restoration was complete and the Mackintosh Building was handed back to the GSA. Brown said; 'we [Page\Park] had a hopeful vision that it would be taken on by the school and developed for other uses, such as facilities management, but also as an archive of the work done.'<sup>436</sup> However, he also made it clear that this would be 'entirely dependent on the enthusiasm of the estates/archive team receiving it, and their familiarity with the technology.'<sup>437</sup> It was hoped by Page\Park that 'the library aspect especially would be used to inform further research and projects surrounding embedding conservation data in a BIM model.'<sup>438</sup> John Brown noted that advances are being made quickly in this field; with 'projects like the refurbishment of the Palace of Westminster... really pushing the boundaries of BIM in heritage repair and reconstruction.'<sup>439</sup> Brown believed that the Mackintosh Building BIM 'definitely has a life beyond MRP1', and could 'become an integral part' of any restoration works on the Mackintosh Building in the future.<sup>440</sup> However he did caution that, 'the next version of the BIM model will have to go to

<sup>&</sup>lt;sup>431</sup> John Brown, 'BIM', 11 July 2019.

<sup>&</sup>lt;sup>432</sup> John Brown.

<sup>&</sup>lt;sup>433</sup> John Brown.

<sup>&</sup>lt;sup>434</sup> John Brown.

<sup>&</sup>lt;sup>435</sup> Elizabeth Davidson, Research Interview on MRP1, 2 July 2019.

<sup>&</sup>lt;sup>436</sup> John Brown, 'BIM', 11 July 2019.

<sup>&</sup>lt;sup>437</sup> John Brown.

<sup>&</sup>lt;sup>438</sup> John Brown.

<sup>&</sup>lt;sup>439</sup> John Brown.

<sup>&</sup>lt;sup>440</sup> John Brown.

another level of sophistication and accuracy' as the software develops, and solutions for the storage of the large datasets being produced must also be found.<sup>441</sup>

# 5.15 Climate Change & Futureproofing: Ensuring long-term sustainability

In their *Brief to the Design Team* the GSA made their intentions towards sustainability and energy efficiency clear:

Glasgow School of Art wishes to improve significantly the energy efficiency of all its buildings, as a commitment to carbon reduction in its estates... It recognizes that as a traditionally built masonry and single glazed building, there are challenges in upgrading the entire building to perform as a modern design would; however it also recognises that it's A lists and iconic design status means that conventional energy efficiency measures are unlikely to be acceptable – in particular to Historic Environment Scotland and the statutory authorities.<sup>442</sup>

In 2009 the Climate Change (Scotland) Act was passed. By 2020 Scotland's overall emissions of greenhouse gases must be at least 42% 'lower than the baseline' and by 2050 'at least 80% lower than the baseline'.<sup>443</sup> The baseline within the Act is defined as:

(a)net Scottish emissions of carbon dioxide for 1990; and

(b)net Scottish emissions of each of the greenhouse gases other than carbon dioxide for the year that is the baseline year for that gas.<sup>444</sup>

The Act also:

places duties on public bodies to contribute to emission reduction targets, deliver programmes for adaption, to increase resilience, and act in a sustainable way. HES is identified as a "Major Player" under the Act, due to its size and influence... Guidance on these duties makes it clear that public bodies are expected to assess the impact of climate change on their areas of responsibility and their daily operations, and build resilience. The Scottish Climate Change Adaption Programme specifically tasks HES with quantifying heritage assets affected by climate change using GIS and creating a climate change risk register for the Properties in Care (PICs).<sup>445</sup>

<sup>&</sup>lt;sup>441</sup> John Brown.

<sup>&</sup>lt;sup>442</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 24.

<sup>443</sup> Scottish Parliament, 'Climate Change (Scotland) Act' (UK Parliament, 2009),

https://www.legislation.gov.uk/asp/2009/12/introduction.

<sup>444</sup> Scottish Parliament.

<sup>&</sup>lt;sup>445</sup> Historic Environment Scotland, 'Screenings for Natural Hazards to Inform A Climate Change Risk Assessment of the Properties in Care of Historic Environment Scotland' (Historic Environment Scotland, 2018), 12.

As a respected Scottish higher education institution, the GSA had a responsibility and legal obligation to ensure that MRP1 did not just restore the Mackintosh Building, it also had to be made more energy-efficient. This meant accepting and negotiating alterations made to the original fabric of the Building was a crucial facet of MRP1. The built heritage sector is aware that the most effective way to preserve a historic or traditional building is to ensure its continued use. This in turn means that the adaption, alteration, and augmentation of original fabric for climate adaption, energy efficiency and sustainability purposes, should become entirely normalised.

Between 2015 and 2016 'it is estimated that the historic environment contributed in excess of £2.3 billion to Scotland's economy'.<sup>446</sup> Our historic built environment is therefore worth preserving from an economic standpoint as well as a moral one. However, because of our rapidly changing climate, HES has declared that 'the outlook for Scotland's historic environment is uncertain.'<sup>447</sup> Scotland, as a nation, must now take preventative measures to ensure that its historic built environment can withstand climate change and be preserved for future generations. HES is at the forefront of this preventative action.

In 2018 HES published their climate change risk assessment of their PIC's, and found that:

Since the 1960s, annual precipitation levels have increased by over 20%; it is now 1°C warmer, the growing season has been extended by over a month and sea levels continue to rise at over 3mm a year. This has implications for the historic environment. Changing climactic conditions can alter and accelerate decay processes of historic monuments and archaeological sites. Historic buildings that have survived well in the past and in current climactic conditions may become less able to cope with changing weather patterns caused by climate change.<sup>448</sup>

It is accepted that 'water is the most destructive agent of decay' in a traditional building, therefore this increase in precipitation levels is hugely problematic. 449 Worse still, over the 'latter part of the last century' there has been 'overall warming with wetter winters, drier summers and increased frequency of extreme and unpredictable weather including heavy rain and storm events.<sup>450</sup>

The dire consequences of climate change to the historic built environment are emphasised by the findings of HES's *Climate Risk Assessment* of its PICs:

Initial analysis of the results has indicated that out of the 352 'sites' investigated, 89% are exposed to high, or very high levels of risk. When we then consider the mitigating factors and

<sup>&</sup>lt;sup>446</sup> Historic Environment Scotland, 13.

<sup>&</sup>lt;sup>447</sup> Historic Environment Scotland, 13.

<sup>&</sup>lt;sup>448</sup> Historic Environment Scotland, 4.

<sup>&</sup>lt;sup>449</sup> Historic Environment Scotland, 38.

<sup>&</sup>lt;sup>450</sup> Roger Curtis and Jessica Hunnisett Snow, *Short Guide: Climate Change Adaption for Traditional Buildings* (Historic Environment Scotland, 2016), 5.

controls already in place, such as routine maintenance and ongoing conservation work, the number of sites classified as "at risk" is reduced to 53%.<sup>451</sup>

Whilst HES researches how we can protect our built heritage against climate change, it nevertheless acknowledges that; 'Scotland has always had to contend with extreme weather conditions, and buildings have generally been designed to cope with the climate.'<sup>452</sup> However:

Whilst the measures by which traditional buildings can be made more resilient to weather and exposure are often not new, the understanding of the purpose of certain building details may have been forgotten, and the need for regular maintenance and appropriate repair is often overlooked.<sup>453</sup>

HES makes it clear that 'many traditional buildings in Scotland can be resilient to extreme weather events without requiring any modifications.<sup>'454</sup> However, it recognizes that, 'in some cases, adaption will be required if the structure is to continue to perform its function over time and for maintenance to remain affordable.<sup>'455</sup> HES have found that the act of reinstating 'original features or the adoption of enhanced or additional detailing can go a long way in protecting a property from weather damage, saving money and protecting the value of an investment as well as conserving the traditionally built environment.<sup>'456</sup> This modern outlook on conservation moves away from SPAB's fetishistic focus on the importance of original fabric, patina and authenticity, and instead looks holistically at the building as an object, and allows for augmentation and adaption in order to secure a future for the structure. Architectural details such as cornicing on the exterior of traditional buildings may appear to be decorative, however, details such as these 'exist primarily as functional elements to shed water and protect the building façade.<sup>'457</sup> This preventative approach was taken by MRP1's Design Team, who were alert to the threat of increased rainfall and an increase in extreme weather brought about by climate change.

#### 5.15.1 Extreme Weather

As the Mackintosh Building sits in a high and exposed location it is even more susceptible to damage from extreme weather. Originally, there was only one metal strip of lightning protection on the Mackintosh Building, which in case of a lightning strike would attract and channel the electric charge through it, and not the materials which make up the building, thereby preventing structural damage. It

<sup>&</sup>lt;sup>451</sup> Historic Environment Scotland, 'Screenings for Natural Hazards to Inform A Climate Change Risk Assessment of the Properties in Care of Historic Environment Scotland', 4–5.

 <sup>&</sup>lt;sup>452</sup> Roger Curtis and Jessica Hunnisett Snow, Short Guide: Climate Change Adaption for Traditional Buildings,
49.

<sup>&</sup>lt;sup>453</sup> Roger Curtis and Jessica Hunnisett Snow, 49.

<sup>&</sup>lt;sup>454</sup> Roger Curtis and Jessica Hunnisett Snow, 49.

<sup>&</sup>lt;sup>455</sup> Roger Curtis and Jessica Hunnisett Snow, 49.

<sup>&</sup>lt;sup>456</sup> Roger Curtis and Jessica Hunnisett Snow, 49.

<sup>&</sup>lt;sup>457</sup> Roger Curtis and Jessica Hunnisett Snow, 11.

was decided that due to the Building's exposed position and the knowledge that extreme weather events in Scotland will only increase in frequency, six to eight lightning strips would be installed on the façades of the Mackintosh Building by the completion of MRP1.<sup>458</sup> These strips were being hidden behind downpipes and behind masonry reveals so that the aesthetic of the building façade, and therefore Mackintosh's original design, would remain unaffected.

It was also clear to the MRP1 Design Team that the delicate gridded windows which allowed light to flood into the Embroidery Studios in the top floor of the East Side of the Mackintosh Buildings had to be made more robust. Deflection had always been an issue with these windows, the putty holding the small square panes of glass in place would crack as the panes moved within their wooden frames, and as a result the wood became damp and rotted (Fig.5.2). HES recommends secondary glazing as an appropriate way to increase the energy efficiency of a traditional window, however, the design of the windows in the Embroidery Studio prohibited this kind of secondary or external glazing, so it was decided that steel flanges should be inserted inside the wooden window frames.<sup>459</sup> These flanges would provide structural support and crucially, would be hidden from view (Fig.5.3).

To cope with increased rainfall, where the external fabric allowed, gutters and downpipes of the Mackintosh Building were enlarged in diameter.<sup>460</sup> Gutters, or rhones as they are sometimes called in Scotland, collect rainwater at the edge of a roof to be carried 'clear of the wall' through downpipes lining a building's exterior.<sup>461</sup> On a traditional building, as at the Mackintosh Building, these will most often be made of cast iron. HES recommends the replacement and/or enlargement of rhones and downpipes, but makes it clear that even with this action, regular maintenance is key, as 'whilst a blocked downpipe may not pose an immediate threat to the building fabric' continued overflow will cause 'wetting and progressive saturation of the adjacent masonry' resulting 'in significant problems over time'; HES therefore recommends that 'blocked, defective or leaking masonry should be repaired promptly and certainly within a few weeks'.<sup>462</sup> Adapting a traditional building for our changing climate is all well and good, but if the new systems are not appropriately maintained, they will become as defunct as the previous systems they replaced.

# 5.15.2 Heat Loss and Insulation

Heat loss is a critical issue in traditional buildings, 'typically around 25% of heat is lost through the roof of a building', therefore, in order to counteract this energy loss in the Mackintosh Building insulation boards were placed under the asphalt of the roof where previously there was just wood with

<sup>&</sup>lt;sup>458</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>459</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>460</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>461</sup> Roger Curtis and Jessica Hunnisett Snow, Short Guide: Climate Change Adaption for Traditional Buildings,23.

<sup>&</sup>lt;sup>462</sup> Roger Curtis and Jessica Hunnisett Snow, 23.

asphalt applied directly onto it.<sup>463</sup> One outcome of MRP1 was a to create a better insulated building, the *Brief* quotes Scottish Building Standards which recommend:

that where works are taking place to alter or build up the external envelope of an existing, listed building – the aim should be to improve the level of thermal insulation. The introduction of insulation via roof or floor voids and through selective slim-line double glazing will assist in the overall heating strategy for the building. The location for such intervention will be on a room by room basis. Double glazing will require listed building consent.<sup>464</sup>

HES is aware that 'insulating flat roofs presents a number of technical challenges', it therefore advises that 'the methods and materials used should be carefully considered prior to any work taking place.'<sup>465</sup> Usually, when insulating a flat roof 'the insulation is... placed between the joists holding the sarking in place', meaning the ceiling would need to be removed partially if not completely for this installation to take place.<sup>466</sup> As the West Side of the Mackintosh Building's roof was destroyed in the 2014 fire and was being rebuilt, this made the process far simpler.

The Design Team elected to use rockwool and ecotherm insulation as it could be easily obtained, was cost-effective, and its thermal u-value was the highest out of other considered products.<sup>467</sup> This complies with HES recommendations that 'a rigid, vapour permeable' material is used in a flat roof.<sup>468</sup> However, installing ecotherm into the Mackintosh Building's flat roof did increase the height of the roof, thereby altering its profile. The original fabric in the East Side roof, which was undamaged during the 2014 fire, was also altered; the same ecotherm boarding was placed under the flat roof, bringing the whole of the flat roof of the Mackintosh Building up to the same u-value. This meant that alterations were aesthetically cohesive and ensured that heat loss was reduced across the Building. This intervention was invasive and required the removal and alteration of original fabric but as it was not detrimental to the aesthetic of the Building, and it would make the Building more energy efficient it was, in this instance, deemed appropriate and necessary. Within the eaves of Studio 58 on the top floor of the Mackintosh Building visual impact, and increased the thermal performance of the space it was also deemed an appropriate intervention (Fig.5.4).<sup>469</sup>

<sup>&</sup>lt;sup>463</sup> Moses Jenkins, *Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings* (Historic Environment Scotland, 2013), 10.

<sup>&</sup>lt;sup>464</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 34.

 <sup>&</sup>lt;sup>465</sup> Moses Jenkins, Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings, 10.
<sup>466</sup> Moses Jenkins, 10.

<sup>&</sup>lt;sup>467</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>468</sup> Moses Jenkins, Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings, 10.

<sup>&</sup>lt;sup>469</sup> Elaine Grogan, Beginnings: Charles Rennie Mackintosh's Early Sketches (Architectural Press, 2002).

#### 5.15.3 Heating Systems

Radiators were installed in the Library soon after it was completed in 1910 after complaints were made by its users that it was unbearably cold in winter.<sup>470</sup> Post-2014 fire the Library was being completely re-created, so the GSA used this opportunity to install underfloor heating whilst the floor was being laid. This meant that there would be no need to install radiators in the Library, thereby presenting it to modern users according to Mackintosh's original design, whilst also ensuring their comfort. As later additions to the Library, the cast iron radiators were considered 'inauthentic'. They were not part of Mackintosh's original design scheme, in fact, their bulk had blocked the recessed bay windows he had created (Fig5.5). The installation of underfloor heating in the Library would, therefore, have improved the aesthetic of the space, returning it to its original 'authentic' state/design, whilst simultaneously improving the energy efficiency of the space. HES notes that 'the approach with floors is largely dictated by access and quality and value of the floor', therefore disruption and damage to original fabric may outweigh the energy savings gained by installing underfloor insulation or heating systems.<sup>471</sup> Scheduling work like this within a larger programme of works, such as rewiring or retrofitting other systems, would, therefore, be the most prudent course of action. Rock wool was used as a modern insulator in the underfloor system, but chipped aggregate, used to deaden sound between floors, was a 'like for like' replacement, as a similar aggregate was found in the library floorspace post-2014 fire (Fig.5.6).

At Uppark House in the 1990s the Restoration Design Team found themselves in a similar position to the MRP1 team in terms of heating arrangements; 'if the house was to be reinstated to its condition on the day before the fire, did this mean putting back out-of-date cast-iron radiators?'<sup>472</sup> The NT believed that this 'general principle' of reinstatement 'applied to the architecture and decoration but that all services would be modernised' with the 'most advanced' heating systems etc being 'discreetly introduced, just as they had been in other National Trust houses.'<sup>473</sup> Similarly, as part of MRP1 the Mackintosh Building's heating systems were being enhanced and made more energy efficient. Post-restoration the Mackintosh Building would have been heated via heat exchange from the same environmentally friendly pellet-fed biomass boiler which supplies the Reid and Bourdon Buildings. Some of the vents or ducts from the original heating system were being reused for this purpose as well as for services. Flat panels, as well as more 'traditional' style radiators, were going to be installed throughout the majority of the Mackintosh Building as part of the restoration. Similarly, at Hampton

<sup>&</sup>lt;sup>470</sup> Dani Garavelli, 'The Mission to Resurrect the GSA's Mackintosh Library', *The Scotsman*, 27 May 2017, https://www.scotsman.com/arts-and-culture/art/the-mission-to-resurrect-the-gsa-s-mackintosh-library-1-4459095 Natalia Burakowska of Page\Park architects conducted rigorous research into the Library and as a result found out when then radiators were introduced.

<sup>&</sup>lt;sup>471</sup> Moses Jenkins, *Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings*, 11.

<sup>&</sup>lt;sup>472</sup> Rowell, Christopher and Robinson, John Martin, Uppark Restored, 46.

<sup>&</sup>lt;sup>473</sup> Rowell, Christopher and Robinson, John Martin, 46.

Court Palace 'it was decided to install a new underfloor heating system in the smaller ground-floor rooms, but only to replace the floor panels in the State Apartments with identical units.'<sup>474</sup>

The flat panels and radiators which were going to be installed throughout the Mackintosh Building were not part of Mackintosh's original designs for the Building. However, in order to ensure its usability, it was accepted by GSA that these modern additions were necessary. The Mackintosh Building has been adapted to suit the needs of its users throughout its history, and as a working art school and not a museum, it is expected to meet the needs of its modern users, in this instance, by keeping them warm. The Library is considered the 'jewel in the crown' of the Mackintosh Building and was therefore treated as such. Spaces considered less 'significant' than the Library were not having underfloor heating installed due to budget restraints.

HES recommends improving the thermal value of a solid floor by 'fixing an insulated board on top of the existing floor or by excavating and laying a new insulated lime concrete in its place.'<sup>475</sup>Originally, the flooring throughout the Mackintosh Building's studios consisted of maple floorboards; in some spaces, the floorboards were laid directly onto the concrete floor or underfloor beams, however in the Library a horsehair matting was placed underneath the floorboards of the mezzanine level to deaden sound (Fig.5.7 and 5.8). As the Library was considered a high-status heritage space and was being accurately re-created in terms of both materiality and design, it was decided that horsehair matting would again be used in the Library's mezzanine level. Outside of the Library modern products such as rock wool were being used.<sup>476</sup> Similarly, at Uppark House where 'the upper floors were to be totally rebuilt internally, the work had to comply with current Building Regulations.'<sup>477</sup> As in the Mackintosh Building's flat roof 'it proved relatively easy to render the upper floors fire-resistant with the use of 'Supalux', a proprietary fire-resisting board, with mineral wool quilt between the joists.'<sup>478</sup>

# 5.15.4 Glazing

The GSA stated in its *Brief to the Design Team* that in the Mackintosh Building the glazing was 'universally single pane and therefore not efficient in terms of insulation values'.<sup>479</sup> The GSA, therefore, saw 'opportunities to re-glaze in slimline double glazing with argon or equivalent gas filled units.'<sup>480</sup> HES advises that 'careful assessment of the historic or cultural significance of the original glass is required before this work is undertaken', for example the removal of crown glass, a rare

<sup>&</sup>lt;sup>474</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 84.

<sup>&</sup>lt;sup>475</sup> Moses Jenkins, *Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings*, 12.

<sup>&</sup>lt;sup>476</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>477</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 59.

<sup>&</sup>lt;sup>478</sup> Rowell, Christopher and Robinson, John Martin, 59.

<sup>&</sup>lt;sup>479</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 28.

<sup>&</sup>lt;sup>480</sup> Glasgow School of Art, 28.

material to find in situ, is discouraged by HES.<sup>481</sup> HES does, however, advocate the use of vacuum insulated glass for 'large panes such as late 19<sup>th</sup> century two-pane ("one over one") windows'.<sup>482</sup>

In the Hen Run and Embroidery Studios, the square panes of original glass are 'rippled', giving the spaces a unique aesthetic (Fig 5.9). All of the glazing in the Hen Run was destroyed in the fire of 2014 and was therefore replaced in a 'like for like manner' with rippled traditionally made glass to create the same visual effect as the original. However, a compromise was reached in that the larger windows in the Mackintosh Building's studios were glazed with slimline double-glazing to improve heat retention in these large spaces (Fig.5.10).<sup>483</sup> The argon gas 'sandwiched' between the two panes of glass has a low thermal conductivity and therefore allowed less heat to escape from these large windows.

#### 5.14.5 Sustainability: Recycling Materials

#### The GSA required that:

The Design Team should display an awareness of the Embodied Energy of the existing building and seek to minimise as afar as possible any wastage through the recycling of existing/original materials by the most appropriate methods to each case. Where quantities of materials, such as timber are proposed for disposal and/or redundant to the future design – consideration should be given as to their 're-purposing' through local charities such as Gal Gael or Glasgow Wood Recycling or their use as part of an associated arts or crafts project as directed by GSA. Decisions as to the disposal of potentially re-usable materials should also form part of the contractor's waste management plans as informed by the brief.<sup>484</sup>

Materials were therefore recycled onsite during MRP1, for example, the roof beams taken from the East Side of the Mackintosh Building when insulation was being installed were re-used in the Professors Studios as underfloor beams (Fig.5.11).<sup>485</sup> The maple floorboards used throughout the Building presented a challenge in terms of material sourcing for the Design Team as the original boards were no longer available as a standard size. The floorboards removed from the Mackintosh Building during the course of the restoration were therefore re-cut, sanded, and re-used as such across the site (Fig.5.12)<sup>486</sup> However, some timber such as the wood-panelling on the walls had previously been coated with lead paint and so could not be sanded-down as this would release toxic lead particles

<sup>&</sup>lt;sup>481</sup> Moses Jenkins, Short Guide: Fabric Improvements for Energy Efficiency in Traditional Buildings, 17.

<sup>&</sup>lt;sup>482</sup> Moses Jenkins, 7.

<sup>&</sup>lt;sup>483</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>484</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 47.

<sup>&</sup>lt;sup>485</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>486</sup> Elizabeth Davidson.

into the air. Instead, they were stripped with Tavec 201 which was applied for a period, then removed and disposed of safely (Fig.5.13).<sup>487</sup>

The large tulipwood timbers needed to re-create the Japanese inspired roof beams in Studio 58 were a procurement issue for Page\Park and engineers David Narro Associates. The size, quality, and age of the timber made it difficult to source. By February 2017, however, tulipwood timber c.150 years old was procured from a demolished mill in New England, USA.<sup>488</sup> These timbers were of the correct age and species and were therefore a 'like for like' replacement (Fig.5.14). These are all positive factors; however, it is worth pausing to think about the negatives of their use. The recycled timbers had to be shipped from America to Scotland, increasing their carbon footprint, and they were being taken from a historic building which was being demolished and stripped of its valuable materials, not repaired or restored, and thereby its embodied energy was being dispersed and lost. The mill was evidently of less cultural significance than the Mackintosh Building, this in itself is not problematic, as in Scotland we categorise our Listed Buildings and accord them protections appropriate to their perceived significance, but we should be wary of differences in cultural significance and value internationally. We need to ensure that we understand the value and significance of materials sourced from other countries to their own local and national cultural heritage, so that taken no communities or their resources are taken advantage of for the benefit of our own heritage.

# 5.14.6 Lighting

After the fire of 2014, the GSA noted that numerous original light fittings survived throughout the Mackintosh Building and it would, therefore, be prudent to restore them and keep them in use.<sup>489</sup> Previously installed modern lighting schemes, such as bulky fluorescent fixtures commonly found in schools and offices, co-existed with these original fittings.<sup>490</sup> During MRP1, non-original fittings would be replaced with modern, energy-efficient, and more aesthetically harmonious fixtures. The GSA's *Brief to the Design Team* spent a great deal of time considering the importance of natural light in the Mackintosh Building (Fig.5.15), as light 'is one of its greatest strengths and distinguishing features'.<sup>491</sup> Page\Park further emphasised the importance of light in the Building:

- Firstly, how daylight is used throughout the building to consummate effect.
- Secondly, how the historic light fittings shape and amplify this experience of light.

<sup>&</sup>lt;sup>487</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>488</sup> Glasgow School of Art, 'Mackintosh Restoration Project Update: February 2017', February 2017, https://glasgowschoolofart2.createsend.com/campaigns/reports/viewCampaign.aspx?d=r&c=F829F3A601CEF 619&ID=B05C6477A9D5F5622540EF23F30FEDED&temp=False&tx=0.

<sup>&</sup>lt;sup>489</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 42.

<sup>&</sup>lt;sup>490</sup> Glasgow School of Art, 42.

<sup>&</sup>lt;sup>491</sup> Glasgow School of Art, 42.

• Thirdly, how we need to introduce new lighting settings in particular areas and primarily in the studios.<sup>492</sup>

With these factors in mind, Page\Park decided upon the following course of action after carrying 'out a double examination of technical requirements.'<sup>493</sup> Ultimately, they wanted to 'demonstrate how the original light fittings can be adapted or replicated in a sympathetic manner and meet contemporary expectations, supplemented in careful ways only where necessary.'<sup>494</sup> Whilst also introducing modern 'higher power fittings to permit flexible use in the studios providing a variety of lighting scenarios'.<sup>495</sup> The GSA expected all lighting within the Mackintosh Building to be:

- Low energy
- Easily sourced/maintained
- Specification and designs to be adapted for the individual spaces
- Dynamic [motion sensor switch on and off]<sup>496</sup>

Kevan Shaw Lighting Design (KLSD), the lighting designers appointed for MRP1, spent time investigating the original lighting scheme before making any recommendations. KSLD found that 'the decision to use electric lighting, particularly during the first phase [Phase One of the Mackintosh Building] was a bold and adventurous move', declaring that 'Mackintosh was an eager early adopter of electric lighting.'<sup>497</sup>

It was decided that a philosophically honest approach to the lighting design would be taken; any 'modern lighting equipment and interventions' would be either 'distinctive and separate from the historic fabric of the building' or 'carefully concealed without intervention to or damage of the historic fabric', in key heritage spaces such as the Library.<sup>498</sup> KSLD stated that it was their 'ambition to conceal all [additional modern] servicing taking advantage of the necessary dismantling of panel work and intervention to finishes for the general building reinstatement.'<sup>499</sup>

Originally, studios within the Mackintosh Building were lit by 'a form of early directional task lighting', which was 'a mixture of utilitarian metal shades with exposed filament hung bulbs whose

<sup>&</sup>lt;sup>492</sup> Page\Park, 'Placing Interventions Draft', 54.

<sup>&</sup>lt;sup>493</sup> Page\Park, 54.

<sup>&</sup>lt;sup>494</sup> Page\Park, 54.

<sup>495</sup> Page\Park, 54.

<sup>&</sup>lt;sup>496</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 42.

<sup>&</sup>lt;sup>497</sup> Kevan Shaw, 'Glasgow School of Art Reinstatement: RIBA Stage 3 Design Report Rev 1', 18 December 2015,

<sup>3.</sup> 

<sup>&</sup>lt;sup>498</sup> Kevan Shaw, 5.

<sup>&</sup>lt;sup>499</sup> Kevan Shaw, 5.

position could be altered by re-hanging across a series of wires and hooks.' (Fig.5.16)<sup>500</sup> The GSA noted in their *Brief to the Design Team* that:

Ironically this latter form of studio lighting has more recently come back into vogue for use in 'industrial chic' interior designs – and their versatility is an aspect that the School would be keen to see explored again in relighting appropriate studio spaces.<sup>501</sup>

Based on this *Brief*, Page\Park and KLSD decided that in the studios 'an adaptable, dimmable and flexible system of lighting' would be installed.<sup>502</sup> Which would 'allow for some directable and modelling light, however, this is not going to be easy and flexible to adjust.'<sup>503</sup> This alteration of Mackintosh's original lighting scheme was considered acceptable to the GSA as 'most work students will do in the studios will be quite different from what happened in the early part of the last century hence the requirement for a changed approach to lighting.'<sup>504</sup> The needs of the GSA's students have altered since the early 1900s, making Mackintosh's task lighting system obsolete. Re-introducing it would, therefore, be of no benefit to the GSA's modern students. Whilst re-creating the task lighting systems could be considered aesthetically pleasing and 'authentic', it would not be inherently useful and was therefore deemed unnecessary.

Dynamic LED bar lighting, on an 'absence detection' system, i.e. lighting which is set on a timer to switch on and off if movement is not detected would also have been installed across the Mackintosh Building.<sup>505</sup> All lights were to have daylight sensors, which would have been 'used to modulate the light level according to the available daylight.'<sup>506</sup> Allowing, for example, lights closest to windows to project less lux, and lights furthest from a source of daylight to produce more lux, thereby ensuring energy efficiency across all spaces. To preserve the original aesthetic of Mackintosh's lighting scheme, where light bulbs were being reinstated, in areas such as the first-floor corridor, LED filament or 'squirrel cage' light bulbs were being used. These were new to the market and had not been available at the start of MRP1 in 2014, highlighting not only how quickly energy efficient technology is developing, but that MRP1were keeping abreast of the latest developments.

# 5.14.7 Wi-Fi and Power

An essential part of any modern learning environment is access to Wi-Fi, and there would have been no Wi-Fi blackspots within the Mackintosh Building post-restoration, doubling the previous

<sup>&</sup>lt;sup>500</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 42.

<sup>&</sup>lt;sup>501</sup> Glasgow School of Art, 42.

<sup>&</sup>lt;sup>502</sup> Page\Park, 'Placing Interventions Draft', 55.

<sup>&</sup>lt;sup>503</sup> Page\Park, 55.

<sup>&</sup>lt;sup>504</sup> Page\Park, 55.

<sup>&</sup>lt;sup>505</sup> Kevan Shaw, 'Glasgow School of Art Reconstruction: Lighting Control Performance Specification RIBA Stage 3 Overview', 30 November 2015, 2.

<sup>&</sup>lt;sup>506</sup> Kevan Shaw, 2.

capacity.<sup>507</sup> It was also considered important that students and staff would have the ability to charge their laptops and other devices throughout the Building. Despite advances in technology which makes wireless charging possible, the Mackintosh Building had to have enough power outlets for students and staff to use until these developments took place.<sup>508</sup> Floor boxes were, therefore, being installed, as were wall sockets, resulting in there being one power outlet for every two students.<sup>509</sup>

#### 5.14.8 Planning for Change

As the Mackintosh Building is A-Listed, its interiors are of great importance, therefore, any augmentation or alteration needs to be reversible and carefully managed. The toilets, for example, would have used an IPS (Interior Panel System) which would enable the easy removal of wall panels when the bathrooms were inevitably refurbished in the future.<sup>510</sup> The GSA also elected to have an 'empty space' policy when considering the use of the Building post-restoration. There was to be an empty room on every floor of the Mackintosh Building with no designated use. This would have ensured that the users of the building had extra space to expand or breakout into.

#### 5.15 Decorative and Applied Finishes: Colour Scheme

The GSA commissioned Page\Park to produce an 'investigation of the decorative history of certain elements' of the Mackintosh Building 'in order to accurately record early decorative schemes present within the building at the time of its completion in 1909.<sup>511</sup> This investigation would then inform the restoration process, enabling the original decorative finishes to be assessed, recorded, and potentially reinstated. Page\Park found that whilst there were references to painting and staining in the archival material relating to the construction of the Mackintosh Building, the colours and finishes themselves were not fully recorded. When Phase One was completed in 1899 the *Evening Times* reported that at the opening ball held in the Building 'the women wore satin, brocade, velvet, and silk in dominant colours of green, pink, black, white and heliotrope. These colours were seen against the woodwork of the School which was painted an artistic shade of green.<sup>512</sup>

Page\Park employed Ian Crick-Smith, historic paint specialist, to conduct paint scrape analysis throughout the Building. In his report, Crick-Smith identified 'that distemper was used extensively across all of the different surfaces and substrates either as a colour paint or colour stain on timber.'<sup>513</sup> However, some brickwork was left bare, such as in the Loggia, whilst other spaces, such as the

<sup>&</sup>lt;sup>507</sup> Elizabeth Davidson, Research Interview on MRP1.

<sup>&</sup>lt;sup>508</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>509</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>510</sup> Elizabeth Davidson.

<sup>&</sup>lt;sup>511</sup> Page\Park, 'Glasgow School of Art: Applied Finishes Appraisal Report DRAFT', October 2017, 4.

<sup>&</sup>lt;sup>512</sup> William Buchanan, ed., *Mackintosh's Masterwork: The Glasgow School of Art* (Glasgow: Glasgow School of Art Press, 2004), 34.

<sup>&</sup>lt;sup>513</sup> Page\Park, 'Glasgow School of Art: Applied Finishes Appraisal Report DRAFT', 8.

Basement Corridor, were coated. Some plaster was also 'left self-finished off the float' to give a soft almost suede-like texture to the walls. (Fig.5.17 and 5.18)<sup>514</sup>

Throughout the Building a distemper made from thinning highly pigmented artists oil paint 'with white spirit or turpentine' was used as an interior paint.<sup>515</sup> This was applied as a 'very thin wash' on timber panelling.<sup>516</sup> This finish 'allowed the substrate to show through', meaning that the grain of the wood was still visible after a stain was applied:

The evidence indicates that distemper was applied and after a short period wiped. The differential absorption between the seasonal growth within the timber produces an effect that highlights and accentuates the grain.<sup>517</sup>

The stain was then sealed into the timber with a 'soft beeswax'.<sup>518</sup> The original finishes throughout the Building had been obscured over the years as 'extensive overpainting' had occurred, particularly in the studios which were painted 'on an annual basis for degree shows using brilliant white emulsion.'<sup>519</sup> In spaces such as the Lecture Theatre and Museum the finishes had been painted over with modern products, whilst the corridors and doors had been overpainted with black paint.<sup>520</sup> This meant that intact historical finishes were 'limited to the high level hard to reach areas' or areas covered by later 'linings or fixtures'.<sup>521</sup> There were also areas throughout the Building where 'later finishes' were 'falling or peeling away, exposing an earlier historic decoration.'<sup>522</sup> These largely untouched areas, coupled with the paint scrapes carried out by Ian Crick-Smith confirmed the original applied finishes.

The colours of the applied finishes were surprising. Within living memory, the Mackintosh Building had been considered a monochrome space; with dark stained or black wooden elements and white walls, but now we know this was due to years of overpainting. The original colour scheme was far more varied. Using this information, the MRP1 Design Team then had to decide upon a cohesive interior scheme. It was discovered that the Senior Architecture Studio was originally a dark oxblood red, and the Junior Architecture Studio was panelled with wood stained 'Jacobean green'. The Design Team informed the staff in the GSA's current Mackintosh School of Architecture (MSA, located in the Bourdon Building), of these discoveries, and entered into discussions (which had not been concluded by the time of the 2018 fire) about reinstating the original colour scheme. In the Museum it

- <sup>516</sup> Page\Park, 8.
- <sup>517</sup> Page\Park, 9.
- <sup>518</sup> Page\Park, 11.
- <sup>519</sup> Page\Park, 14.

<sup>521</sup> Page\Park, 13.

<sup>&</sup>lt;sup>514</sup> Page\Park, 10.

<sup>&</sup>lt;sup>515</sup> Page\Park, 11.

<sup>&</sup>lt;sup>520</sup> Page\Park, 16.

<sup>&</sup>lt;sup>522</sup> Page\Park, 13.

was also found that the walls were originally painted a lavender/blue colour. Again, the MRP1 Design Team informed the GSA's current Exhibitions Team of these discoveries and asked them for feedback on how to proceed. As the Museum was used as a temporary exhibition space before the 2014 fire, and would be again post-restoration, the Exhibitions Team felt that this colour scheme would be incongruous. A white background has become the standard interior finish in contemporary and modern art museums and galleries. 'Sacrificial' walls were therefore going to be installed in the museum, preserving the original wall finishes behind them, whilst also creating space for the installation of services in a gap between the two 'walls'. The new walls would be able to be re-painted as required and used to hang and install artworks by the Exhibitions Team, allowing the space to be used flexibly.

Therefore, the conservation philosophy of taking the Mackintosh Building back to its original design as far as was practicable could be said to have been achieved in terms of interior finishes. By entering a dialogue with the Building's previous and future users, the MRP1 Design Team were ensuring the suitability of the Mackintosh Building for its user's post-restoration. In an ideal world the colour schemes would have been completely reinstated throughout the Mackintosh Building, however, acceptable compromises had to be made in order to ensure that the Building could work practically as a  $21^{st}$  century art school.

#### 5.15.1 Interior Finishes: Plasterwork

At Hampton Court Palace 'it was not possible to use traditional lath and plaster for every ceiling, simply because of the size of the area to be covered and the difficulty of obtaining adequate quantities and lengths of split laths.'<sup>523</sup> The Project Management Team stated that 'splitting is a manual process carried out by only a few small firms around the country. Each lath is split individually by driving a blade down the full length of the wood', making it a labour-intensive process.<sup>524</sup> Therefore, 'in the end, expanded metal lathing had to be used for the ceiling of the Cartoon Gallery', as 'this vast area measuring 117 feet by 24 feet could not possibly have been completed on time using chestnut laths.'<sup>525</sup> Michael Fishlock said that this decision 'was a disappointment, but one of the few occasions where historical integrity had to give way to practical necessity.'<sup>526</sup> At Uppark House the NT 'negotiated a rationale with the loss adjusters whereby the ground-floor rooms would be painstakingly repaired using traditional, and expensive, methods and materials – including lime and hair plaster on riven chestnut laths', whilst 'more modern, and economical, materials could be used on the upper

<sup>&</sup>lt;sup>523</sup> Fishlock, Michael, *The Great Fire at Hampton Court*, 1993, 102.

<sup>&</sup>lt;sup>524</sup> Fishlock, Michael, 102.

<sup>&</sup>lt;sup>525</sup> Fishlock, Michael, 102.

<sup>&</sup>lt;sup>526</sup> Fishlock, Michael, 102.

residential floors, with the plastering there being executed on an expanded metal mesh base, but still using lime plaster.<sup>527</sup>

The Mackintosh Building also used traditional lath and plaster for its ceilings and walls, as revealed by the fire (Fig 5.19) The GSA felt that 'these materials have both distinctive appearance and acoustic which are deemed important to the final restoration of the Library, in particular.'<sup>528</sup> However, at the very beginning of MRP1 they did acknowledge that; 'it may be appropriate to consider use of other materials, such as plasterboard etc – within plainer, less public rooms'.<sup>529</sup> The MRP1 Project Team reported no resistance from the GSA in terms of budget to the re-installation of traditional lath and plaster throughout the Building, and GCC and HES also backed this decision. The chestnut laths used across the building were not difficult to source, and the Scottish Lime Centre (SLC) in Fife tested samples of plaster from across the Building so that they could be accurately re-created. The GSA's decision, the existence and popularity of the SLC, and ease with which traditional materials can be sourced are signs that since the 1980s traditional skills and materials have become an increasingly valued facet of the restoration, re-creation and repair of our built heritage, as well as a successful part of the construction industry.

## 5.16 The Library

The Library in the Mackintosh Building has been described as 'the masterpiece within the masterwork', 'a realm of architecture unparalleled then and seldom since.'<sup>530</sup> Architecture Journalist Oliver Wainwright discussed its use prior to the fire in a *Guardian* article contemplating its restoration after the 2014 fire:

Anyone who visited the building as a tourist might have felt uneasy as the sacred library was opened up for the tour, then swiftly locked shut after they left. Indeed, even students were only allowed into the holy of holies for half-a-day a week.<sup>531</sup>

Wainwright was concerned that if re-created, the Library 'could have all the atmosphere of a freshly fitted MFI kitchen.'<sup>532</sup> Nevertheless, Wainwright also believed that re-creating the library 'as faithfully as possible to the original... is the right thing to do – particularly because, remarkably, all the information required to do so exists.'<sup>533</sup> The GSA concurred with this viewpoint and Brian Page of Page\Park thought that whilst the Library would 'feel new' at first, 'the patina will come with use'.<sup>534</sup>

<sup>&</sup>lt;sup>527</sup> Rowell, Christopher and Robinson, John Martin, *Uppark Restored*, 59.

<sup>&</sup>lt;sup>528</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 29.

<sup>&</sup>lt;sup>529</sup> Glasgow School of Art, 29.

<sup>&</sup>lt;sup>530</sup> Buchanan, *Mackintosh's Masterwork*, 2004, 87.

<sup>&</sup>lt;sup>531</sup> Oliver Wainright, 'Things We Found in the Fire: Glasgow's School of Art Restoration Begins'.

<sup>&</sup>lt;sup>532</sup> Oliver Wainright.

<sup>&</sup>lt;sup>533</sup> Oliver Wainright.

<sup>&</sup>lt;sup>534</sup> Oliver Wainright.
Natalia Burakowska, Heritage and Conservation Researcher at Page\Park was largely responsible for researching and managing the re-creation of the Library, creating a timeline recording alterations to the Library since its completion in 1910. Again, the Bedford Lemere photographs of the Mackintosh Building's interiors were crucial to this research, as was *The Guardian's* 360° interactive panoramic, created in 2011.<sup>535</sup> The GSA had decided that the Library would be reconstructed to look as it was when completed in 1910, which meant that a number of later alterations and additions would not be included in the re-created Library, as they were not part of Mackintosh's original design for the space.

It was discovered that 'the original opening windows in the Mackintosh Library were horizontal in emphasis – but replaced with vertical slide hung casements following a decision by the Board of Governors in 1947'.<sup>536</sup> The GSA, therefore, felt that post-fire 'the opportunity exists to renew these windows based on photographic/archival evidence and surviving fabric, and should be pursued'.<sup>537</sup> An internal stair which connected the mezzanine level with the ground floor of the library was also added in 1945, so that the Librarian on-duty could more easily move between these areas, without having to exit the Library.<sup>538</sup> The GSA stated that; 'if the balcony is not to be used for reading/study space – then it is preferred not to replace this feature unless required to as part of a listed building consent or building warrant compliance issue.'<sup>539</sup>

The cabinets running around the Library's walls were also 'added to over the decades', with Burakowska pinpointing 1915 as the year in which any 'gaps' left by Mackintosh on the walls, were filled with extra cabinets.<sup>540</sup> The GSA stated that 'depending on the demand for storage and end users requirements – there may be a decision not to replace later [cabinet] additions.'<sup>541</sup> These decisions show that the GSA wanted to re-create the Library to Mackintosh's original designs, however, as an institution they nevertheless needed to acknowledge that some alterations had positively benefited the users of the Library, and as such these could remain. Despite their lack of 'authenticity', compromises had to be made as practicality was still crucial.

The fire, as well as the research of Burakowska and others, revealed new information about the structure and materiality of the Library. As in Studio 58, the timber used throughout the Library, both decorative and structural, was tested and identified as tulipwood (Fig.5.20). Described in a 1903

<sup>&</sup>lt;sup>535</sup> Katherine Rose and Jim Powell, 'The Library at Glasgow School of Art - 360 Interactive Panoramic', the Guardian, 9 September 2011, //www.theguardian.com/artanddesign/interactive/2011/sep/09/glasgow-school-art-library-360-interactive-panoramic.

<sup>&</sup>lt;sup>536</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 28.

<sup>&</sup>lt;sup>537</sup> Glasgow School of Art, 28.

<sup>&</sup>lt;sup>538</sup> Natalia Burakowska, 'The Mackintosh Building Library'.

<sup>&</sup>lt;sup>539</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 28.

<sup>&</sup>lt;sup>540</sup> Natalia Burakowska, 'The Mackintosh Building Library'.

<sup>&</sup>lt;sup>541</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 29.

publication entitled *The Modern Carpenter and Joiner and Cabinet-Maker: a complete guide to current practice* as:

CANARY WOOD – (liriodendron tulipferia) – This justly esteemed wood has many aliases - tulipwood, American whitewood, basswood, and yellow poplar. It is one of the largest trees of the Atlantic forests, 80 to 150 feet high, with a trunk up to about 13 feet in diameter. The wood is of fine texture, of a pale canary colour, with the low specific gravity of 0.4230, and as it is easily worked, its uses are illimitable for interior finish, mouldings, and furniture. It should not, however, be applied to constructive purposes, as it is not adapted to carry heavy loads. Owing to the fine grain it possesses, it is capable of either being polished in its natural colour, or made to imitate any other wood, such as mahogany or walnut; and taking into account the great widths in which it is obtainable (say 24 to 30 inches in lengths from 10 to 16 feet, without a defect), it is surprising that it has so long remained at the low prices which have been current.

This wood is imported in cut stuff and logs from 20 to 40 inches deep, and the wholesale prices from the latter range from 1s 9d to 2s 6d per cubic foot (string measure), and for lumber from 1s 9d to 3s per cubic foot, but prices at present have a strong upward tendency.<sup>542</sup>

We know that Charles Rennie Mackintosh wanted the Library to be constructed from oak, and until recently, it has therefore been accepted as fact that oak was the main timber used in the space. James Macaulay, former Senior Lecturer of the Mackintosh School for Architecture, placed great emphasis on the fact that the library was made of oak in his biography of Mackintosh's life published in 2010.<sup>543</sup> The type of wood used clearly impacts upon the interpretation of the space it is used in. This change of materials was most likely imposed on Mackintosh by the Building Committee, who had learnt from Phase One of the building that Mackintosh could not be trusted to stay on budget.

It is easy to see why Tulipwood would have appealed to the Board of Governors given Sutcliffe's complementary description of the material; with its ability to be stained to imitate darker more expensive woods, with large widths available for decent prices, and it was also deemed 'easily worked' and suitable for 'interior finish'.<sup>544</sup> Sutcliffe also very helpfully informs the reader how this 'exceedingly useful wood' was imported, and from where.<sup>545</sup> It is an Atlantic wood, from the North

<sup>&</sup>lt;sup>542</sup> Lister Sutcliffe and Morris, p.74, Volume 1.

<sup>&</sup>lt;sup>543</sup> James Macaulay and Mark Fiennes, *Charles Rennie Mackintosh: A Biography*, First Edition edition (New York: W. W. Norton & Company, 2010), p.147.

<sup>&</sup>lt;sup>544</sup> Ibid, p.74, Volume 1.

<sup>&</sup>lt;sup>545</sup> Lister Sutcliffe and Morris, pp.74–75, Volume 1.

East coast of America, and was imported to Britain both cut and as logs. The drying of wood is also discussed, with Sutcliffe confidently asserting that:

Many experts are of the opinion that natural seasoning gives the best results, but the time required is so long that more rapid methods are now preferred. Drying in kilns is the process most generally adopted and, if due care is exercised, appears to be perfectly satisfactory; on the other hand, if carried on too quickly, it may prove injurious.<sup>546</sup>

In 2017 The Scotsman reported on the procurement challenges faced by the MRP1 Design Team:

In Mackintosh's day, the tulip wood used in the library's construction grew tall and wide in virgin forests across North America. Now it is farmed and harvested as soon as it reaches a certain height; and it is kiln-dried as opposed to air-dried, making it more brittle to work with.

After being told by US companies the wood could not be supplied in the dimensions required to create the pendants, MacDonald managed to locate an alternative European supplier.<sup>547</sup>

As America's supply of old-growth Tulipwood either depleted from over-logging or were now protected by law, Laurence MacIntosh had to locate Tulipwood plantations in Europe which had been growing this timber for commercial sale.

Once selected as the principal architects for MRP1 Page/Park insisted on the creation of a prototype Library Bay, which was carried out over a six-month period by Laurence MacIntosh at their workshops in Edinburgh. Burakowska's research was combined with information garnered by an archaeological survey taken post-2014 fire, further highlighting the value of conducting an archaeological survey and/or dig in a post-disaster scenario. The process of designing and building the prototype enabled Burakowska to work closely with the craftspeople constructing it to problem solve as they worked, in preparation for constructing the full Library in situ in the Mackintosh Building. The prototype allowed the MRP1 Design Team to 'test and retest every aspect of the design and manufacture' of the Library.<sup>548</sup> Laurence MacIntosh were subcontracted to produce the prototype and were then able to tender for the construction of the complete Library. Satisfied with their work, the Design Team contracted them to do so. Elizabeth Davidson and Burakowska believe that the creation of the prototype project was immensely valuable to MRP1. At time of writing the prototype remains in storage, and it is hoped that it will be exhibited in the future.

<sup>&</sup>lt;sup>546</sup> Ibid, p.74, Volume 1.

<sup>&</sup>lt;sup>547</sup> Dani Garavelli, 'The Mission to Resurrect the GSA's Mackintosh Library'.

<sup>&</sup>lt;sup>548</sup> Richard Waite, 'Glasgow School of Art Unveils Full-Size Prototype of Mac Library Rebuild', Architects Journal, accessed 26 August 2019, https://www.architectsjournal.co.uk/news/glasgow-school-of-art-unveilsfull-size-prototype-of-mac-library-rebuild/10023282.article.

#### 5.16.1 The Library Lights

At the time of the 2014 fire the Library Lights were considered fixtures, and as such they were not accessioned within the GSA's collection as objects. This meant that when it came to their restoration the Design Team, in particular Project Manager Sarah Mackinnon, could take the lead. Polly Christie, the Recovery Lead for GSA's Archives & Collections worked alongside Mackinnon after the Library was excavated to identify and catalogue all the salvaged fragments. As described in the previous chapter, using a grid system created by Kirkdale and AOC Archaeology Mackinnon and Christie were able to use the location of each fragment when found to piece together each individual lamp. Once matched with their corresponding parts these 'light kits', as dubbed by Christie and Mackinnon, were restored back to their original condition by metalworker Rodney French of Lonsdale and Dutch.

Any new pieces of metalwork which had to be added to create a complete light were clearly stamped so that these new elements could be distinguished from the original restored fragments. The original light fragments were tested by HES Conservation Science Team so that the new components could be created from the same metal compounds. In the long-term this 'like for like' replacement also means that the new and old pieces will not chemically interact with one another in an unexpected or damaging way. A short film was produced by the GSA recording French in his workshop discussing the lights and revealing his methods. As yet unreleased, this film is part of the educational legacy of the Library Lights project, highlighting the importance of traditional skills and materials in MRP1.

Alongside the physical evidence of the light fragments, archival materials once again became crucial to the restoration process. Two drawings by Mackintosh dated to 1909 held by the University of Glasgow's Hunterian Museum, revealed his original designs for the Library Lights, as well as their intended layout in situ (Figs.5.21, 5.22 and 5.23). A diagram of the 'Electric Lamps' as Mackintosh describes them in his own hand, also contained valuable information on the materials and original finish of the lights.<sup>549</sup> Mackintosh writes that the 'lamps' are 'to be made in brass-finished antique.'<sup>550</sup> The drawings also showed the various heights Mackintosh wanted the Library Lights to sit at and revealed that there were to be fifty-three Lights in total.<sup>551</sup> The cost of each 'lamp' in 1909 was £1.<sup>552</sup> All of the restored Lights were accessioned into the GSA's collection; whereas prior to the fire of 2014 the Library Lights as 'worthy' of inclusion in their collection, the fire and their possible loss has

<sup>&</sup>lt;sup>549</sup> Charles Rennie Mackintosh, *Design for a Light Fitting, Glasgow School of Art*, 1909, pencil and watercolour on paper, 1909, The Hunterian.

<sup>&</sup>lt;sup>550</sup> Charles Rennie Mackintosh.

<sup>&</sup>lt;sup>551</sup> Charles Rennie Mackintosh, *Design for the Central Group of Light Fittings, Library, Glasgow School of Art*, 1909, pencil and watercolour on paper, 1909, The Hunterian.

<sup>&</sup>lt;sup>552</sup> Charles Rennie Mackintosh.

therefore acted as a dramatic and destructive catalyst, highlighting their importance to the GSA as objects.

## 5.17 Upgrading the Fire Detection and Suppression Systems

The GSA has stated that 'one consequence of the 2014 fire was that it fundamentally changed the circumstances for installing fire prevention measures within the Mackintosh Building.'<sup>553</sup> As the Building would be vacant of staff and students over the course of the restoration process, and with funding secured, the GSA were able to agree upon five key fire protection targets in consultation with HES, GCC, SFRS and their insurers:

- 1. To improve compartmentation within the building;
- 2. To install fire stopping within all ducts and rises;
- 3. To install a 'state of the art' fire detection system;
- 4. To install 'water mist fire suppression system';
- 5. To install a smoke extract system.<sup>554</sup>

The GSA also specified that 'all materials and surfaces incorporated in both the conservation and new construction work should have the requisite fire resistance, resistance to surface spread of flame and other relevant characteristics appropriate to their location and purpose as specified by the statutory authorities and in accordance with current legislation.'<sup>555</sup> Alongside the installation of suppression and detection systems all structural beams in the Building were given an intumescent coating, and intumescent strips were unobtrusively inserted around all doors.

#### 5.17.1 Water Suppression Systems

The most common, and one of the oldest, methods of firefighting technology are sprinklers, which have been used as a method of fire suppression within buildings for over 140 years.<sup>556</sup> The earliest systems were installed in cotton mills in Britain and the USA between 1852 and 1860, and there was also a primitive system installed in London's Theatre Royal c.1812.<sup>557</sup> Records from the USA, Britain, New Zealand, and Australia 'indicate that around 98% of all fires in sprinklered premises are either extinguished or controlled by the sprinkler system', and this figure is considered conservative

<sup>&</sup>lt;sup>553</sup> Glasgow School of Art, 'The Glasgow School of Art: Statement of Rebuttals' (Glasgow School of Art, 15 November 2018), 12.

<sup>&</sup>lt;sup>554</sup> Glasgow School of Art, 12.

<sup>&</sup>lt;sup>555</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 38.

<sup>&</sup>lt;sup>556</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:40.

<sup>&</sup>lt;sup>557</sup> Stewart Kidd and Sharon Haire, 2:40.

'since small incidents where sprinklers have extinguished a fire with no resulting property damage are not necessarily reported'.<sup>558</sup> HES Guidelines state that:

A properly designed, installed and maintained system will, at the very least, contain a fire to a small area and consequently reduce the extent of the damage. Indeed in many cases the system will often manage to extinguish the fire before the arrival of the fire and rescue service. The damage minimisation potential of suppression systems is especially beneficial in the historic buildings context where historic fabric or contents may be irreplaceable.<sup>559</sup>

As part of MRP1, the Mackintosh Building had a low-pressure mist suppression system installed. These systems are increasingly seen as an effective means of fire suppression in historic and traditional buildings. HES has stated that 'apart from sprinkler systems, the only other water-based suppression system which would be appropriate for traditional buildings is water mist.'<sup>560</sup> Water mist suppression systems (which can be both High Pressure and/or Low Pressure) employ 'heads discharging aerated water in a mist or fine spray'.<sup>561</sup> Traditional 'sprinklers extinguish or control a fire by cooling – the spray pattern from the sprinkler heads wets the area around the fire preventing it from spreading.'<sup>562</sup> However; 'mist systems have a dual mechanism, the water does provide some cooling but the most effective extinguishment is accomplished when the water in the mist is converted to steam which the then smothers a fire by excluding oxygen.'<sup>563</sup> This means that 'in comparison with sprinklers, water mist systems use comparatively small amounts of water to fight a fire', less water has to be stored in tanks in or near the building in question, and if the system is activated less water damage will occur to the building's interior and any objects it contains.<sup>564</sup>

During the restoration and re-creation of Stirling Castle, as part of the Stirling Palace Project, HES (then Historic Scotland) decided that an automatic fire suppression system should be introduced. It was the first water mist system installed in a 'Scottish historic structure.'<sup>565</sup> Stewart Kidd also claims that Stirling Castle is the oldest building in the world to be fully protected by a water mist system'.<sup>566</sup> A mist suppression system was decided upon for a number of reasons; the mist heads and pipes were smaller than that of a sprinkler system, making them less visually intrusive, and mist suppression was seen as better able to 'protect the building, its original fabric and contents.'<sup>567</sup> Smoke and water

<sup>&</sup>lt;sup>558</sup> Stewart Kidd and Sharon Haire, 2:40.

<sup>&</sup>lt;sup>559</sup> Stewart Kidd and Sharon Haire, 2:39.

<sup>&</sup>lt;sup>560</sup> Stewart Kidd and Sharon Haire, 2:50.

<sup>&</sup>lt;sup>561</sup> Stewart Kidd and Sharon Haire, 2:50.

<sup>&</sup>lt;sup>562</sup> Stewart Kidd, 'Protection of a Major Heritage Building Using a Watermist Fire Suppression System', n.d., 7.

<sup>&</sup>lt;sup>563</sup> Stewart Kidd, 7.

<sup>&</sup>lt;sup>564</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:51.

 <sup>&</sup>lt;sup>565</sup> Stewart Kidd, 'Protection of a Major Heritage Building Using a Watermist Fire Suppression System', 1.
<sup>566</sup> Stewart Kidd, 2.

<sup>&</sup>lt;sup>567</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:51.

damage of the interiors and contents of Stirling Castle would therefore be limited by this system should a fire occur. The mist system in Stirling Castle was also installed in the roof spaces, to protect the original timbers and prevent the spread of fire in this notoriously vulnerable area of historic and traditional buildings.<sup>568</sup> For the Castle, HES selected an innovative mist system which combined both low and high pressure. High pressure systems are acknowledged as being 'particularly good for protecting small localised areas, forming a standalone system to protect a restricted space or single object.'<sup>569</sup> Whereas low-pressure systems are 'best suited to protecting a total locality.'<sup>570</sup>

At the time of the 2014 fire, the GSA was retrofitting a mist suppression system in parallel with the Mackintosh Conservation and Access Project into the Mackintosh Building. The GSA does state, however, that at the time 'fire prevention and safety measures in the Mackintosh Building were already compliant with what was permissible in listed buildings in general'.<sup>571</sup> The process was days away from completion on the day of the fire. During the fire half of the suppression system which had been installed was destroyed, and as a result had to be removed from the Building during MRP1. In 2015, the GSA had hoped that as 'a new fire suppression system was 90% installed just over a year ago... it may be possible to utilise some of this pipework for the purpose of Low Pressure Mist'.<sup>572</sup> However, the undamaged sections of the system could not be retained and repaired as they impeded other works, being attached to finished ceilings etc. A fire suppression system can only be installed once other works, such as ceiling repair and replacement, have been completed. Technology had also advanced since the first fire, which meant that the 2014 system was essentially obsolete by the time it was possible to install a new system.

The GSA decided to install a Low Pressure Mist Suppression System as part of MRP1. The table below reveals the rationale behind this decision:

<sup>&</sup>lt;sup>568</sup> Stewart Kidd and Sharon Haire, 2:51.

<sup>&</sup>lt;sup>569</sup> MPS UK Marketing Communication Specialists, 'Protecting Stirling, Editorial Copy', 2009, 2–3.

<sup>&</sup>lt;sup>570</sup> MPS UK Marketing Communication Specialists, 2–3.

<sup>&</sup>lt;sup>571</sup> Glasgow School of Art, 'The Glasgow School of Art: Written Submission' (Glasgow School of Art, 7 November 2018), 7.

<sup>&</sup>lt;sup>572</sup> Glasgow School of Art, 'The Mackintosh Building: Brief to the Design Team DRAFT', 5.

Fire Suppression system	Pros	Cons
Traditional wet sprinkler	Tried and tested and relatively	Large bore pipes not suitable
installation	easy to obtain Insurance	for the Mack.
	approval	Large water storage tank required circa 185,000 litres (small swimming pool). The Mack has not got space for this tank. High water consumption hence extensive water damage if activated.
High Pressure Mist	Very small bore pipes – easy to	Expensive
	integrate into the sensitive architecture. Small water storage tank	Not insurance approved to serve rooms greater than 5.0m high.
	Low water consumption hence minimal water damage if activated.	
Low Pressure Mist – Preferred	Medium to small bore pipes.	Nothing to write home about.
solution for the Mack	Relatively easy to integrate with the architecture. Can serve rooms up to 12m high due to larger mist particles than HP mist. Low/medium water storage so can be accommodated within the Mack	Slightly larger pipes than HP mist to deal with and slightly larger tank (circa 40,000 litres)

Table: 5.3: Table created by MRP1 staff showing the pros and cons of the fire suppression systems considered for installation into the Mackintosh Building as part of MRP1.

	Low water consumption hence	
	minimal water damage if	
	activated.	
	Less cost than HP Mist.	
Inert Gas suppression and		These systems are generally
oxygen depletion systems		only suitable for rooms that
		can achieve a good air
		tightness. Not suitable for the
		Mack.

This decision concurred with a statement made by the GSA in their Brief to the Design Team:

One of the challenges of this project will be to repair and reconstruct the Mackintosh so that the latest technology in fire detection and suppression is integrated seamlessly into the architecture of the entire building.<sup>573</sup>

## 5.17.2 Automatic Fire Detection

In its *Brief to the Design Team*, the GSA stated that in the newly restored Mackintosh Building 'fire systems and alarms should be unobtrusively sited and sensitively detailed whilst maintaining full functionality.'<sup>574</sup> The GSA also noted that 'it may be appropriate to specify a non-obtrusive 'VESDA' system of detection in main heritage rooms and spaces.'<sup>575</sup> VESDA is a brand of Aspirating Smoke Detection System, also called air sampling systems. These 'consist of a network of small diameter perforated pipes connected to a detector unit.'<sup>576</sup> Stirling Castle, Hampton Court Palace, and Hill House all use these systems as they are far less visually obtrusive than other detector heads and are highly sensitive. Ultimately, a VESDA system was selected for installation during MRP1, alongside heat detectors and flame detectors in larger, high ceilinged spaces in particular.

#### 5.18 Conclusion

This chapter has shown that each fire incident and subsequent restoration and/or re-creation project has had a positive impact on the next. To encourage this exchange of knowledge and expertise, the relationships fostered between sites such as Clandon Park and the Mackintosh Building could be

<sup>&</sup>lt;sup>573</sup> Glasgow School of Art, 5.

<sup>&</sup>lt;sup>574</sup> Glasgow School of Art, 5.

<sup>&</sup>lt;sup>575</sup> Glasgow School of Art, 38.

<sup>&</sup>lt;sup>576</sup> Stewart Kidd and Sharon Haire, *Guide for Practitioners 7: Fire Safety Management in Traditional Buildings*, 2010, 2:32.

formalised into a nationwide network of buildings undergoing restoration/repair whether or not they had also suffered a disaster incident, thereby creating a knowledge exchange network. This could be done through an existing charitable or professional body such as HES or the Institute of Historic Building Conservators (IHBC). IHBC's Summer School 2019 was entitled; 'Heritage, Risk & Resilience: confronting conservation calamities', proving that this topic is a contemporary concern for practitioners and an area in need of further research. This chapter has been written to add to the scholarship in this area of research; picking-up the torch where the publications written on Hampton Court Palace, Uppark House, and Windsor Castle left off. It adds another case study restoration/recreation to the record in the hopes that it too will positively impact the next similar project.

It has also been made clear in this chapter that site access to an ongoing restoration project is of great educational value to both attendees of site visits as well as the project team. Site visits by external parties allow the exchange of ideas and promote an 'open' attitude where knowledge exchange and dissemination are at the core of the restoration project. Unlike the other restoration projects analysed at the start of this chapter MRP1 also had two PhD students connected to it, producing research about the project itself. This provides a further research legacy for MRP1 via their output, and it also gave two people the rare opportunity to gain professional experience working on an internationally important restoration project. The second fire of 2018 slowed the publication of much of the research on MRP1, written by GSA and MRP1 staff, but the research output of the project is, and will be, interdisciplinary and innovative in nature.

Ultimately, MRP1 proved that modern and traditional materials and systems can be used successfully in conjunction with each other in historic and traditional buildings, at no detriment to the building's 'authenticity'. It showed that technology, in particular laser scanning, has a huge role to play in the future of building conservation, and it confirmed that climate change adaption will now be an intrinsic part of the repair and restoration of our built heritage. The fire of 2018 physically destroyed much of the Mackintosh Building, but the research carried out during the project has ensured that lessons can still be learned from MRP1. Despite the fire, this project is still worthy of study.



Figure 5.1: Studio 58 as photographed by Bedford Lemere, 1910. Copyright HES.



Figure 5.2: On the left had side of this image you can see the small gridded windowpanes of the Embroidery Studio. Photograph taken by Bedford Lemere, 1910. Copyright HES.



Figure 5.3: The steel flanges had been inserted into new the window frames to provide strength. The metal bosses can still be seen, they would have been covered by wooden panelling. The bottom sill has been raised slightly to accommodate the steel flanges. Image taken by Rachael Purse, February 2018.



Figure 5.4: The new, lower, timber roof of Studio 58, with insulation concealed behind the sarking. Photograph taken by Rachael Purse, February 2018.



Figure 5.5: The radiators in the Library's bay windows can be seen in this photograph taken in 2014. Copyright GSA.



Figure 5.6: Laurence Macintosh, the joiners who were tasked with re-creating a bay of the Library, created this cross-section of potential underfloor heating and insulation materials Rock wool and sound-deadening. Taken by Rachael Purse, October 2017.



Figure 5.7: Horsehair matting used in the Laurence Macintosh Library Bay prototype, seen here under the floorboards of the balcony level. Taken by Rachael Purse, October 2017.



Figure 5.8: The Library being constructed, the sound-deadening stone can be seen as the underfloor heating is laid. Taken by Rachael Purse February 2018.



Figure 2: The small panes of single glazed rippled glass in place in the Hen Run. Taken by Rachael Purse, June 2018.



Figure 3: New slimline double-glazed panes and original panes of glass installed in the Embroidery Studio's windows. Taken by Rachael Purse, February 2018.



Figure 5.11: This image shows the Professors Studios as the floors were being reconstructed using de-charred roof beams from the Building as underfloor beams. Taken by Rachael Purse. September 2017.



Figure 5.12: The floor in the Studio's is re-laid using floorboards from across the site, sanded-down and re-varnished. Taken by Rachael Purse June 2018.



Figure 5.13: Tavec being used on the wooden panels in Studios throughout the Mackintosh Building to remove lead paint. Taken by Rachael Purse June 2018.



Figure 4: Seen here are the large timbers taken from the demolished sawmill in Massachusetts in Studio 58 after installation and prior to staining. Image taken by Rachael Purse, September 2017.



Figure 5.15 The Loggia on the top floor of the Mackintosh Building, with its bare brick interior and drawing desks. Photograph taken by Bedford Lemere, 1910. Copyright HES.



Figure 5.16: The original task lighting can clearly be seen in this photograph of one of the Modelling Studios. Photograph taken by Bedford Lemere, 1910. Copyright HES.



Figure 5.17: The finished plasterwork in the corridor outside the Library, note how the light is diffused across the soft suede-like finish. Image taken by Rachael Purse, February 2018.



Figure 5.18: A close-up image of the plasterwork in the corridor outside the Library. A piece of cloth was used on the float to bring the aggregate in the plaster out, creating a 'natural' texture. Image taken by Rachael Purse, February 2018.



Figure 5.195: Hazel laths in the Mackintosh Building, prior to the application of plaster. Image taken by Rachael Purse, February 2018.



Figure 6: Tulipwood Log, cut and stored in Laurence McIntosh's workshop in Edinburgh, where the Library Bay prototype was constructed. Image taken by Rachael Purse, October 2017.



Figure 5.217: Mackintosh's design for the library light fittings, pencil and watercolour on paper, 1909, copyright The Hunterian Museum, GLAHA:41746



*Figure 5.22: Mackintosh's intended layout for the library light fixtures, pencil and watercolour on paper, 1909 copyright The Hunterian Museum, GLAHA: 41747* 



Figure 5.23: Photograph of the Library lights in the Mackintosh Building, 2002, copyright GSA.

# 6. The Fire of 2018 and the Aftermath

### **6.1 Introduction**

On the evening of Friday the 15<sup>th</sup> of June 2018, a major fire started in the Mackintosh Building. Graduations had taken place for GSA students in the University of Glasgow's Bute Hall that afternoon, and with the restoration of the Mackintosh Building progressing well, there was a celebratory mood within the GSA community. At the time of writing the cause of the fire is unknown, as the SFRS Fire Report has not yet been published. This chapter does not speculate on the cause of the 2018 fire; instead, it provides a critical analysis and record of the emergency and salvage works carried out to stabilise the Building post-fire. The media reaction in the aftermath of the fire, as well as opinions on rebuilding the Mackintosh Building, differed greatly from the ones expressed after the first fire of 2014 and these topics are also discussed. The findings of evidence sessions held by the Scottish Parliament's Culture, Tourism, Europe and External Affairs Committee (CTEEAC) which was convened in 2018 in order to investigate the fire of 2018 in the Mackintosh Building, will also be examined.

This case study aims to add to the literature on the salvage of collections and historic or traditional buildings, as planning for disasters and emergencies should be an inherent part of the management of any historic or traditional building, with or without a collection. My involvement in the post-2018 fire salvage operation meant that I was able to put into practice what I had learned in theory about salvage methodologies and best practice during the course of my PhD research, and as a result, I can now provide a case study of the 2018 salvage operation for inclusion in this thesis. It should be noted that after December 2018 the salvage of the interior debris of the Mackintosh Building stalled for several reasons and did not restart until October 2019. It is ongoing at time of writing; these delays are also analysed within the case study.

#### 6.2 Post-Fire Structural Salvage

When news of the fire reached the MRP1 Team, (who were not on-site as the fire occurred outside of office hours), most immediately headed to the Mackintosh Building. The SFRS had established a cordon surrounding the Building, and adjacent tenements and nightclubs were evacuated to ensure the safety of users and occupants. At its height, there were 120 firefighters with 20 fire engines at the scene, and water had to be pumped up from the River Clyde.<sup>577</sup> The bright orange flames could be seen across the city as the fire burnt up through the building and out of the roof and windows (Fig.6.1) and Fig.6.2). The fire also spread onto the roof of the adjacent O2 ABC, a B Listed nightclub and

<sup>&</sup>lt;sup>577</sup> 'Major Fire Devastates Glasgow School of Art', *BBC News*, 16 June 2018, sec. Glasgow & West Scotland, https://www.bbc.com/news/uk-scotland-glasgow-west-44504659.

music venue (Fig.6.3) and Glasgow landmark. No one was injured as it had already been evacuated, but the building was so badly damaged it will now have to be demolished.

On the 17<sup>th</sup> of June, some GSA staff were allowed limited access to the Reid Building via its rear entrance to assess the damage to this building, as well as the adjacent Mackintosh Building. By the next day the fire 'had been largely extinguished', but 'a few pockets of fire' remained and were being doused by the SFRS.<sup>578</sup> The Reid Building had suffered damage to the large bespoke plate glass panels affixed to its exterior, but other than some water damage to interior plasterwork it remained in good condition.<sup>579</sup> Debris and masonry fragments had exploded outwards from the Mackintosh Building during the fire, most likely due to thermal shock from the cold water used in the firefighting efforts, shattering the glass plates on the Reid's exterior and showering glass across Renfrew Street (Fig.6.4).

On the 19<sup>th</sup> of June 'with the support of Scottish Fire and Rescue Service and Police Scotland, a team of experts', and GSA and MRP1 staff entered the cordon to begin assessing the condition of the Mackintosh Building.<sup>580</sup> Emergency meetings were being held by the GSA and MRP1 Team and it was decided that 'detailed photography and aerial drone footage' surveys should be undertaken so that a condition assessment of the Building could begin as quickly as possible. As the Mackintosh Building and the buildings surrounding it were made inaccessible due to the cordon, it was difficult to fully assess the damage done to the structure and interior fabric. The drone was able to provide aerial images of the Building as well as fly alongside the facades, gaining views of the interiors through the blown-out windows. The footage captured by the drones was then pored over by MRP1 team members, including Dominic Echlin, Conservation Engineer from David Narro Associates. The GSA's School of Simulation + Visualisation also laser scanned the Building using drones, this data will be compared with scan data captured before the 2018 fire and will provide a digital record of the Building before, during, and after emergency structural works took place.<sup>581</sup>

Some footage from the drone surveys was released by the GSA, and is still available online, revealing the extent of the damage caused to the public. The GSA also announced at this point that the Reid and Bourdon Buildings would remain closed until July 2<sup>nd</sup>, but the cordon would remain in place for many

<sup>&</sup>lt;sup>578</sup> Glasgow School of Art, 'Latest Statement from Scottish Fire and Rescue Service (SFRS)', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 18 June 2018, http://www.gsa.ac.uk/about-gsa/keyinformation/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>579</sup> Glasgow School of Art, 'Statement on the Mackintosh Building 4 October Work on West Gable on Schedule', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 4 October 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

 <sup>&</sup>lt;sup>580</sup> Glasgow School of Art, 'Statement from the GSA 19 June 2018 - Work to Assess the Condition of the Mackintosh Building Underway', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 19 June 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.
<sup>581</sup> Glasgow School of Art.

more weeks.<sup>582</sup> There was a great deal of media coverage about the fire, with many publications and commentators raising concerns that the Mackintosh Building was so badly damaged it would have to be demolished. However, on the 20<sup>th</sup> of June, writing for *Dezeen*, Mark Cousins disagreed, pronouncing that in the aftermath of the 2018 fire 'talk of wholesale demolition is a distraction' and that 'Glasgow School of Art carries with it an immense historical burden. It simply cannot be razed.'<sup>583</sup>

#### 6.2.1 Planning Process and Initial Steps

On June 25<sup>th</sup> Dominic Echlin was able to produce an *Initial Structural Report* on the Mackintosh Building, based on the collated drone surveys. At this time 'a series of point monitoring stations' were also being set-up; readings were being taken from them twice a day to 'give an accurate assessment of any ongoing movement in the façade.'. <sup>584</sup> However, further surveys were necessary, and Echlin was making arrangements for mobile elevated working platforms to be brought on-site as this would 'allow a close visual inspection of the building 'from high level and above'; this was considered 'a fundamental requirement for understanding the building and its current condition.'<sup>585</sup> The fact that the Mackintosh Building was a live construction project at the time of the 2018 fire meant that experts such as Echlin, as well as other MRP1 team members, were able to quickly spring into action.

By the 27<sup>th</sup> of June 'working with its team of structural experts', the GSA finally 'had an opportunity to continue its assessment of the structural integrity of the Mackintosh Building' using cranes and mobile working platforms.<sup>586</sup> Reigart, demolition and down taking experts, became the site contractor. Once collated, the survey information was shared with Glasgow City Council (GCC) Building Control.<sup>587</sup> At this point the GSA released the following statement:

The detailed visual assessment shows that damage to the Mackintosh Building is significantly greater than had initially been anticipated from ground visual assessment and the data from the drone and scanning footage which were undertaken last week.<sup>588</sup>

Reigart, David Narro Associates, and the GSA then developed 'a plan of works to achieve structural stability of the building', which would then be presented to HES and GCC Building Control for their

<sup>587</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>582</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>583</sup> Mark Cousins, 'Glasgow School of Art Simply Cannot Be Razed', Dezeen, 20 June 2018,

https://www.dezeen.com/2018/06/20/glasgow-school-of-art-fire-rebuild-opinion-mark-cousins/.

<sup>&</sup>lt;sup>584</sup> Dominic Echlin, 'Initial Structural Inspection of the Mackintosh Building' (David Narro Associates, 25 June 2018), 2.

<sup>&</sup>lt;sup>585</sup> Dominic Echlin, 2.

<sup>&</sup>lt;sup>586</sup> Glasgow School of Art, 'Statement from The Glasgow School of Art on the Mackintosh Building 28/06/18', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 28 June 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>588</sup> Glasgow School of Art.
approval.<sup>589</sup> The GSA made it clear that at this point 'the areas of significant concern' were 'the east elevation, the west elevation and sections of the south elevation.'<sup>590</sup> This meant that Reigart would be 'undertaking extensive down takings and potential structural bracing... in a highly controlled way to minimise any potential risk of failure and be sufficient to achieve structural stability of the Mackintosh Building.'<sup>591</sup> The GSA also stated that; 'the aim of the GSA and GCC will be to return normal access for residents and businesses as soon as possible', and that 'when the plan of works has been agreed with HES and GCC Building Control it will be made public.'<sup>592</sup>

On the 28<sup>th</sup> of June, GCC confirmed that 'a significant part' of the Mackintosh Building 'will need to be urgently dismantled because it is dangerously unstable'.<sup>593</sup> The same day *The Guardian's* Scotland Editor, Severin Carrell, reported that the dismantling would 'be carried out in a controlled manner to prevent the structure's catastrophic collapse, and ensure the stability of surviving walls.'<sup>594</sup> *The Daily Record*, however, ran a headline stating; 'Glasgow School of Art to be demolished after fire amid fears it will collapse any day now'.<sup>595</sup> The article itself clarified this headline, by explaining that 'parts of Glasgow School of Art will be demolished', and that work to 'dismantle' sections of the building would be starting that week.<sup>596</sup> There is an issue here with the definition of the word 'downtaking', a term used widely in the construction sector to describe the careful dismantling of a structure, but not common knowledge to most people. Miles Glendinning also spoke to the BBC about the process of dismantling a building and said that whilst this kind of process 'hasn't really been used for 19<sup>th</sup> or 20<sup>th</sup>-century buildings', he could not 'see why not.'<sup>597</sup>

On the 29<sup>th</sup> of June, it was announced that 'Glasgow School of Art and Kier Construction Scotland Limited confirm they have jointly concluded that the current contract for the Mackintosh Building restoration will end with immediate effect.'<sup>598</sup> This step enabled control of the site to be handed over to its new contractors, in this case, Reigart, the demolition experts. The GSA was fully aware that their conservation and downtaking strategy, which had to be approved by HES and GCC, had to be

<sup>&</sup>lt;sup>589</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>590</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>591</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>592</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>593</sup> Severin Carrell, 'Large Part of Glasgow School of Art to Be Urgently Dismantled', *The Guardian*, 28 June 2018, sec. UK news, http://www.theguardian.com/uk-news/2018/jun/28/large-part-glasgow-school-of-art-demolished-urgently.

<sup>&</sup>lt;sup>594</sup> Severin Carrell.

<sup>&</sup>lt;sup>595</sup> Kathleen Speirs, 'Glasgow School of Art to Be Demolished amid Fears It Will Collapse Any Day Now', *The Daily Record*, 28 June 2018, https://www.dailyrecord.co.uk/news/scottish-news/glasgow-school-art-demolished-after-12811116.

<sup>596</sup> Speirs.

<sup>&</sup>lt;sup>597</sup> Paul O'Hare, 'What Now for the Mackintosh Building?', *BBC News*, 28 June 2018, sec. Scotland, https://www.bbc.com/news/uk-scotland-44645097.

<sup>&</sup>lt;sup>598</sup> Glasgow School of Art, 'Joint Statement by The Glasgow School of Art and Kier Construction Limited 29/06/18', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 29 June 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

produced quickly. Whilst there had been no major debris falls since the fire, the Building was nevertheless still at risk of further deterioration, and Echlin warned that at this stage the condition of the structure would not remain static. This deterioration would be 'largely dictated by the weather'.<sup>599</sup> Heavy rain and wind could have caused further damage to the Building, so the weather report had to be carefully monitored. Strong winds and rain could also halt downtaking works as it would not be safe for Reigart operatives to work from a height in such conditions. There were also increasing external pressures to reduce the GCC cordon and allow people back into their homes and businesses, the works, therefore, had to commence as soon as was possible. A conservation working group, including Page\Park architects and the MRP1 Project Management Team, was therefore formed to plan the emergency works. By the 2<sup>nd</sup> of July David Narro Associates and the GSA were able to present their downtaking methodology to GCC Building Control and HES, whilst the cordoned area remained under the control of GCC.<sup>600</sup> Unstable, and therefore dangerous, sections of the Mackintosh Building were to be carefully taken down by hand by Reigart operatives, who were saving as much original fabric as was possible in the process.

### 6.2.2 Dismantling and Downtaking Works

The dismantling works began on the 10<sup>th</sup> of July, with Dominic Echlin saying that:

The primary aim of the initial works is to make the building safe and structurally stable... It is important to understand that our agreed approach is the safest way to dismantle the dangerous elements of the building and, importantly, ensure there is no damage to nearby properties or risk to those working on site.<sup>601</sup>

The GSA evoked the 'brick by brick' conservation philosophy of MRP1 architects Page\Park when they confirmed that 'masonry and brickwork will need to be dismantled in a controlled manner, brick by brick, block by block' (Fig. 6.5).<sup>602</sup> That this phrase would be being employed to describe the dismantling of the badly damaged Building when it had been almost fully restored would have been unthinkable when it was first used by Page\Park. Where stonework had been 'assessed as significantly damaged and too dangerous to lift off the building' it had to be 'pushed into the interior' of the Mackintosh Building, where it would later be removed during the interior salvage works (Fig. 6.6).<sup>603</sup>

<sup>&</sup>lt;sup>599</sup> Dominic Echlin, 'Initial Structural Inspection of the Mackintosh Building', 8.

<sup>&</sup>lt;sup>600</sup> Glasgow School of Art, 'Statement from The Glasgow School of Art, 2 July 2018', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 2 July 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>601</sup> Glasgow School of Art, 'Update 10/07/18 Work Begins to Dismantle Dangerous Sections of the Mackintosh Building', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 10 July 2018,

http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/. 602 Glasgow School of Art.

<sup>&</sup>lt;sup>603</sup> Glasgow School of Art, 'Update 18/07/18 Statement from The Glasgow School of Art on the Progress of the Dismantling Work', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 18 July 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

The GSA made it clear that the downtaking was 'expected to take several weeks', and that as work progressed GCC Building Control would continue to assess a possible reduction in the exclusion cordon around the site.<sup>604</sup>

Tom Inns ended 'weeks of speculation' in his first interview since the 2018 fire on the 10<sup>th</sup> of July with *The Guardian* by stating; 'we're going to rebuild the Mackintosh building... from our point of view [the GSA's] and the city of Glasgow, it is critically important that the building comes back as the Mackintosh Building.'<sup>605</sup> Inns also confirmed that 'the rebuild costs would be covered by insurers.'<sup>606</sup> He went on to express that 'he was confident that many of the questions raised about how the building could have suffered another devastating fire,... would be answered by an ongoing investigation' by the SFRS.<sup>607</sup> As previously stated, the Fire Report has not yet been published. Its production is a process which the GSA has no control over, and the delay in its publication has not only put a hold on receiving the insurance monies necessary for a rebuild, but has also left the public without any concrete answers as to how the fire started, how it spread, or how it could have been prevented, which has allowed speculation on the subject to continue unchecked.

By the 24<sup>th</sup> of July, down taking works were 'going to plan', however, 'most of the material removed during this week was too badly damaged to retain and was therefore moved safely into the building.'<sup>608</sup> This meant that 'a limited amount of material which was in a good enough condition for retention was brought off the building for recording' and could then 'be removed off-site for storage.'<sup>609</sup> On the 31<sup>st</sup> of July stabilisation works began, and 'on the east gable remedial steel restraint strapping was installed', allowing for all of the mangled fire damaged scaffolding to be removed.<sup>610</sup> Meanwhile, a huge shoring scaffolding system was being designed by David Narro Associates, which were then shared with GCC Building Control.<sup>611</sup> This new scaffolding system was approved and was installed by SGB from 2<sup>nd</sup> of August.<sup>612</sup>

<sup>&</sup>lt;sup>604</sup> Glasgow School of Art, 'Update 10/07/18 Work Begins to Dismantle Dangerous Sections of the Mackintosh Building'.

<sup>&</sup>lt;sup>605</sup> Libby Brooks, 'Mackintosh Building Will Be Rebuilt, Says Glasgow School of Art Director', *The Guardian*, 10 July 2018, sec. UK news, http://www.theguardian.com/uk-news/2018/jul/10/mackintosh-building-will-be-rebuilt-says-art-school-director.

<sup>606</sup> Libby Brooks.

<sup>607</sup> Libby Brooks.

 <sup>&</sup>lt;sup>608</sup> Glasgow School of Art, 'Update 24/07/18 Statement from the Glasgow School of Art on Further Progress
Made on Mackintosh Building Dismantling', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 24
July 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.
<sup>609</sup> Glasgow School of Art.

 <sup>&</sup>lt;sup>610</sup> Glasgow School of Art, 'Update 31/07/18 Statement from The Glasgow School of Art Work Progressing on Three Sides of the Mackintosh Building', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 31 July 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.
<sup>611</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>612</sup> Glasgow School of Art, 'Update 07/08/18 Statement from The Glasgow School of Art Stabilisation of East Gable Takes Another Step Forward Work on Shoring Scaffolding on Dalhousie Street Gable Underway', *Key* 

#### 6.2.3 The Contentious Cordon

GCC began to reduce the cordon surrounding the Mackintosh Building from the 25<sup>th</sup> of August.<sup>613</sup> Tom Inns stated that 'our number one priority has been getting people back into their homes and business[es]'.<sup>614</sup> The Guardian reported that c.350 business owners and staff, as well as c.67 local residents, had been unable to enter their homes and properties since the fire (Fig.6.7).<sup>615</sup> All displaced residents were rehoused and given a £3000 hardship grant by the Scottish Government and GCC, and the Scottish Government announced the creation of a £5 million fund for businesses affected by the fire, but there were 'complaints about the quality of the temporary accommodation.'616 Displaced residents and business owners from within the cordon staged several protests to express their outrage at the lack of support and information they had received from GCC, whilst the GSA repeated that the dismantling process was the only course of action which would prevent further damage to surrounding properties and ensure public safety. The contentious issue of the cordon highlighted how crucial disaster and emergency planning is for all organisations, from small businesses to local authorities. It is not enough to plan for a disaster in your own building, consideration must be given to how a disaster in a neighbouring building or street could impact your organisation/property. Local authorities, in particular, should have plans in place to provide suitable temporary accommodation for its tenants should a variety of emergency or disaster scenarios occur, including property damage caused by flooding and fires, and terrorist attacks.

Catriona Stewart of the *Evening Times* asserted that whilst 'the devastation caused to the Mackintosh Building is heart-breaking, the damage to the adjacent ABC is worth attention too', as 'it is also a building that holds many memories for Glasgow's population.'<sup>617</sup> Stewart also drew attention to the 'ripple effect' of the closure of this large capacity venue on other businesses on Sauchiehall Street, much of which would remain under a cordon for many weeks.<sup>618</sup> Kevin McKenna, a columnist for the *Observer*, wrote a piece for *The Guardian* focusing on the importance of Sauchiehall Street as a place

*Information: Mackintosh Building Fire 15 June 2018* (blog), 7 August 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>613</sup> Glasgow School of Art, 'Statement on the Mackintosh Building 25 August', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 25 August 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>614</sup> Glasgow School of Art.

<sup>&</sup>lt;sup>615</sup> Libby Brooks, 'Locals Decry "tortuous" Exclusion after Glasgow School of Art Fire', *The Guardian*, 13 August 2018, https://www.theguardian.com/education/2018/aug/13/glasgow-school-of-art-fire-locals-call-public-inquiry.

<sup>616</sup> Libby Brooks.

<sup>&</sup>lt;sup>617</sup> Catriona Stewart, 'The Glasgow School of Art Fire Is Devastating but We Must Remember the ABC Too', *Evening Times*, 18 June 2018,

http://www.eveningtimes.co.uk/news/16296807.Catriona\_Stewart\_\_The\_Glasgow\_School\_of\_Art\_fire\_is\_dev astating\_but\_we\_must\_remember\_the\_ABC\_too/.

<sup>&</sup>lt;sup>618</sup> Catriona Stewart.

that has become 'emblematic of Glasgow'.<sup>619</sup> McKenna believes that if the Mackintosh Building is 'rebuilt, brick-by-brick, regardless of cost', then the Building should come 'under public ownership' and should be 'administered by a consortium of our main heritage agencies'.<sup>620</sup> This radical suggestion would mean that the Scottish Government would somehow have to forcibly purchase or otherwise remove the Mackintosh Building from its current owners, the GSA.

The fact that the restoration and re-creation of the Mackintosh Building would be paid for via insurance money, and via public funding was not understood by Annie Brown, a columnist for the Daily Record. Brown believes that 'the potential cost of £200 million to restore a building when half the city's children live in poverty is vulgar.<sup>621</sup> It is important to examine the provenance of this £200 million figure. The GSA had not made a statement regarding the cost of restoring and re-creating the Mackintosh Building when Brown's article was published on the 20<sup>th</sup> of June, so this figure is speculative. Previously, Professor Billy Hare of Glasgow Caledonian University, who was not involved in MRP1, told the BBC he thought that 'a rebuild could cost up to £100m while the bill could rise to more than £200m if the green light is given for a complete restoration.<sup>22</sup> Hare could, therefore, be the source for Brown's figure. At the time of writing, no monetary figure has been released by the GSA, Brown's statement is therefore supposition. Brown appears to suggest that this money would be coming from public funds, which she believes would be better spent elsewhere. In reality, the money to pay for the re-creation and reconstruction of the Mackintosh Building would be coming from its insurers, and could therefore only be spent on the reconstruction of the Building and related activities. However, the GSA did not confirm any of the above until the 10<sup>th</sup> of July, when Director Tom Inns gave his first interview to the press since the fire.<sup>623</sup> The GSA's delay in releasing the information about their insurance position meant that other commentators, such as Hare and Brown, could step into the void and posit their own theories and opinions, potentially causing damage to the reputation of the GSA in the process.

Since the fires at Hampton Court Palace, Uppark House, and Windsor Castle, the way we consume news has been revolutionised; we now have a 24-hour news cycle, and the first reports of the 2018 fire were to be found on Twitter and Facebook. Clear communication strategies for similar events should, therefore, be a part of a robust emergency and disaster plan, ensuring that accurate information is shared locally, nationally, and globally. Heritage is a shared resource and effectively

<sup>&</sup>lt;sup>619</sup> Kevin McKenna, ""Sauchie" Means Too Much to Scots for It to Suffer This Terrible Decline | Kevin McKenna', *The Guardian*, 8 July 2018, sec. Opinion, http://www.theguardian.com/commentisfree/2018/jul/08/glasgow-sauchiehall-street-mackintosh-fire.

<sup>620</sup> McKenna.

<sup>&</sup>lt;sup>621</sup> Annie Brown, 'Spending £200m on Glasgow School of Art Is Vulgar When City's Kids Live in Poverty', *Daily Record*, 20 June 2018, https://www.dailyrecord.co.uk/news/scottish-news/spending-200m-glasgow-school-art-12744794.

<sup>&</sup>lt;sup>622</sup> O'Hare, 'What Now for the Mackintosh Building?'

<sup>&</sup>lt;sup>623</sup> Libby Brooks, 'Mackintosh Building Will Be Rebuilt, Says Glasgow School of Art Director'.

communicating accurate information about our heritage is crucial to the way it is viewed, understood and appreciated, this becomes even more important in emotive situations such as a devastating fire in a beloved building.

# 6.2.4 Stabilisation Works

By the 11<sup>th</sup> of September, the GSA was able to announce that 'the 8-week programme for the managed downtaking of the dangerous high-level elements of the Mackintosh Building' was 'now virtually complete.'<sup>624</sup> The 'bracing scaffolding' which would ensure the Building remained structurally stable was also almost fully installed.<sup>625</sup> However, more work was still needed to stabilise the badly damaged Library Tower in the West Gable, which meant that the neighbouring buildings and businesses could not reopen as yet. By October 4<sup>th</sup>, the GSA and SGB, the scaffolding specialists, had been able to install over 450 tonnes of steel scaffolding to 'ensure maximum stability' of the Mackintosh Building, and a 'substantial steel cage' was also 'being erected over the former library tower' to provide this particularly fragile area with extra support and protection (Fig.6.8).<sup>626</sup> Bad weather delayed these works, which were finally completed on the 19<sup>th</sup> of October.

# 6.3 Current Condition of the Mackintosh Building

At the time of writing the Mackintosh Building remains in a stabilised condition. However, its exposure to the elements is a concern. As a roofless ruin, the Building needs more protection against the elements. Monoflex wrapping was installed to provide a degree of protection but this is not a long-term solution as the material can tear and fly-off, and is not easily re-installed. Of most immediate concern is the Library Tower, and its weakened stone window piers, which will become increasingly fragile as time goes on.

Due to delays caused by the Coronavirus Pandemic, works on the Mackintosh Building and the Reid Building had to be halted in March 2020, and could not restart until July 2020.

### 6.4 To re-create or not to re-create?

*The Guardian's* Architectural Critic Oliver Wainwright eloquently summarised the debate over the Mackintosh Buildings future in the immediate aftermath of the 2018 fire; 'the smoke has barely cleared over the blackened carcass of the Glasgow School of Art... but the architecture world is already alight with debate about what it should do next.'<sup>627</sup> Similarly, John Glenday, editor of *Urban* 

<sup>&</sup>lt;sup>624</sup> Glasgow School of Art, 'Statement on the Mackintosh Building 11 September', *Key Information: Mackintosh Building Fire 15 June 2018* (blog), 11 October 2018, http://www.gsa.ac.uk/about-gsa/key-information/mackintosh-building-fire-15-june-2018/.

<sup>&</sup>lt;sup>625</sup> Glasgow School of Art.

 <sup>&</sup>lt;sup>626</sup> Glasgow School of Art, 'Statement on the Mackintosh Building 4 October Work on West Gable on Schedule'.
<sup>627</sup> Oliver Wainwright, 'Bulldoze or Rebuild? Architects at Odds over Future of Glasgow School of Art', *The Guardian*, 19 June 2018, sec. Art and design,

*Realm Magazine*, said; 'we've had these arguments before, after the first fire in 2014'.<sup>628</sup> These arguments played out in the media are not unique to the Mackintosh Building, they happen in the wake of all fire events which cause damage to the historic built environment.

On the 18<sup>th</sup> of June, a *BBC News* article asked; 'Demolition or Restoration: What should happen to the Glasgow School of Art?'.<sup>629</sup> It went on; 'can the [Mackintosh] building..., be saved and restored or will it have to be taken down and rebuilt from scratch?'.<sup>630</sup> This article was typical of the kind being produced in the aftermath of the 2018 fire, as it was full of speculation and the opinions of external 'experts', that is to say, individuals who worked within related fields such as architecture and construction, but who were not involved in MRP1. In this *BBC News* article Professor Bill Hare from Glasgow Caledonian University, 'said that there was a "growing consensus" the globally significant building would have to be pulled down.'<sup>631</sup> It was not specified which group of people was producing this consensus, however, I can confirm it did not include members of the MRP1 Project Team.

Miles Glendinning, Architectural Historian and Director of the Scottish Centre for Conservation Studies voiced another opinion, stating that 'he would be "very surprised" if the building had to be knocked down and rebuilt, saying the walls could instead be reinforced.<sup>632</sup> Glendinning is quoted as saying that the Mackintosh Building 'should be restored and will be restored.<sup>633</sup> He also pointed out that due to the laser scanning of the Mackintosh Building after the 2014 fire and during MRP1 that 'the building still exists digitally even if the inside is for the moment physically absent.'<sup>634</sup> Whilst Architectural author Robin Ward asked the unanswerable question, 'what would Mackintosh do, were he around today?'.<sup>635</sup> Professor Alan Dunlop, visiting Professor at Robert Gordon University, and former GSA student, questioned 'whether a reconstruction, done brick-by-brick, would be truly authentic', and 'said he believes Charles Rennie Mackintosh himself would favour a modern building on the site.'<sup>636</sup> Dunlop, who had no involvement in MRP1 or the salvage operation which followed the 2018 fire, told *Dezeen* that 'there is very little left to restore' and that Charles Rennie Mackintosh 'would not approve of pastiche or replication.'<sup>637</sup> However, it has been argued in this thesis that

<sup>633</sup> 'Demolition or Restoration'.

http://www.theguardian.com/artanddesign/2018/jun/19/bulldoze-or-rebuild-architects-at-odds-over-future-of-glasgow-school-of-art.

<sup>&</sup>lt;sup>628</sup> 'Demolition or Restoration: What next for the Mack?', *BBC News*, 18 June 2018, sec. Glasgow & West Scotland, https://www.bbc.co.uk/news/uk-scotland-glasgow-west-44519443.

<sup>&</sup>lt;sup>629</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>630</sup> 'Demolition or Restoration'.<sup>631</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>632</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>634</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>635</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>636</sup> 'Demolition or Restoration'.

<sup>&</sup>lt;sup>637</sup> Amy Frearson, "Don't Create a Sad Replica of Glasgow School of Art" Says Alan Dunlop', *Dezeen*, 19 June 2018, https://www.dezeen.com/2018/06/19/glasgow-school-of-art-fire-dont-create-sad-replica-alan-dunlop-opinion/.

Charles Rennie Mackintosh may well have been a conservationist, and as he was heavily influenced by Scottish Baronial Architecture, it could also be argued he that he was a Revivalist, as well as a noted member of the Art and Crafts Movement; all styles and movements which rely on some form of 'replication'.

Artist Lachlan Goudie, writing for *The Times* 'Saturday Review' described Mackintosh as 'the greatest and perhaps only genius in the story of Scottish art', and believed that:

Mackintosh would have been horrified to see his designs being pastiched, packaged and sold in gift shops. But that sense of despair would be nothing compared with his misery at seeing what we have allowed to happen, twice, to his greatest masterpiece, the Glasgow School of Art.<sup>638</sup>

Goudie goes on to worry that 'the soul' had been 'ripped out' of the Mackintosh Building, however, he concludes that the Building should be 'resurrected' and 'rebuilt', with the conditions that 'it must be undertaken faithfully, honestly and with the same attention to detail and intolerance of compromise that Mackintosh would have insisted on. That is how you make a masterpiece.'<sup>639</sup> I would argue quite the contrary, compromise and negotiation is at the heart of any successful conservation or restoration project. Mackintosh Research Fellow Robyne Calvert also agrees, she believes that 'this romanticised notion of Mackintosh as a 'Creator-Genius' is where problematic and wrong-headed views that the Mack cannot or should not be rebuilt' spring from.<sup>640</sup> Calvert highlights that whilst Mackintosh was 'an architect-designer' he was 'at the helm of a project that was created by many hands, and asserts that the Mackintosh Building 'is a work of design, and a design that worked. Design is an iterative process, and the building itself had evolved through a century of change. This is another tragic chapter, but not the end.'<sup>641</sup> Statements I wholeheartedly agree with.

Turner prizewinning GSA alumni Martin Boyce commented that after the fire of 2018 he had 'heard people speaking on Mackintosh's behalf', in terms of Mackintosh's disapproval of 'replication'.<sup>642</sup> However, Boyce believed that the destruction caused by the fire was not 'an opportunity for a new architectural response to this traumatic event'; He went on to say that:

<sup>&</sup>lt;sup>638</sup> Lachlan Goudie, 'The Glasgow School of Art Fire: "It's as If the Soul Has Been Ripped out of Charles Rennie Mackintosh's Masterpiece", *The Times*, 14 July 2018, sec. Saturday Review,

https://www.thetimes.co.uk/article/the-glasgow-school-of-art-fire-its-as-if-the-soul-has-been-ripped-out-of-charles-rennie-mackintoshs-masterpiece-f3l8pz68g.

<sup>639</sup> Goudie.

 <sup>&</sup>lt;sup>640</sup> Robyne Calvert, Impromptu conversation on the problematic 'genius' trope, Facetime, 15 July 2020.
<sup>641</sup> Robyne Calvert.

<sup>&</sup>lt;sup>642</sup> Martin Boyce, 'Can Glasgow School of Art Rise from the Ashes? Turner Prize Winners and Nominees on What Made It so Magical', *Frieze* (blog), accessed 1 August 2019, https://frieze.com/article/can-glasgow-school-art-rise-ashes-turner-prize-winners-and-nominees-what-made-it-so-magical.

There is a strange vanity to the idea that this moment could be an opportunity for new architecture. The fire has no meaning or significance, it's not a sign of anything. We have an architect and a building and it's one of the greatest. It is crystal clear to me that the building must be rebuilt. This moment, the fires and the voices around this issue are just a blip in history. What matters is that in 20 or 50 years from now people can push open those swing doors, walk-in and study art in the Mack.<sup>643</sup>

Mackintosh expert and gallerist Roger Billcliffe, like many conservation architects, disagreed with Dunlop's approach, stating that he saw 'no argument for why you wouldn't rebuild the school of art as it was', citing the Reid Building as an example of what happens when you 'get a good modern architect instead'.<sup>644</sup> The Stephen Holl designed Reid Building has previously been described by Architectural Critic Oliver Wainwright as 'looming opposite the Mackintosh with all the elegance of a discarded fridge.'<sup>645</sup>

Julian Harrap, one of the architects behind the much-lauded restoration of the Neues Museum in Berlin, stated that the next step of excavating the debris inside the Building would be crucial; 'there will be piles of material lying at the bottom of the building that can be easily repaired and reused... Think of Mackintosh's metalwork: every door had hinges, locks, push plates, the most fantastic material, which could still be there.'646 However, Harrap was 'emphatic that building an exact replica is not the right way forward', stating that it 'would be a disgrace to our profession'.<sup>647</sup> The 'idea of knocking it down and building something entirely new is equally unacceptable' to Harrap, he instead warns that 'we have to tread a fragile middle ground', suggesting that 'the shell of the building' should be retained and combined with 'a very simple interior, with memories of Mackintosh where they're available'.<sup>648</sup> Harrap also suggested that the GSA should seek to acquire adjoining properties damaged in the 2018 fire 'to satisfy the needs of a modern art school, rather than trying to shoehorn everything into the reconstructed shell' further expanding the campus.<sup>649</sup> This 'fragile middle ground' approach was employed by Harrap and architect David Chipperfield to carry out the acclaimed restoration of the Neues Museum. However, Wainwright cautions that this approach, 'if bodged... could be another act of reckless "facadism", an insult to Mackintosh by keeping his hollow stone mask as a redundant husk of history.'650

<sup>648</sup> Wainwright.

<sup>&</sup>lt;sup>643</sup> Martin Boyce.

<sup>&</sup>lt;sup>644</sup> Wainwright, 'Bulldoze or Rebuild?'

<sup>&</sup>lt;sup>645</sup> Wainwright.

<sup>646</sup> Wainwright.

<sup>&</sup>lt;sup>647</sup> Wainwright.

<sup>&</sup>lt;sup>649</sup> Wainwright.

<sup>650</sup> Wainwright.

Tony Barton, of Donald Insall Associates, the architects who carried out the post-fire restoration of Windsor Castle believed that:

There is not one single technical reason why it cannot be fully restored. There are very few buildings in the world for which you can argue for total reconstruction, but this is one of them. It's not just about the façade: Mackintosh designed every corner of the thing down to every last detail. Even the back stairs were beautiful.<sup>651</sup>

Mark Cousins, teaching fellow in architecture at the University of Edinburgh agrees, basing his argument for complete re-creation within a national and international context:

The school is not only integral to the nation's [Scotland's] self-image but also embedded within a wider international discourse. Liberal historians and commentators may speculate on notions of national identity, but the GSA needs to be seen as symbolic architecture, which effectively transcends petty concerns such as budgetary constraints.

Cousins believes that 'the project affords Scotland immeasurable kudos and this disaster represents an opportunity to reflect on a broader philosophical narrative.'<sup>652</sup> He, therefore, considers it 'paramount that the GSA is rebuilt as a showcase for Scottish craft skills and a testament to Mackintosh's influential role in the development of contemporary design culture.'<sup>653</sup> Cousins reasons that 'we may only be able to retain the façade but Page\Park are talented architects and can comprehensively incorporate salvaged elements within the proposition.'<sup>654</sup> He was also adamant that after it is recreated 'the building must not be relegated to mere museum status but remain a functioning art college.'<sup>655</sup>

Architect John McAslan wrote a piece for *The Guardian* in which he agrees with Cousins assessment of the Mackintosh Buildings importance, describing it as a 'work of international cultural heritage of the highest order'.<sup>656</sup> For that reason, he feels that 'the question of how best to save what is left deserves the utmost consideration, and cannot be left to the GSA alone.'<sup>657</sup> McAslan also urged the GSA to consider 'alternative uses for the restored building'.<sup>658</sup>

<sup>&</sup>lt;sup>651</sup> Wainwright.

<sup>&</sup>lt;sup>652</sup> Mark Cousins, 'Glasgow School of Art Simply Cannot Be Razed'.

<sup>&</sup>lt;sup>653</sup> Mark Cousins.

<sup>&</sup>lt;sup>654</sup> Mark Cousins.

<sup>655</sup> Mark Cousins.

<sup>&</sup>lt;sup>656</sup> John McAslan, 'Glasgow School of Art Must Be Rebuilt – with No Corners Cut | John McAslan', *The Guardian*, 11 July 2018, sec. Opinion, http://www.theguardian.com/commentisfree/2018/jul/11/glasgow-school-of-art-charles-rennie-mackintosh-fire.

<sup>&</sup>lt;sup>657</sup> McAslan.

<sup>658</sup> McAslan.

Some commentators took the fire of 2018 as an opportunity to air their views about the GSA as an institution, one of these individuals was artist and GSA alumni John Byrne, who wrote an acidic piece entitled 'The School that Died of Shame':

It's no coincidence, in my view, that 'The Mack as it was dubbed by 'Johnny-come-latelys', was no longer in use as a working Art School (neither students nor staff can actually draw) but switched roles to become, instead, a 'museum', then throws itself onto the funeral pyre on the one hundred and fiftieth anniversary of Rennie Mackintosh's birth.<sup>659</sup>

None of the views recorded above are 'wrong', nor are any of them inherently 'right'. The conservation and restoration of built heritage is a complex, interdisciplinary, and emotive subject, especially after a disaster has caused such unexpected destruction. Whilst I am against attempting to guess what Charles Rennie Mackintosh would think about re-creating the Mackintosh Building in the wake of the 2018 fire, it is important to respect the memory, work, and philosophies, of the creator of a piece of art and/or design. Usually, this is done through the careful preservation of their works, however, when their works have been damaged or destroyed, we are faced with the challenging question of what to do next. There is no 'right' or easy answer, which is what makes conservation such a fascinating and lively discipline. Discussions will soon have to be had between the GSA staff and student body, HES, the MRP1 Team, the local community, and various experts, to establish a conservation philosophy for the Mackintosh Building. Ultimately, this philosophy will be based on contemporary conservation philosophies expounded by organisations like ICOMOS and HES, statutory and legal requirements, budget restraints, and the needs of the Mackintosh Building's users and owners.

### 6.5 Attempts to Lay Blame

*The Guardian* published 'The Guardian View' on the 'Mackintosh Fire' on the 19<sup>th</sup> of June 2018. The piece began by stating that 'the gutting fire of Glasgow School of Art's Mackintosh building is a huge loss to Scotland and the world.'<sup>660</sup> The anger surrounding the fire was acknowledged as 'fully understandable, and right', and *The Guardian* also made it clear that 'Kier Construction, the contractor that had day-to-day charge of the site, has a case to answer.'<sup>661</sup> Specifically, 'questions about fire prevention and why a sprinkler system wasn't operational require an answer'.<sup>662</sup> It was also

<sup>&</sup>lt;sup>659</sup> John Byrne, 'The School That Died of Shame', Sunday Post (blog), 2018,

https://www.sundaypost.com/fp/artist-john-byrne-says-the-glasgow-school-of-art-died-of-shame-and-had-lost-its-soul-before-being-destroyed-by-fire/.

<sup>&</sup>lt;sup>660</sup> Editorial, 'The Guardian View on the Mackintosh Fire: How to Rebuild Is Scotland's Choice | Editorial', *The Guardian*, 19 June 2018, sec. Opinion, http://www.theguardian.com/education/2018/jun/19/the-guardian-view-on-the-mackintosh-fire-how-to-rebuild-is-scotlands-choice.

<sup>&</sup>lt;sup>661</sup> Editorial.

<sup>662</sup> Editorial.

recognised that 'the School of Art too must account for its stewardship of the Mack'.<sup>663</sup> The 2018 fire was all the more unacceptable given the 2014 fire, after which 'neither an individual act of negligence nor a broader failure of process or leadership was blamed. In the aftermath of the second fire', *The Guardian* felt that 'responsibility must not be ducked.'<sup>664</sup>

Some commentators were looking at the 2018 fire in the wider context of the built heritage of Glasgow, with Paul Sweeney, then the Glasgow North East MP declaring that the city 'urgently needed a comprehensive strategy for preserving its ageing stock of Victorian architecture'.<sup>665</sup> He went on to say that; 'it's not just a problem that exists in Glasgow, it's a problem facing all British cities... we can't just rely on the national lottery and ad hoc projects to fund it [the historic built environment].<sup>666</sup> Columnist Annie Brown also looked at the fire in a national context, reminding readers that the 2018 fire in the Mackintosh Building took place 'the day after the first anniversary of the Grenfell Disaster', stating that 'the death of 72 people in one of the UK's worst tragedies is not comparable but should lend some perspective.<sup>667</sup>

Brown also commented on Glasgow's historic built environment, stating that 'Glasgow has an uneven relationship with its buildings.'<sup>668</sup> Brown claims that 'the legacy of Glasgow's other great visionary architect Alexander "Greek" Thomson has been left to rot or worse, razed to the ground by successive councils.'<sup>669</sup> Brown also highlights the issue of regular maintenance, pointing out that 'trees and bushes grow out of neglected Victorian marvels in the city centre.'<sup>670</sup> Like Paul Sweeney, Brown is highlighting that the fire of 2018 in the Mackintosh Building is part of a much larger problem we have in caring for our historic built environment, a problem which this thesis aims to address.

The reality is that we do not yet know what caused the fire of 2018 and speculation is, therefore, natural but ultimately unproductive. The 2014 and 2018 fires have had a huge impact across Scotland, making the public more acutely aware of the fragility of the seemingly robust historic built environment and the effort required to preserve and maintain it. The interest in the Mackintosh Building caused by these fires should be harnessed by the Scottish Government and bodies such as HES, and used as a catalyst for change; educating the public about fire and historic and traditional

<sup>663</sup> Editorial.

<sup>664</sup> Editorial.

<sup>&</sup>lt;sup>665</sup> Libby Brooks, 'Glasgow Must Review Heritage Planning Following Fire, Says MP', *The Guardian*, 18 June 2018, sec. UK news, http://www.theguardian.com/uk-news/2018/jun/18/glasgow-must-review-heritage-planning-in-wake-of-fire-says-mp.

<sup>666</sup> Libby Brooks.

<sup>&</sup>lt;sup>667</sup> Annie Brown, 'Spending £200m on Glasgow School of Art Is Vulgar When City's Kids Live in Poverty'.

<sup>668</sup> Annie Brown.

<sup>669</sup> Annie Brown.

<sup>&</sup>lt;sup>670</sup> Annie Brown.

buildings, as well as on maintenance, restoration, and conservation, thereby encouraging discourse on these important topics. We need to be asking if it is the institution who is to blame or the system.

### 6.6 The Culture, Tourism, Europe and External Affairs Committee

The Scottish Parliament's CTEEAC held several evidence sessions throughout 2018 during which they invited individuals they considered experts to present evidence on the 2018 fire in the Mackintosh Building. The GSA and Kier Construction Scotland Ltd were also invited to be questioned by the Committee. The following is the remit of the CTEEAC as described by the Scottish Government:

To consider and report on the following (and any additional matter added under Rule 6.1.5A)— (a) proposals for European Union legislation; (b) the implementation of European Communities and European Union legislation; (c) any European Communities or European Union issue; (d) the development and implementation of the Scottish Administration's links with countries and territories outside Scotland, the European Union (and its institutions) and other international organisations; and (e) co-ordination of the international activities of the Scottish Administration. (f) culture and tourism matters falling within the responsibility of the Cabinet Secretary for Culture, Tourism and External Affairs<sup>671</sup>

The Committee stated that these evidence sessions would focus 'on the management and custodianship of the Mackintosh building and its collections' and that the 'future of both the building and the collections' would also be examined. <sup>672</sup> The Committee's Report, *The Glasgow School of Art Mackintosh Building – The Loss of a National Treasure*, was published on 8 March 2019. The report concluded that:

164. The Committee considers from the evidence gathered that the Mackintosh fires raise a host of associated issues which go beyond the cause of the fire itself and as such require further examination.

165. The Committee recommends that after the conclusion of the SFRS report, the Scottish Government should establish a public inquiry with judicial powers into the 2014 and 2018 fires at the Glasgow School of Art. The inquiry should also examine the risks posed by fire in

<sup>&</sup>lt;sup>671</sup> Scottish Government, 'Remit & Responsibilities of the Culture, Tourism, Europe and External Affairs Committee - Parliamentary Business: Scottish Parliament', The Scottish Parliament, accessed 27 September 2019, https://www.parliament.scot/parliamentarybusiness/CurrentCommittees/109525.aspx.

<sup>&</sup>lt;sup>672</sup> 'The Glasgow School of Art: Scottish Parliament's Culture, Tourism, Europe and External Affairs Committee', The Scottish Parliament, accessed 27 September 2019,

https://www.parliament.scot/parliamentarybusiness/CurrentCommittees/109732.aspx.

historic buildings nationally and the ability of custodians to manage these properties, drawing on the lessons learned from the GSA.<sup>673</sup>

The GSA published a *Statement of Rebuttals* on the 8<sup>th</sup> of November and also published a response to the *Report*. The most discussed topic during the evidence sessions were mist suppression systems. One of the questions which was most widely asked regarding fire suppression systems was; why was a temporary sprinkler system not installed during the construction works of 2018? In their *Rebuttals* the GSA covered this issue:

An average person looking at the situation would see it as extremely unfortunate that in both fires you were just about to put in a sprinkler system. This question was answered at the Hearing on 25 October by Page\Park. We confirm that, to the best of our knowledge, there is no temporary fire suppression system suitable for a building of the scale and complexity of the Mackintosh Building that could have been installed during the construction period.<sup>674</sup>

Another topic, which also appeared repeatedly in the media, was concern over access to the Mackintosh Building whilst it was a construction site. To that end the GSA made the following statement:

After the award of the Main Contract to Kier Construction (Scotland) Ltd in June 2016, GSA continued to seek opportunities to provide safe access for interest groups, our own and other students and professionals to the building whenever the operations on site allowed. These visits were developed with Kier subject to the GSA Access Protocols 56, the status of operations on-site and Kier's Health and Safety assessments. Safety of visitors and operatives and efficient site operations remained the absolute priorities at all times. If physical access was not possible, an alternative was arranged normally including a talk or "virtual tour" from a member of the GSA Project Management Team.

We had a commitment throughout the contract works to permit, where possible, public and professional access to the building where it could be accommodated without detriment to safety of momentum of works on going on the site.

In line with this commitment, we hosted and spoke at numerous lectures, seminars and outreach events from audiences ranging from the half dozen or so SPAB (Society for Ancient Buildings) scholars to up to 500 - where venues such as Glasgow Royal Concert Hall were used. We also organised nearly 100 tours of the building for school groups, professional

<sup>&</sup>lt;sup>673</sup> The Culture, Toursim, Europe and External Affairs Committee, 'The Glasgow School of Art Mackintosh Building: The Loss of a National Treasure', Scottish Parliament Reports, accessed 29 September 2019, https://digitalpublications.parliament.scot/Committees/Report/CTEEA/2019/3/8/The-Glasgow-School-of-Art-Mackintosh-Building--The-loss-of-a-national-treasure.

<sup>&</sup>lt;sup>674</sup> Glasgow School of Art, 'The Glasgow School of Art: Statement of Rebuttals', 1.

bodies, Scottish government officers and elected members and occasionally individuals. Events were also held in the building, but of much less frequency, due to the desire not to impede the contractors progress and the need always to ensure safety and supervision.<sup>675</sup>

During the restorations at Hampton Court Palace, Uppark House, and Windsor Castle, access to the live construction sites was also granted to professionals and the public. The Mackintosh Memories Tea, which gathered alumni of the GSA for an oral history project, was held in Kier's offices in December 2017 within the Mackintosh Building as a research exercise beneficial to the restoration project. Part of my role as the Bringing Back the Mack PhD student became providing educational 'virtual tours' as well as site visits to GSA staff, students and professionals. If I was not inducted and had been unable to access the site, this PhD thesis would have been impossible to produce. MRP1 was a project of national and international importance, and to completely deny safe and supervised access to the site would have been a great loss for the wider academic and heritage community.

#### 6.7 Salvage Case Study

After the fire at Uppark House, it was recognised that the debris in the interior of the building should be examined post-fire. It was removed from the site in dustbins and sifted, and everything which could be of use to the future restoration project was retained. The largest category of 'find' was 'miscellaneous fittings', such as 'picture hooks, curtain cloakpins, door-locks, window catches, bells and equipment from the servants' bell system', as well as 'fireplace metalwork.'<sup>676</sup> Despite the ferocity of the 2018 fire in the Mackintosh Building, similar metal objects have been recovered during the initial limited salvage process. The success of the debris sift at Uppark House meant that 'none of the principle fittings from the rooms on the *piano nobile* needed to be replicated', thereby proving that an expensive and time-consuming excavation/sifting process was worth the effort.<sup>677</sup> The following is a case study of the initial salvage operation which took place after the 2018 fire at the Mackintosh Building. It is recorded here so that it can be of use in emergency and disaster planning to museums and similar institutions with collections.

### 6.7.1 Initial Salvage Methodology: Masonry

Whilst salvage post-fire was a priority, the main priority was the stabilisation of the Building. The salvage process became part of these works as the down taking began and masonry was carefully removed from the building. Working with Page\Park in an advisory role before the down taking process, Sarah Mackinnon and Dominic Echlin identified key areas of the Mackintosh Building where masonry was recognised as important to salvage due to its decorative or otherwise unique attributes. These areas were marked up onto plans of the facades of the Building, copies of which were then

<sup>&</sup>lt;sup>675</sup> Glasgow School of Art, 4.

<sup>&</sup>lt;sup>676</sup> Rowell, Christopher and Robinson, John Martin, Uppark Restored, 150.

<sup>&</sup>lt;sup>677</sup> Rowell, Christopher and Robinson, John Martin, 150.

distributed to Reigart operatives, the MRP1 Project Team, and David Narro Associates. Hard copies were also kept in a Salvage Box for use on-site.

The first meeting I attended onsite (after being inducted) took place on the 16<sup>th</sup> of July 2018 (Fig.6.9). I met with Polly Christie, Recovery Project Lead, Archives & Collections, Thom Simmons, Conservation Skills Co-ordinator for MRP1, and Hannah Patching, (former) MRP1 Project Assistant, on-site to assess what had been salvaged from the Building since down taking began (Fig.6.10). Mackinnon, Patching and Simmons had to establish an initial salvage methodology in a short space of time as these processes needed to be in place before the down taking began. At this point, the masonry was the focus, but larger metal objects, and fixtures and fittings such as the weathervane, were also being removed from the top floor of the Building when they became accessible to Reigart operatives. These objects were being stored onsite, where possible in the shipping container which would become our onsite salvage headquarters.

The Initial Masonry Salvage Methodology developed by MRP1 project members, alongside recommendations for the caretakers of historic and traditional buildings is outlined below. These recommendations are based on the practical experience of the salvage process:

- 1. A member of MRP1 staff is onsite at all times to ensure that masonry designated as significant could be identified and processed upon removal from the Building.
- 2. Masonry which could be safely removed from the Building is numbered using yellow beeswax crayons in situ by Reigart operatives. The beeswax crayon numbers identified the location of the stone within the Building façade. The masonry blocks were being stored outdoors on wooden pallets on-site at this point, so using a waterproof wax crayon which could also easily removed from the stone if necessary was an effective method of labelling each item.

<u>Recommendation</u>: Disaster boxes and salvage kits contain these wax crayons or chalk in case they are needed for this or similar purposes.

3. The numbered masonry blocks were photographed in situ by Reigart operatives using disposable cameras purchased for this purpose. Disposable cameras could be easily purchased in larger numbers in Glasgow city centre and were simple to operate. Whilst a digital camera may have produced 'better' images they also require charging and/or batteries, are less robust than a disposable film camera and are arguably more user-friendly. <u>Recommendation:</u> A suitable number, dependent on the size of your institution/team/collection are kept in your disaster or salvage box so that they can be used immediately to record the salvage process, providing an invaluable record as well as being a useful recording tool. As film can expire the expiry dates of these film cameras should be noted and they should be replaced once they reach expiry.

4. Numbered masonry blocks were removed by Reigart operatives and brought to the ground where they were placed on pallets and moved away from the Mackintosh Building. <u>Recommendation</u>: Pallets are commonly found on construction sites, however not all buildings which experience a disaster scenario will be undergoing construction works. It is therefore worth identifying and contacting supplies of pallets as part of the emergency and disaster planning process. Pallets enable larger objects to be moved across site via a forklift or similar, and also serve as a way to group and therefore organise objects placed on them.

### 6.7.2 Salvage Methodology Adapted and Improved

During our first meeting, the initial methodology for the salvage and recording of masonry was adapted and improved and our salvage methodology for smaller objects was created. To establish a simple and efficient system we 'rehearsed' salvaging several masonry blocks which had already been photographed and numbered and were now being stored on site. This allowed us to identify how to improve the current processes and also highlighted any material needs we may have going forwards. Our workspace was also identified at this point, a shipping container on-site with no electricity or lighting, where we could process smaller finds, and store larger metal fixtures alongside our materials and equipment. The process we established had to be adaptable and it did change as we discovered issues with our original, more idealised, plans.

As we would not have access to lighting and electricity whilst working from our container it was important to arrive on-site with a fully-charged mobile phone and laptop or iPad. Initially, we took an MRP1 laptop onsite with us to update a spreadsheet as we recorded finds, but this proved to be far less efficient than using pen and paper to record finds. The Wi-Fi signal on site was very poor which meant that we could not remain connected to the central spreadsheet and the laptop battery was not capable of lasting for more than 4 hours. Initially, Thom Simmons proposed the creation of an app which would allow us to use iPads to record objects. This information would then be collated into a spreadsheet which was centrally managed and stored.

In theory, this was an excellent idea, but as the salvage methodology had to be up and running so quickly the glitches encountered with the app and systems which surrounded it slowed down and further complicated the salvage recording process. We therefore reverted to a pen and paper methodology for much of the salvage process. A clipboard with empty print-out tables which matched-up with the information required by the central spreadsheet was kept in the Salvage Box. When we returned to the office at the end of the day the central spreadsheet could be updated using the notes we had taken. Clipboards, extra printouts and ink pens were all easily sourced from the MRP1 office, and extra materials could be ordered via the GSA's regular stationery suppliers. To ensure that the hard copies of our notes were not lost, I would photograph each page with a phone at the end of the day, a quick way to digitally record this important information. Our mobile phones

became invaluable tools during the salvage process, I used my phone to photograph and record finds as well as notes and activity on site. I could then email these photographs to other MRP1 Salvage Team members for upload onto the shared drive.

During our 'practice salvage' we established that the following information needed to be recorded for every find:

- Photograph the object.
- An accession or object number.
- The date the record was being created, and who it was being created by.
- A short descriptive name for the object.
- A description of the condition of the object.
- The current location of the object as well as its intended storage destination. This was regularly updated if objects were moved, for example, offsite into storage.
- The 'Object of Significance Number', if applicable. This number was given to blocks of masonry on plans of the façade, ensuring that once removed from its original context of the Building the significance and provenance of these objects were easily identifiable.

This information, which we had identified as 'essential', was based on museum recording procedures when accessioning an object into a collection. The location of items was particularly crucial, as on a live and complex building site it was important to keep track of where objects were at present, and where they would need to be stored in the long term.

### 6.7.3 Recording, Labelling and Packing Objects

As the down taking progressed debris was removed from areas such as the still intact concrete floors. Reigart operatives swept up debris with a dustpan and brush, then placed the debris into buckets which were brought down to ground level and sifted through by hand by the onsite member of the MRP1 team. This method of salvage was possible as the volume and speed of debris being removed were not overwhelming for our small team of three (me, Patching and Simmons). Small finds were placed in plastic boxes purchased for this purpose and were stored in the salvage shipping container where they could be processed. We did not have space for a table or work surface inside the shipping container so Patching and I ordered white dinner trays from the GSA's stationary supplier to transport small finds as well as provide a flat clean space to examine and photograph them on.

We did not perform any object first aid as such, but it quickly became clear that moisture was an issue. Most metal objects removed from the Building looked, and remained, damp in the shipping container which was not well ventilated. The large wrought-iron seed-heads which curved upwards into the first-floor windows of the Mackintosh Building were all safely removed by Reigart operatives (Fig.6.11). They were intact but incredibly rusted and despite being stored outside in the dry summer

weather they 'sweated' moisture for many weeks. Once removed from the site they were wrapped in bubble wrap and taped up in a shipping container stored in the car park of nearby Stowe College (the new School of Fine Art building for the GSA). Upon later inspection, we found that the seed-heads were still weeping water within their bubble wrap packing. This wrapping therefore had to be removed to allow further drying to take place. This was unexpected as metal is not generally thought of as a porous material, especially when that metal has been outdoors and coated in suitable paint for over a hundred years. I would, therefore, recommend that suitable drying space for metal fixtures and fittings (which in the case of the seed-heads are very large) is considered when creating an emergency and disaster response plan. Space is usually always allocated for textiles and paper, but as we discovered, metalwork can also need to be dried out. To that end a moisture-reader could also be included in a disaster or emergency box so that the moisture content of objects can be monitored and assessed regularly, enabling their more effective treatment and storage.

During our 'rehearsal salvage' we devised a labelling and recording methodology for salvaged objects. Masonry was being labelled with yellow beeswax crayons, and we recognised that the pallets they were placed on should also be labelled, as in a museum store where the container and the object are labelled to minimise the decontextualization of the object. These labels were made of an adhesive waterproof paper which we wrote on using a black permanent marker. Sheets of labels were easy to order in bulk and were kept with black permanent markers in the Salvage Box.

We had to create our own durable tags for large metal objects, which we knew would be outside and onsite for some time before suitable storage could be found. With this in mind, large metal objects such as the flagpole were labelled using waterproof adhesive paper and wire, which formed a robust 'tag' (Fig.6.12). Wire cutters and wire were easily sourced and kept in the salvage box for this purpose. It is worth noting that the wire was particularly stiff and difficult to work with, therefore using a slightly more pliable wire is advisable. Museum best practice standards dictate that objects should be physically labelled using a reversible technique, however, as the corroded and damaged surfaces of our objects were likely to be removed or were unstable, we also used tags for smaller objects (Fig.6.13).

Tagging large blocks of masonry was more problematic, not just because of their size, but also because they were going to be stored outdoors for an unknown amount of time. To this end Patching and Simmonds ordered orange barcoded 'cattle-tags' early in the salvage process (Fig. 6.14). These plastic tags are used to tag the ears of cattle, and so are exceptionally durable and weatherproof. The tags all had a unique barcode number, which could then be connected to a database. We attached these labels to large objects, added their barcode number to each individual object record, then once connected to the object database, these barcodes could be scanned and immediately the object record via a connected smart-phone or iPad (Fig. 6.15). This would be useful for keeping track of objects, as

well as quickly identifying them once in storage in the long-term. Unfortunately, these tags took around 8 weeks to arrive after they were ordered. This meant that objects had to be re-tagged when they eventually arrived, doubling our work. Identifying suppliers of museum standard tags and labelling tools and storing them in an emergency or disaster box is therefore advisable, as is considering ordering more durable 'non-museum' tags, alongside some kind of pliable wire to attach them with.

#### 6.7.4 Identifying Storage Locations

The McClellan Galleries, used by the GSA since the fire of 2014 to store materials such as the charred remains of chairs, as well as undamaged plaster casts and light fittings from across the Mackintosh Building, was identified as a secure location for the storage of small finds from the 2018 salvage. Patching and I cleared space on the existing metal shelving units where we created a 'mini-museum store' (Fig. 6.16). Space was also made for a trestle table and mobile lights as the basement store was dimly lit, this became our processing area where we could assess objects condition, then label and safely package it.

# 6.8 Conclusion

As a result of my work on the Salvage Team after the 2018 fire I was invited to speak at the annual Salvage Seminar hosted by HES. Judith Rowett stated that the attendees 'found your [the team's] solutions to problems to be very inspiring, and, like me, were keen to see what had worked and what hadn't'.<sup>678</sup> This chapter is therefore a written record of this process; it aims to add to the existing scholarship on the subject, and practically affect current salvage planning in historic and traditional buildings. Judith Rowett was asked if and how the salvage 2018 salvage works had impacted her work as a Collections Manager at HES. She confirmed that it had impacted her own work as well as HES as an organisation, in terms of recording methods she said that:

The use of documentation methods, such as cattle tags, is a great idea and one I fully intend to steal! These are always issues we struggle with and seeing methods that have been tried and tested really helps us to hone our own plans and buy in necessary equipment to be kept ready.<sup>679</sup>

Rowett also stated that she was not aware of an instance of metal 'sweating' water after a fire, finding it 'fascinating, and [it] showed that even if metal can survive the fire it might not be able to be returned to its original location' in or on a buildings as it may prove difficult, or too fragile, to restore'.<sup>680</sup> Rowett felt that the 2018 fire and salvage of the Mackintosh Building 'has shown that we must never stop training and preparing our [HES] staff. We look after a range of buildings across the

<sup>&</sup>lt;sup>678</sup> Judith Rowett, 'Mackintosh Building Salvage: 2018', 26 August 2020.

<sup>&</sup>lt;sup>679</sup> Judith Rowett.

<sup>&</sup>lt;sup>680</sup> Judith Rowett.

country and it is vital we are prepared for anything that may happen.<sup>681</sup> This second fire also made it clear 'that lightening can indeed strike twice!<sup>682</sup> When asked about the post-fire media reaction/interest Rowett stated that this:

Showed us [HES] what impact a major incident can have... The public are always keen to know what is going on, and it is important to take this into consideration when communicating developments,... As we hold our collections on behalf of the people of Scotland it reminded us that so many people are invested in what we do and can be impacted significantly when incidents happen.<sup>683</sup>

On the subject of salvage training Rowett also confirmed that:

The fires showed us how important basic training is for salvage teams, and has helped with organisation-wide buy-in. We still have a lot of work to do but it has definitely helped us to show the importance of the work we do. Many members of staff also attended GSA after the first fire [in 2014] so many have seen the destruction a fire can cause first hand, and again that has helped us all to understand the importance of planning and preparing for these types of events.<sup>684</sup>

The 2018 fire in the Mackintosh Building was a disaster, but by sharing information about the postfire salvage with HES it has already had positive impacts on current salvage and collections care.

One of the problems shared by each of the buildings used as case studies within this chapter was that of adequate documentation. This highlights how crucial it is that historic and traditional buildings should be photographed by their caretakers, internally and externally, even spaces which seem unimportant should be recorded. Archival materials and objects within a historic or traditional building should likewise be photographed and digitised. This information should be held as hard copies as well as digitally in various locations to reduce the risk of their loss. Laser scanning historic and traditional buildings, as well as their associated collections, should now be seen as a necessary component of any restoration project occurring in an A-Listed building. The data created by scanning historic and traditional building's exteriors and interiors can be used to produce valuable educational and building management tools. Scanning also ensures that we can preserve our built heritage digitally in case of a disaster scenario. At present, much of the Mackintosh Building is physically lost,

- <sup>682</sup> Judith Rowett.
- <sup>683</sup> Judith Rowett.

<sup>&</sup>lt;sup>681</sup> Judith Rowett.

<sup>&</sup>lt;sup>684</sup> Judith Rowett.

however, it does exist digitally, providing GSA with the necessary data to re-create the Building physically in its entirety.

All buildings in the care of organisations such as HES and NTS should be accurately recorded, however, many A Listed Buildings in Scotland are in private ownership. The caretakers of these buildings therefore need to be actively encouraged by the Scottish Government and organisations such as HES to similarly record their buildings. Equally, historic and traditional buildings should also be photographed by their owners, internally and externally.

Disasters such as fires are preventable; risk levels can be managed effectively and buildings and their contents can be protected, but there is no such thing as a completely fireproof building. The 2018 fire and the salvage operation which followed served to highlight that salvage planning is an emerging field of study and must become an integral part of best practice building management.



Figure 6.18: Image taken by twitter user Peter Swanton showing the ferocity of the fire, seen across Glasgow from Garnethill. Copyright Peter Swanton, 2018.



Figure 6.2: The damage done by the fire to the interior of the Mackintosh Building can clearly be seen. The Hen Run has been destroyed and Studio 58 has no roof. Image copyright Getty Images, 2018.



Figure 6.3: Aerial image taken after the fire was put out by SFRS, who were still dousing hotspots. The collapsed roof of the O2 ABC is seen to the left of the Mackintosh Building. Image copyright Police Scotland, 2018.



Figure 6.4: The Reid Building's smashed glass panelling, broken during the fire in the Mackintosh Building. Image taken by Rachael Purse, July 2018.



Figure 6.5: Damaged masonry from the Mackintosh Building, removed from the Building during the downtaking works. Image taken by Rachael Purse, 2018.



Figure 6.6: Above The East Gable, the remains of the Embroidery Studio can be seen on the left. On the right of the image, Reigart employees working from a basket remove dangerous debris from the staircase on the South Facade. Image taken by Rachael Purse, 2018.



Figure 6.7: The cordon is marked out by a red line surrounding the evacuated buildings in the Garnethill/Sauchiehall Street area, the green zone shows areas at risk from falling masonry, and the red zone highlights areas where fire damage had occurred. Image taken from Initial Structural Report on the Mackintosh Building by Dominic Echlin, 25<sup>th</sup> June 2018.



Figure 6.8: The scaffolding-clad Mackintosh Building after all dismantling and stabilisation works were completed. Image taken by Rachael Purse, 2019.



Figure 6.9: The Mackintosh Building in July 2018, my view of the Building as I made my first visit to site post-fire to be inducted. Image taken by Rachael Purse.



Figure 6.10: On site post-2018 fire with Polly Christie (left) and Hannah Patching (right) carrying out a 'practice salvage' to create our methodology.



Figure 6.11: The rusted seed-heads after removal from the Mackintosh Building. Image taken by Rachael Purse, September 2018.



Figure 6.12: The feet of the weathervane, all labelled with one object number as a group. Image taken by Rachael Purse, August 2018.



Figure 6.13: Door lock, casing and doorknob which had been removed from the accessible debris in the Mackintosh Building by Reigart operatives. Note the corroded and damaged surface. Image taken by Rachael Purse, September 2018.



*Figure 6.14: An example of one of the 'cattle tags', each with its own unique barcode. Image taken by Rachael Purse, September 2018.* 



*Figure 9: Our makeshift processing set-up inside the onsite shipping container. Image taken by Rachael Purse, August 2018.*


Figure 6.16: Our 'mini museum store' in the basement of the McLellan Galleries. Image taken by Rachael Purse, August 2018.

# 7. Conclusion and Lessons Learned

#### 7. Managing the Built Environment: Fire Suppression and Detection

HES are not currently permitted to provide grants for the installation of fire detection and suppression systems in historic or traditional buildings, as they are classed as new additions to a structure rather than as an augmentation or alteration. However, it should also be recognised that most buildings, of any age and Listing, do not have fire suppression systems and may not need them to be considered safe. Since October 2010, the Scottish Government has made it mandatory that all new schools built in Scotland should have a fire suppression system installed:

Standard 2.15 Every building must be designed and constructed in such a way that, in the event of an outbreak of fire within the building, fire growth will be inhibited by the operation of an automatic fire suppression system.<sup>685</sup>

Schools minister Nick Gibb has confirmed that 105 of the 673 schools built and open by February [2019] were fitted with sprinklers', despite Government guidelines making it clear that sprinklers should be installed in *all* new-build schools 'except in a few low-risk schools'.<sup>686</sup>

A Freedom of Information (FOI) request about exemptions granted by the government concerning the installation of sprinklers revealed that from 2011 until July of 2019, 59 schools had been granted exemptions for sprinkler installation in extensions to an existing school building. Some of these extensions were for temporary accommodation for pupils whilst refurbishment work took place in the main school building, however others were permanent extensions to the main school building.<sup>687</sup> The FOI data also reveals that out of the 59 primary and secondary schools listed 52 main school buildings were not sprinklered (with 7 schools not providing this information).<sup>688</sup> Forty cases out of 59 also stated as a reason for the exemption that; 'the additional cost of sprinklers is considered disproportionate to construction cost.'<sup>689</sup> In 2018 SFRS Inspectors carrying out risk assessments in Scottish schools found that 66 were at 'high risk' of a fire event, whilst 3 were considered at a 'very

<sup>&</sup>lt;sup>685</sup> Scottish Government Website, 'Building Standards technical handbook 2017: Domestic buildings', 8 July 2020, https://www.gov.scot/publications/building-standards-2017-domestic/2-fire/215-automatic-fire-suppression-systems/

<sup>&</sup>lt;sup>686</sup> BBC News, 'Most New Schools Not Fitted with Sprinklers', *BBC News*, 14 April 2019, sec. UK, https://www.bbc.com/news/uk-47923843.

<sup>&</sup>lt;sup>687</sup> Scottish Government, 'FOI-18-01685 Related Document Re School Sprinklers' (Scottish Government, 9 July 2018).

<sup>&</sup>lt;sup>688</sup> Scottish Government.

<sup>&</sup>lt;sup>689</sup> Scottish Government.

high risk'.<sup>690</sup> The SFRS also inspected c.8000 public buildings in 2018, finding that 1048 were at 'high risk', and 22 were at 'very high risk' of a fire event.<sup>691</sup>

On the 26<sup>th</sup> of August 2019 Woodmill High in Fife was set alight by a pupil. The fire took place on a Sunday when the building was unoccupied and there were no casualties, however, the school itself was destroyed and as a result, pupils have been separated across the area to study at different schools. A purpose-built campus which will include St. Columba's High and Fife College will replace the burned-out Woodmill building, and is slated to be ready for students in 2024, costing the Scottish Government between £150 and £180 million.<sup>692</sup> The above evidence, as well as the fire at Woodmill High, suggests that fire suppression systems are often considered too expensive to install or retrofit by the Scottish Government in schools, but millions of pounds of funding to *replace* fire-damaged buildings *is* available. There was a public outcry when people learned that the Mackintosh Building did not have a fire suppression systems installed at the time of the 2014 and 2018 fires, but at least the GSA was in the process of retrofitting this system as a recommended additional fire protection method.

Grenfell Tower did not have a fire suppression system at the time of the 2017 fire. The Tower was not a Listed Building, and it did not contain a recognised cultural heritage collection, but it did contain at least 72 people on the night of the fire, all of whom perished. It is problematic that there was more public outrage over the fact that the Mackintosh Building did not have a sprinkler system than the fact that Grenfell Tower did not. That is not to say that the Mackintosh Building and other historic and traditional buildings like it should not have fire suppression systems installed, but it does raise the question of where our priorities lie over what we deem worthy of protection. At the time of writing 56,000 people are still living in homes with the same flammable cladding which caused the fire to spread so rapidly, and in June 2020 it was reported that 7 households were still living in temporary accommodation.<sup>693</sup>

I would, therefore, suggest that the Scottish Government invest in a programme of grants which would provide funding for the retrofit of suitable fire suppression systems and/or passive methods of fire suppression such as compartmentation etc where necessary, in public buildings such as schools as well as in A Listed Buildings. The cost of this funding package should be seen as an investment in Scotland's built environment, historic and modern, which could save money and original fabric in the

<sup>&</sup>lt;sup>690</sup> Paula Murray, 'One Scottish School in Every Seven Is a High Fire Risk, Alarming Figures Show', *The Express*, 8 September 2019, https://www.express.co.uk/news/uk/1175230/scottish-schools-safety-high-fire-risk-snpministers.

<sup>&</sup>lt;sup>691</sup> Paula Murray.

<sup>&</sup>lt;sup>692</sup> BBC News, 'Joint Campus to Replace School Destroyed by Fire', *BBC News*, 9 April 2019, https://www.bbc.com/news/uk-scotland-edinburgh-east-fife-49582271.

<sup>&</sup>lt;sup>693</sup> Andrew Woodstock, 'Grenfell tower fire: 56,000 'still at risk' from flammable cladding three years on', The Independent, 13 June 2020, https://www.independent.co.uk/news/uk/politics/grenfell-tower-fire-flammable-cladding-labour-a9563936.html

long-term, as well as protect our cultural heritage and the users of said buildings. The lack of fire suppression systems in Scottish schools, both new and old, as well as in buildings like Grenfell Tower are symptomatic of a much wider problem; the way we look after our building stock, and the heritage sector can be at the forefront of a positive movement to radically change this.

#### 7.1: Managing the Historic Built Environment: Affordable Housing and Climate Change

There is currently a lack of affordable housing in the UK. In February 2020 the BBC published a *Briefing on Housing* which asserted that; 'the UK is experiencing what many would refer to as a housing crisis'.<sup>694</sup> There are 320,000 homeless people in the UK, there are more than 1 million UK households on waiting lists for affordable council-housing, and there are more than 4 million people in the UK living in housing deemed sub-standard or inappropriate.<sup>695</sup> As a significant 21% of Scotland's dwellings were built before 1919, and are therefore classed as traditional, active steps must be taken to educate and empower homeowners and landlords to maintain these traditional buildings and make them more energy-efficient, providing advice, financial assistance, and where necessary financial penalties if buildings are not properly maintained.<sup>696</sup>

To counteract this lack of affordable housing, in April 2016 the Scottish Government pledged to build 50,000 new affordable homes by March 2021.<sup>697</sup> However, building new homes is not the most energy or resource-efficient way to create more housing, instead, bodies including English Heritage, Historic England, RICS, the BPF and Deloitte have been championing the re-use of heritage assets, which they believe are 'a key component of sustainable development.'<sup>698</sup> As discussed in earlier this thesis:

The re-use of heritage buildings safeguards the embodied carbon emitted during the production of the materials used in those assets. Further energy would also be expended during its demolition, disposal of waste materials and in the manufacture and transport of new materials for the replacement building. In short, a new building would have to be extremely energy efficient to balance this equation over normal pay-back periods. This is why re-use of existing buildings is now being prioritised wherever possible in the built environment.<sup>699</sup>

Affordable housing, the re-use of heritage buildings and climate change are inextricably linked. The heritage sector therefore has positive role to play in the housing and climate crises.

<sup>699</sup> English Heritage, 8.

<sup>&</sup>lt;sup>694</sup> BBC 'BBC Briefing: Housing' BBC, 26 February 2020, 4.

<sup>&</sup>lt;sup>695</sup> BBC, 5-7.

<sup>&</sup>lt;sup>696</sup> BBC, 23.

<sup>&</sup>lt;sup>697</sup> Scottish Government, 'Affordable Housing Supply Programme', accessed 8 July 2020, https://www.gov.scot/policies/more-homes/affordable-housing-supply/

<sup>&</sup>lt;sup>698</sup> English Heritage, *Heritage Works: The use of historic buildings in regeneration, toolkit and good practice,* (English Heritage, 2006), 6.

#### 7.2.2 Manging the Historic Built Environment: Unglamorous Maintenance

Restoring and re-creating lost or damaged historic and traditional buildings and interiors are academically and technically important processes discussed throughout this thesis. Regular maintenance and more subtle augmentations, alterations and adaptions to our built heritage are not as attention-grabbing as dramatic re-creations or restorations but are nevertheless deserving of equal attention. There is an irony in this statement as this thesis contains a whole chapter dedicated to MRP1 and this PhD Scholarship was also established as part of MRP1. However, prevention is always better than the cure, and taking proactive measures to properly maintain and future-proof our historic built environment against climate change is undeniably more cost-effective and less detrimental to the original fabric and character of a building than the results of a reactive approach, which consists of carrying out a restoration or re-creation after a disaster or neglect has caused often irreparable damage to original fabric.

In June 2020 when the statue of notorious human trafficker Edward Colston was toppled in Birmingham, many were pleased to see the monument go, but others were concerned that history itself was being tampered with. Historian Kate Williams pointed out that; 'Victorian buildings in this country are torn down all the time. No one cares. But remove a statue of a horrific slave trader in human souls – and its "erasing our history" and "mob rule"<sup>700</sup> The economic fallout from the Coronavirus Pandemic is not going to make looking after our cultural heritage any easier, but the heritage industry is perfectly placed to act as a catalyst for positive change as we move towards a greener economy.

I would argue that as well as a climate emergency there is also a heritage emergency. Collectively we must use disasters such as the 2014 and 2018 fires in the Mackintosh Building as lessons to learn from, and examine, how we manage *all* of our built heritage, not just tourist attractions or A Listed Buildings.

#### 7.3 The Mackintosh Building as a Historic House Museum

I believe that the Mackintosh Building does not comfortably sit within any current standard building categories, and it, as well as other buildings of a similar nature could sit within in the building category of the Historic House Museum. HES's Fire Risk Assessment Matrix currently lists the following of its PICs as at a Level 5 or 'catastrophic' level of risk:

- Duff House
- Fort George
- Urquhart Castle

<sup>&</sup>lt;sup>700</sup> Professor Kate Williams, via tweet, 11 June 2020.

- Argylls Lodgings
- Dunblane Cathedral
- Edinburgh Castle
- Longmore House
- John Sinclair House
- Causewayside Store<sup>701</sup>

These buildings are of various architectural styles, were built at different times for different purposes, and are not all Listed within the same category. The factor which unites them is the inherent cultural value and significance of their interiors and/or collections. Based on the above factors, all of these buildings, could be considered Historic House Museums, suggesting that the Historic House Museum is the most vulnerable building category for a fire incident to occur within.

I would argue that the Mackintosh Building and others like it need to be re-categorised, perhaps as something similar to a Historic House Museum; as an art school it has always contained artists' studios, it contained a museum which became an exhibition space, and it has a very important collection of furniture and fixtures which were designed by Mackintosh specifically for use within the Building. Prior to the 2014 fire the Mackintosh Room and Library functioned in a similar manner to spaces for hire within HES and NTS properties. The high-status heritage spaces in the Mackintosh Building were used by GSA staff as meeting rooms as well as for events such as evening lectures, and rooms like the Library were visited by tourists on guided tours, with staff and students allowed only limited access to this 'masterpiece within the masterwork'.

The rest of the Mackintosh Building, particularly the studios and spaces such as the professor's studios, continued to function as 'living' or 'everyday' spaces used by staff and students on a daily basis. They were, therefore, treated with less reverence. As the needs of the GSA changed these spaces were altered and augmented, which meant that the original aesthetics of these rooms were not as well preserved, and so arguably, their status, authenticity, or 'value' as heritage spaces decreased. Mezzanines were added to the double-height studios by students in the 1960s to create more workspace as student numbers increased, and other studios were divided up in the 1970s into modern offices for staff.

*Mackintosh's Masterwork's* description of these studios, written in 1989, does not mention any of these alterations. Instead, the 'magnificent' studios are described as they would have looked in 1910, with their system of 'electric lights on pulleys' which students could move around the space to light their work, when in reality this lighting system had long been removed. This lack of

<sup>&</sup>lt;sup>701</sup> Historic Environment Scotland, 'Historic Environment Scotland Fire Safety Risk Assessment Matrix' (Historic Environment Scotland, 31 July 2015).

acknowledgement of change within the building is problematic, it perpetuates a damaging 'rosetinted' view of a building which has undergone a great deal of alterations since its completion in 1910, and thereby perpetuates the false idea which Historic House Museum's often fall prey to; that these buildings are perfectly preserved relics from another period. If our built and cultural heritage is to survive climate change as well as economic recession, we must abandon this idealistic and false viewpoint, and instead focus on the positive impacts altering and augmenting our built environment can have, especially if the buildings in question are Historic House Museums.

Since the fire of 2014 in the Mackintosh Building, the need for accurate records of a historic or traditional building's void spaces has been highlighted. It was found that no completely accurate drawings existed of the University of Glasgow's Gilbert Scott Building which was completed in 1891 and designed by its namesake Sir George Gilbert Scott (1811-1878). After the fire of 2014, the University of Glasgow's Fire Engineer felt compelled to commission accurate drawings of the Gilbert Scott Building using standard surveying techniques as well as laser scanning and Ground Penetrating Radar (GPR). The size and complexity of a building makes this kind of assessment time consuming and expensive, but it should nevertheless be seen as a crucial component of any fire prevention strategy. The project was successful, and now an accurate measured survey of the Gilbert Scott Building, including any ducts or void spaces, is being used as a baseline for any maintenance works or retrofitting schemes, with any voids or ducts being fireproofed.

I believe that the Gilbert Scott Building should also be defined as a Historic House Museum. It is a Category A Listed Building which is used as a teaching and event venue, and it also contains important heritage spaces such as Bute Hall and the Hunterian Museum. The categorisation of buildings implies that the properties of each individual building included are understood. Therefore, categorising the Mackintosh Building and similar structures such as the Gilbert Scott Building as Historic House Museums would enable the heritage sector to effectively target and promote best practice management of this building type to their owners.

This categorisation process would encourage owners and caretakers to investigate and, therefore, understand how their buildings were designed to function, how they have changed over time, and how these crucial factors impact on the fire risk management and maintenance of their building. With this baseline information, the need for intervention can then be effectively assessed by owners. Information gathered from the assessment of Historic House Museums could then be assessed by organisations such as HES for any trends, i.e., difficulties in locating and protecting ducts, and grant funding and/or support could be made available for the mitigation of these risks. Buildings within the Historic House Museums category would be assessed as sitting within the 'catastrophic' risk band, using HES standards. This knowledge should make their owners and users, as well as the public, alert

to the losses which would be incurred, should a fire event ever take place, thereby encouraging best practice from owners and users.

With the above risk factors in mind, if the Mackintosh Building can be considered a Historic House Museum, then it would also be assessed by HES to sit within its 'catastrophic' risk band; given the original and unique contents, collections, and interiors. The number of people who used the Building on a daily basis prior to the 2014 fire increased the risk of damage to the Building, as it contained public exhibition spaces, event spaces, and studios. However, this does not mean the Mackintosh Building should have to cease functioning as an art school. It has to be accepted that any attempt to ensure the preservation and continued use of a historic building can result in tensions between the retention of the original fabric and the safety of its users when new systems are retrofitted or when augmentations are made. This negotiation process should be recognised as a natural part of ensuring the sustained use of a building, and it is clear that more research must be carried out in the area of fire prevention and suppression systems in historic and traditional buildings, and that building categorisation as a whole needs reconsidered.

#### 7.4 Research and Information Dissemination

Writing this thesis has highlighted areas where further research would be beneficial to the management of our built heritage. *The Guide for Practitioners: Fire Safety Management in Traditional Buildings* was published by HES in 2010 and has been an invaluable resource, however, it is currently out of print, and could be updated to include the 2014 and 2018 fires in the Mackintosh Building as case studies. A Short Guide for Fire Detection and Suppression systems in historic and traditional buildings could also be created by HES; these Short Guides are designed to appeal to homeowners and would therefore disseminate accessible information to a group of people who may not otherwise be targeted. The SFRS also have a role to play in the collection of data in fires in historic and traditional buildings; if they were to record the Listed status of buildings they are called out to, the data could be used by HES and the Scottish Government to produce a variety of research that could lead to the prevention of fire events. Raid Hanna of the Mackintosh School of Architecture brought the research of Shrivastava Preeti R., Sawanti P. H. to my attention, who has produced research on the calculation of fire load density which could be augmented and applied to historic and traditional buildings after the appropriate research was undertaken.<sup>702</sup>

Likewise, research showing how beneficial the adaptive reuse of historic and traditional buildings must be championed by the Scottish Government. HES have published on this topic and have clearly stated that 'for a building to stay in use over the long term, change will be necessary', and that:

<sup>&</sup>lt;sup>702</sup> Shrivasta Preeti R., Sawant P. H., 'Estimation of Fire Loads for an Educational Building - A Case Study', International Journal of Scientific Engineering and Technology 2, no. 5 (2013): 389.

Alterations to a building, even if they are extensive, will be better than losing the building entirely. If the only way to save a building is a radical intervention, we have to avoid being too cautious when we look at the options. If a building might be totally lost, we should be open to all the options to save it.<sup>703</sup>

This may seem like a radical statement from a conservation organisation, but it is how society must now perceive change and the historic built environment; it is therefore crucial that this message is promoted and supported by all heritage organisations as well as the Scottish Government. Acceptance of alterations must become the 'new normal'. However, contemporary conservation and restoration practices are still influenced by Victorian ideals which, as shown through the analysis of case study buildings in this thesis, are no longer wholly practicable for application in the 21<sup>st</sup> century. In questioning whether or not to conserve a building it is important to remember that doing something, even if it is controversial, is preferable to doing nothing, as inertia and indecision could potentially allow more damage to occur to an already fragile building in the long-term, as can be seen at Hill House.

Whilst it is impossible to know what Charles Rennie Mackintosh, ostensibly a Victorian himself, would have thought about the fire in 2014, or the following restoration project, an analysis of his writing also suggests that he was a conservationist and was not against restoration and conservation in the same way that John Ruskin was, proving that these more 'modern' ideas are anything but. We therefore need to be progressive in our use of language and no longer use terms such as 'pastiche' and 'Disneyfication' to describe perfectly valid re-creations and restorations, and we need to come to terms with the fact that authenticity, like gender, is a social construct.

#### 7.5 Closing Statement

As the beneficiary of the Bringing Back the Mack PhD Scholarship, co-funded by HES and GSA, I can endorse the experience of studying for a doctorate linked to a project of international importance as professionally fulfilling. I would therefore advocate for similar PhD studentships to be connected to large restoration, reconstruction, re-creation or alteration/augmentation projects such as MRP1. The publication of much of the research relating to MRP1 has been delayed due to the fire of 2018, but this thesis forms part of the project's legacy, as does the Scholarship via the skills I have attained and developed during the course of this PhD. Site access and site visits to a projects of this nature are therefore crucial, as it puts dissemination of knowledge at the core of a project. This allows for the promotion of traditional skills and materials, and also furthers the knowledge of visiting professionals within the industry as well as students.

<sup>&</sup>lt;sup>703</sup> HES, *Managing Change in the Historic Environment: Use and Adaptation of Listed Buildings,* HES, April 2019, updated February 2020, 4.

The course of this PhD Scholarship and thesis was unexpectedly and dramatically altered after the fire of 2018 gutted the Mackintosh Building, and as a result this thesis is now as much about fire in historic and traditional buildings as it is about their restoration and conservation. The fires of 2014 and 2018 are presented as vitally important case studies, as are the salvage operations which followed. Through documenting and investigating these events and processes from 2016-2019, as well as being an active participant in the 2018 post-fire salvage, this thesis contributes new research which has practical applications in the heritage and built environment sectors. This thesis contains a warning which I hope is heeded; the risk fire poses to historic and traditional buildings should never be underestimated.

As of August 2020, irreversible environmental damage is occurring to the masonry which makes up the ruins of the Mackintosh Building. It sits shrouded in scaffolding, looming over Renfrew Street and its neighbouring GSA buildings, waiting for the next chapter in its history to begin. With the 2018 Fire Report still unpublished two years on, the Building remains in a bureaucratic limbo, and the delays caused by the Coronavirus Pandemic will inevitably have a negative effect on this process. I have written about conservation inertia within this thesis, and my opposition to it, yet this is the situation the Mackintosh Building finds itself in, through no fault of the MRP1 team. I hope that we do, eventually, learn from what happened to the Building and that the Scottish Government and heritage sector can come together to ensure that these lessons are applied, positively impacting the way we manage our built heritage. As the saying goes; 'those who cannot learn from history are doomed to repeat it'; I do not know what the next chapter of the Mackintosh Building's story will contain, but I know for certain that the Mackintosh Building can be re-created.

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