



Buro Happold
F E D R A

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Glasgow School of Art

The Mackintosh Building

Stage 3 - Fire Protection Strategy Options Summary

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1 Introduction

This summary note has been prepared to outline the findings of stage 1 of the fire engineering appointment and discuss the feasible options available to the owners of the building for the long term protection of the occupants, property and contents of the Glasgow School of Art Mackintosh Building.

Due to the historic nature and value of the property and many of its contents, a fire poses a great threat.

2 Existing Pro's

The existing building has a number of features which are beneficial in protection of the property and contents against fire. These are:-

- Provision of automatic fire detection in certain locations;
- Provision of CCTV in certain areas;
- Occupation of the building on a 24/7 basis; and
- Provision of security staff within the building.

These features should reduce the likelihood of a malicious fire occurring and should ensure that in the event of a fire it is detected at a relatively early stage. This has been borne out in the past where two fires have been detected reasonably quickly and extinguished before a fire has had opportunity to take hold.

3 Existing Cons

Many of the existing features / operational procedures within the building fail to comply with modern fire safety requirements/ legislation and could potentially cause, or contribute significantly to a fire within the building. There is currently a very real threat of a fire not being detected quickly enough and taking hold and spreading through the building which could cause considerable damage. In summary:-

- There is limited structural fire protection;
- There are many routes for fire and smoke to spread;
- There is a high fire loading;
- There are ignition sources present;
- Many of the escape routes are not adequately protected;
- The automatic fire detection system is not a full coverage system;
- There are no fire fighting measures within the building other than portable extinguishers;
- There is no formalised fire safety management plan or risk assessment procedures set in place; and
- The evacuation procedures for disabled occupants are unsafe.

4 Existing Assessment

Our assessment of the risk posed by fire to the current building is as follows:-

- Likelihood/ potential for fire occurring in building – Medium – High risk.
- Potential for fire to remain undetected – Medium – High risk.
- Potential for fire to grow/ spread beyond item first ignited – High risk
- Potential for fire to grow/ beyond room of origin – High risk
- Hazard posed by fire – High risk
- Consequences in the event of fire spreading - High

5 Future Fire Strategy Objectives

The primary objectives for any future fire protection strategy in the building are seen as being:-

- To reduce the likelihood of a fire occurring within the building;
- To detect fire at the earliest opportunity;
- To evacuate the building quickly in the event of fire detection;
- To provide protected escape routes which lead to a place of safety at ground level;
- To provide all occupants with the opportunity to turn and move away from a fire;
- To prevent fire and smoke from spreading throughout the building;
- To contain a fire in the room of origin;
- To minimise damage caused by fire to property and contents;
- To protect the valuable contents/ artefacts from the effects of a fire; and
- To ensure a fire is extinguished quickly and safely.
- To improve evacuation procedures for disabled persons.

These are to be discussed and agreed with the building owners.

6 Fire Protection Improvement Strategy Option 1

In order to fulfil the objectives stated within section 5, the following measures would need to be implemented. This list is not exhaustive at this stage and is produced for illustrative purposes.

- Upgrade the fire detection system to a full coverage system. (Rooms and all voids. Category L1/ P1).
- Possibly increase the coverage of the CCTV system and ensure that this is monitored 24/7.
- Maintain security within the building 24/7.
- Develop and implement a robust fire safety management plan.
- Improve housekeeping measures within the building.
- Re-wire the building.
- Ensure all portable electrical appliances are PAT tested on a regular basis. All sub standard equipment should be disposed of.
- Devise a policy and ensure all flammable liquids etc are controlled and stored safely throughout the building.
- Implement a policy for safely storing combustible materials.
- Upgrade fire protection to all escape stairs to comply with current legislation.
- Provide suitable smoke management procedures in the corridors leading to escape stairs.
- Improve emergency signage and lighting throughout the building to meet current standards.
- Upgrade the integrity and smoke retarding nature of the construction of all rooms.
- Form dedicated fire rated service risers within the building.
- Improve surface spread of flame characteristics of all wall and ceiling surfaces within the building to comply with modern fire safety requirements.
- Form suitable protection to all archive/ storage areas used for the protection of historic artefacts/ contents.
- Train all staff in fire fighting procedures using portable fire extinguishers. Provide fire awareness training to staff.
- Produce and maintain a fire risk assessment for the premises.
- Improve means of escape facilities for disabled occupants.

7 Fire Protection Improvement Strategy Option 2

In order to fulfil the objectives stated within section 5 and as an alternative to Fire Protection Improvement Strategy Option 1, the following measures could be implemented.

- Provision of a property protection sprinkler system throughout the building (Rooms and void protection where necessary).
- Develop and implement a robust fire safety management plan.
- Improve housekeeping measures within the building.
- Re-wire the building.
- Ensure all portable electrical appliances are PAT tested on a regular basis. All sub standard equipment should be disposed of.
- Devise a policy and ensure all flammable liquids etc are controlled and stored safely throughout the building.
- Implement a policy for safely storing combustible materials.
- Improve emergency signage and lighting throughout the building to meet current standards.
- Form dedicated fire rated service risers within the building.
- Form suitable protection to all archive/ storage areas used for the protection of historic artefacts/ contents.
- Train all staff in fire fighting procedures using portable fire extinguishers. Provide fire awareness training to staff.
- Produce and maintain a fire risk assessment for the premises.
- Improve means of escape facilities for disabled occupants.

8 Risk Assessment Following Improvement Works

Our assessment of the risk posed by fire to the building, should either of options 1 or 2 be adopted is as follows:-

- Likelihood/ potential for fire occurring in building – Low
- Potential for fire to remain undetected – Low
- Potential for fire to grow/ spread beyond item first ignited – Low
- Potential for fire to grow/ beyond room of origin – Low
- Hazard posed by fire – Low
- Consequences in the event of fire spreading – Lower than at present.

9 Fire Fighting Facilities and Response Time

The building currently has no recognised fire fighting facilities within it other than portable extinguishers. Strathclyde Fire and Rescue Service will view the building as presenting a higher risk to that of a standard modern commercial property.

Should an alarm occur it is likely that the fire service would respond in around 5 minutes to any incident due to the location of the building and its risk rating. This is borne out by a number of false alarms that have occurred in the past. Such a quick response time could mean that the fire service prevent the entire building and its contents from being lost due to fire. It is worthy to note that the fire service response time cannot be guaranteed in the future and it may well increase due to proposed modernisation changes being made to the service. Reliance on fire service intervention as a means of individually satisfying some of the objectives stated in section 5 of this report is in our opinion, not a viable protection strategy for the property, or its valuable contents.

Fire fighting within the building at the moment would be difficult, arduous and time consuming due to the lack of facilities present i.e. no dry risers within escape stairs. Furthermore water pressures in the vicinity of the building are understood to be poor and insufficient for tackling a large fire in the building. There is currently an inherent risk that even if the fire service responded quickly to an alarm in the building, they would be unable to adequately protect the building and its contents due to the lack of suitable facilities.

One last consideration regarding fire fighting within the building is the potential damage caused to the property and its contents by water discharged during fire fighting. A fire fighters hose will discharge 600 litres of water per minute. This is a vast quantity of water. In comparison a sprinkler head will use six times less water and the vast majority of sprinklered fires (85%) are controlled by less than 4 heads operating.

10 Next Steps

- The building owners should consider this summary paper.
- The building owners should consult with their Insurers and seek feedback on proposed options.
- Budget costs should be compiled for both options outlined within this document.
- A meeting should be held with the Building Owners and Design team to identify the fire protection strategy to be adopted.
- The chosen strategy should be implemented in a realistic and achievable timeframe to the building owners.

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