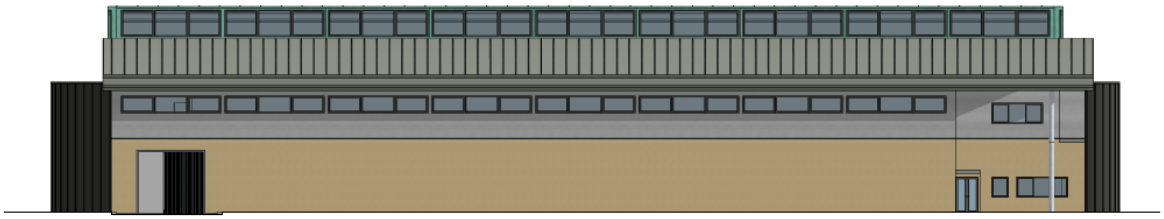
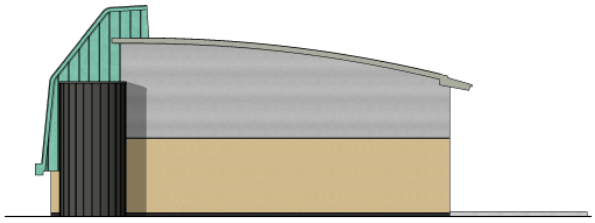
CMP COURSE JUNE 2023

HEALTH AND SAFTEY AND WELFARE

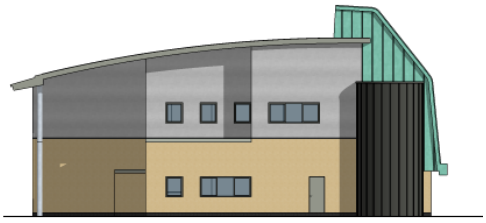
PROJECT - NEW MUESEUM STORAGE FACILITY



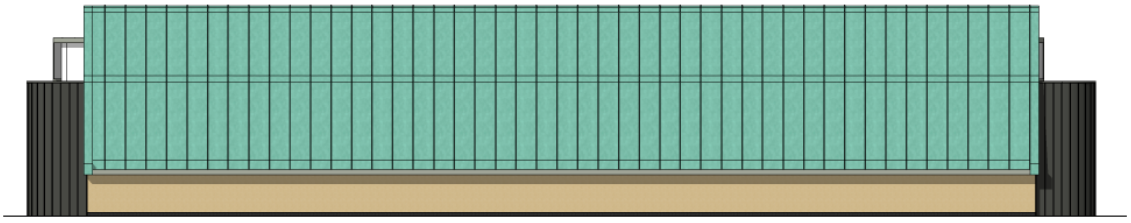
D South Elevation (Front)



D West Elevation



D East Elevation



D North Elevation (Rear)

CONTENTS

1. INTRODUCTION

Our company has been appointed as the main contractor to construct the proposed Museum Storage facility.

The client has requested the project is designed and constructed with maximum protection from fire thus preventing subsequent damage to the artefacts stored there.

The purpose of this report is to capture the applicable UK fire legislation suitable for the storage facility.

The report will also explain and illustrate how both the client's requirements and legislative requirements for fire safety can be achieved.

2. APPLICABLE LEGISLATION

The Museum storage facility design will be subject to Building Regulations 2010: Part B – Fire Safety: Part B.

This document provides details on which the design should adhere to. This is covered in sections listed below.

- Requirements B1 : Means of warning and escape
- Requirements B2 : Internal fire spread (Linings)
- Requirements B3 : Internal fire Spread (Structure)
- Requirements B4 : External Fire Spread
- Requirements B5 : Access and facilities for the Fire service.

(HM Goverment, 2019)

As part of the planning application process the fire brigades advise is usually consulted on with regards to planned developments. They review the proposed plans and the potential fire risks associated with the building design and its proposed use. The design team will have to take cognizance of there considerations and comments.

During the construction process, the works will be covered under CDM regulations, with reference to fire considerations items this will be covered in the sections listed below.

- CDM 2015 Regulation 29 Prevention of risk from fire
- CDM 2015 Regulation 32 Fire detection and fire fighting.

(HM Goverment, 2015)

A construction stage fire risk assessment will have to be undertaken, and the fire brigade should be consulted on the fire strategy throughout the construction process. Best practice would be to provide a fire grab pack which would detail evacuation plans, floor plans and layouts, locations

of wet risers (if applicable), firefighting equipment and locations of hazardous/ highly flammable materials.

Prior to the completion of the construction works we as the main contractor will be legally obligated to provide all relevant fire safety documentation pertaining to constructions works. This is in refence to Regulation 38 extract below.

The person carrying out the work shall give fire safety information to the responsible person not later than the date of completion of the work, or the date of occupation of the building or extension, whichever is the earlier.

In this regulation— "fire safety information" means information relating to the design and construction of the building or extension, and the services, fittings and equipment provided in or in connection with the building or extension which will assist the responsible person to operate and maintain the building or extension with reasonable safety; (HM Goverment , 2010)

Following occupancy of the building the client or proposed tenants will have to comply with the Fire Safety Order 2005. A new fire risk assessment will have to be completed before occupation. (HSE Gov, 2023)

3. DETAILED ILLUSTRATED REPORT

Given the Museum comprises of 2no floors this would be classed as a multi-story. For multi-story buildings with a low fire risk, the travel distance to a means of escape is typically limited to a maximum of 45 meters. See below illustrations indicating the proposed fire plan and escape strategy

for the Museum storage facility. Would note the longest route is on the first floor where the distance from the center of the floorplate to the stair is 30.829 meters. This is shown highlighted yellow to take into account the bend around the lift shaft.

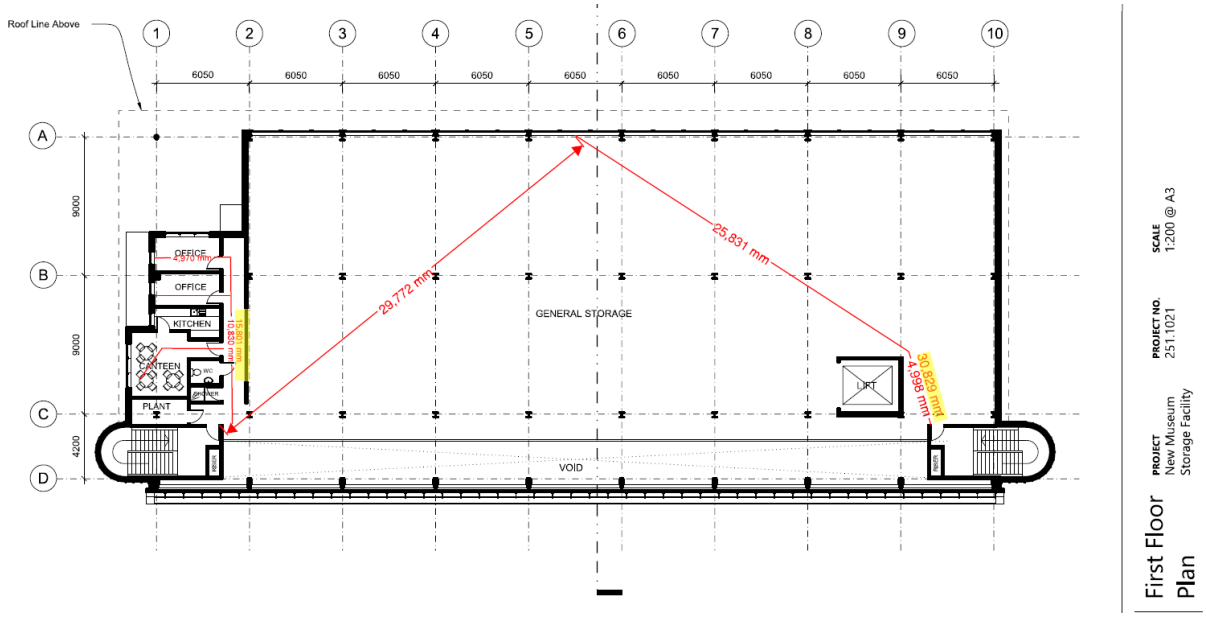


Figure 1 (Sketch First floor plan)

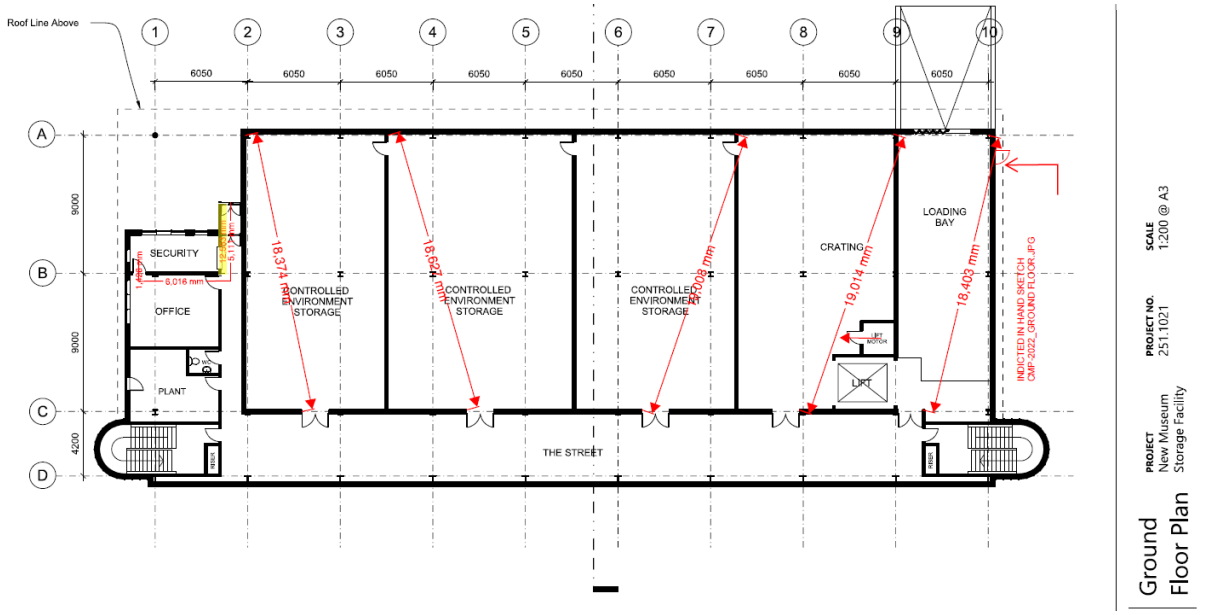


Figure 2 (Sketch Ground floor plan)

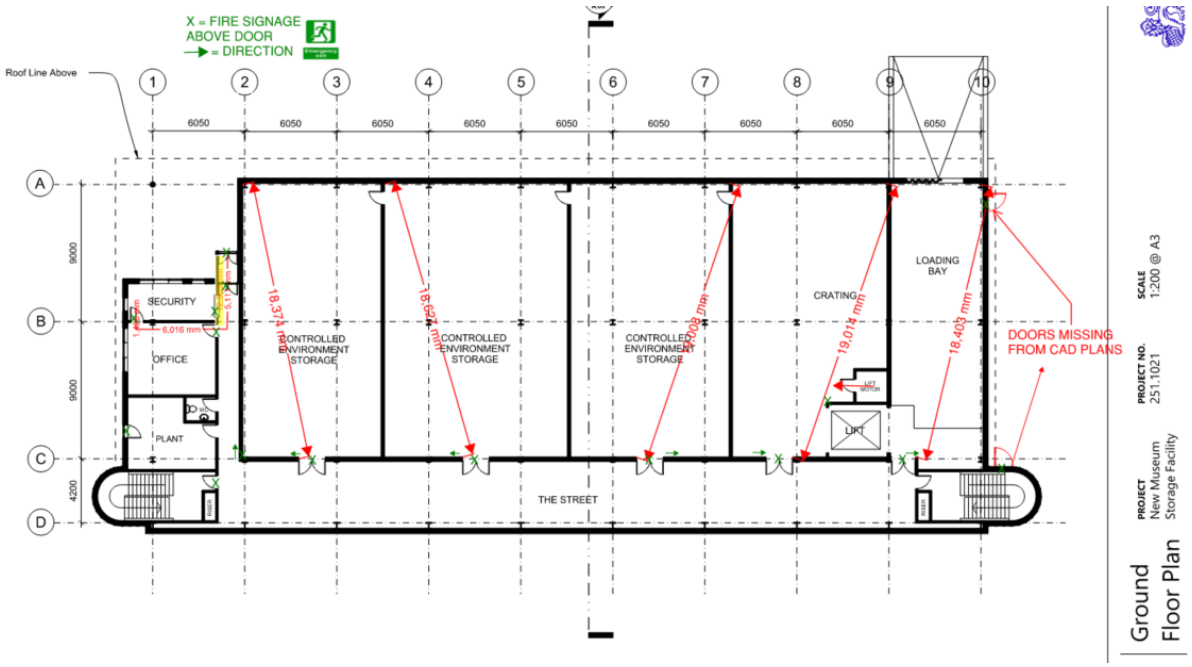
Would note that we have added an additional door in on gridline 10 as this was sketched by the architect but not included on the CAD drawings. This will be required as 2no MEO (methods of escape) are compulsory.

The fire strategy for the building should include the installation of a fire alarm system this will in Line with BS 5839-1. The standards stipulate that a fire detection system is designed by a competent person, this competent person should also take responsibility for signing a design certificate.

Below are calculations show areas of each identified on each floor.

Location	Level	Floor area (m2)
Controlled environment storage	Ground Floor	Room 1 (GL 2 & 3) – 164 Room 2 (GL4 & 5) – 218 Room 3 (GL 6 & 7) – 189
Office	Ground Floor	33
Crating	Ground Floor	180
Loading Bay	Ground Floor	108
Security	Ground Floor	13
Kitchen	First Floor	9
Office	First floor	Office 1 – 10 Office 2 – 9
General Storage	First Floor	958

In order to meet current legislative requirements & the clients requirements an L2 system should be incorporated, this would provide comprehensive coverage in all areas including escape routes. The system will include smoke detectors in every room and multi-use smoke & heat in the kitchen facilities. For the general storage area on the first floor which is sized at 958 meters, multiple detectors may be required. This will be determined by the fire risk assessment.



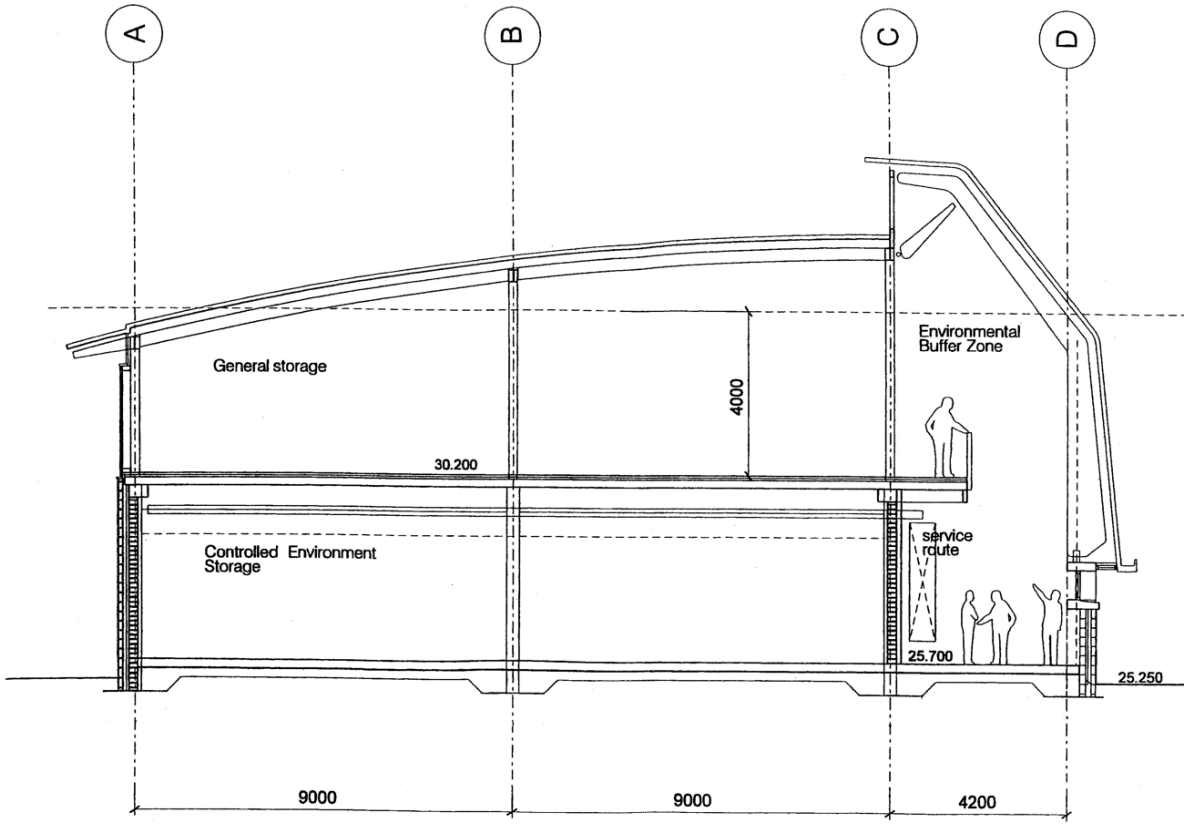


Figure 3 (Storage Facility Drawing Pack_F01)

Given the clients request for maximum protection we should consider beam detection. This is suitable for areas where floor to floor heights are above 4m as noted in the above diagram. This will be more practical is it can increase coverage in comparison to regular smoke detectors and provide the client with a robust system.

LED EML (LED Emergency Lighting) should be installed in accordance with BS 5226 to ensure safe evacuation of the building in the event of an emergency. All rooms noted above in the facility will require emergency lighting. The frequency of the lighting will be determined by a competent person carrying out a risk assessment, this assessment will review many factors such as occupancy and potential use of the spaces in question.

Emergency signage will have to be installed in accordance with B5499, each room will require at least 1no emergency sign indicating the location of the nearest emergency exit, the signage should be done taking into account any changes in direction in accordance with the fire plan/ risk assessment. The above noted distances diagram detail. Ground floor emergency exist signage should be places above each door as shown below.

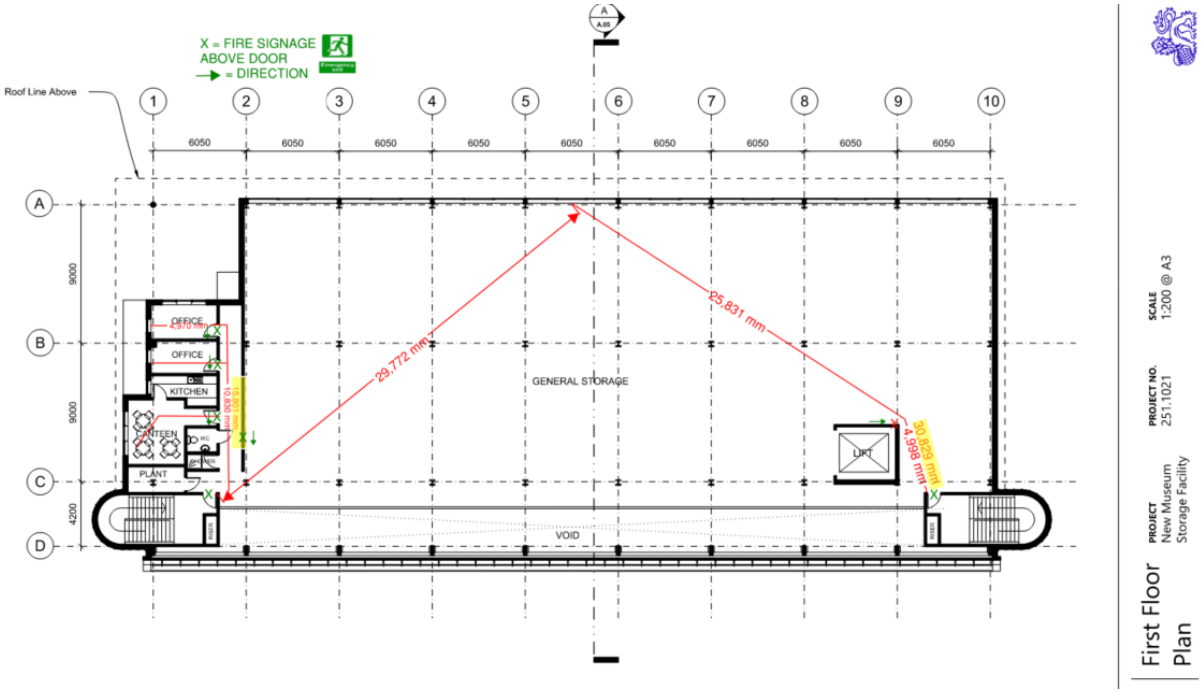
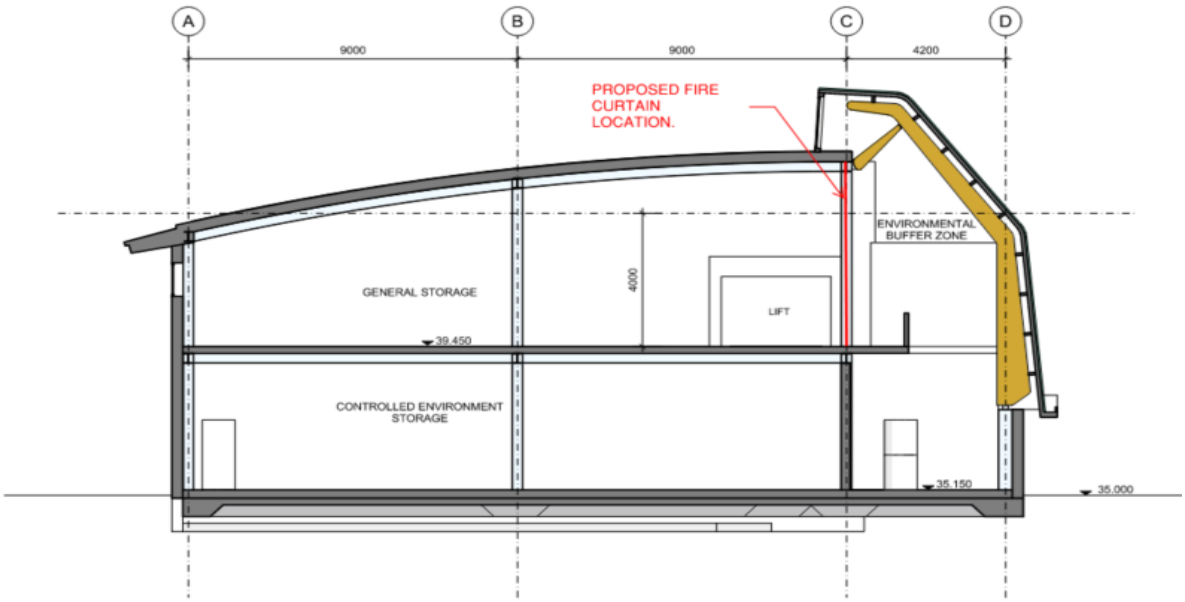


Figure 4 (Emergency exists plan - Storage Facility Drawing Pack_F01)

Further to above the mark up more factors will have to be considered when the design is formalized, the orientation of the doors will have to be reviewed, all doors should be a “push” exist and be the doors should be orientated in the direction of exit. Given the clients request for maximum protection for the valuable artifacts a fire curtain solution should be considered on the first floor at the void space, the curtain should be installed on gridline C column line, this would provide 60-minute protection and could still provide the architects vision of an open plan atrium.



Proposed Fire Curtain (Storage Facility Drawing Pack_F01)

Assembly/ Muster point is located in the adjacent car park. Shown below.

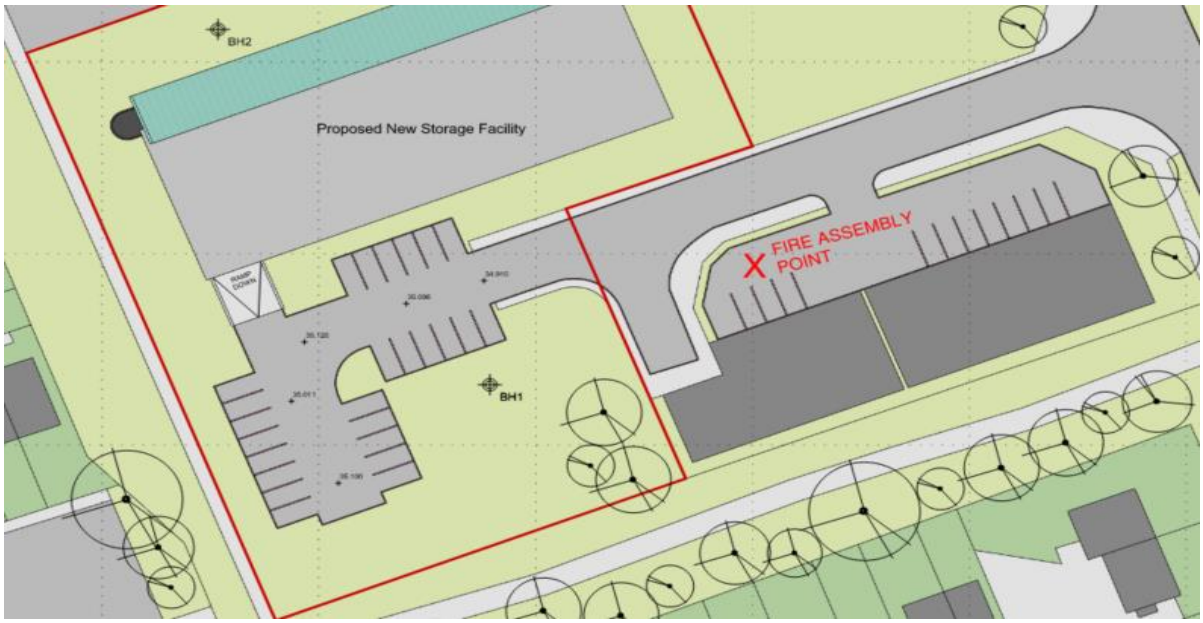
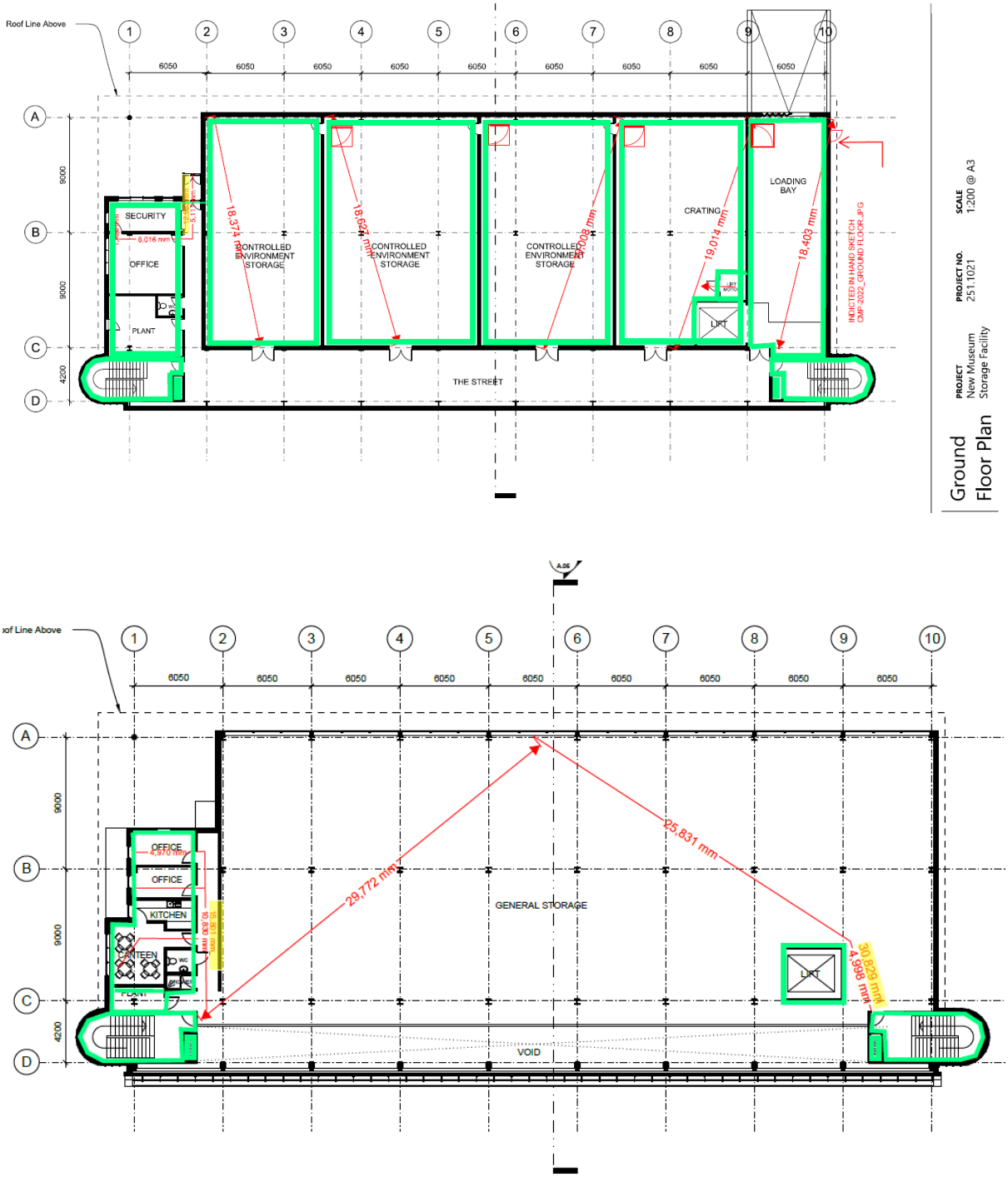


Figure 5 (Fire Assembly Point Storage Facility Drawing Pack_F01)

Given the proposed use of the building as a storage facility a sprinkler system will not be appropriate, this would have potential to damage artifacts. In the event of a small fire this could potentially cause more damage than a fire itself. A gas suppression system may be more appropriate. Any gas suppression system would have to comply with BS EN 15004.

The museum facility has given prior notice that it plans to store highly flammable liquids on site to assist with cleaning of the artifacts. Given this is known a DSEAR (Dangerous Substances and Explosive Atmospheres Regulations) assessment should be completed this assessment should capture several critical items, including the identification of any dangerous substances, assessment of fire and explosion and associated risks, the pertinent risk control measures required, hazardous area classification, emergency preparedness and employee training and information & review and monitoring.

With regards to fire compartmentation, in order to comply with Building regulations & Fire Safety Order 2005 60-minute fire compartments are required. The below illustrations will delineate the requirements. 60-minute fire protection is required to the proposed escape routes.



Figures 6 & 7 Fire comparts (Storage Facility Drawing Pack_F01)

The compartment acts as barriers to prevent the spread of fire and smoke to other parts of the building, this would limit damage to the valuable artifacts in the event of a fire and allow time for the occupants to escape. Fire compartments help assist the fire brigade by providing selected zones to focus on for the fire bridge to combat in the event of an emergency.

The museum storage facility may which to implement a salvage plan for the facility. This would outline the actions and procedures required to minimize the damage to the artefacts, this would include an emergency response team, this team made up of museum staff who have knowledge of

the artefacts and the relative conservation methods. This may involve a more complex alert system for example an intercom or a bespoke emergency alert system linked to the local relevant fire service. This salvage plan will likely include a plan for prioritization. This will classify items by value, rarity or historical significance, the plan will include a strategy for retrieving these items. This strategy will detail the relevant equipment and ensure it is readily available. Equipment such as fire-resistant gloves, plastic sheeting, packing materials.

4. BIBLIOGRAPHY

HM Goverment . (2010). *The Building Regulations.* Retrieved from https://www.legislation.gov.uk/uksi/2010/2214/regulation/38/made

HM Goverment. (2015). *HSE GOV.* Retrieved from https://www.hse.gov.uk/construction/safetytopics/processfire.htm

HM Goverment. (2019). *Approved Document B (fire safety) volume 1: .* Retrieved from HMGOV website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1124733/Approved_Document_B__fire_safety__volume_1_-_Dwellings__2019_edition_incorporating_2020_and_2022_amendments.pdf

HSE Gov. (2023). *Process Fire Risks*. Retrieved from HSE.GOV.UK: https://www.hse.gov.uk/construction/safetytopics/processfire.htm