

**Enfys Developments Ltd**

**Residential/Office  
Development**

**Cardigan Memorial Hospital**

**Fire Strategy Report**

**December 2023**

**hnla** fire engineering

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# 1 Introduction

HNLA Fire Engineering has been appointed by Enfys Developments Ltd. to provide a fire strategy report for a mixed-use development at the site of Cardigan Memorial Hospital, Cardigan

This report for RIBA Stage 3 is designed to act as a basis for compliance with Part B of the Building regulations 2010 as amended. The design has been reviewed by Ceredigion County Council, Building Control

Fire safety provisions for new buildings and conversions of existing buildings are enforced under The Building Regulations 2010. The standards laid down under the Regulations are functional and state only the aim to be achieved by the Regulations

Guidance on achieving compliance with the Regulations is contained in Approved Document B to the Building Regulations (for use in Wales). An alternative approach may be adopted using British Standard 9999:2017 and BS9991:2015.

This report follows the guidance in BS9999 and BS9991. Where there are any deviations from the guidance, these are fully discussed.

The Regulatory Reform (Fire Safety) Order 2005 (RRO) will apply to the completed buildings.

This report should be read in conjunction with the relevant plans for the building.

This report is based on plans provided by Gaunt Francis Architects.

20041-GFA-CA-00-DR-A-11701 rev 04 Cambria GA Plans  
20041-GFA-O-00-DR-A-11501 rev 05 Ground Floor Plan  
20041-GFA-O-01-DR-A-11502 rev 05 First Floor Plan  
20041-GFA-O-02-DR-A-11503 rev 05 Second Floor Plan  
20041-GFA-O-LG-DR-A-11500 rev 05 Lower Ground Floor Plan  
20041-GFA-O-RP-DR-A-11504 rev 05 Office Roof Plan  
20041-GFA-ZZ-ZZ-DR-A-10017 Rev 07 Proposed Site Layout  
20041-GFA-ZZ-ZZ-DR-A-11500 rev 01 Residential Floor Plans

Fire plans are included with this report.

## 2 Description of the Project

The project comprises new build residential and the refurbishment/extension of the existing Nash House building.

The residential accommodation consists of 3 connected blocks.

Block	Apartments GF	Apartments 1 <sup>st</sup> Floor
A	2	2
B	5	5
C	2	4

Flats are open provided with open deck access/egress

Nash house will be converted and extended to form an office building comprising Ground, 1<sup>st</sup> and 2<sup>nd</sup> Floors. A café will be provided on the Ground Floor

### 3 Sprinkler System

All flats will be provided with a Category 1 sprinkler system in accordance with BS 9251:2021 and will cover all flats with the following characteristics.

Design density 2.04mm/min.

Number of sprinklers 1.

Duration of water supply 10 min.

Since the flats are served by open balconies, it is not considered appropriate to provide sprinklers in common areas.

## 4 Risk Profile (non-residential)

### 4.1 Occupancy Characteristics

Use	Occupancy Characteristic	
Offices	A	Awake and familiar with the building
Café	B	Awake but may be unfamiliar with the building

### 4.2 Fire Growth Rate

All areas of the building with the exception of hazard rooms would be regarded as Category 2.

### 4.3 Risk Profile

For simplicity the entire building will be classified as Risk profile B2.

## 5 Management

Management of fire safety is crucial to the success of any fire safety scheme. Once the building is occupied, management procedures are enforced under the Regulatory Reform (Fire Safety) Order 2005.

BS9999 includes requirements for management of fire safety as part of the overall risk relevant approach.

The minimum Management Level specified in BS9999 is **Level 1**.

A Fire Safety Manual for the building should be developed prior to occupancy by the owners or occupiers. The manual should detail objectives and procedures which

achieve a level 1 Management Level as a minimum. The Fire Safety Manual covers the following subjects:

- Planning for changes in risk profile
- Resources and authority
- Staffing level (staff–occupant ratio)
- Fire training
- Work control
- Communications procedures
- Maintenance and testing of fire safety systems
- Liaison with the fire and rescue service
- Contingency planning

## **6 Fire Protection Measures**

### **6.1.1 Fire Detection and Alarm System**

#### **Non Residential Areas**

From Table 7, a minimum type M fire detection and alarm system is required in accordance BS5839-1:2017. In addition an L2 automatic fire detection and alarm system will be provided in accordance with BS5839-1.

Actuation of the fire detection system will initiate evacuation in all non-residential areas.

#### **Residential Areas**

Individual flats will be provided automatic fire detection and alarms systems in accordance with BS5839-6:2019. The system will be Category LD1 Grade D1.

### **6.1.2 Artificial and Emergency Escape Lighting**

Emergency escape lighting will be provided in accordance with BS5266-1:2016 to all escape routes.

### **6.1.3 Fire Safety Signage**

Every doorway or other exit providing access to a means of escape, other than exits in ordinary use (e.g. main entrances), should be distinctively and conspicuously marked by an exit sign in accordance with BS ISO 3864-1 and BS 5499-4.

### **6.1.4 Access Control**

Doors should be provided with the following facilities.

They release automatically on:

Failure of the electricity supply.

Operation of the fire alarm system.

Operation of a green break glass box situated adjacent to the doors.

### 6.1.5 Automatic doors

They should open automatically on:

Failure of the electricity supply.

Operation of the fire alarm system

Operation of a green break glass box situated adjacent to the doors.

### 6.1.6 Other Provisions

All other fire safety provision will be designed in accordance with BS9999.

## 7 Means of Escape (non-residential areas)

### 7.1 Evacuation

All non-residential areas will be designed for total evacuation immediately on activation of the fire detection and alarm system.

### 7.2 Occupancy

	Area (m <sup>2</sup> )	Floor space factor (m <sup>-2</sup> )	Occupancy
Lower Ground Floor Offices	100	6	17
Ground Floor Café	Estimated	less than 50	50
Ground Offices	60	6	10
1 <sup>st</sup> Floor	150	6	25
2 <sup>nd</sup> Floor	66	6	11

#### 7.2.1 Travel Distances

From Table 11 and Clause 18, travel distances are increased by 15% where automatic fire detection is provided.

The travel distances shown below are applied.

	Single direction (m)		Two directions (m)	
	Actual	Direct	Actual	Direct
B2	23	15	57	38

All travel distances will be within the above limits.

#### 7.2.2 Exit Widths

From BS9999 Table 12 and Clause 18, exit width capacities are increased by 15% where automatic fire detection is provided.

	Exit width per person	Capacity of 850mm exit	Capacity of 1050mm exit
B2	3.5	142	300

## Lower ground Floor

Exit	Minimum width	Capacity
To Stair 1	850	142
To Stair 3 (external)	850	142

The total maximum occupancy of the Lower Ground Floor is less than 60.

Escape widths are therefore satisfactory.

## Ground Floor

Exit	Minimum width	Capacity
To main entrance	850	142
To stair 2 entrance	850	142

The total maximum occupancy of the Ground Floor is less than 60.

Escape widths are therefore satisfactory.

## 1<sup>st</sup> Floor

Exit	Minimum width	Capacity
Stair 1	850	142
Stair 2	850	142

The total maximum occupancy of the 1<sup>st</sup> Floor is less than 60.

Escape widths are therefore satisfactory

## 2<sup>nd</sup> Floor

Exit	Minimum width	Capacity
Stair 1	850	142

The total maximum occupancy of the 2<sup>nd</sup> Floor is less than 60.

Escape widths are therefore satisfactory.

### 7.2.3 Open Spatial Planning

A void connects the Ground and 1<sup>st</sup> Floors. The void is not considered to be an atrium as defined in BS9999. Means of escape should not pass within 4.5m of an unprotected void edge unless an alternative escape route is available.

Means of escape is available from the 1<sup>st</sup> Floor offices via Stair 8 which does not pass within 4.5m of the void edge.

### 7.3 Vertical Escape (non-residential areas)

Stair 7 will be a protected stair, a minimum of 1100mm wide.

The stair serves the Lower Ground, 1<sup>st</sup> and 2<sup>nd</sup> Floors.

BS 9999 17.5 allows a stair to serve a basement and upper floors if a fire resistant ventilated lobby is provided at basement level.

The stairs are also lobbied on the Ground and 1<sup>st</sup> Floors.

Stair 8 is an existing stairs, 960mm wide with spiral winders.

The stairs serves as an alternative means of escape for the 1<sup>st</sup> floor office only.



The maximum occupancy of the office is 20 and the escape route is considered adequate for the number of people.

### Stair Capacity

Stair Number	Effective Width (mm)	Floors served	Width of stair/person	Capacity
7	1100	2	4	275
8	960	1	N/A	20

## 7.4 Means of Escape for Disabled Persons

It should be noted that the facilities described below will meet the recommendations of BS9999. It will be the responsibility of the organization running the building to ensure that adequate facilities are provided for people who may require assistance in evacuation.

### 7.4.1 Ground Floor

Level and ramp egress is available via the Main Entrance and the Stair 7 exit

### 7.4.2 Other Floors

Refuges (minimum 900mm x 1400mm) will be provided in Stair 7.

It is not feasible to provide refuges in Stair 8 or the external stair serving the Lower Ground due to the layout of the existing building. Travel distances via these routes are short and are considered acceptable, provided that procedures are put in place to rapidly assist in evacuation of these areas.

## 7.5 Communication

An emergency voice communication (EVC) system will be provided for each refuge.

The EVC system should conform to BS 5839-9:2021 and consist of Type B outstations which communicate with a master station located in a suitable control point at fire and rescue service access level.

## 7.6 Emergency Lighting

Emergency lighting should be provided in all common areas in accordance with BS 5266-1:2016.

## 7.7 Fire Safety Signage

Every doorway or other exit providing access to a means of escape, other than exits in ordinary use (e.g. main entrances), should be distinctively and conspicuously marked by an exit sign in accordance with BS ISO 3864-1:2011 and BS 5499-4:2013.

## 8 Means of Escape (Residential Areas)

Residential areas will not automatically evacuate the building. The residential parts of the building are designed to support a stay-put policy. Full evacuation may be initiated by the fire and rescue service or by residents if desired.

## 8.1 Horizontal Means of Escape

### 8.1.1 Within Flats

#### Ground Floor

All flats will be provided with escape windows in accordance with BS9991 Clauses 5.1 and 9.3(a).

Escape windows should have an unobstructed openable area that is a minimum of 0.33 m<sup>2</sup>, having the minimum dimensions of 450 mm in height and 450 mm in width.

The bottom of any openable area should be not more than 1100 mm above the floor of the room in which it is situated.

#### 1<sup>st</sup> Floor

With the exception of Apt A4, all flats are open plan with bedrooms which are accessed via the living/dining/kitchen area.

The design of open plan flats is covered in BS9991 Clause 9.7.

All flats will be provided with a sprinkler system and an LD1 fire detection and alarm system.

The flats do not exceed 16m x12m.

The flats are on a single level.

The ceilings of the flats should be at least 2.25m in height.

Cooking appliances should not be sited adjacent to the flat entrance

BS9991 imposes a limit on the dimensions of a flat with an open kitchen to 8m x 4m. Open flats in the development exceed this limit.

The principal fire risk in kitchens is from a fire occurring in a pan on a cooking hob. This risk can be substantially reduced by using cooking hobs which do not retain heat when switched off. If these types of cooking hobs are provided with appropriate facilities to shut them off on detection of a fire, the size of the fire can be reduced and the likelihood of automatic water fire suppression systems extinguishing the fire increased.

The following measures will be provided to reduce the fire risk from an unenclosed kitchen.

Cooking hobs appliances will be sited at least 2m from the entrance door to the flat.

Cooking hobs will be provided with an automatic shut off facility complying with BS EN 50615:2015.

The above facilities are considered to provide an equivalent level of safety to the provision for enclosure of kitchens given in Clause 9.7

Apartment A4 is provided with an entrance hall. Travel distance within the flat is less than 9m. The flat is compliant with BS9991, 9.4.2 and Figure 10(b).

## **8.1.2 In Common Areas**

### **Ground Floor**

In accordance with BS9991 Clauses 6.1 and 7, Ground Floor flats are provided with direct access to the exterior and escape windows.

### **1<sup>st</sup> Floor**

With the exception of Block A, flats are provided with means of escape via open balconies with escape in 2 directions in accordance with BS9991 para 7.3.

The balconies are less than 2m wide. In accordance with BS9991 Para 7.3 (d), down-stands are not required.

All surfaces in the balcony areas should be a minimum Class B-S3,D2 (BS 13501-1).

The structure of the balconies should achieve at least 30 minutes fire resistance and floors should be imperforate.

Escape via the balcony on Block A is in a single direction.

Flats opening onto the balcony in block A should be provided with fire resistance to balcony wall up to a height of 1100mm above floor level (BS9991 Figure 5(b)).

## **8.2 Vertical Means of Escape**

3 escape stairs are provided.

Stair 2, located between blocks B and C, is the main entrance and will be used for fire fighting. The stair connects all floors and should be at least 1100mm wide.

Stairs 1 and 3 should be at least 750mm wide

A single openable vent (1.0m<sup>2</sup>) should be provided at the highest floor level in each stair.

## **8.3 Emergency Lighting**

Emergency lighting should be provided in all common areas in accordance with BS 5266-1:2016.

## **9 Internal Fire Spread (Linings)**

All circulation spaces will be class B-s3,d2.

All other rooms will be a minimum C-s3,d2; with respect to surface classification.

## **10 Internal Fire Spread (Structures)**

### **10.1 Structural Fire Resistance**

The buildings are less than 18m above Ground Level

All structural elements should provide 60 minutes fire resistance.

The exterior balconies should provide a minimum 30 minutes fire resistance.

## 10.2 Compartmentation

Compartmentation will be provided according to the tables below.

### Non-residential

	Fire resistance (minutes)	
	Integrity	Insulation
Separating stairs	30	30
Separating stair lobbies	30	30
Risk rooms	30	30

### Fire Doors

	Fire resistance (minutes)
	Integrity
Fire doors to stairs and lobbies	30s
Risk Rooms	30

### Residential

	Fire resistance (minutes)	
	Integrity	Insulation
Floors	60	60
Separating flats	60	60
Separating stairs from flats	60	60
Separating stairs from balconies	30	30
Separating Apts A3 and A4 from balconies up to 1100mm	30	30

Compartmentation should continue to through roof voids to the roof where applicable

### Fire Doors

	Fire resistance (minutes)
	Integrity
Doors to flats	30s
Doors to stairs	30s

### Protected Shafts

Any protected shafts should provide a minimum 60 minutes fire resistance.

## 10.3 Concealed Spaces

Cavity barriers will be provided in accordance with BS9999 Clause 33, Figure 35 and Table 32.

# 11 External Fire Spread

## 11.1 Building Envelope

The buildings are less than 11m in height.

There are currently no restrictions on the use of combustible materials within the building façade.

Cavity barriers and fire stopping should be provided where appropriate at junctions of compartment wall and floors.

Cavity barriers should be provided where appropriate around windows and doors and at edges of cavities.

## 11.2 Space Separation

In accordance with BS9999 Clause 35.3.5(b) the Enclosing Rectangles method given in BR 187:2014 has been used to evaluate the building.

The closest boundary to the buildings is the centre line of Pont Y Cleifon which is approximately 6.5m from Block A.

The maximum size of any emitter on this elevation will be contained within an enclosing rectangle 15m x 3m.

At distance of 4m, 100% of the elevation may be unprotected.

All other elevations are remote from nearby buildings and no protection to elevations should be required.

## 11.3 Roof Coverings

The buildings are at least 6m from any boundary.

All roof coverings to new build roofs should meet as a minimum  $E_{ROOF}(t4)$  (BS EN 13501-5).

# 12 Firefighting Facilities

## Residential

The buildings are less than 11m in height.

Firefighting stairs are not required.

BS 9991 Para 50 specifies that fire mains should be provided where the distance to a fire appliance access point is greater than 45m.

All flats within Block A are within 45m of an access point.

A single dry fire main will be provided with outlets in the lobbies to the central stairs. The outlets are positioned so that all flats in Block B and C are within 45m of an outlet.

The inlet for the main should be located on Pont Y Cleifon where there is access for fire appliances.

The inlet is within 18m of the vertical section of the main (BS9990).

### **Non-Residential**

The building is less than 11m in height and less than 2000m<sup>2</sup> in area.

Vehicle access is provided to within 45m of every point on the footprint of the building.

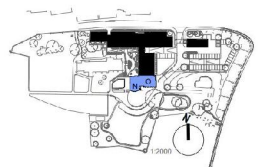
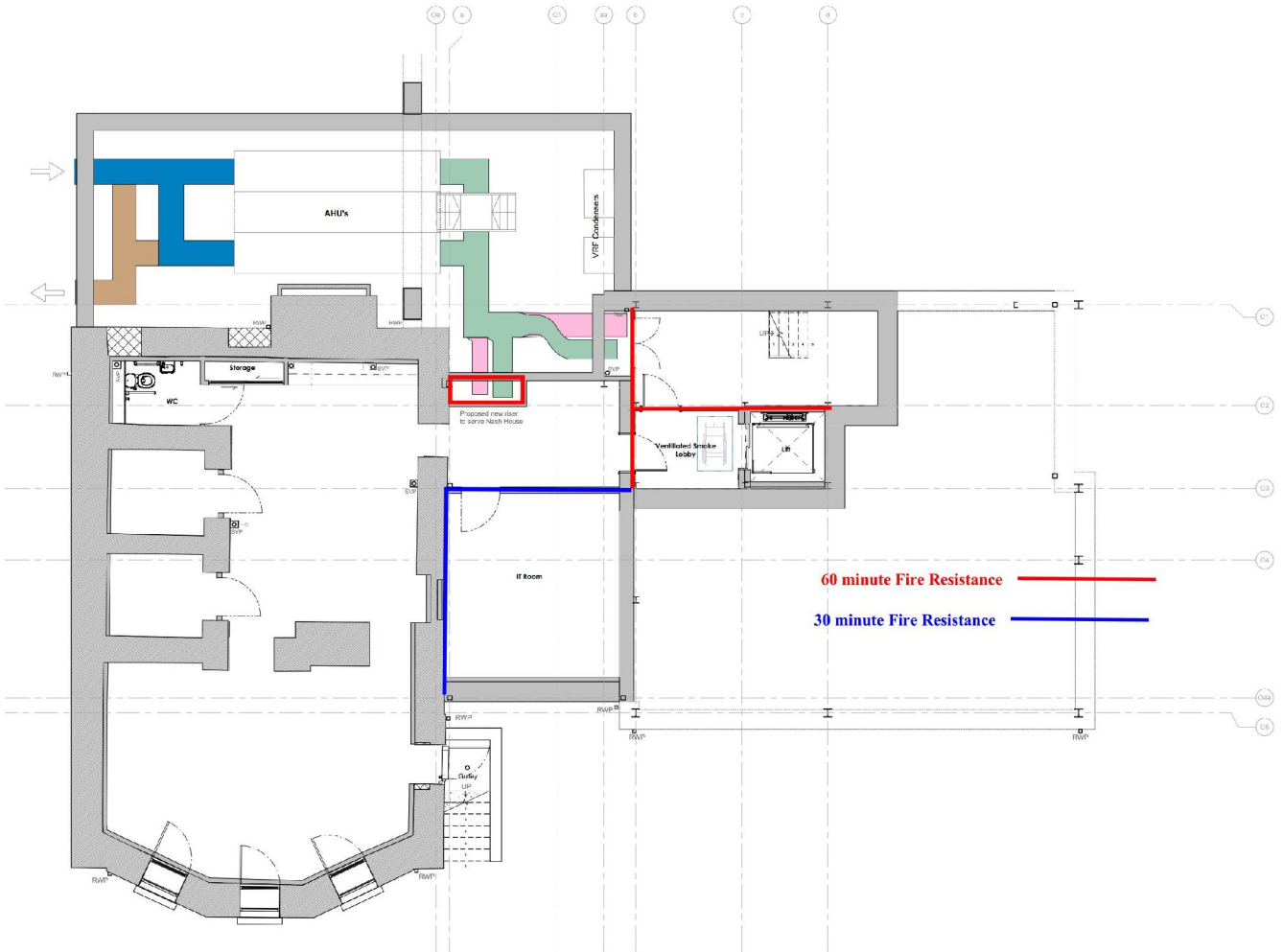
## **12.1 Fire Hydrants**

There are existing fire hydrants on Pont-Y-Cleifon.

A hydrant is located near the junction of Blocks A and B

A hydrant is located at the junction with the entrance road to the buildings.

Hydrants are within 90m of the dry riser inlet, the entrances to each stairs in the residential areas and the main entrance to the office building.



**GA - Offices - Lower Ground Floor Plan**  
1 : 50

05	Rev 05	PL	RD	12/1/23
04	Rev 04			
03	Rev 03			
02	Rev 02			
01	Rev 01			
Rev Description		Initials	Checked	Date
<small>           To ensure compliance with all applicable standards, products and materials must be approved by the relevant authority prior to construction. An alternative approval for products and materials to those specified is permitted where the design is substantiated.         </small>				
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<b>Client</b> <b>WWHA</b>				
<small>Project</small> <b>Cardigan Memorial Hospital</b> <b>EMPLOYERS REQUIREMENTS</b>				
<small>File</small> <b>Proposed</b> <b>GA</b> <b>Offices</b> <b>Lower Ground Floor Plan</b>				
<small>Drawings No</small> <b>20041-GEA-O-LG-DB-Ar-11500</b>				<small>Scale</small> <b>1 : 50</b>
<small>Contractor</small> <b>WJ</b>		<small>Start</small> <b>03/23</b>		<small>End</small> <b>03/23</b>
<small>Drawn</small> <b>DS</b>		<small>SL</small> <b>RD</b>		<small>10/03/23 </small>

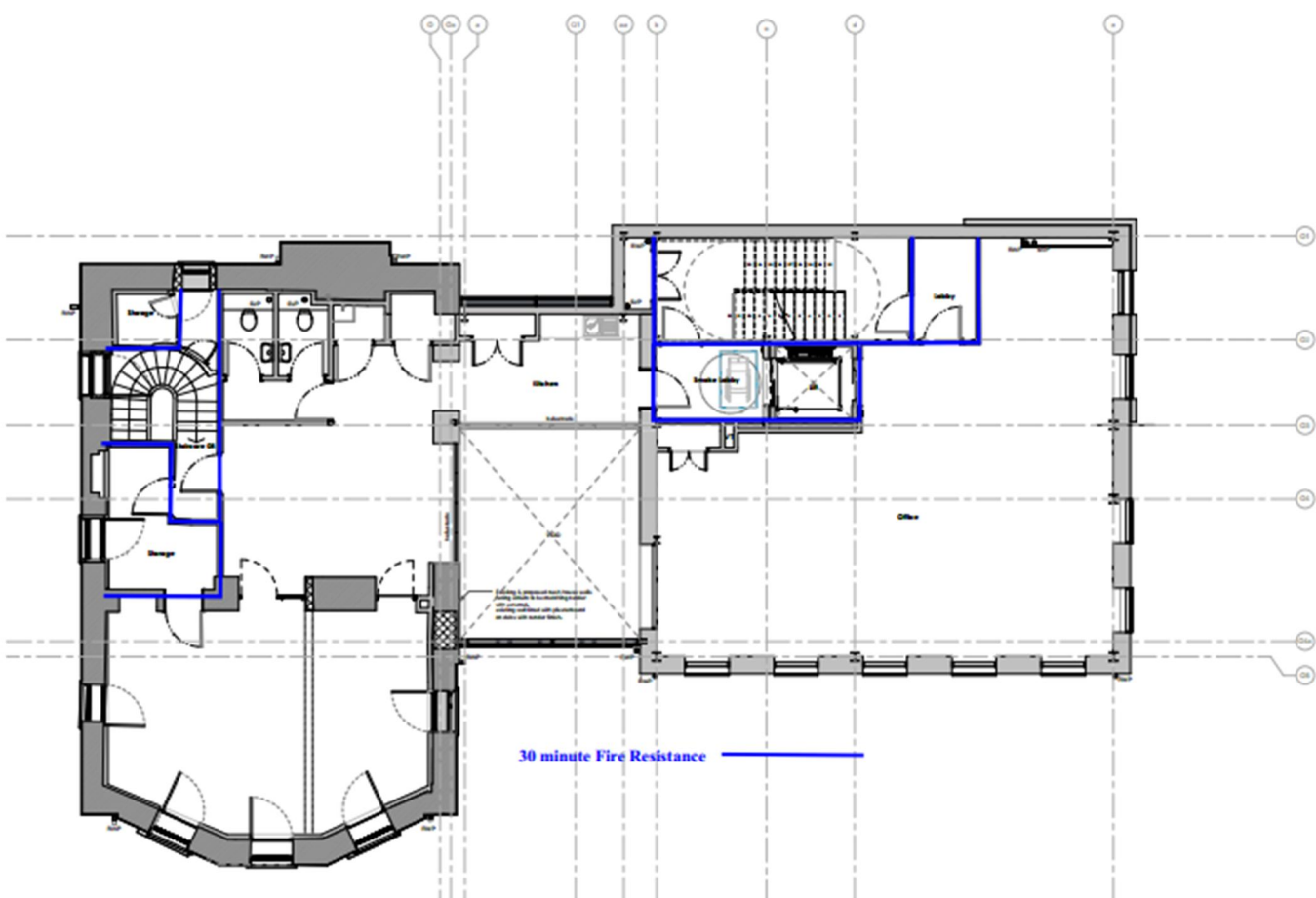
**GAUNT FRANCIS**  
 Architects

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13/03/2023-02







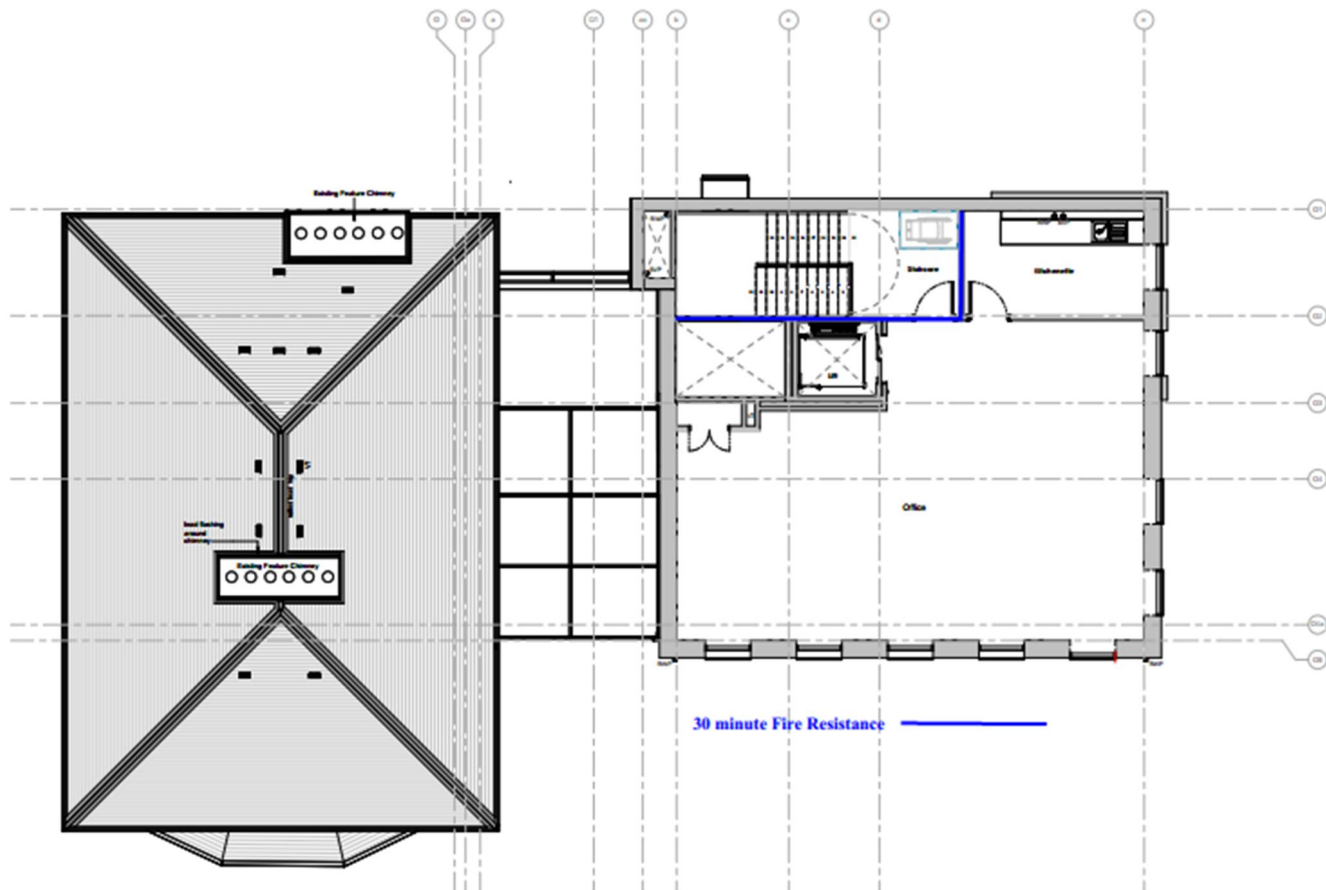
30 minute Fire Resistance

GA - Offices - First Floor Plan  
1 : 50



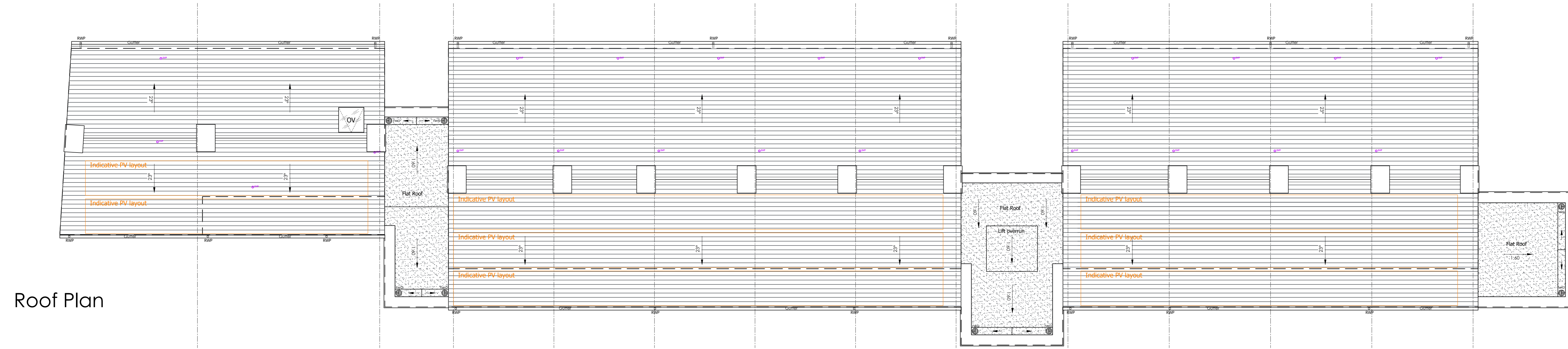
NO.	DESCRIPTION	DATE	BY
01	ISSUE FOR PERMITTING	01/15/10	JF
02	ISSUE FOR PERMITTING	01/15/10	JF
03	ISSUE FOR PERMITTING	01/15/10	JF
04	ISSUE FOR PERMITTING	01/15/10	JF
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09	ISSUE FOR PERMITTING	01/15/10	JF
10	ISSUE FOR PERMITTING	01/15/10	JF

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 PROJECT  
 Cardigan Memorial Hospital  
 EMPLOYERS REQUIREMENTS  
 NO.  
 Proposed  
 GA  
 Offices  
 First Floor Plan  
 SCALE  
 1/8" = 1'-0"  
 DATE  
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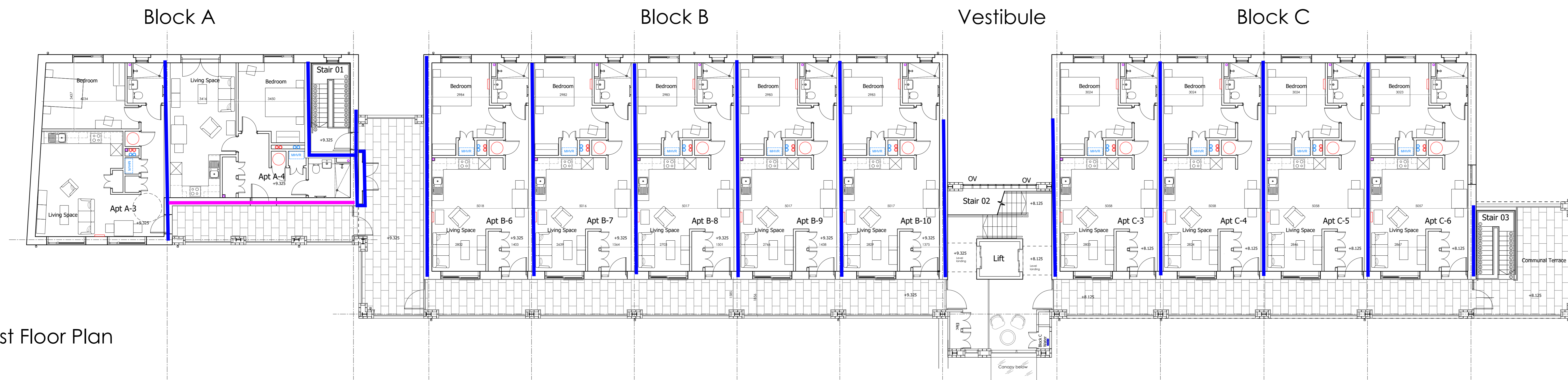


GA - Offices - Second Floor Plan  
1:50

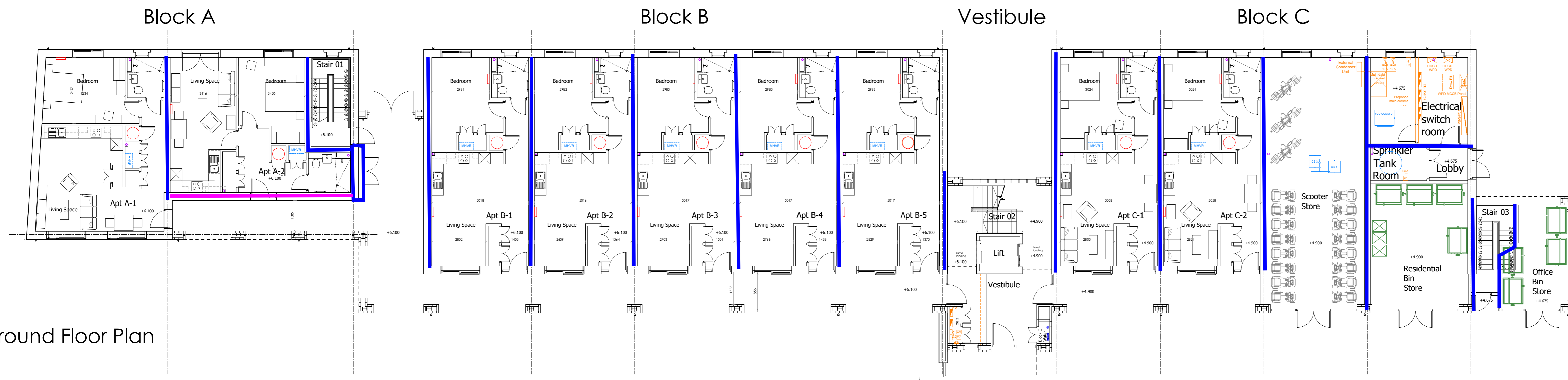
Architect	GAUNT FRANCIS ARCHITECTS
Project	Cardigan Memorial Hospital EMPLOYERS RECOGNIZEMENT
Proposed	GA OFFICE SECOND FLOOR PLAN
Scale	1:50
Date	11/10/10
Author	GAUNT FRANCIS ARCHITECTS
Checked	GAUNT FRANCIS ARCHITECTS
Approved	GAUNT FRANCIS ARCHITECTS



Roof Plan



First Floor Plan



Ground Floor Plan

- 60 minute Fire Resistance
- 30 minute Fire Resistance
- FR 1100mm above floor level (BS9991 Figure 5(b)).

# RESIDENTIAL - FLOOR PLANS

Client  
WVHA

Project  
Cardigan Memorial Hospital

Title  
Residential  
Proposed Floor Plans

Drawing No  
20041 -GFA-ZZ-DR-A-11500

Rev Drawn Date Scale  
01 RD 02/11/23 1:100 @A0

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